May 28, 1946. W. J. McDONALD 2,401,263

CONCRETE FORM

Original Filed Nov. 10, 1942

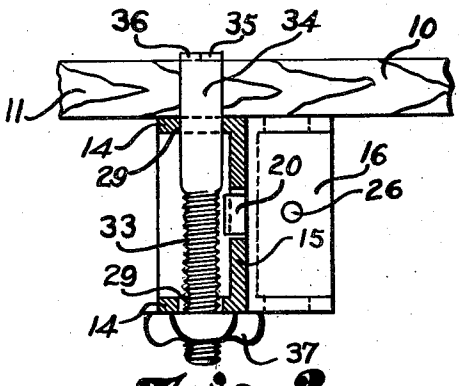


Fig. 2.

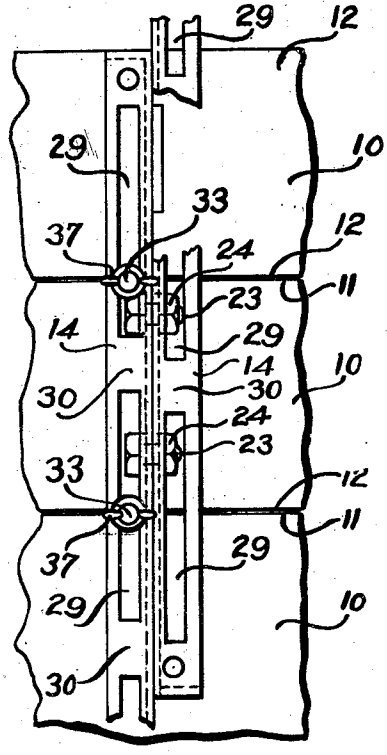


Fig. 1.

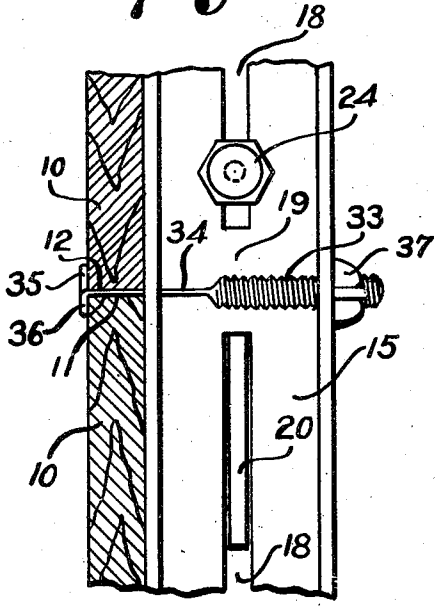


Fig. 3.

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CONCRETE FORM

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Original application August 24, 1938, Serial No. 226,476. Divided and this application August 12, 1942, Serial No. 454,545

3 Claims. (Cl. 25—131)

My invention relates to concrete forms and ties therefor. This is a division of my application Serial No. 226,476, filed August 24, 1938, on Form and scaffold structure, issued as Patent No. 2,301,306 on Nov. 10, 1942.

My invention has for one of its purposes the provision of a concrete form, which can be quickly erected and easily and quickly torn down, after the concrete has become set, and which requires no nailing of the wall forming members, in the form of boards or other lumber, to the studs, or other frame members, used in making the form.

My invention is adapted to be utilized with a plurality of duplicate frame units, which are so constructed that the same may be secured together in interlocking relation to hold the same in longitudinal alignment with each other, and which are so constructed that suitable fastening elements for securing the boards, or other wall forming members, thereto can be arranged in proper position for securing said boards, or wall forming members, to the frame members at the top and bottom edges of each of said wall forming members. This is accomplished by providing openings in the walls of the frame members, that are so arranged that securing elements engaging the wall forming members, or boards forming the wall of the form, can be engaged with said frame members in a manner that suitable fingers on said securing means will engage the boards, or wall forming members, adjacent said securing elements at the adjoining upper and lower edge portions thereof, said securing elements extending between vertically adjacent wall forming members, or boards.

It is a particular purpose of my invention to provide securing means, in a device of the above mentioned character, having flattened shank portions that are adapted to extend between two adjacent boards, or other wooden members, used for forming the wall of the form in a manner that these will not be spaced any further apart than is necessary to allow for the swelling of the wood of which said members are made when it becomes wet after the concrete has been poured, said securing elements further having flattened oppositely extending prongs, or fingers, thereon. One of said fingers, or prongs, engages a board or other wooden wall forming member, above the securing member, and the other engages a board, or other wooden wall forming member, below said securing member. Said securing member further comprises a shank portion that is partly flattened and partly circular in cross section, and is provided with means for clamping the same in position, said means, preferably, comprising screw-threads on said round shank portion and a wing nut engaging the threads thereon.

While slots that are arranged in alignment are preferred for receiving the elements for securing the frame and the wall forming boards together, other arrangements and forms of openings can be used for this purpose, as long as these are so arranged that the securing members are always insertable at proper places for engagement with the upper edge of one board, or wall forming member, and the lower edge of the next board, or wall forming member.

A very important feature of the invention is that ordinary boards of standard dimensions can be used over and over again in making the forms. There is practically no sawing involved in making forms in accordance with my invention, and accordingly there are no odd lengths of scrap lumber produced, and the boards can be used over and over again, as no damage is done thereto in placing the same in the form, and no special construction of wooden members is required for building the form.

Other objects and advantages of my invention will appear as the description of the drawing proceeds. I desire to have it understood, however, that I do not intend to limit myself to the particular details shown or described, except as defined in the claims.

In the drawing:

Fig. 1 is a fragmentary face view of a concrete form employing my invention.

Fig. 2 is a fragmentary horizontal section on an enlarged scale taken between two boards below the joint in the frame member shown in Fig. 1, and

Fig. 3 is a view partly in vertical section and partly in elevation on an enlarged scale, taken slightly to the left of the joint in the frame member shown in Fig. 1.

Referring in detail to the drawing, the concrete form is shown in Fig. 1 as being made up of a plurality of boards, or wall forming members, 10, which are arranged as is customary to provide a trough-like space between the same, into which concrete is poured. Each wall is supported by means of framing, only a portion of which is shown in the drawing, and the two parts of the form, that is, the two opposite wall portions made up of boards, or wall forming members, 10 are secured together so as to prevent separation thereof, by means of suitable tie members, which may be of any desired character. It is to be understood that a large number of these are uti-

lized, but inasmuch as these tie members are not part of my invention, the same are not shown, it being understood that these are used in a conventional manner.

The frame is made up of identical units, such as the channel members having flanges 14 connected by means of a web portion 15, said flanges extending perpendicularly to the web portion and substantially parallel to each other. Preferably, the web portion 15 is extended and bent at right angles to itself to form end walls 16 that are welded to the flanges 14.

A row of aligned slots 18 is provided in the web portion 15 of each of the frame units, said slots 18 extending lengthwise of said web portions and being separated by means of connecting wall portions 19, which are part of the web portion 15. The interruptions between the ends of the slots 18 are, preferably, much shorter than the slots, the purpose of this being to enable the elongated rectangular lugs 20, which are provided at each end of the frame unit in alignment with the slots 18, to be engaged with any one of said slots in such a position that any desired length of frame member can be obtained by connecting the members together in the manner shown in Figs. 1 and 3. The lugs 20 are of such width and length that these fit within the slots 18, so as to readily pass into said slots, but engage with the walls of the slots 18 so as to hold the adjoining frame members in longitudinal alignment with the web portions 14 thereof in face to face engagement, said web portions being held in such face to face engagement by means of bolts 23 provided with nuts 24, which bolts are passed through aligning slots 18 of the adjoining sections, or units, of one frame member, and are adapted to clamp said units in back to back relation. It will be noted that the end walls 16 have openings 26 therein, said openings being utilized for securing the lower ends of the studs to wooden plates, (not shown).

It will be noted that not only are the slots in each flange 14 in longitudinal alignment with each other, but that there are slots 29 in the parallel flanges 14 of each frame unit, which are in transverse alignment with each other. Also the slots 29 have a certain definite relationship to the connecting portions 30, so that wall forming units, or boards, 10, customarily used for making concrete forms, will always be so located that both a top edge 12 and a bottom edge 11 of a pair of the wall forming units 10 will be in alignment with a pair of opposite slots 29 when the studs are in position in the form, that is, the slots 29 are so arranged that an unslotted portion 30 of a stud will not ever align with a top or bottom edge of a wall forming member 10 in the form, so that the fastening elements that are to be described below can always be put in place to secure the wall forming members to the studs.

The elements for fastening the boards, or other wall forming members, 10 to the studs comprise screw-threaded shank portions 33, and flattened portions 34 that extend from said screw-threaded shank portions, and are wide and thin, so that said portions 34 are adapted to lie between the adjacent edges 11 and 12 of two of the wall forming members 10, as shown in Fig. 3. The flat portion 34 is split and bent in opposite directions at its extremity, to form the prongs or fingers 35 and 36, which extend in opposite directions. The fastening element extends through a pair of aligned slots 29, as will be evident from Figs. 1 and 2, and is provided with a wing nut 37 that engages the outer side of one of the flanges 14 of the stud.

In assembling the wall made up of the elements 10, an element 10 is inserted in place and the fastening elements are then passed through the slots 29 with one of the prongs or fingers of the fastening element in engagement with the inner face of the wall forming element 10 near the upper edge thereof, with the portion 34 of the fastening element lying on the surface of the top edge of said wall forming element. The fastening element is then tightened up by means of the wing nut 37, so as to firmly hold the same in place. This is done with all of the fastening elements along the length of the board, or other wall forming member, 10, and after all these have been fixed in position in this manner, the next higher wall forming element, or board, 10 is inserted in place on top of the flat portions 34 of the fastening elements with the upwardly directed prongs, or fingers, 35 engaging the inner face of said wall forming element 10 and one flange 14 of the stud engaging the other face of said board, or wall forming element, 10.

It is obvious that the boards, or wall forming elements, can thus be easily put in proper position, by merely sliding the same back of the prongs 35. After this has been done the wing nuts 37 can be tightened up further to embed the prongs, or fingers, 35 and 36 in the boards, or wall forming elements, 10. As a result, after such tightening has taken place there will be very little projection of the fingers 35 and 36 from the inner face of the form, providing a very smooth wall when the concrete is poured. The prongs 35 and 36 are alike and the fastening element can, of course, be turned with either prong upward, the two distinguishing numbers having been used for the prongs, or fingers, on the fastening elements to make the description of the use thereof in conjunction with the wall forming elements 10 clearer.

As the wall forming elements 10 are standard pieces of lumber, it will be obvious that the slots 29 can be so arranged that a slot 29 will always be intersecting the spaces between the two wall forming elements 10. The slight cracks, or spaces, left after the insertion of the flat parts 34 of the members 33 are just sufficient to allow for the swelling of the wooden wall forming elements 10 when these become wet upon pouring the concrete.

It will be obvious from the description of my invention that use of my invention eliminates much sawing and nailing and saves a large part of the lumber used in making concrete forms, eliminating all the wooden framing that is ordinarily sawed up in such a manner, in its use in making forms, as to be eventually reduced to such size that it is wasted. The wall forming members are not in any manner cut or otherwise damaged in being used in conjunction with my invention, and the frame forming members can be used over and over again and adjusted in any desired manner for making any desired form for any desired height or length of wall. The form can be quickly taken apart after the concrete is set, as it is only necessary to unscrew a small number of nuts and to unscrew the wing nuts that hold the fasteners in position, to take down the form. The fasteners and the frame members, as well as the lumber used in making the wall portions of the form, can be used over and over again.

What I claim is:

1. In a concrete form, vertical studs angular in cross section, a plurality of vertically closely adjacent, horizontally extending, elongated, imperforate vertical wall forming members, having narrow spaces between the adjacent horizontal edges thereof, members for securing said wall forming members face to face to said studs, said securing members having thin flat shank portions extending through said narrow spaces between and in engagement with adjacent longitudinal edges of adjacent wall forming members, and having oppositely directed flat faced narrow fingers thereon each engaging face to face the faces remote from said studs of one of the wall forming members adjacent said securing members, said securing members having integral threaded shank portions extending through slots in said studs, said securing members being adjustable longitudinally of said studs in said slot, and means engaging said threaded portions to detachably adjustably clamp said wall forming members directly to said studs.

2. In a concrete form, studs having a pair of parallel flanges spaced apart, said flanges having rows of longitudinally spaced longitudinally extending slots therein, the slots in one flange being transversely aligned with the slots of the other flange, horizontally extending, vertically adjacent, closely spaced, elongated vertical wall forming members, and adjustable means for clamping said wall forming members face to face to one of the flanges of said studs, said clamping means comprising members having flat faced narrow fingers engaging the inner faces of said wall forming members and having flattened shank portions extending between and in engagement with adjacent flat longitudinal edges of adjacent wall forming members and through the slots in one of said flanges and having integral threaded shank portions extending from said flattened portions through the slots in the other flange and means screw-threadedly engaging said threaded portions and engaging the outer face of said other flange, said clamping members being adjustable longitudinally of said studs in said slots.

3. In a concrete form, vertical studs angular in cross section having a pair of parallel flanges spaced apart and having rows of longitudinally spaced longitudinally extending slots therein, the slots in one flange being transversely aligned with the slots in the other flange, a plurality of vertically closely adjacent horizontally extending imperforate boards of standard dimensions constituting vertical wall forming members, said boards having spaces so narrow between the same as to close upon swelling of said boards when moistened by the concrete in engagement therewith, and spaced members for securing said boards to said studs, each having a thin flat shank portion extending between and in flat face to face engagement with the contiguous flat horizontal longitudinal faces of adjacent boards, said flat shank portions terminating in oppositely directed flat ears flatly engaging the faces remote from said studs of both the boards between which said shank portions extend, and each having a threaded shank portion extending to the end thereof opposite that having said ears, said shank portions extending through said slots and said securing members being individually adjustable lengthwise of said studs in said slots, and means engaging said threaded shank portions and said studs to adjustably detachably clamp said boards to said studs.

WILLIAM J. McDONALD.