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Thornton

[11] **3,762,678**

[45] **Oct. 2, 1973**

[54] **REUSABLE FORMS FOR CASTING WALLS**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 17,053, March 6, 1970, Pat. No. 3,672,626.

[52] **U.S. Cl.** **249/193**

[51] **Int. Cl.** **E04g 9/00**

[58] **Field of Search** 249/26, 27, 32, 48, 249/49, 194, 195, 47, 50, 51, 191, 192, 44, 45, 189, 193

[56] **References Cited**

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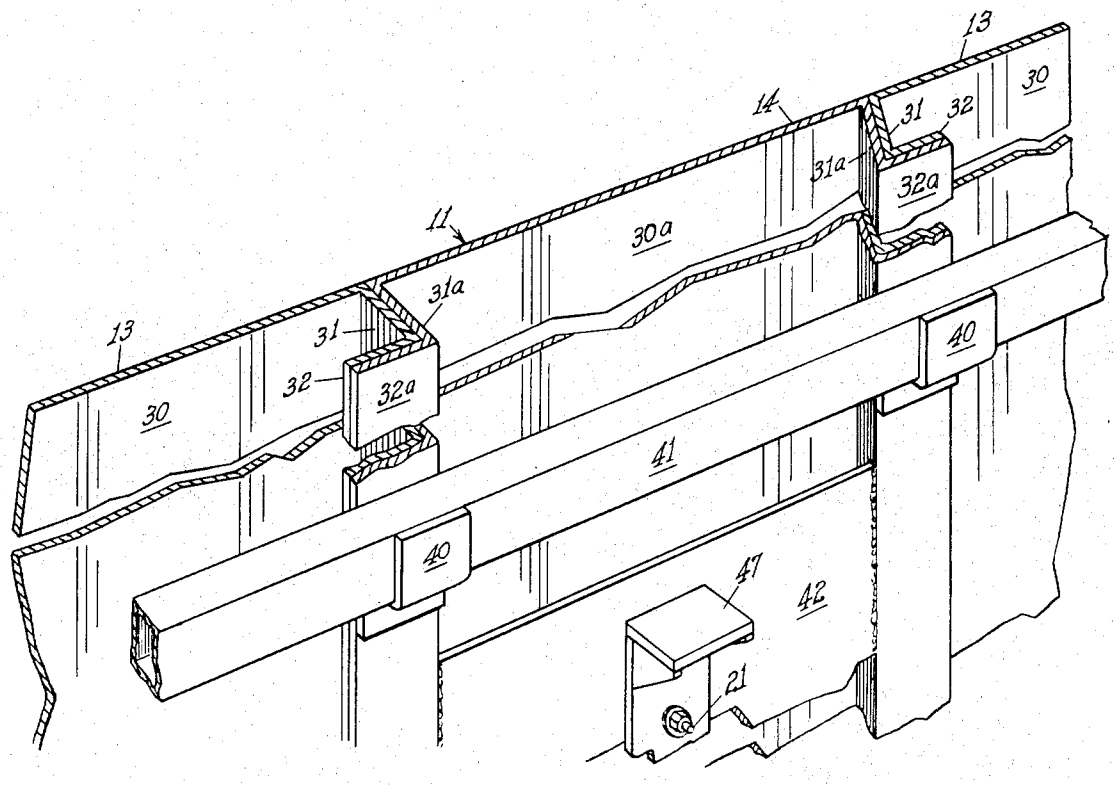
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Assistant Examiner—John S. Brown
Attorney—William V. Miller et al.

[57] **ABSTRACT**

A reusable form assembly for casting walls and footings from concrete or other suitable material consisting of corner-forming members, side-forming panel members and main support members disposed between successive panel members, all detachably bolted together to provide a selected form length for forming one surface of the wall or footing. If a form is to be used in forming the other surface of the wall, a similar arrangement of corner-forming members, panel members, and main support members is provided in suitable length and in laterally spaced relationship to the first mentioned form assembly. A dovetail joint arrangement is provided between the corners and the cooperating side panels and between the panels and cooperating support members to effectively align the cooperating members and hold them in true alignment until the form is disassembled. Additional longitudinally extending support wales or bars are secured to the exterior of each of the wall-form assemblies to prevent outward bulging thereof from the force of the poured concrete.

6 Claims, 6 Drawing Figures



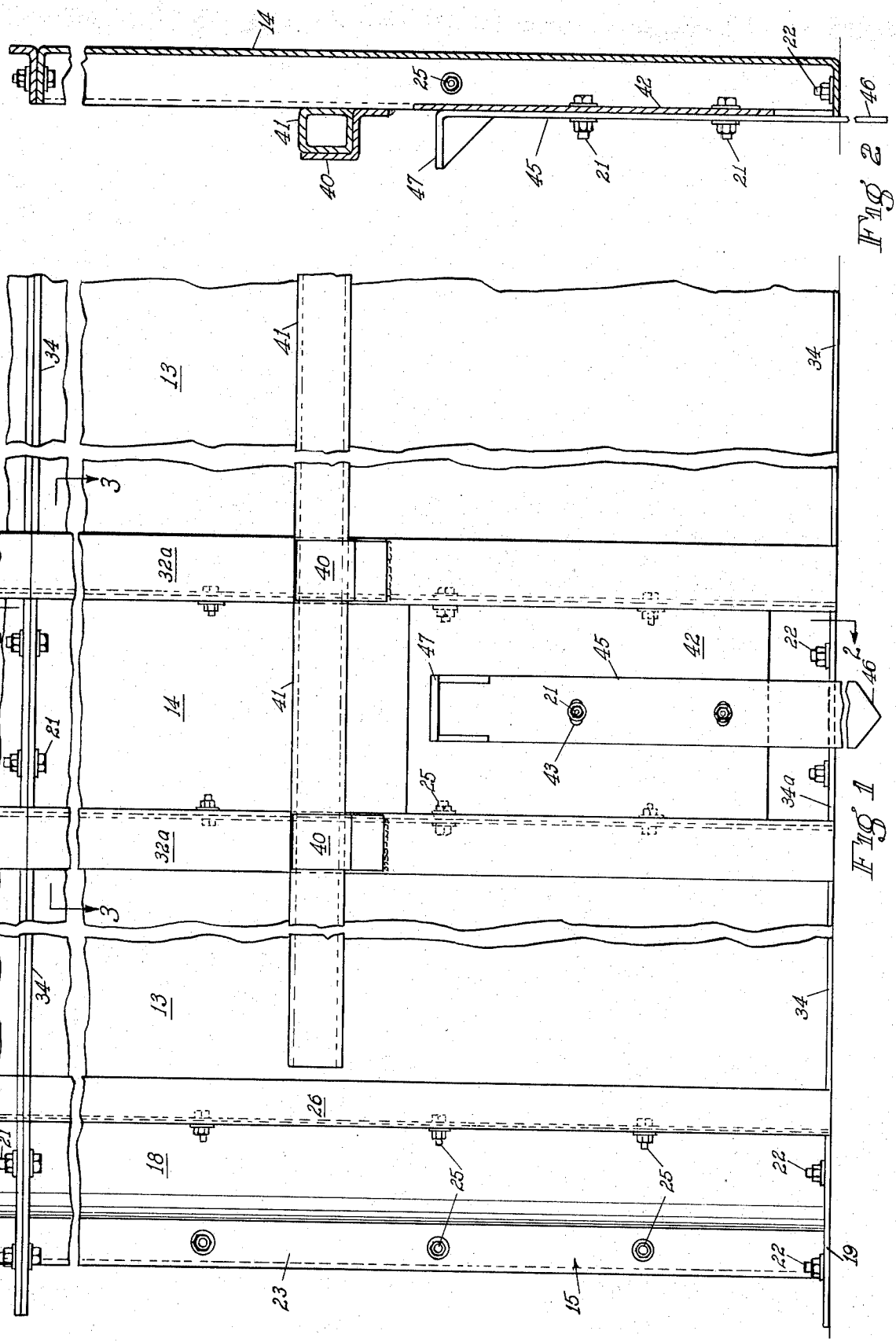

14
22
25
42
46
41
40
47
45
21
21
34
13
41
34
3
32a
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2
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41
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45
42
22
2
46
21
21
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25
34a
32a
40
3
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13
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26
21
18
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25
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22
19
23
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FIG. 2

FIG. 1

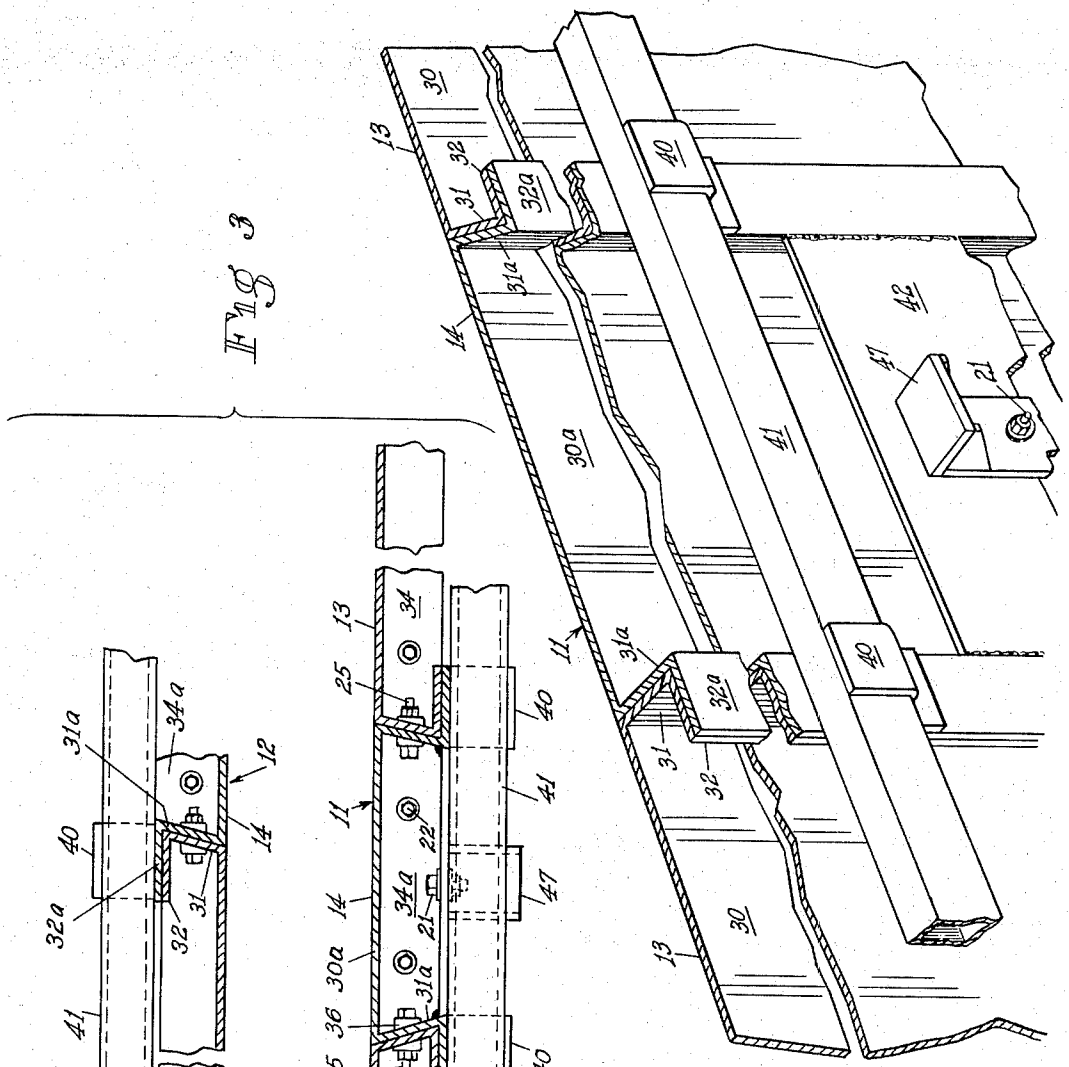

30
13
32
31
32a
31a
14
40
42
41
21
30a
11
34
25
22
34a
36
47
12
15a
16
19a
26
23
17
15
19

Fig 3

Fig 4

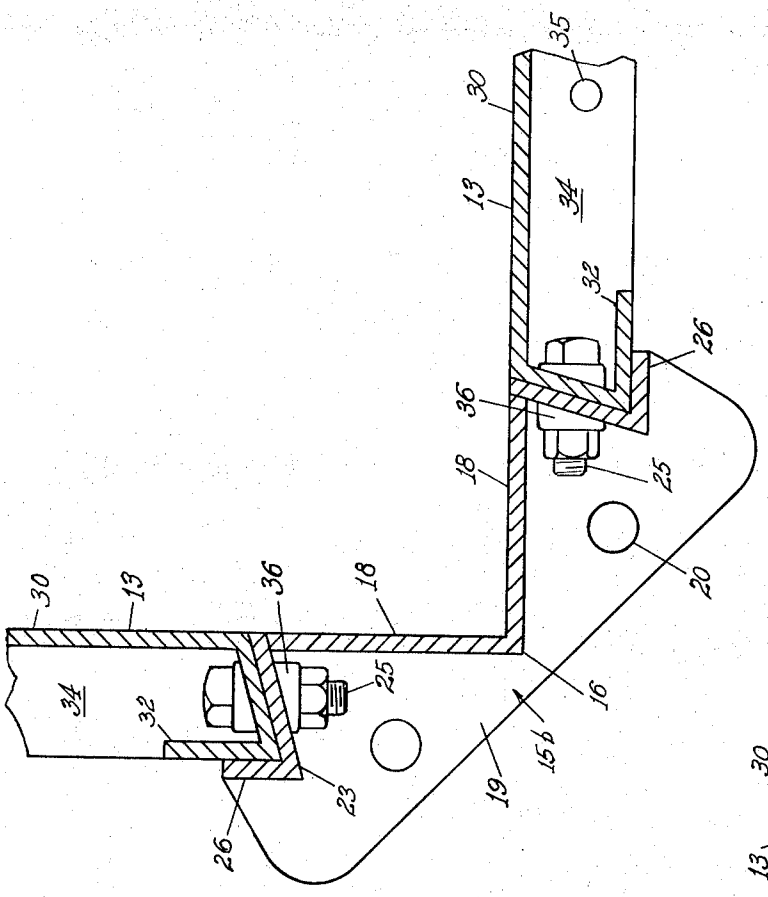

30
13
34
32
26
36
18
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16
15b
19
23

Fig 6

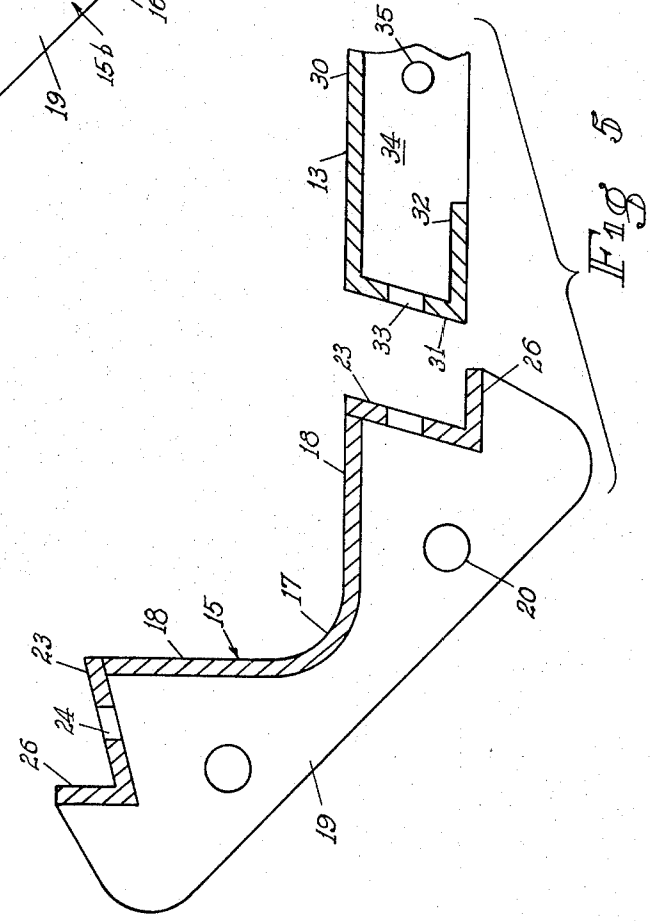

35
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17
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24
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Fig 5

REUSABLE FORMS FOR CASTING WALLS

This application is a continuation in part of my copending application, Ser. No. 17,053, filed Mar. 6, 1970, and now Pat. No. 3,672,626.

Various form assemblies have been provided in the past for casting walls. The present invention is an improvement over the prior art form members in that it provides separate corner members, side-forming panel members and intermediate vertical support members which can be readily bolted together for use and separated for reuse. Furthermore, the members of the form assembly can be supplied in modules of suitable heights which can be readily bolted together in vertical relationship to form walls or footings of any desired height and which can be easily disconnected for handling as the form is removed. Also, dovetail joints are provided between corner members and associated panel and support members to aid in true alignment of the form members and in holding them in alignment against the pressure exerted by the material cast in the form assembly. In addition longitudinal wales or bars may be removably attached to each wall form assembly at a suitable height to prevent outward bulging. Furthermore, means is also provided for removably attaching a stake to the lower end of each main vertical support member, if needed.

The following description and claims will refer to forms for walls but it is to be understood that this term includes forms for footings or other similar cast structures.

The best mode contemplated in carrying out my invention is illustrated in the accompanying drawings in which:

FIG. 1 is a side elevational view of a wall form assembly embodying my invention. FIG. 2 is a vertical sectional view taken along line 2—2 of FIG. 1.

FIG. 3 is a plan view showing two of the form assemblies in wall-forming spaced relationship.

FIG. 4 is an enlarged perspective view of a longitudinal portion of the wall form.

FIG. 5 is a detail in horizontal section of the outer corner form of FIG. 3.

FIG. 6 is a horizontal sectional view showing a modified corner form.

With reference to the drawings and especially to FIGS. 1 and 2, an assembly of form members is shown with the members disposed side-by-side in vertical or upright position to produce one surface on a wall of selected longitudinal extent. In some instances only one wall form assembly will be used, as where the outer surface only of the wall is formed and its inner surface is against a bank of earth, but in other instances both the outer surface and the inner surface are formed by laterally spaced longitudinally extending form assemblies, as in FIG. 3, between which the concrete or other material is poured. In this Figure, the outer form assembly is indicated generally at 11 and the inner form assembly is indicated generally at 12.

Each assembly is composed of alternating upright panel members 13 and main support members 14. The inner and outer assemblies 11 and 12 are identical except that an outer corner form member 15 is on the assembly 11 and an inner corner form member 15*a* is on the assembly 12.

The corner form member 15 is identical to the outer corner form member described in my copending application, Ser.No. 17,053, and now Pat. No. 3,672,626

and the inner corner form member 15*a* is substantially the same but faces in a reverse direction. Either corner form member may have its upright walls 18 arranged at a right angle to provide a sharp angle joint, as at 16, or a rounded joint, as at 17. The outer corner form member 15 is shown more in detail in FIG. 5 with its two main upright walls 18 disposed at a right angle and joined by the curved joint 17. At each of its upper and lower ends, the corner form member is provided with an outwardly extending attaching flange 19 which is disposed in a plane at right angle to the planes of the walls 18 and this flange is provided with bolt holes 20 for receiving clamping bolts 21 to bolt vertical modules of the corner form member together or anchoring bolts 22 to bolt the lower end of the corner form member to a footer, as shown in FIG. 1. The outer corner form member 15*b* shown in FIG. 6 is the same as that shown in FIG. 5 except that it has the sharp corner angle 16 instead of the rounded one 17 of FIG. 5. The inner corner form member 15*a* is practically the same as the outer corner form member 15*b* of FIG. 6 except that its flange 19*a* extends horizontally outwardly in a reverse direction on the opposite side of the corner joint 16

The corner form members are thus of elongated angular form with the main walls 18. The walls 18 carry outer longitudinal or vertical connector flanges 23 which are provided with longitudinal spaced bolt-receiving holes 24 which are adapted to receive clamping bolts 25. It will be noted that each of the flanges 23 angles outwardly relative to the wall 18 at an acute angle. The flanges 23 are provided with outer stop or aligning flanges 26 which are in planes parallel to the respective planes of the walls 18 and outwardly thereof. All of the flanges and walls of the corner form members extend the full length thereof and are integrally formed together, preferably from sheet metal of a suitable gauge.

Each of the panel members 13 is also preferably made of sheet metal of suitable gauge and comprises the flat panel or wall 30 having integral outwardly extending angular connector flanges 31 so that it is of elongated tray-like form. These respective flanges carry outer stop flanges 32 which project laterally towards each other in a plane parallel to that of the panel 30 and spaced outwardly thereof. The flanges 31 and 32 extend the full length of the panel 30. The connector flanges 31 angle outwardly relative to the panel 30 at an obtuse angle. The flanges 31 are provided with bolt-receiving openings 33 and it will be noted that these flanges are angularly disposed relative to the panel 30 and the flanges 32 which they connect. At each end of the panel 13 an integral transverse abutment flange 34 extends outwardly at a right angle from the panel 30 and is provided with openings 35 for use in connecting adjacent identical vertical sections or bolting the lowermost section to a footer.

Each of the main support members 14 is adapted to be disposed between a pair of adjacent panels 13. These support members are practically identical with the panels 13 but usually are of less width. Each panel 14 is practically the same tray-like structure as the panels 13 and is provided with a corresponding panel 30*a* and similarly arranged integral flanges 31*a* and 32*a* with the flanges 31*a* provided with bolt holes for alignment with the bolt holes 33 in the respective flanges 31 of the panels 13 for receiving clamping bolts 25. Each of the panels 14 is further provided with upper and

lower abutment or connector flanges 34*a* which project outwardly therefrom in planes at right angles to the panel 30*a* and are provided with bolt holes 34*a* for receiving anchoring bolts 22 to connect the support to a footer or clamping bolts 21 to connect one support member to a vertically adjacent support member. The members 14 are also preferably of sheet metal of a suitable gauge.

When a member 14 is connected to an adjacent member 13, the flanges 31*a* and 32*a* will abut the flanges 31 and 32 respectively, being complementally disposed, and will be exteriorly thereof. Clamping bolts 25 will pass through aligning openings in the adjacent flanges 31 and 31*a*. Each support 14 will always be disposed between two adjacent members 13. However, adjacent the corners, each member 13 will have one edge connected to a corner member 15. At this joint, the flanges 23 and 26 will be outwardly of the respective flanges 31 and 32 and in contact therewith since they are complemental thereto. Clamping bolts 25 will pass through aligning openings in adjacent flanges 23 and 31. Whenever the bolts 25 are used, angular washers 36 are preferably provided so that they will contact properly with the adjacent angular flanges 23, 31, or 31*a*.

Each of the flanges 32*a* of the support members 14 is provided at a suitable level or levels with an outwardly extending angular clip 40 which may be welded thereto. Each clip forms an upwardly opening bar-receiving socket. Thus, these sockets will be disposed at intervals longitudinally along the wall form and can receive a re-enforcing wale or bar 41 which can be dropped downwardly thereinto. The bar 41 is preferably of a proper angular cross-section to fit tightly into the sockets in the clips 40. The bar will preferably extend the full length of the wall form but need not be secured to the corner form members as the preformed angular corner members will be sufficient to carry the outward stress. Intermediate the corner members this stress will be resisted by the bars 41 and prevent outward bulging of the wall form.

In some cases it may be desirable to bolt the lower end of a support 14 to a footer as previously indicated. In other cases it may be desirable to locate it and secure it by means of a stake such as the stake 45. For this purpose, the lower end of each support member 14 is provided with an anchoring plate 42 adjacent its lower end extending between the flanges 32*a* thereof and with its outer surface substantially flush with the outer surfaces of the flanges. The point 46 of the stake may be driven into the ground by taping the top abutment 47 of the stake and when properly driven into place the stake may be connected to the plate 42 on the member 14 by means of passing clamping bolts 21 through vertically spaced transverse slots 43 in the stake and vertically aligning bolt openings in the plate 42.

Each of the wall forms is assembled in the manner previously indicated. In some cases the corner form members may not be required. However, the wall will always include alternating panels 13 and 14 which are of elongated tray-like form. When a panel 13 is disposed between a pair of spaced supports 14, the outwardly diverging flanges 31*a* of the opposed members 14, in effect, provide a vertically extending dovetail socket for receiving the panel 13. The flanges 31 on the panel 13 fitted between the two members 14 will also diverge outwardly and will be complemental to and engage the respective flanges 31*a*. Outward movement of the panel 13 relative to the support members 14 between which it is disposed will be limited by engagement of the stop flanges 32 with the stop flanges 32*a* and, at this time, the inner surfaces of the panels 30 and 30*a* will be flush so as to produce a smooth surface on the cast wall. The openings for receiving the clamping bolts 25 will be in alignment and the bolts will be inserted. The support members 14 may be bolted to a footer by the anchoring bolts 22 or the stakes 45 may be used as the anchoring means. When a panel 13 is between a corner member and a support member 14, the flange 23 of the corner member will cooperate with the flange 31*a* of the support member to provide the dovetail socket for the panel member which will function in the same manner described above. The corner members are actually support members and function exactly the same as the support members 14 except that they have portions extending angularly in two directions. If desired, vertically extending modules of the corner members, panel members and support members may be bolted together by bolts 21 at the abutting end horizontally disposed flanges. The panels and corner members will be aligned by the flange arrangements described which result in the dovetail sockets and the alignment will be maintained. To resist bulging from stres of the concrete, the bar 41 is extended across the outer faces of the panels 13 and supports 14, being fitted into the clips 40 carried by the opposed flanges 32*a* of the respective members 14.

It will be apparent that my invention provides wall form members which can be easily assembled and disassembled for repeated use. Any desired length and height of form may be provided.

Having thus described the invention what is claimed is:

1. A wall form assembly comprising upright panel members and support members which alternate and are removably secured together at adjacent vertical edges:

each of said members being of elongaged tray-like form having a main panel, an outwardly extending angular connector flange at each of the opposed side edge extremities of the panel which extends vertically thereof and angles outwardly relative to the panel, and a lateral inwardly extending stop flange on the outer extremity of each of said connector flanges;

the two connector flanges on each of said support members at its extremities angularly converging outwardly and the two connector flanges on each of said panel members diverging outwardly;

said alternating panel members and support members having their connector flanges at complemental angles so that adjacent connector flanges are in contact with the stop flanges of the support members outwardly of and in contact with the stop flanges of said panel members to locate the inner surfaces of the panels of the respective members relatively, said contacting connector flanges having aligning openings which receive removable clamping bolts.

2. A wall form assembly according to claim 1 including an upright corner form member adjacent the outermost panel member, the panel member being between it and the support member:

said corner member being of elongated angular form having two main walls joined together at an angle joint and being relatively angularly disposed, an

outer vertically extending connector flange on the outer extremity of each of said side walls which angles outwardly relative to the wall and a lateral inwardly extending stop flange on the outer extremity of each of said connector flanges;

said corner member having its angularly disposed connector flange complemental to the adjacent flange of said panel member with its stop flange outwardly of the stop flange on said adjacent connector flange of the panel member, said adjacent connector flanges of the said corner member and panel member having aligned openings which receive clamping bolts.

3. A wall form assembly according to claim **1** in which:

each of the stop flanges of said support members carries a bar-receiving socket member with the socket members disposed substantially at the same level above the lower ends of the support members; and

a re-inforcing bar fitted into said socket members and extending longitudinally of the wall form to prevent outward bulging.

4. A wall form assembly according to claim **3** in which:

each of said socket members is provided by a clip attached to each flange and having an angular socket opening upwardly; and

said bar is of complemental angular cross section and is dropped into said sockets.

5. A wall form assembly according to claim **1** in which:

each of said support members and panel members is provided with an abutment flange at its upper and lower ends to facilitate bolting identical vertical sections together and the lowermost section to a footer or similar support.

6. A wall form assembly according to claim **1** in which:

each of said support members is provided with an anchoring plate extending between the stop flanges substantially flush therewith; and

stakes adapted to be driven into the ground to anchor the respective support members;

said stakes and said plates having aligning openings which receive anchoring bolts when the support members are disposed with their plates in contact with the stakes.

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