

May 24, 1938.

C. W. DOYLE

2,118,374

CONCRETE FORM

Filed Feb. 19, 1936

5 Sheets-Sheet 1

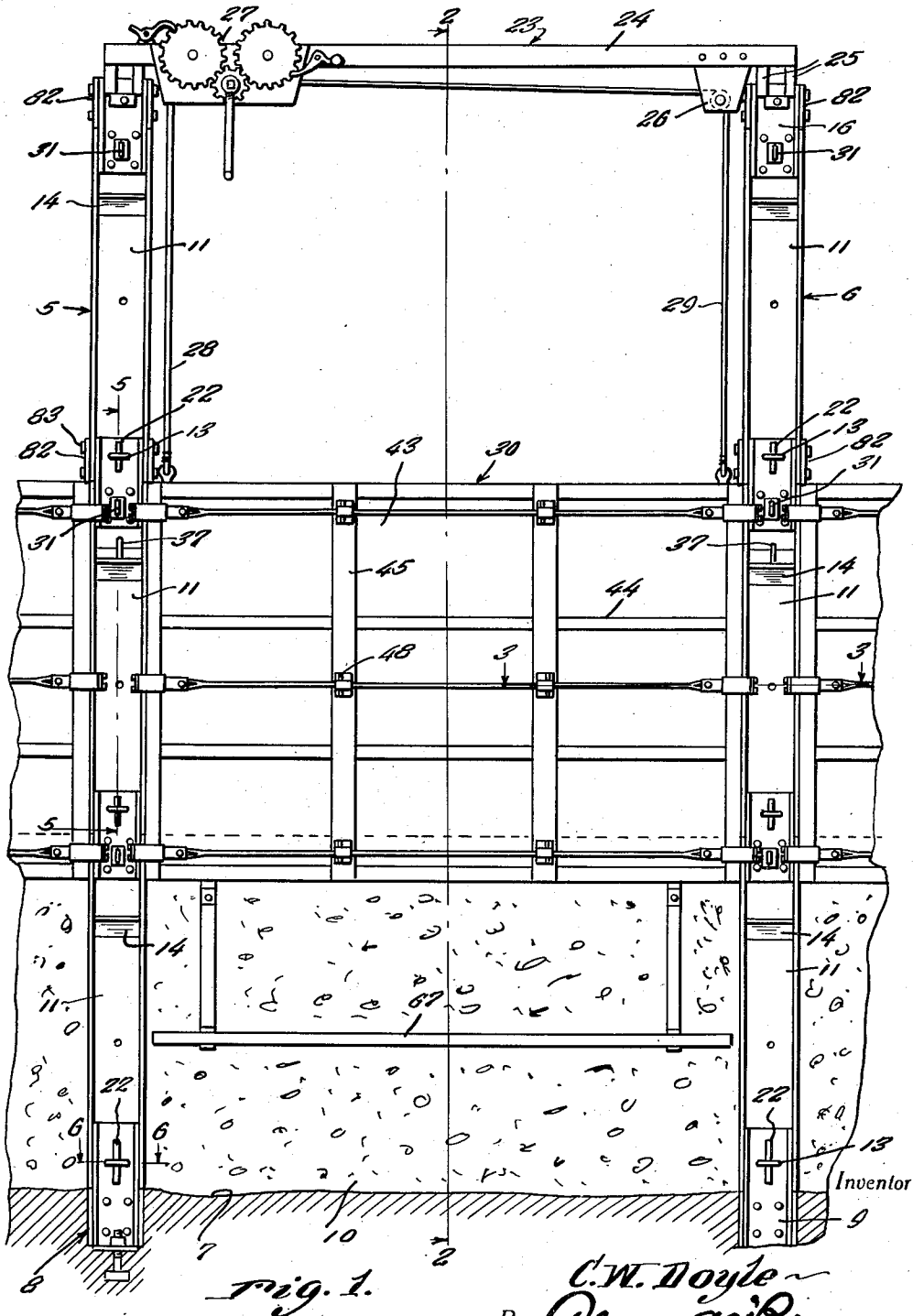


Fig. 1.

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5 Sheets-Sheet 2

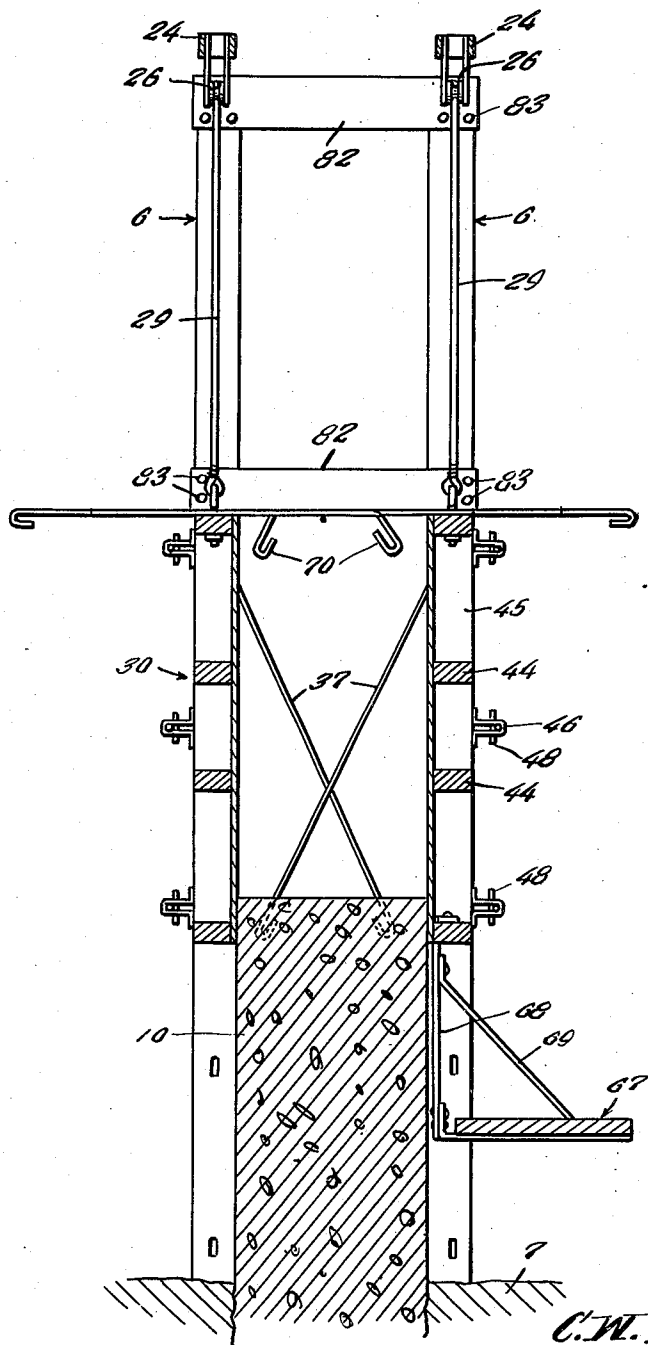


Fig. 2.

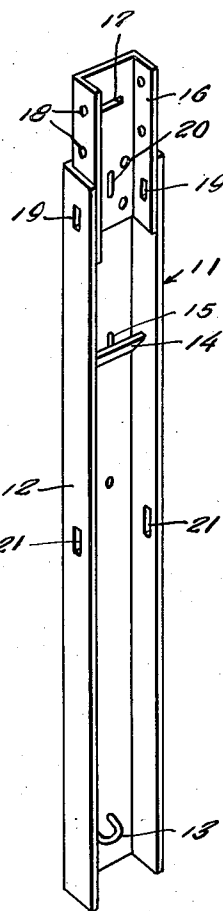


Fig. 4.

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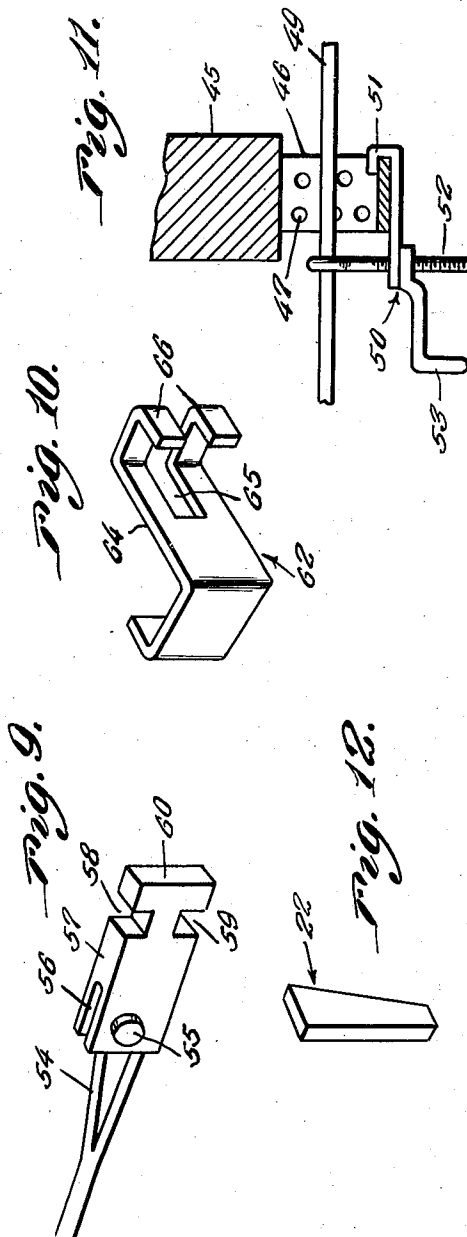
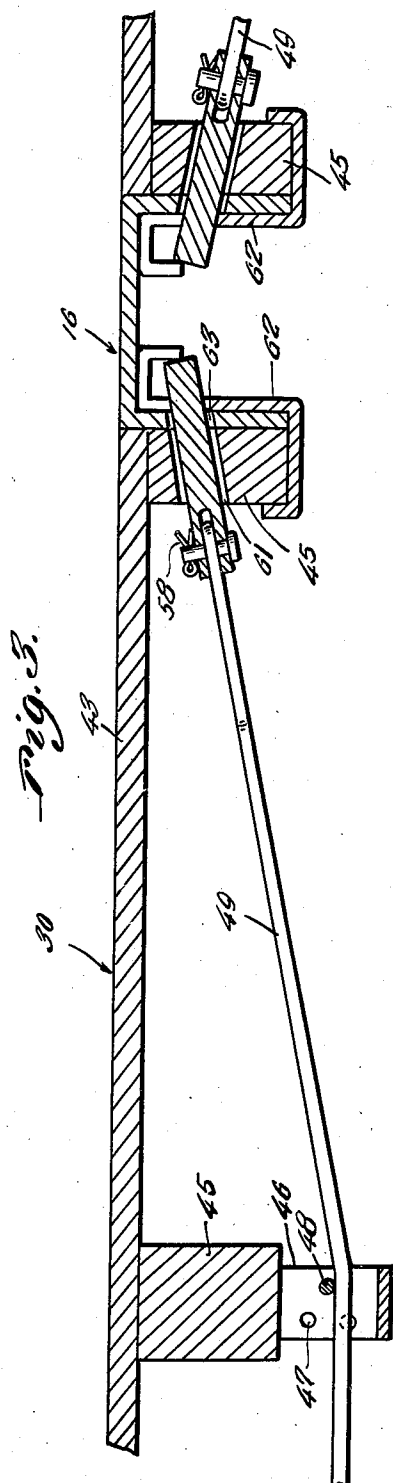
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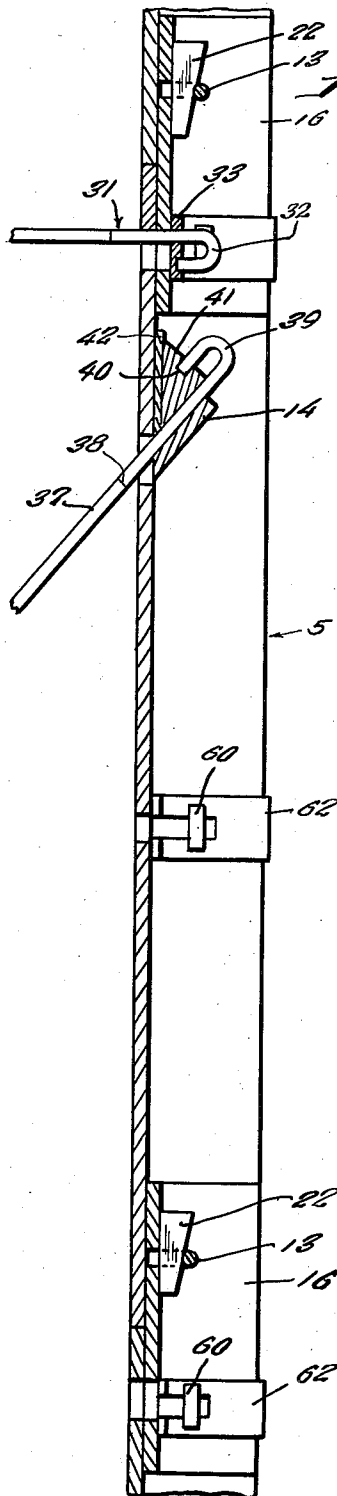


Fig. 5.

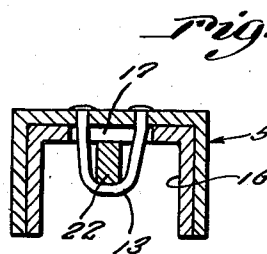


Fig. 6.

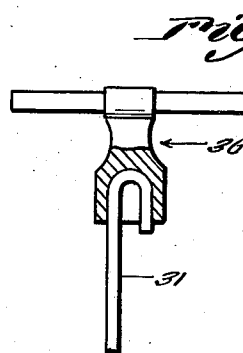


Fig. 7.

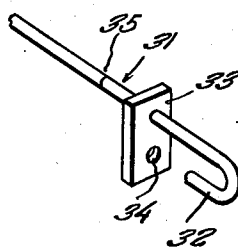


Fig. 8.

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Fig. 13.

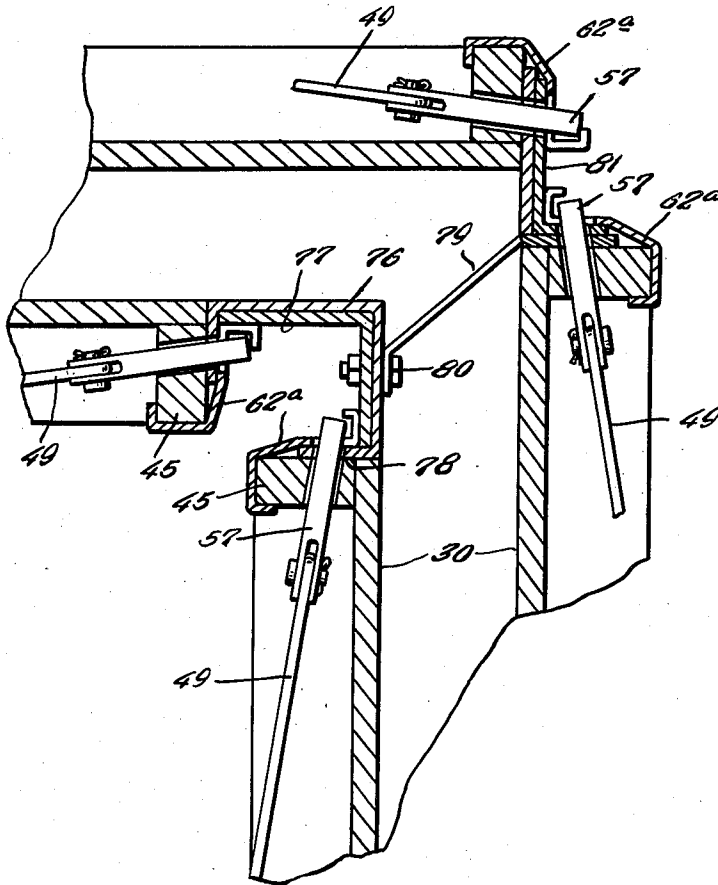


Fig. 14.

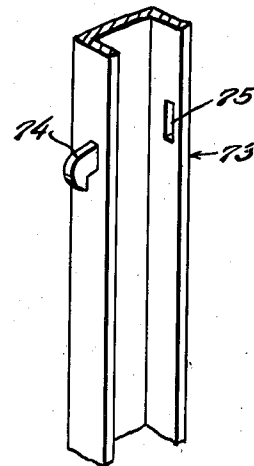
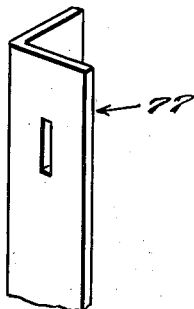


Fig. 15.



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UNITED STATES PATENT OFFICE

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CONCRETE FORM

Conrad Walton Doyle, Warrendale, Oreg.

Application February 19, 1936, Serial No. 64,737

1 Claim. (Cl. 25—131)

My invention relates generally to concrete forms utilized in the building of concrete walls and the like, and particularly to a concrete form of this type which can be vertically adjusted into a new and higher position as successively higher sections or stages of the wall or the like are poured and moulded, and an important object of my invention is to provide concrete forms of this character which greatly facilitate the building and construction of concrete walls and the like by reducing the amount of expense and labor concerned, and by greatly speeding up the operations of construction, while more perfectly maintaining the vertical and longitudinal alignment of the wall or the like.

Another important object of the invention is to provide adjustable concrete forms of the types indicated above which are of rugged but inexpensive construction and which can be easily collapsed and transported from job to job.

Other important objects of my invention will be apparent from a reading of the following description in connection with the drawings, wherein for purposes of illustration I have shown preferred embodiments of my invention.

In the drawings:—

Figure 1 is a general side elevational view of an embodiment of the invention showing the same vertically adjusted or extended to form a concrete section on and above a preceding concrete section.

Figure 2 is a transverse vertical sectional view taken through Figure 1 and looking toward the right in the direction of the arrows.

Figure 3 is a horizontal sectional view taken through Figure 1 approximately on the line 3—3 and looking downwardly in the direction of the arrows.

Figure 4 is a perspective view of one of the channel post sections.

Figure 5 is a transverse vertical sectional view taken through Figure 1 approximately on the line 5—5 and looking toward the right in the direction of the arrows.

Figure 6 is a horizontal sectional view taken through Figure 1 approximately on the line 6—6 and looking downwardly in the direction of the arrows.

Figure 7 is a sectional elevational view of an implement used in severing a portion of the tie-bars.

Figure 8 is a perspective view of one of the horizontal post securing bars showing the lock arrangement thereon.

Figure 9 is a perspective view of the headed end of one of the longitudinal tightening rods.

Figure 10 is a perspective view of one of the tightening rod locks.

Figure 11 is a horizontal sectional view showing one of the screw jacks for tightening the corresponding tightening rod.

Figure 12 is a perspective view of one of the wedges used in assembling sections of the channel posts.

Figure 13 is a horizontal sectional view through another embodiment of the invention showing an arrangement for the corner of two right-angulantly intersecting walls.

Figure 14 is a perspective view of another form of channel post section.

Figure 15 is a perspective view on one of the corner angle iron post sections.

The invention contemplates the provision of an easily assembled frame adapted to be anchored with side members at either side of the location on which the wall is to be built, the side members having slidable vertically thereon concrete holding forms or walls which may be elevated and depressed at will to different vertical positions by the operation of a winch on the frame, for disposing the formed walls to form vertically successive sections of a concrete wall or the like as one section is laid or built upon the other, provision being made for adding to the height of the frame as the wall goes up, so that the wall forms may be adequately supported in correct positions until the full height of the wall has been constructed. Simple and effective means are provided for slidably assembling the wall forms to side and end posts of the frame, while equally simple and effective means are provided for holding the various vertical sections of the frame posts properly connected. Further, simple and effective tightening means engaged with the posts and lying longitudinally therebetween engage the outer sides of the wall forms for holding these in properly aligned and immobile positions, diagonal tie rod means between the sides of the frame or between adjacent end posts of the frame being provided in such an arrangement that they form concrete reinforcing rods as the concrete is poured into the particular wall section being constructed, these reinforcing rods being left behind in the wall as the wall forms are elevated to make the next vertical section of wall.

In accomplishing the above means and purposes and other associated ends, I have provided a frame which consists of opposed pairs of ver-

tical channel posts 5 and 6 which are anchored in the ground 7 as indicated at 8 and 9 so as to extend parallelly above the ground and along-side of an initial wall section 10 after the formation of the initial wall formation.

Each of the posts 5, 5 and 6, 6 is composed of a plurality of channel sections 11 each of which is composed of the channel form 12 provided in the web thereof near the lower end with a loop 13 arranged in a horizontal plane and above the middle with an angulated plate 14 on a level with a vertical slot 15. Within the upper end of the channel form 12 is the reduced channel member or coupling 16 which has the horizontal slot 17 adjacent its upper end and the holes 18 in its flanges and also the registering vertical slots 19 therebelow in the flanges and substantially aligned with these in the web is a vertical slot 20. Intermediate the ends of the flanges of the channel form 12 are vertical slots 21.

The channel sections 11 have their lower ends disposed relative to the anchors 8 and 9 by a telescopic arrangement shown in Figure 1 with the loop 13 passing through the slot 17 in the coupling member and with the wedge 22 driven home between the web of the coupling and the inner side of the loop 13. The next higher channel section is assembled to the lowermost channel section by telescoping the lower end of the upper section on the coupling of the lower section with the corresponding loop 13 through the slot 17 and with a wedge 22 in place.

With four of the posts 5, 5, and 6, 6 constructed as indicated, the upper end of the uppermost channel sections have mounted thereon the opposite corners of the winch assembly which is generally designated 23 and which may assume any suitable form but which can be successfully used in the form shown in Figure 1 as consisting of longitudinal side members 24 having depending lugs 25 engaging the upper ends of the corresponding couplings 16 so as to support the side members in a horizontal position and longitudinally between the posts 5 and 6 on the same side of the wall. A pulley 26 depends from the side members 24 adjacent the posts 6, while a suitably geared winch 27 is mounted on the side members 24 adjacent the posts 5. Depending cables or ropes 28 and 29 depend from the winch 27 and the pulley 26, respectively, for connection to the upper edges of the wall forms 30.

Bracing rods 31 of the form of that shown in Figure 8 are provided for tying together the upper end of the uppermost sections of the posts, that is, the adjacent end posts, the rod 31 being disposed in a transverse position and having a crook 32 at its ends and within the end a slidable plate 33 traversed by the rod near one end, the said plate having an opening 34 adjacent its opposite end to receive the terminal of the crook 32 as indicated in Figure 1 and in Figure 5.

Similar brace rods are arranged through the next lower couplings which are on a level with the top of the section of wall to be formed, as indicated in Figure 1, while the coupling portions of the next lower sections are devoid of the rods 31 and the connection thereof with the posts, for the reason that the crook head of these rods was twisted off at the weakened point 35 by manipulation of the implement which is generally designated 36 and is socketed to receive the crook of the rod as indicated in Figure 7. In this way the horizontal tie bars are left in the formed con-

crete wall section and act as reinforcements therein.

At the level of the wall section being or about to be formed there are arranged also the diagonal tie bars or reinforcing bars 37 the outer ends of which are provided with weakened portions 38 and the terminals with hooks or crooks 39 arranged to lie along the angulated plates 14 and having the terminals of the crook enter the socket opening 40 in the triangular filler block 41 as shown in Figure 5, the filler block 41 being secured in place by driving the wedge 42 between the web of the channel member and the block 41. The lower or depressed ends of the rods 37 are embedded in the upper portion of the lower wall section as clearly indicated in Figure 2.

The wall forms 30 may have any suitable arrangement and be composed of any suitable material to include the plates 43 preferably having the longitudinal ribs 44 and the vertical cleats 45 properly longitudinally spaced thereon and connected with the longitudinal ribs 44 as clearly shown in Figure 1 and in Figure 2.

Each vertical cleat 45 has at vertically spaced intervals thereof a U-shaped bracket 46 which has lateral flanges attached to the cleats, the bracket having in its legs a plurality of vertically aligned holes 47 for receiving the pin 48 in a selected position to hold the corresponding tightening rod 49 in laterally tensioned position. The tightening rod 49 has its ends connected in a manner to be indicated below to the posts on the same side of the form. The tightening of the tightening rods 49 is accomplished by means of a screw jack which is generally designated 50 and which has a J-flange 51 to engage the bight of the bracket 46 and an eye equipped screw 52 engaging the tightening rod 49 in a manner indicated in Figure 11. Operating the screw crank 53 draws the tightening rod toward the bottom of Figure 11 or laterally outwardly with respect to the form wall 30 so as to impart the desired tension to the tightening rod.

The opposite ends of the tightening rods are widened as indicated by the numeral 54 and traversed by a pivot 55 which traverses the slots 56 in the end of the locking head 57 and is held in place by a cotter pin or the like 58 as clearly shown in Figures 3 and 9.

The locking head is rectangular and elongated and is provided in opposite side edges with the notches 58 and 59 defining the T-head 60. At a proper point of elevation the end vertical cleat 45 of the form wall is provided with a properly angulated opening 61 through which the head 57 passes to engage the locking member 62. An opening 63 in the flange of the coupling channel member 57 is provided to pass the head into a position to engage the lock 62 as indicated in Figure 3.

The lock 62 comprises the J-shaped member 64 which is bifurcated as indicated by the numeral 65 at the upper end of its standard and the resultant legs are provided with L-shaped extensions 66.

The locking head 57 and the locking member 62 are assembled with the T-head 60 engaged between the bifurcated extensions 66 and the assembled unit is then placed upon the cleat 45 with the locking head inserted in the opening 61 and the parts secured to the rod 49, as shown in Figure 3.

The wall forms having been constructed and set up in the manner indicated and the tightening rods 49 having been tightened, the concrete

is poured between the wall forms and when suitably set, the winch is operated to draw the wall forms upwardly into the next position for forming the next concrete wall section; appropriate additions being made to the upper ends of the posts in the manner indicated as required to bring the posts to the proper height for the operation being performed.

Reference to Figure 2 will show the mounting of a step or platform 67 held up by a bracket 68 having a diagonal brace 69, these parts being mounted to depend from the wall form as indicated in Figure 2 when the proper elevation of the wall form is achieved. Reference to Figure 2 will also disclose the initial position of the diagonal reinforcing rods 37 which are laid across the top of the wall forms and the depressed ends 70 thereof disposed below the upper edges of the wall forms so as to be embedded in the concrete as the same is poured. After the concrete is somewhat set the rods are bent up into the positions illustrated in Figure 2 and connected at their upper ends to the adjacent coupling channel sections.

Reference to Figures 14 and 15 show alternative forms of channel posts, the form shown in Figure 14 being capable of being substituted for the forms already described in Figures 1 through 12. In the alternative form which is generally designated 73 one flange is provided with the assembling hook 74 while the opposite flange is provided with a receiving slot 75 with which a hook 74 of the telescoping section is engaged.

In Figure 15 is shown the angle form rather than the channel form, the angle form being utilized as indicated in Figure 13 at the corner of intersecting walls to provide the proper form and arrangement of the device of the invention for constructing a wall corner.

In the case of the arrangement shown in Figure 13 the ends of the wall forms 30 abut right angular flanges on the ends of the angle girders

76 within which lie the angle forms 77. The extra flanges 78 of the angle girders 76 have openings receiving the heads 57 of the tightening rods 49, the said heads traversing the adjacent vertical cleats 45, and locks 62a generally similar to the locks 62 lock the heads 57 in place. Braces 79 go diagonally across the space between the wall forms 30 and have one end bolted as indicated at 80 to the angle forms 77 and angle girders 76 and the opposite end of the brace 79 forms part of the outer corner arrangement 81 the side portions of which are also traversed by heads 57 on the outer tightening rods 49 which are locked in place by locks 62a.

Although I have shown and described herein preferred embodiments of my invention, it is to be definitely understood that I do not desire to limit the application of the invention thereto, and any change or changes may be made in the materials, and in the structure and arrangement of the parts, within the spirit of the invention and the scope of the subjoined claim.

What is claimed is:—

A wall forming device of the character described, said device comprising a vertical frame having channel posts longitudinally spaced along the location for the wall, wall forms slidably engaged with the posts and extending therebetween, and means for elevating and lowering the wall forms, tightening rods extending between the longitudinally spaced posts and engaging outside portions of the corresponding wall forms, and means releasably securing the rods to the posts comprising bifurcated locking members positioned within the channels of the posts and notched locking heads on the ends of the rods positioned crosswise of the locking members with the notches engaging the bifurcations of the locking members.

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