

[54] **SUPPORT BRACKET FOR CONCRETE FORM**

[76] Inventor: **Dwight W. Carr**, Rt. 1, Box 459,
Casa Grande, Ariz. 85222
[22] Filed: **July 16, 1973**
[21] Appl. No.: **379,787**

[52] U.S. Cl. **249/192, 249/216, 249/219 W**
[51] Int. Cl. **E04g 11/06**
[58] Field of Search **249/216, 217, 218, 219 R,**
249/219 W, 36, 44, 192

[56] **References Cited**

UNITED STATES PATENTS

3,030,059	4/1962	Jahn	249/219 W
3,216,690	11/1965	Jahn	249/219 W
3,374,984	3/1968	Mueller	249/216
3,697,039	10/1972	Phelps	249/219 R

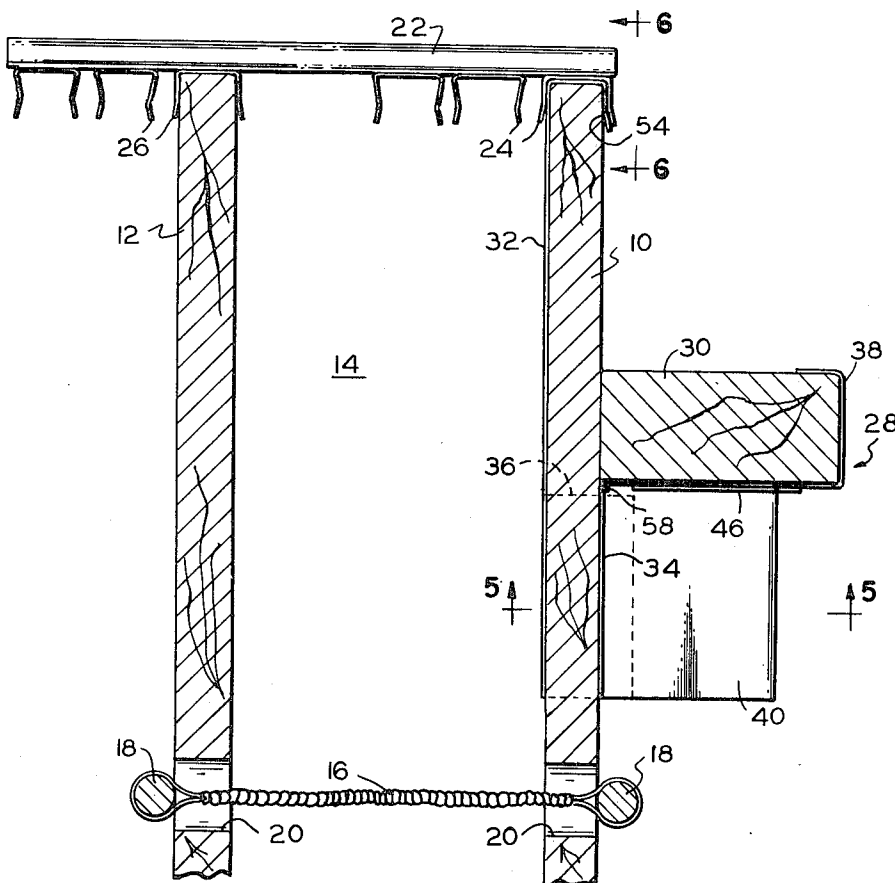
Primary Examiner—Francis S. Husar
Assistant Examiner—John S. Brown
Attorney, Agent, or Firm—Klarquist, Sparkman,
Campbell, Leigh, Hall & Winston

[57]

ABSTRACT

A bracket is described which extends between concrete form panels for holding elongated support members or walers which extend horizontally across such panels. The bracket includes a backing plate engaging the inner surface of the panels, a waler holder means including a channel member on the opposite side of such panels and joined to the backing plate by a web portion extending between the edges of adjacent panels. A stop flange is provided on the bracket below the holder means to engage the outer surface of the panels and is spaced from the backing plate a distance equal to the panels' thickness to properly position the bracket so that the waler can be inserted into the holder. The bracket may be provided with a clip at the top of the back plate for insertion over the top edge of the panels to provide vertical support. This top clip is eliminated in another embodiment so that the bracket may be installed in an intermediate position on the panels by another fastening means, such as nails extending through the stop flange and into such panels.

10 Claims, 9 Drawing Figures



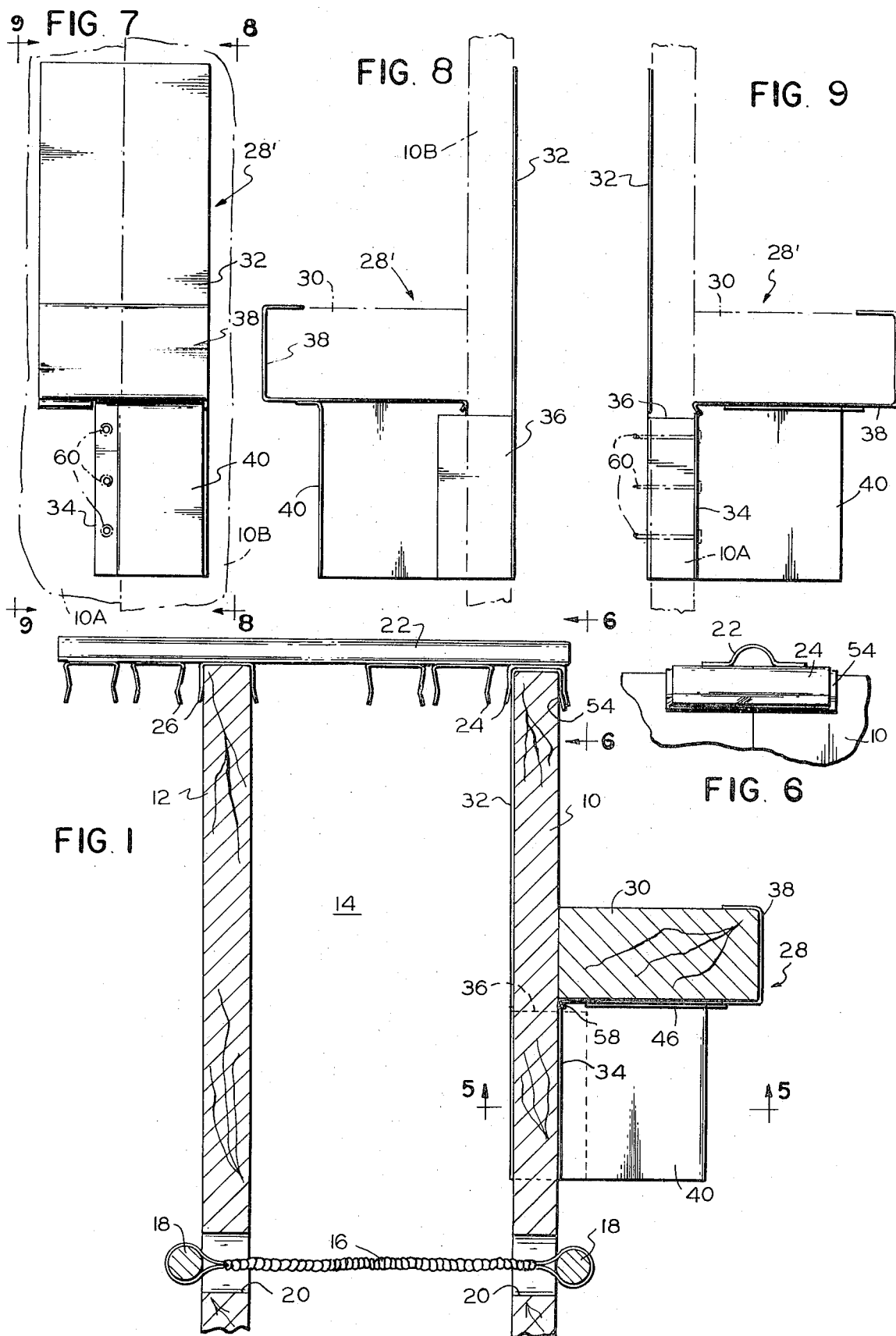


FIG. 2

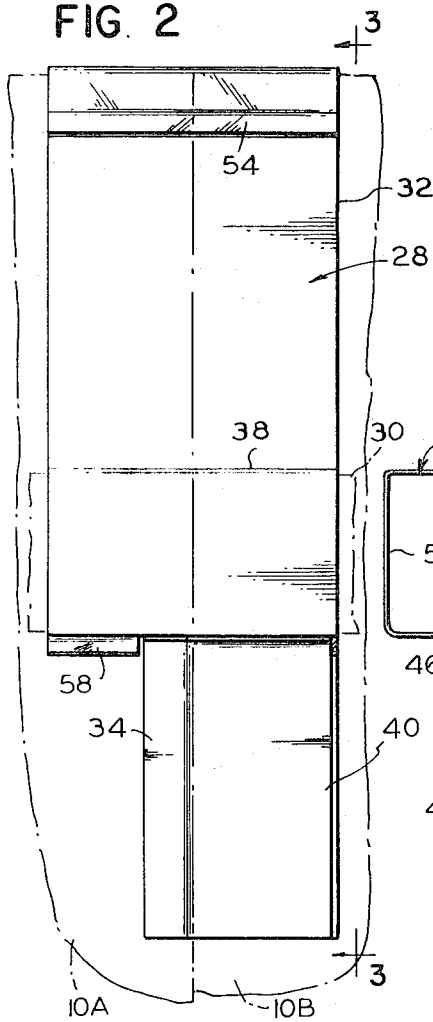


FIG. 3

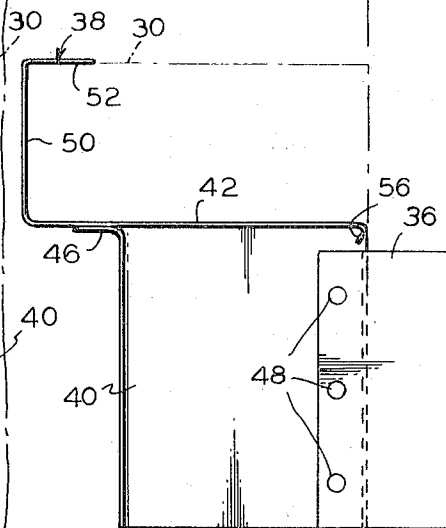


FIG. 4

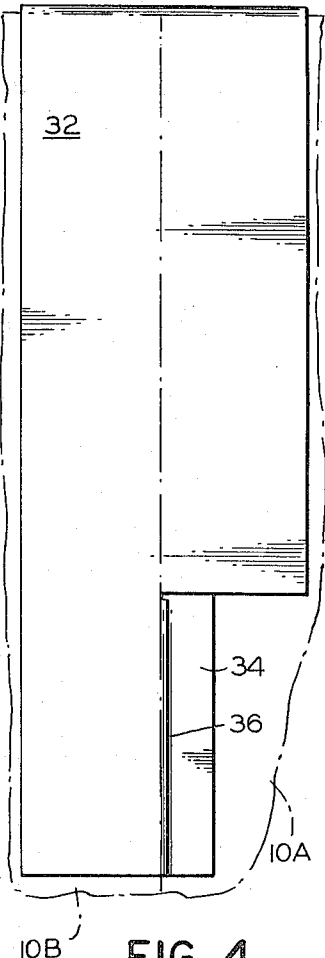
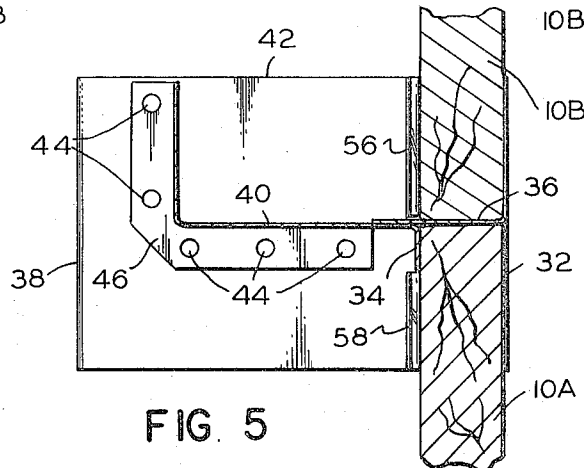


FIG. 5



SUPPORT BRACKET FOR CONCRETE FORM

BACKGROUND OF THE INVENTION

The subject matter of the present invention relates generally to concrete forms such as those used in the construction of concrete walls and the like, and in particular to a bracket for aligning the form panels and for holding elongated support members extending horizontally across such panels. These elongated support members may be wooden "two-by-fours" called walers and serve the dual function of supporting the concrete form panels to prevent "bowing" and of providing a walkway for the workmen to stand on while pouring concrete into the forms.

One type of concrete wall form known as the "Gates system" includes a plurality of plywood panels 2 feet wide and up to 8 feet high having a thickness of $\frac{3}{4}$ inch which are supported in horizontal alignment to provide the front and back sides of the wall form. The front panels are secured to the back panels by ties in the form of metal strips or twisted wires extending between them and support rods extending through the ends of such ties across the outer surface of the panels to hold them in proper spaced relationship when concrete is deposited between such panels. One such system is shown in U.S. Pat. No. 3,185,433 of Mueller granted May 25, 1965, and includes a plurality of waler support brackets which clip over the top edge of the panels. However, the clip portion of the bracket is secured by a hinge to a waler holder member and has the disadvantage that inclined braces must be provided between such holder members and ground to support the waler sufficiently to enable a workman to walk on them. Such braces require time to install and interfere with the positioning of the ties and their accompanying support rods. This problem is eliminated by the improved bracket of the present invention, which is made of sheet metal members welded together to be sufficiently rigid that it does not require any such bracing. In addition, the present bracket functions to align adjacent wall panels since it extends through the junction between the side edges of such adjacent panels and is provided with a backing plate and a stop member on opposite sides of such panels.

Other types of concrete forms, such as that shown in U.S. Pat. No. 2,632,228 of Huntington granted Mar. 24, 1953, have employed rigid waler holder brackets extending between adjacent form panels, but they also require vertical inclined braces, among other reasons, because they do not employ a backing plate and stop member on opposite sides of the wall panel. In addition, this prior system has the disadvantage that vertical metal support "studs" extend the entire height of the panels to support a plurality of such brackets and the tie rods extending through the concrete wall between the front and rear panels. In contrast, the concrete form brackets of the present invention are entirely separate from each other and from the tie rods so that they are much easier to install and remove.

SUMMARY OF THE INVENTION

One object of the present invention is to provide an improved bracket for aligning concrete form panels and for holding elongated support members on such panels.

Another object of the invention is to provide a concrete form employing such brackets which is easily and quickly assembled and disassembled.

A further object of the invention is to provide such a bracket and concrete form in which the elongated support members are supported on the form panels by the brackets without any additional vertical bracing and such brackets are made of sheet metal with a rigid structure of sufficient strength to enable a workman to walk on the elongated support members.

A still further object of the invention is to provide such a bracket which is easily attached to the form panels at the junction between adjacent panels, either by a clip to the top of the panels or other fastening means at an intermediate position between the top and ground.

BRIEF DESCRIPTION OF DRAWINGS

Additional objects and advantages will be apparent from the following detailed description of preferred embodiments thereof and from the attached drawings of which:

FIG. 1 is a vertical section view taken through a concrete wall form made in accordance with the invention including one embodiment of the support bracket of the present invention;

FIG. 2 is a front elevation view of the bracket in FIG. 1;

FIG. 3 is a side elevation view of the right side of FIG. 2 taken along the line 3—3 of FIG. 2;

FIG. 4 is a rear elevation view of the bracket of FIG. 2;

FIG. 5 is a horizontal section view taken along the line 5—5 of FIG. 1;

FIG. 6 is an elevation view of a portion of FIG. 1 taken along the line 6—6;

FIG. 7 is a front elevation view of another embodiment of the bracket of the present invention;

FIG. 8 is a side elevation view of the right side of FIG. 7 taken along the line 8—8 of FIG. 7; and

FIG. 9 is a side elevation view of the left side of FIG. 7 taken along the line 9—9 of FIG. 7.

DESCRIPTION OF PREFERRED EMBODIMENTS

As shown in FIG. 1, a concrete form for constructing a wall or the like, in accordance with the present invention, includes a plurality of front panels 10 and a plurality of rear panels 12 positioned on opposite sides of the wall forming cavity 14. Each set of front panels and rear panels includes a plurality of flat, rectangular sheets of plywood or other suitable material which may have dimensions of, for example, 2 feet wide by 8 feet tall by $\frac{3}{4}$ inch thick. The panels of each set are positioned with their side edges in alignment so that adjacent panels lie in substantially the same plane. A plurality of ties 16 of twisted wire or metal strips extend through the form cavity 14 and are secured to metal support rods 18 extending through openings in the opposite ends of such ties which protrude through slots 20 in the panels. The support rods 18 extend horizontally across the outer surfaces of the panels 10 and 12 so that each support rod extends through a plurality of such ties, as shown in the abovementioned U.S. Pat. No. 3,185,433. When concrete is poured into the form cavity 14, the form panels 10 and 23 spread until the ties 16 and rods 18 prevent further outward movement and hold such panels in the proper spaced relationship to

provide the concrete wall with the proper thickness. When the concrete wall has hardened, the form panels 10 and 12 are removed after cutting the tie wires 16 and removing the rods 18. The ties 16 may be removed from the concrete wall in the case where the ties are to be reused, or such ties may be left permanently imbedded in the wall after their ends are clipped when they are not to be reused.

The form panels 10 and 12 are initially held in proper spaced relationship by a spacer bar 22 having a plurality of front clips 24 welded to the front end of the bar and a plurality of rear clips 26 welded to the rear end of such bar. One of the front clips 24 is secured over the top edge of the front panel 10 or over a corresponding clip on a waler support bracket 28 hereafter discussed, and one of the rear clips 26 is fastened over the top edge of the rear panel 12. In this manner, the spacer bar 22 holds the top edges of the panels 10 and 12 in proper spaced relationship against inward and outward movement, while the bottom of such panels is also held in a conventional manner before the ties 16 and metal rods 18 are attached thereto. It should be noted that the plurality of front clips 24 and the plurality of rear clips 26 are provided to enable the same spacer bar to be employed for different wall thicknesses.

A plurality of waler support brackets 28 are attached to at least the front set of panels 10 for supporting elongated support members 30 called "walers" which may be boards, such as two-by-fours. The walers 30 extend horizontally across the outer surface of the front panels 10 to hold adjacent panels in alignment and to prevent outward bowing of such panels. In addition, some of these walers 30 may be positioned adjacent the top of the form panels 10 to serve as a walkway for workers, such as when they are pouring concrete into the form cavity 14. Thus, the bracket 28 provides vertical support for the walers 30 as well as clamping the waler horizontally against the panels 10.

The bracket 28 of FIG. 1 is shown in greater detail in FIGS. 2 to 5, and is made entirely of welded members of sheet metal, such as 1/16 inch thick steel. The bracket includes a back plate portion 32 and a stop flange portion 34 positioned on opposite sides of the panel 10 and spaced apart a distance approximately equal to the thickness of such panel. The back plate 32 is joined to the stop flange 34 by a web portion 36 which extends through the junction between the side edges of adjacent front panels 10A and 10B, as shown in FIG. 5. A holder means for holding the elongated support member, or waler 30, is provided on the bracket 28 at the front side of the panel 10. The holder means includes a U-shaped channel member 38 and a Z-shaped channel support member 40. The channel support member 40 is secured to the bottom of a lower side portion 42 of the channel member by spot welding at points 44 on a flange 46 at the top of the support member 40, as shown in FIG. 5. The channel support member 40 is also secured to the web portion 36 of the bracket by spot welds 48, as shown in FIG. 3. In addition, the stop flange 34 may be provided as an integral portion of the channel support member 40 and is bent at right angles to the main body thereof so that such stop flange extends substantially parallel to the back plate 32. In a similar manner, the web portion 36 may be formed integral with the back plate member 32 by

bending the web portion so that it extends substantially perpendicular to the main body of the back plate.

The channel member 38 includes a vertical front portion 50 extending substantially perpendicular to the lower side portion 42 and joining a shortened upper side portion 52. This front portion 50 is spaced from the stop flange 34 a distance equal to the width of the waler 30. The upper side portion 52 of the channel extends substantially parallel to the lower side portion 42 and is spaced therefrom by a distance substantially equal to the thickness of the waler 30. Thus, when installed in the bracket 28, the waler 30 is clamped between the front portion 50 of the channel member 38 and the front of the form panels 10, and extends across the junction between two adjacent panels 10A and 10B. The waler is supported against vertical movement by the lower side portion 42 of the channel member and the upper side portion 52. It should be noted that the upper side portion 52 terminates after extending a distance of only about 3/4 of one inch from the front portion 50 to enable the waler to be inserted into the channel member 38 through the opening between such upper side portion and the form panel 10B, and such waler is moved into its horizontal supporting position by tapping it down with a hammer.

In the embodiment shown in FIGS. 2 to 5, the bracket 28 is attached to the panels 10 by a support clip 54 formed integral with the top portion of the back plate 32. The clip 54 extends over the top edge of the panels and holds the bracket against downward movement. Of course the back plate 32 prevents outward horizontal movement of the bracket while the stop flange 34 and inner edges 56 and 58 of the lower side portion 42 of the channel member prevent inward horizontal movement of such bracket. The inner edges 56 and 58 are bent downward to provide a smooth rounded surface so that they do not damage the form panels 10A and 10B. Thus, the bent edge 56 engages panel 10B, while the bent edge 58 engages panel 10A, which is also engaged by the stop flange 34. As a result, all three of these members function as the stop means to hold the edges of the two form panels 10A and 10B in alignment, and enable the waler 30 to be inserted into the channel member 38.

Another embodiment of the bracket 28' of the present invention is shown in FIGS. 7, 8 and 9, which is similar to the bracket 28 of FIGS. 1 to 5, except that the support clip 54 at the top of the back plate 32 is eliminated to enable the bracket to be located at an intermediate position between the top of the panels and ground. Any suitable means may be employed for attaching the bracket 28' to the form panels 10. However, it has been found convenient to employ a plurality of nails 60 extending through holes in the stop flange 34 to provide the necessary vertical support for the modified bracket 28'. Other than this, the bracket 28' of FIGS. 7, 8 and 9 is similar to bracket 28 previously described, and for this reason the same reference numerals have been employed to designate like parts.

As indicated above, the waler support bracket of the present invention enables the waler 30 to be supported on the concrete form panels 10, without any additional vertical bracing members such as are employed with the conventional Gates system. This bracket enables quick installation and removal of the walers and also enables easier installation of the ties 16 and support

rods 18, since it eliminates the vertical braces which interfere with the positioning of the rods 18.

It will be obvious to those having ordinary skill in the art that many changes may be made in the above-described details of the preferred embodiments of the present invention. For example, the concrete form of the invention may be employed to build other objects than walls, and the bracket may be employed to support other elongated members than walers. Therefore, the scope of the present invention should only be determined by the following claims.

I claim:

1. A concrete form apparatus including a plurality of brackets for concrete form panels in which each bracket comprises:

a backing plate portion;

stop means separated from said backing plate by a distance substantially equal to the thickness of the form panels, for engaging the opposite side of the panels from said backing plate;

web means rigidly joining said backing plate and said stop means, for extending through the junction between the edges of two adjacent form panels with at least a portion of said web means spaced below the top of said adjacent panels; and

holder means fixedly attached to said bracket for holding an elongated support member so that said support member extends across the junction of said adjacent panels, said holder means being provided on the opposite side of said panels from said backing plate to clamp said panels between said support member and said backing plate.

2. An apparatus in accordance with claim 1 in which the top of said backing plate is provided with a clip means for fastening the bracket over the top edge of said panels.

3. An apparatus in accordance with claim 1 in which the backing plate, stop means, web means and holder means are all made of sheet metal.

4. An apparatus in accordance with claim 1 in which the holder means includes a support portion for supporting the elongated support member and extending substantially perpendicular to said backing plate, a stop portion extending upward from the outer end of said support portion, and a lip portion extending inward from the upper end of said stop portion.

5. An apparatus in accordance with claim 4 in which the support portion is attached to, and supported on,

the web means.

6. An apparatus in accordance with claim 4 in which the stop means includes flange means extending from the side of said web means substantially parallel said backing plate, and also includes the inner end of said support portion of said holder means with said inner end being in alignment with said flange means.

7. A form for molding a concrete wall, including two sets of panels positioned consecutively along the length of the section and said sets being spaced apart to provide a mold cavity for the wall formed therebetween, said panels being supported by a plurality of tie means extending through said cavity between said sets and a plurality of elongated support members extending across the adjacent panels of at least one of said sets, in which the improvement comprises:

a plurality of brackets attaching the elongated support members to the outer surfaces of at least some of said panels at the junctions between adjacent panels;

each of said brackets including a backing plate engaging the inner surface of the panels, a stop means provided on the opposite side of the panels from said backing plate, and web means rigidly joining said backing plate and stop means, said web means extending through the junction between the edges of two adjacent panels with at least a portion of said web means spaced below the top of said adjacent panels; and

holder means fixedly attached to said bracket for holding the elongated support member to clamp said adjacent panels between said support member and said backing plate.

8. A form in accordance with claim 7 in which at least some of the brackets are provided with a first clip means at the top of said backing plate for fastening the bracket over the top edge of said panels in one set.

9. A form in accordance with claim 8 in which a second clip means is provided over the top edge of panels in the other set for each first clip means, and the first and second clip means are secured together by a spacer rod extending across the width of the mold cavity.

10. A form in accordance with claim 7 in which the elongated support members are walers and at least some of the brackets have a fastening means for fastening them to the panels at positions spaced below the top of said panels.

* * * * *

50

55

60

65

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,863,886 Dated February 4, 1975

Inventor(s) Dwight W. Carr

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the title page of the printed patent, in the left-hand column, after "Inventor: Dwight W. Carr, Rt. 1, Box 459, Casa Grante, Ariz. 85222", insert --Assignee: Albert E. Kane and Ruth E. Kane, Wenatchee, Washington, an undivided 25%--

Signed and Sealed this

third Day of February 1976

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,863,886 Dated February 4, 1975

Inventor(s) Dwight W. Carr

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 30 "ttthe" should be --the--

Column 2, line 66 "10 and 23" should be --10 and 12--

Column 3, line 37 "concerete" should be --concrete--

Signed and sealed this 15th day of April 1975.

(SEAL)

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents
and Trademarks