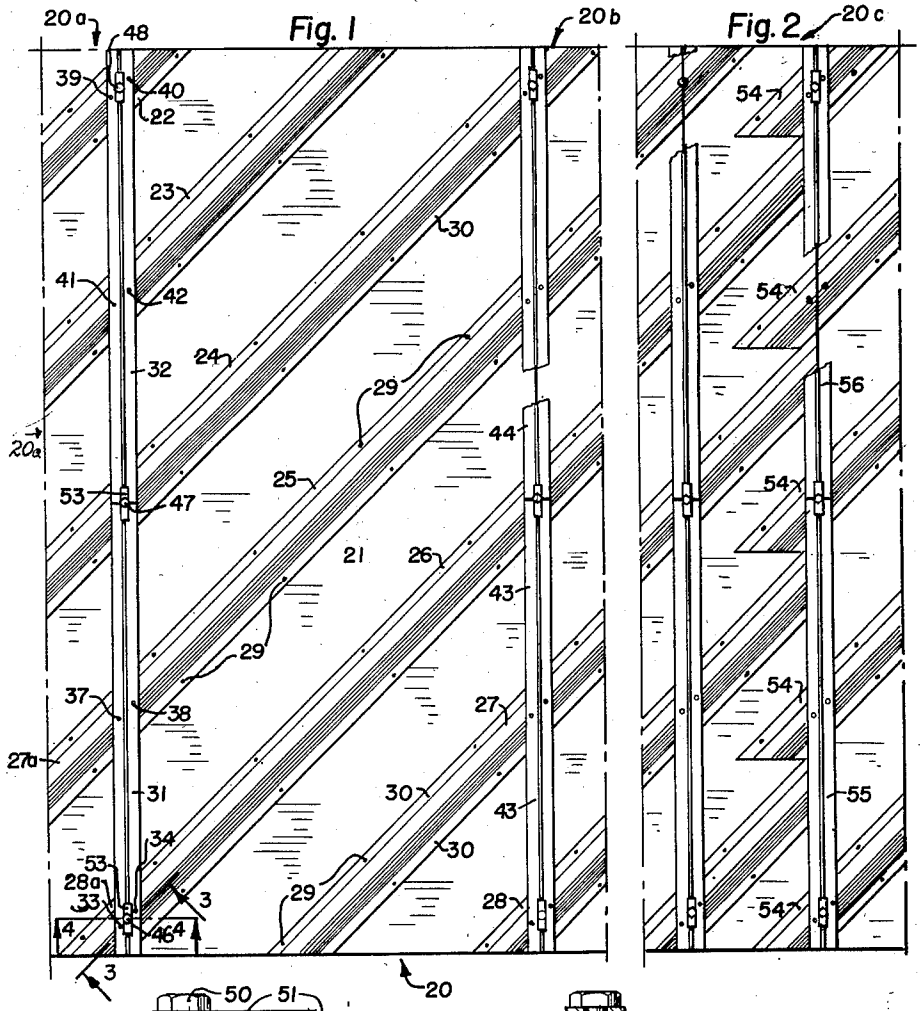
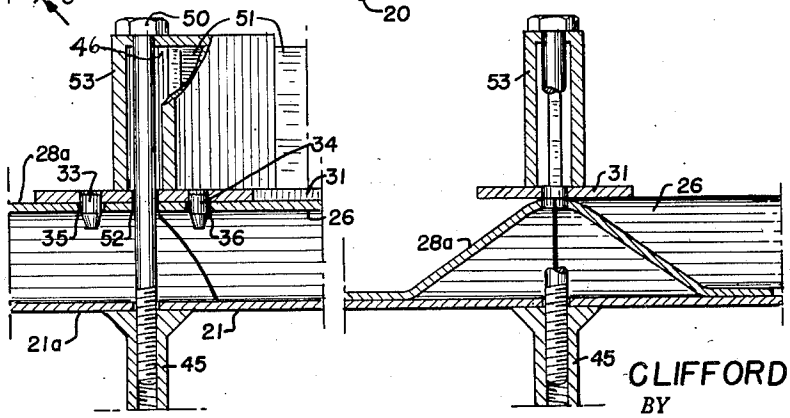
June 9, 1953 C. M. MARTIN 2,641,043

FORM FOR MOLDING CONCRETE WALLS

Filed July 14, 1950 2 Sheets-Sheet 1





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FORM FOR MOLDING CONCRETE WALLS

Filed July 14, 1950 2 Sheets-Sheet 2

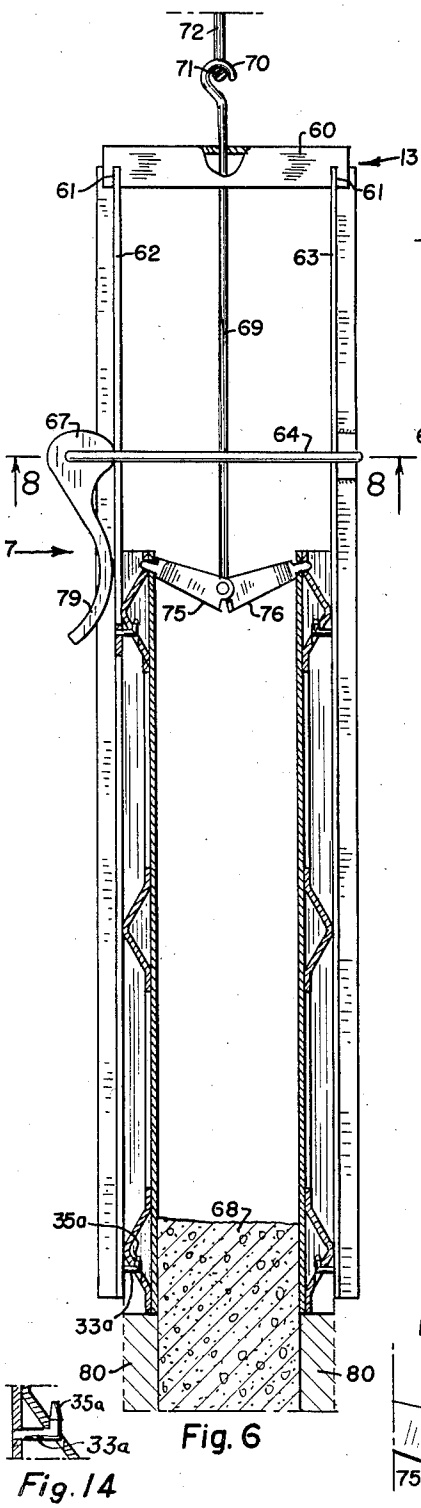


Fig. 6

Fig. 14

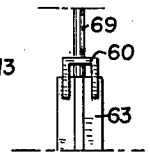


Fig. 13

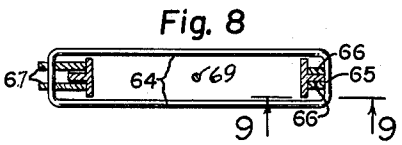


Fig. 8

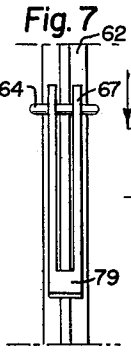


Fig. 7

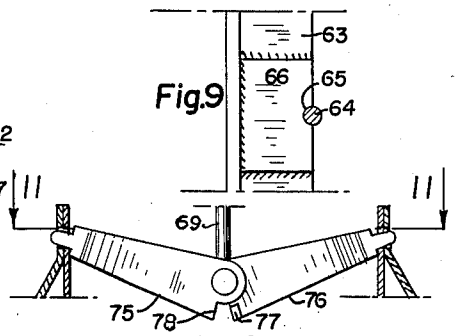


Fig. 9

Fig. 10

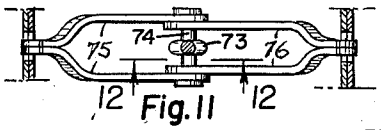


Fig. 11

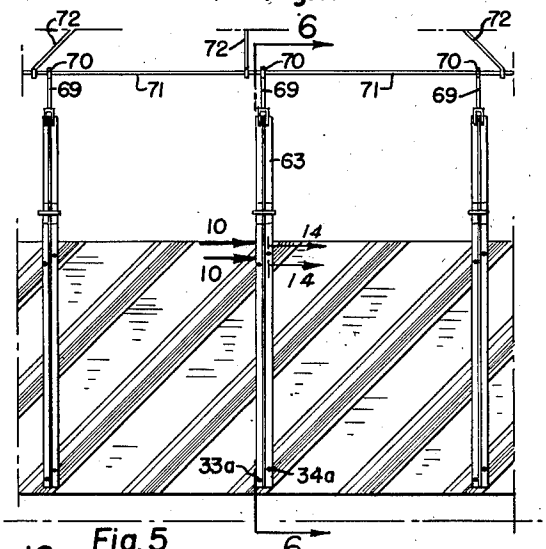


Fig. 5

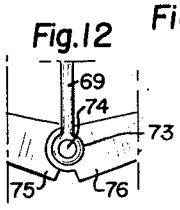


Fig. 12

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FORM FOR MOLDING CONCRETE WALLS

Clifford M. Martin, Hartsel, Colo.

Application July 14, 1950, Serial No. 173,788

2 Claims. (Cl. 25—131)

1

This invention relates to improvements in forms employed in pouring concrete walls and is a continuation-in-part of my copending application, Serial No. 789,021, now U. S. Patent 2,523,131.

In the above identified application I have disclosed certain novel ribbed metal plates which may be secured together to provide a form of any desired length. The present invention relates to somewhat similar plates or panels, but the means for securing them together differs.

One of the objects of the invention is to provide a novel bar construction which secures adjacent panels together.

Another object is to draw edges of the adjacent panels together when the bar construction is applied thereto.

Another object is to provide a plurality of standard width panels and panels of fractional width thereof so that a wall of any desired length may be poured.

A further object is to employ the principals of the invention to a slip form.

Still further objects, advantages, and salient features will become more apparent from a consideration of the description to follow, the appended claims, and the accompanying drawing, in which:

Figure 1 is a side elevation of one standard panel shown secured to adjacent panels, portions being broken away;

Figure 2 is a similar view showing a fractional width panel interposed between adjacent panels;

Figure 3 is an enlarged section taken on line 3—3, Figure 1;

Figure 4 is an enlarged section taken on line 4—4, Figure 1;

Figure 5 is a side elevation of a similar set of panels employed on a slip form;

Figure 6 is an enlarged section taken on line 6—6, Figure 5;

Figure 7 is a fragmentary side elevation taken in the direction of arrow 7, Figure 6;

Figure 8 is a section taken on line 8—8, Figure 6;

Figure 9 is an enlarged section taken on line 9—9, Figure 8;

Figure 10 is an enlarged section taken on line 10—10, Figure 5;

Figure 11 is a section taken on line 11—11, Figure 10;

Figure 12 is a section taken on line 12—12, Figure 11;

Figure 13 is a fragmentary end elevation in the direction of arrow 13, Figure 6; and

Figure 14 is an enlarged section taken on line 14—14, Figure 5.

Referring in detail to the drawing, and particularly Figures 1 to 4, a panel 20 comprises a flat sheet of metal 21 having a plurality of diagonal hollow ribs 22 and 28 secured thereto by rivets 29 passing through the plate and flanges 30 on the ribs. Instead of rivets, spot welding or any other means of securement may be employed. Any metal may be employed; however, aluminum alloy is preferable because of its strength and lightness. The panel 20 may be any size, but it has been found preferable to construct it four feet wide and slightly over eight feet high with the ribs disposed at 45° to its vertical edges.

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A pair of T-shaped bars 31, 32 overlie the joint between panel 20 and adjacent panel 20*a*. Bar 31 is provided with projecting taper pins 33, 34 (see Figure 3) near its lower end which engage in apertures 35, 36, near the ends of adjacent ribs 28*a*, 26, respectively. An identical pair of pins 37, 38 engage in similar apertures in ribs 27*a*, 25, respectively. All of these pins have a tapered portion and a cylindrical body portion and are so spaced relative to the apertures in the ribs that the tapered portions wedge the edges of adjacent panels together when the bar is drawn toward the ribs, the final position being as shown in Figure 3 with the cylindrical portions fitting the apertures in the ribs. The upper T-bar 32 is identical to lower bar 31 but disposed in inverted position, pins 39, 40 corresponding to pins 33, 34, and pins 41, 42 corresponding to pins 37, 38. T-bars 43, 44 are identical to the bars just described, these bars securing panel 20*b* to panel 20 in the same manner described for bars 31, 32.

In setting up the panels to pour a wall they are temporarily supported in any suitable manner and anchors 45 are disposed therebetween at points 46, 47, 48 and corresponding points between panels 20 and 20*b*. These anchors are of a length the same thickness as the concrete wall to be poured and threaded on opposite ends for receiving tie bolts 50, one end of the anchor and the panel of one side of the form being shown in Figures 3 and 4. Tie bolts 50 are inserted through the flanges 51 of the T-bars at points 46, 47 and 48, the flange 51 of the T-bar being cut away at point 46 to receive a tie bolt 50, an aperture 52 being provided in the base of the T-bar through which the bolt extends, suitable juxtaposed semicircular holes being provided in the ribs and plates at their juncture edges through which the tie bolt extends. A U-shaped clamp 53 straddles the flange of the T-bar providing a bearing upon which the head of the bolt may turn, the clamp also adding strength to the construction. The upper end of T-bar 31 is provided with a semicircular hole and a similar cut away flange for receiving a tie bolt at this point, a similar U-shaped clamp 53 being provided which bears on the ends of T-bars 31 and 32. The construction at point 48 is the same as at point 46 and the

same construction is employed between panels 20 and 20b.

It will now be apparent that as tie bolts 50 are drawn into anchors 45 the taper pins will first wedge adjacent panels toward each other and when the panels are finally drawn against the anchors the pins will appear as shown in Figure 3 with the edges between panels abutting.

Since walls are not always of a length which is an even multiple of panel width, it is necessary to provide fractional width panels which may be attached to standard width panels, and hence a set of panels will include the former. In Figure 2 a sixteen-inch panel 20c is illustrated. This panel is identical to the first sixteen inches of panel 20 from its left edge towards its right edge, but differs in that auxiliary short ribs 54 are secured thereto. These ribs are provided with apertures like 35 for receiving the taper pins on T-bars 55, 56, the later being identical to the other T-bars. With a twenty-four inch width panel the auxiliary ribs are not required, since the normal ribs on a panel of this width will terminate in alignment with the continuing ribs of the next standard panel. It is apparent that any other suitable fractional width panels may be employed in the set.

In Figures 6 to 13 another application of the invention is illustrated wherein a so-called "slip form" is employed. The panels in this case are similar to the ones previously described, but no tie bolts are employed. The taper pins 33a, 34a are disposed on the T-bars in the same angular relationship as taper pins 33, 34 previously described but are bent upwardly and engage in apertures, such as 35a, in the sides of the ribs. When a T-bar is moved vertically, adjacent panels are drawn together by each set of adjacent taper pins in the same manner described for Figures 1 to 4.

A removable channel shaped spacer bar 60, having notches 61 near its ends, extends between the upper ends of T-bars 62, 63, the notches engaging the bases of the T-bars and preventing the T-bars from spreading or moving toward each other. The notches are sufficiently loose, however, to permit some pivotal movement between the spacer bar and the T-bars.

A looped rod 64 extends around the two T-bars (see Figure 8), one bight thereof engaging a notch 65 in reinforcing plates 66 welded to the sides of the flange of T-bar 63. The other bight has pivoted thereon a cam 67. It will be apparent that when the lower ends of the panels are disposed as shown in Figure 6, on the sides of a previous poured portion of a concrete wall 68 they may be clamped thereto by applying spacer bar 60 and moving cam 67 to the position shown.

The various panels of the form may be supported by a plurality of rods 69 having hooks 70 at their upper ends, the latter engaging a bar 71 which is supported by rods 72 which join at their upper ends on the hook of a crane (not shown). The lower end of each rod 69 has an eye 73 which engages a cross pin 74 which extends between the links 75, 76 of a toggle device. A lug 77 is provided on each side of link 76 which engages ends 78 of link 75 to limit upward relative movement of the links.

In the operation of the construction just described, the form is lowered into place on wall 68, cam 67 being in its disengaged position, that is, with lever 79 thereon in a horizontal position. The toggle device will be straight at this time and the lower ends of the panels spread apart a distance greater than the width of the concrete wall 68. The lower edges are lowered onto any suitable support such as bars 80 which prevent downward movement of the form. Rods 69 are then lowered breaking the toggle links to the position shown in Figure 6 after which lever 79 is moved to the position shown which draws the lower ends of the panels toward each other, pivoting about slots 61. The wall is then poured, and after it has set, cam 67 is moved to unclamped position and bars 60 are removed. Upward movement of rods 69 straighten the toggles, breaking the panels away from the wall. After the suction has been broken and the panels thereby loosed from the wall, rods 69 are lowered and bars 60 reapplied. Vertical movement of the rods again straighten the toggles breaking the lower edges of the panels away from the walls. Further vertical movement of rods 69 removes the panels from the poured wall. It is to be understood that rods 69, cams 67, and bars 60 may be manipulated in various manners and sequences and the particular operation just described is only one of the several manners of manipulation.

Having described the invention, what I claim as new is:

1. A form for use in molding concrete walls, comprising, a pair of plates abutting along juxtaposed edges thereof, at least two spaced diagonal ribs on each plate, the ribs on one plate being in axial alignment with the corresponding ribs on the other plate and the ends of the ribs at the line of juncture between the plates being juxtaposed, a bar overlying said edges and the ends of all ribs, and wedging means on the bar engaging adjacent abutting ribs on adjacent plates for securing the plates together, said securing means comprising pins on the bar engageable in apertures in the ribs.

2. A form for use in molding concrete walls, comprising, a pair of plates abutting along juxtaposed edges thereof, at least two spaced diagonal ribs on each plate, the ribs on one plate being in axial alignment with the corresponding ribs on the other plate and the ends of the ribs at the line of juncture between the plates being juxtaposed, a bar overlying said edges and the ends of all ribs, and wedging means on the bar engaging adjacent abutting ribs on adjacent plates for securing the plates together, said securing means comprising pins on the bar engageable in apertures in the ribs, said pins being tapered to draw the plates together upon relative movement between the bar and plates.

CLIFFORD M. MARTIN.

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