May 8, 1945. V. A. HAMILTON 2,375,648

MEANS AND METHOD OF CONSTRUCTING WALLS

Filed July 20, 1942 2 Sheets-Sheet 1

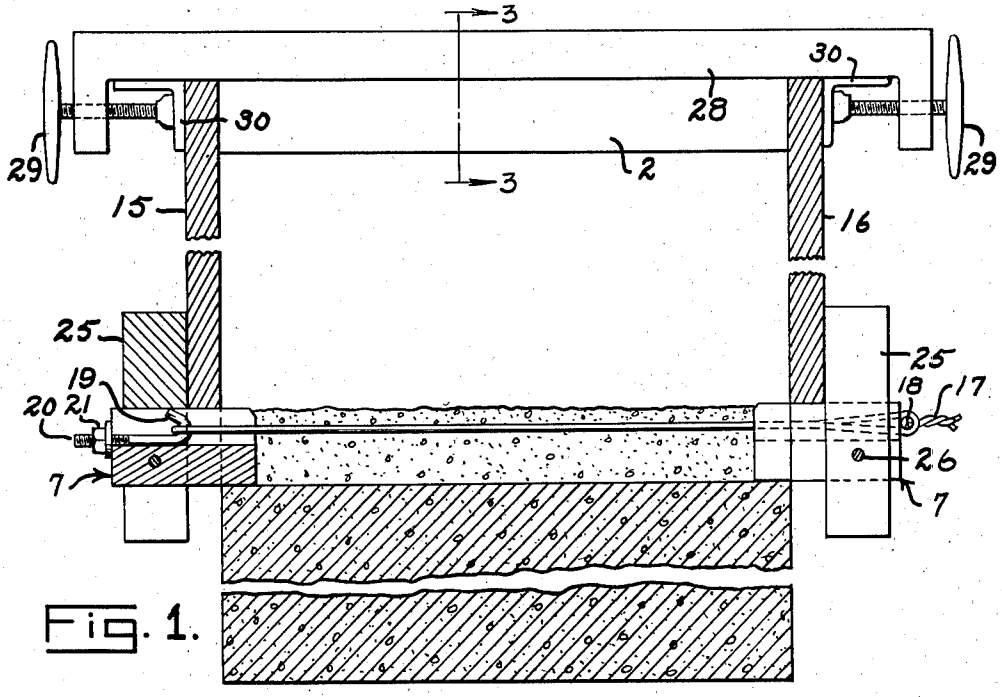


Fig. 1.

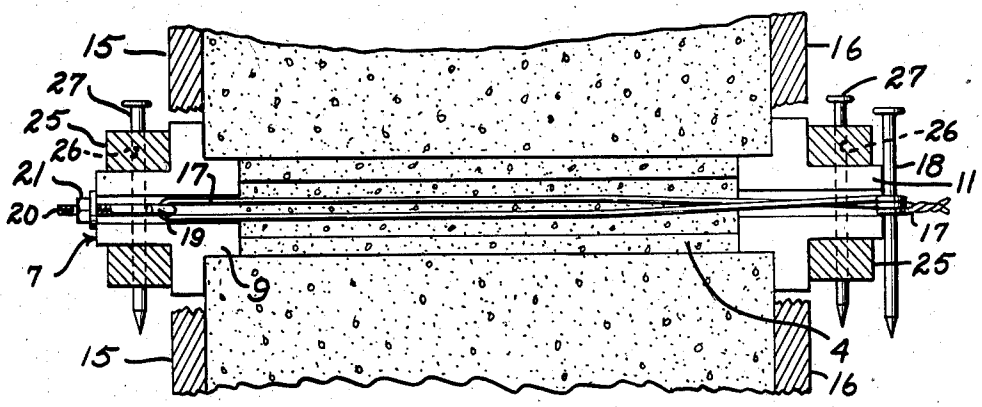


Fig. 2.

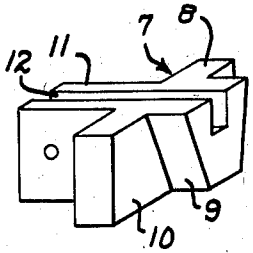


Fig. 4.

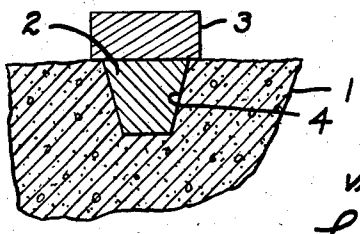


Fig. 3.

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MEANS AND METHOD OF CONSTRUCTING WALLS

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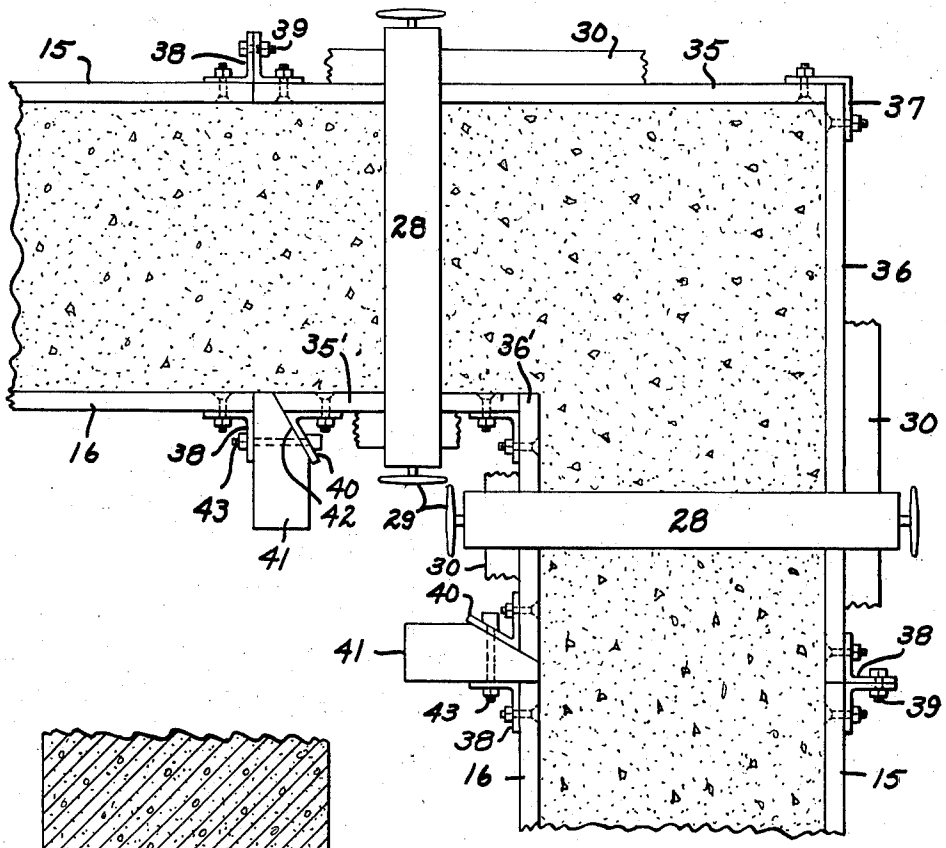


Fig. 5.

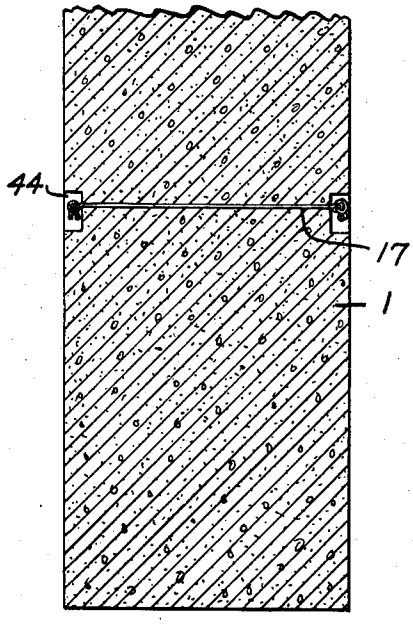


Fig. 6.

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MEANS AND METHOD OF CONSTRUCTING WALLS

Van A. Hamilton, Palestine, Tex.

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4 Claims. (Cl. 25—131)

This invention relates to the construction of concrete walls. More particularly the invention comprehends the production of a wall of cementitious material by the utilization of an improved form whereby there is cast a series of superposed beams to produce a monolithic wall structure.

The primary object of the invention is to provide method and apparatus for constructing concrete walls in an inexpensive and expeditious manner.

Another object is to provide means and method whereby rapid and accurate alinement of successively cast portions of a wall will be effected.

A further object is to provide a method of construction in which the precast portion of a wall serves as an alining support for the addition of a successive portion.

A still further object is to provide a form which includes a transverse spacer proximate its upper edge to serve the dual function of providing the proper wall thickness and providing a transverse surface groove in the cementitious material cast therein, such groove serving to lock spacer lugs for subsequent positioning of the form thereabove.

Still another object of the invention is to cast a concrete wall in superposed sections with successive sections thereof in accurate alinement.

Another object is to cast a concrete wall in superposed sections with desired openings blocked out during the casting operations.

The foregoing objects together with additional objects will be more fully apparent from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a transverse sectional view in elevation through a cast beam portion of a wall showing the form positioned to receive a quantity of material to form the successive beam portion of a wall;

Fig. 2 is a sectional plan view through the form used in practicing the invention and showing the relative position of parts preliminary to the pouring of concrete therein;

Fig. 3 is a sectional view taken on the line 3—3 after cement has been poured within the form, and also shows the manner of providing transverse grooves on a starter wall or grade beam;

Fig. 4 is a perspective view of one form of lug used in accordance with the invention;

Fig. 5 is a plan view showing a corner construction of the form used in the practice of the invention;

Fig. 6 is a sectional view through a wall showing the manner of disposing of the ties embedded in the cast concrete.

While the word, "concrete" is used in the present disclosure of the invention, it is to be understood that the invention pertains to the production of wall structures from any cementitious material, and also comprehends the utilization of reinforcement members, such as steel bars or rods, to enhance strength of the resultant monolithic structure.

In the practice of the invention it will be assumed that a starter wall or grade beam 1 (Fig. 3), is first cast, a filler strip 2 being utilized in connection with the cross ties 3 of the form used in casting such starter wall. The filler strips 2 serve the dual function of determining the width of the form and also provide transverse grooves 4 in the upper surface of the starter wall to serve the purpose that will presently appear. The spacer block 2 is shown as trapezoidal in cross section, such configuration being used since the block may more readily be removed after the cast concrete has set thereabout. It is to be understood that the invention is not confined to the use of spacer blocks having this cross sectional configuration since other configurations may be used, the principal requisite being that the spacer blocks be removable so that a transverse groove is provided in the upper surface of the concrete cast within the form in which the spacer block is used.

The wall that is constructed upon the starter wall 1 is cast in a series of horizontally extending superposed beams. The following decription applies to the casting of any of these beam portions which are cast in succession, each portion being preferably constructed upon the preceding portion as soon as practicable after the cementitious material of the preceding portion has set.

In order to cast a beam portion upon the starter wall or upon a precast beam portion, a plurality of lugs 7, preferably of wood, are provided to serve in accurately locating the side members 15 and 16 of the form relative to the precast portion of the wall. Each of these lugs 7 comprises a body portion 8 and an inner projection or pilot 9 which is of the same configuration and which extends into the end of one of the grooves 4 as the face 10 on the body 8 engages the outer surface of the precast portion of the wall. The body portion 8 is preferably, though not necessarily, of the same thickness as the form members 15 and 16.

The lug 7 also includes a rectangular leg 11 which extends outwardly from the body in a direction opposite from the direction of the projection 9.

The entire lug has a groove 12 in its upper

surface to receive a tie 17 which is preferably of wire in the form of a link or loop. Such tie is secured at one end by a pin or nail 18 which engages the outer surface of one of the lug members. The tie then passes through the transverse groove 4 and its opposite end is engaged by the hook 19 on the bolt 20 so that the nut and washer 21 at the outer end thereof engage the outer surface of the lug 10. By means of this construction tightening of the bolt will cause the lugs 7 to tightly engage the sides of the precast portion of the wall. The projection or pilot 9 is instrumental in effecting accurate location of the lugs.

After the lugs have been positioned along a precast portion of the wall to which an additional beam portion is to be added and with the upper surfaces of such lugs proximate or slightly below the upper surface of the precast portion, the members 15 and 16 are positioned on edge upon the body portions 8 of the lugs on the respective sides of the wall. Inverted U-shaped keepers 25 are then placed over the legs 11 of the lugs and extend upwardly a short distance therefrom. Each of these keepers has a transverse opening 26 adapted to move into alinement with a like opening in the leg 11 and such alined openings are adapted to receive a pin or nail 27 so that the form members 15 and 16 will be accurately and rigidly held in desired position above the precast portion of the wall.

The upper portion of the members 15 and 16 are held in desired spaced position by means of spacers 2 against which the members 15 and 16 are clamped by means of a U-shaped clamp member 28 having wing screws 29 at its opposite ends so that bearing angles 30 will apply desired inward pressure to hold the form in position.

A novel feature of my form structure is also to be found in the manner of constructing the corner portion of a wall, as illustrated in Fig. 5. In this construction it is to be noted that the outer portion of the form is made up of members 35 and 36 which are interconnected at right angles by means of an angle iron 37. This composite structure is attached to adjacent members 15 by means of complementary flanges 38 secured together by means of bolts 39. It seems apparent that this assembly may be readily completed or dismantled whereby construction operations are facilitated.

The inner portion of the corner form is constructed in a manner that such portion is easily removable after the cast cement has set. Members 16, like the members 15, are provided with flanges 38. However, the composite corner structure comprising members 35' and 36' are foreshortened and acute angles 40 are attached thereto so that the ends of the members 16 and 35' are in spaced relation. A filler block 41 is provided with a tapered surface 42 at its inner end and has an opening therethrough so that the bolt 43 may be passed through the flange members 38 and 40 when the inner end of the filler block is substantially coplanar with the inner faces of the members 16 and 35'. This structure is such that the filler block 41 may be removed when it is desired to dismantle the form, and thereupon the composite corner structure may be moved inwardly so that complete dismantling and reassembling of the form may be carried out.

It is to be understood that concrete which is cast within the form above described fills the grooves intermediate the inner ends of the lugs 7 and hence the tie 17 is embedded within the concrete. It is also to be understood that spacers 2 at the upper edge of the form are instrumental in providing transverse grooves for use in the casting of a superposed beam portion upon the precast portion which has become set within the form.

When the form is to be removed and reassembled at a higher elevation, the pins or nails 27 and 18 and the nut and washer assembly 21 may be removed whereby the lugs 7 and the keepers 25, as well as the side members 15 and 16, can be removed for assembly at a new location. The projection or pilot 9 on the lugs 7 thus produces an indentation such as shown at 44 in Fig. 6. Thereafter, the ends of the tie 17 may be curved inwardly and filled with cementitious material whereby the outer surface of the wall is formed into a continuous plane surface. The filling of the indentations 44 is effected before the concrete has completely cured and hence the filling material adheres to the walls of the indentations and the outer ends of the tie 17 as well, and there is provided a smooth, continuous surface on each side of the wall that is produced in accordance with the invention.

The construction and practice of the invention is believed apparent from the foregoing description. By way of summary, it will be assumed that the precast portion of a wall, such as a starter wall or the superposed beam portion 1, has been cast with transverse grooves 4 at spaced intervals on its upper surface. A pair of lugs 7 are then placed with their pilot projections 9 in the ends of each of these grooves and the tie 17 is placed within the grooves 12. A pin, or nail, 18 is passed through one end of the tie 17 and a hook 19 of the bolt 20 is engaged with the opposite end of the tie. The nut 21 is then tightened so that the faces 10 of the lugs 7 are drawn into engagement with the outer faces of the precast portion of the wall.

Form members 15 and 16 may have been previously clamped together by means of clamp members 28 and spacers 2 and such clamping may be effected after these form members are placed on edge upon the body portions 8 of the lugs 7 at the respective sides of the precast wall portion. The keepers 25 may be placed in position either before or after the members 15 and 16 are located upon the lugs 7. In any event, such keepers are retained in place by means of the pins or nails 27 passing through these keepers and the legs 11 of the lugs. It is to be understood that the nuts 21 may be, if desired, loosened so that a given lug or lugs may be shifted slightly to perfect alinement.

If the corner construction shown in Fig. 5 is to be used, the foregoing procedure is followed with the ends of members 15 so located at opposite sides of the corner that the flanges 38 on the members 15 and on the corner members 35 and 36 come into mating relation and are secured together by the bolts 39. The inner corner members 35' and 36' likewise are located in abutting relation with the respective form members 16. Filler blocks 41 are positioned in the gaps formed by the juxtaposed flange members 38 and 40, whereupon the component parts of the corner assembly are secured together by means of bolts 43.

After the form has been filled with cementitious material and such material has set, the form may be removed and the operation repeated. When the lugs 7 have been removed, the outer ends of the ties 17 may be deformed

and forced into the depressions 44 left by the pilot ends 9 of the lugs. These depressions are then filled with cement whereby there is provided a continuous and smooth wall surface.

It seems apparent that where openings such as doors, windows, etc. are to be provided, suitable frames may be inserted between the form sides at proper locations and concrete is cast thereagainst so that such frames become an integral part of the completed wall.

Broadly, the invention comprehends a novel method and apparatus for the construction of concrete walls at a minimum of expense and in an expeditious manner.

What is claimed is:

1. In the method of constructing walls of cementitious material, the steps of, casting a started wall or grade beam with transverse grooves in the upper surface thereof, securing form members above said started wall, locating said members by inserting lug members into said grooves, interconnecting said lugs by a tie rod, filling said grooves and form, removing said forms and lugs while allowing the tie rod to remain, and thereafter filling the openings produced by the lugs at the ends of the grooves.

2. A form for casting superposed beam portions of a wall, said form comprising, side members, a spacer interposed between said members at their upper edges, means for clamping said members to said spacer whereby the members are held in predetermined spaced relation and the spacer is adapted to form a transverse groove in the upper surface of the material cast within the form, means for holding said members in alinement with a precast portion of the wall, said last mentioned means including a pair of lugs adapted to be fitted into a groove in the upper surface of the previously cast portion, an interconnecting tie for holding such lugs in engagement with said precast portion of the wall, said lugs being engageable by said side members whereby such members are held in alinement with the precast portion of the wall by said lugs.

3. A form for casting superposed beam portions of a wall, said form comprising, side members, a spacer interposed between said members at their upper edges, means for clamping said members to said spacer whereby the members are held in predetermined spaced relation and the spacer is adapted to form a transverse groove in the material cast within the form, a tie extending transversely of the side members proximate the lower edge thereof, lugs engageable with the outer surfaces of said side members, said tie passing through said lugs, and adjustable means engageable with the opposite ends of the tie and the outer ends of the lugs for holding the lugs in engagement with a precast portion of the wall.

4. A lug member for securing a form upon a precast portion of a wall comprising, a body portion having a face adapted to engage the surface of said precast portion, a pilot extending outwardly from said face to enter an opening proximate the upper surface of the precast portion, and means for securing the lug in position with the pilot in the opening.

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