CONCRETE WALL AND METHOD OF FINISHING SAME

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This invention relates to improvements in concrete walls and method of building and finishing the same, and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The primary object of the invention is to provide an improved wall of this kind and one which may be built with greater speed and at a less cost than is possible under methods as today practiced.

Another object of the invention is to provide a wall of this kind including members employed for spacing the forms and which members may not be used as ties for veneering brick, as well as means for holding the reinforcing members during the pouring of the concrete.

A further object of the invention is to provide a wall of this kind having facings of insulation which provide the forms for the wall and which facings or forms are held in spaced relation to members that tie the veneering brick in place.

Still a further object of the invention is to provide an improved method of building a wall of this kind which is fast and economical and which insures a substantial tied connection for the veneering brick.

The above mentioned objects of the invention as well as others, together with the many advantages, will more fully appear as I proceed with my specification.

In the drawings:

Fig. 1 is a vertical sectional view through a part of a brick veneered concrete wall embodying one form of my invention.

Fig. 2 is a horizontal sectional view through the same as taken on the line 2-2 of Fig. 1.

Fig. 3 is a perspective view of a certain bar embodying a part of the invention for holding the forms in spaced relation and for tying the veneering brick to one face of the wall.

Fig. 4 is a detail perspective view of a modified form of tie bar which may be advantageously employed in building the wall.

Fig. 5 is a perspective view showing another modified form of tie bar including a different kind of reinforcing bar engaging parts.

Fig. 6 is a perspective view of a slightly modified form of bar for use in building a brick veneered concrete wall devoid of insulation facing sheets.

Fig. 7 is a vertical sectional view through a part of brick veneered wall in the course of erection and illustrates the manner in which a different kind of form is employed in connection with the bar shown in Fig. 6.

Fig. 8 is another vertical sectional view similar to Fig. 7 but illustrates a finished wall construction devoid of the facing sheets of insulation.

In general, in building up the improved wall, I provide forms which are held in the desired spaced relation by transverse bars having portions formed to receive both margins of adjacent form members. Said bars as here shown are so made as to cast in securing in place, at points between said form, the reinforcing bars for the concrete and in one form of the invention each bar has a tongue at one end extending beyond the adjacent form for engagement in the mortar between two courses of veneering brick so as to tie them to the wall.

Preferably but not necessarily so, the form members employed may be sheets of insulating material, which are not thereafter removed but are left as facings for the wall so that the conduction of heat units through said wall is reduced to a minimum.

Referring now in detail to that embodiment of the invention illustrated in Figs. 1 to 6 inclusive, of the drawings and especially to Fig. 3, the same shows a form spreading and veneering brick the bar 1 made of flat strap metal of the desired length. At one end said bar is slit longitudinally to provide parts which may be turned at right angles but in different directions to provide an outer set of oppositely extending fingers 2-2. Near said fingers, there is punched from opposite sides of the bar, parts which are turned at right angles in different directions to provide an inner set of shorter fingers 3-3 which are spaced from the fingers 2-2 a distance approximating the thickness of the form material to be used and which will be later referred to.

The other end of said bar is formed to provide a head 4 with a short flange 5 bent at a right angle to the bar, as shown and this flange may extend upwardly or downwardly. Near said head, 1 form from opposite margins of the bar, a set of outer fingers 6-6 which are companions to the fingers 2-2. Preferably in said bars between said sets of fingers, are longitudinally spaced openings 8-8.

In building a brick veneered concrete wall in accordance with one embodiment of my invention, I take one of the bars 1 as shown and flatten back the fingers on the bottom side of the bar and secure it in place to the footing for the wall. The number of bars thus used of course, 110...
depending upon the length of the walls. This leaves the first or footing bar or bars with only the upwardly facing fingers. I then place the bottom marginal part of two form members 9-10 in the spaces between the sets of fingers 2-3 and 8-9 and then swing them into a perpendicular position. A second bar is applied to the top margin of said form members and this holds the said form members in spaced relation. It is pointed out that when an insulated wall of this kind is desired, the form members used are preferably sheets of insulating material. When the bars are in this position, the head 4 extends a suitable distance outwardly beyond the outer form member 9.

Reinforcing rods 12 are inserted down through the holes 8-3 in the said bars and concrete 11 is then poured in between the forms. In the erection of the forms and the pouring of the concrete, the veneering brick 12 may be laid, with mortar 13 in between the outer form 9 and the brick and in between the courses of said brick, as shown in Fig. 1 or an air space may be provided between the veneer and the other part of the wall as indicated at 13 of Fig. 8.

It is pointed out that the head end 4 of the bar will come in between the courses of the brick and when said mortar hardens, the mortar not acts to secure the bricks to each other but to the outer facing member 9 and at the same time the heads 4 are securely anchored in said mortar to tie the veneering brick to the wall. In practice the forms for one floor of the building will usually be erected but if desired, a simple course of forms may be erected and after the concrete substantially reaches the second bar, the next course of forms can be applied with their bottom margins disposed in the spaces between the top sets of fingers 1-3 and 6-7 and then allowed to go into a perpendicular position. Thereafter more bars 1 are applied to the rods 10 from their top end and slid down into place so as to engage the top margins of the form members just mentioned and concrete is then poured and the associated veneering brick are laid as before mentioned. It is pointed out that at predetermined courses, the bars 4 thus act to tie the brick to the forms and concrete, and the steps are continued preferably in the sequence mentioned until the desired height of wall is attained. Thus a wall having a reinforcing concrete core and inner and outer facings of insulation is provided with a veneering of brick on the outer face of the wall, all tied together in an integral structure.

Instead of having the flat bar structure shown in Figs. 1 and 2, I may twist that portion 14 of the bar between the sets of fingers mentioned as best shown in Fig. 4 so that the edges thereof are disposed perpendicularly. Such a structure eliminates the formation of voids beneath said bars during pouring of the concrete as is apparent. To hold the reinforcing bars in place to such a bar, fingers 15 are punched out from the spaces between the bar to receive the reinforcing rods 10 between them after which said fingers may be bent over to engage the bar and hold it against displacement as when the concrete is being poured. Such fingers are advantageous because it is not necessary to slip the bars upon the reinforcing rods from the top ends and then slide them down in place.

As a modification of the arrangement shown in Figs. 1 and 2, so far as engagement with the reinforcing rods 10 is concerned, I may cut out a part of one margin of the bar so as to leave an opening 16, therein, with two fingers 17-17 at its open side which after the reinforcing bar is in place, may be bent down to confine said bars in said openings. Such an arrangement is best shown in Fig. 5.

Where it is not desired to provide the insulation facings for the concrete as before mentioned, I provide bars 1 such as before described, but merely cut or break off the head end 4 close up to the outer fingers 6-7 and such a bar is best shown in Fig. 6. In building up a wall wherein the insulation facings are not desired, I set up wooden forms as shown in Fig. 7 and such forms consists merely of boards 18 engaged at their margins in the spaces between the sets of fingers 2-3 and 6-7. The concrete 11 is then poured and is allowed to set. After the concrete has set, the form boards 18 are removed and this leaves the outer fingers 8 spaced from the concrete and both sets of inner fingers 3-7 embedded in the face of the concrete. Thereafter the outer fingers 2 and that narrow part of the bar connecting them to the remainder of the bar on that side of the concrete to be the inside of the wall are broken off close up to the associated inner fingers. This may be readily done by engaging a claw hammer with said narrower part of the bar and twisting same which will cause the unnecessary part to break off at the desired point adjacent the fingers. The outer fingers 8 projecting from that face of the concrete which is to be the outer face are then bent into substantially the plane of the bar in question.

Thereafter veneering brick 12 are laid in the usual manner to provide the different courses of brick, the flattened out outer fingers being disposed in the layer of mortar between those courses of brick that align with the bar. Thus when the mortar hardens, the flattened out inner fingers 6 act to tie or bind certain courses of the veneering brick to the concrete of the wall. It is of course understood, that in building a wall as above described, the concrete may be reinforced by providing the rods 10 that may be secured to the bars in any of the manners before described, or in the following manner:

Along each side margin of the bar near the inner fingers 3 and 7, I punch out a relatively long finger 19 which is still connected at one end to the bar. This leaves a shallow recess in the bar into which the reinforcing bar is engaged after which said long finger 19 is partially wrapped around the reinforcing bar as best shown in Fig. 6.

A wall built as described, has the veneering brick positively tied or bonded thereto so that a permanent veneering is attainable and one which is not liable to loosen up from the concrete. When the wall is built with the insulation sheets as forms and these forms are left in place, it is apparent that a thoroughly insulated brick veneered wall is provided wherein heat transmission through the wall is effectively prevented.

It should also be mentioned that where the forms are left in place they not only provide insulation but also provide a suitable plaster base so that any desired finish can readily be applied.

Again, even where the forms are not left in place, but are made of wood, many advantages result from the use of my invention. For example, it has been the common practice in erecting wooden forms to provide vertical 2 x 4 braces on the outer side of the form every eighteen inches.
In addition to the vertical 2 x 4 members, horizontally disposed whalers were also necessary. The common and accepted practice was to use much heavier material for the whalers and in a five foot form to provide three spaced whalers. With my method and construction, the vertical 2 x 4 members can be spaced apart eight feet instead of eighteen inches and the whalers can be eliminated entirely. This results in a saving of about 35% in the lumber required and also in a great saving in labor. Thus the total reduction, including material and labor, may be as high as 50%.

Hence such a wall is economical to build and the building thereof may be carried on at a rapid rate and with a reduced cost as to forms and as to the wall itself.

While in describing the invention, I have referred in detail to the form, construction and arrangement of the parts thereof, as well as to the sequence of the steps employed, the same is to be considered merely as illustrative so that I do not wish to be limited thereto except as may be specifically set forth in the appended claims.

I claim as my invention:

1. The method of building brick veneered concrete walls which consists in erecting wall forms in spaced relation, applying a tie member to said forms to hold them in said spaced relation and which tie member includes an end extension, pouring concrete between the forms and applying veneering brick and mortar in place along one face of the wall so that said end portion of the tie is anchored in the mortar between certain courses of said brick and ties said brick to said wall.

2. The method of building brick veneered concrete walls which consists in erecting wall forms in spaced relation, applying a tie member to said forms to hold them in said spaced relation, and which tie member includes an end extension, positioning reinforcing members in place between said forms and operatively connecting them to said tie member, pouring concrete between said forms, and applying veneering brick and mortar along one face of the wall so that said end portion of the tie member is anchored in the mortar between certain courses of said brick and ties said brick to said wall.

3. The method of building brick veneered concrete walls which consists in erecting spaced form members of insulating material, applying a tie member to said form members to hold them in said spaced relation and which tie member includes an end part extending beyond one of said form members, pouring concrete between said form members and without removing either of said form members applying veneering brick and mortar in place along the outer face of one of said form members so that said end part of said tie member is anchored in the mortar between certain courses of said brick and ties said brick to the wall.

4. The method of building brick veneered concrete wall which consists in erecting spaced form members of insulating material, applying a tie member to said form members to hold them in said spaced relation and which tie member includes an end part extending beyond one of said form members, positioning reinforcing members in place between said form members and operatively connecting them to the tie members, pouring concrete between the form members to embed said tie member and reinforcing members and applying veneering brick and mortar in place with respect to said one of said form members so that said end part of the tie member is anchored in the mortar between certain courses of said brick and ties said brick to the wall.

5. The method of forming a brick veneered concrete wall which consists in erecting wall forms in spaced relation, applying a tie member to said forms to hold them in spaced relation and which tie member includes a part engaging the outer face of one of said forms, pouring concrete between said forms, removing said one of said forms and bending said part of said tie member into substantial extension with respect to the body of the tie members and applying veneering brick and mortar in place with respect to the concrete from which said form member has been removed so that said part of said tie member will beanchored in substantially the plane of the body of the tie member is anchored in the mortar between certain courses of the brick and ties the same to the wall.

6. The method of forming a brick veneered concrete wall which consists in erecting wall forms in spaced relation, applying a tie member to said forms to hold them in spaced relation and which tie member includes a part engaging the outer face of one of said forms, pouring concrete between said forms to embed said tie member and reinforcing members, removing said one of said forms and bending said part of said tie member into substantial extension with respect to the body of the tie member and applying veneering brick and mortar in place with respect to the concrete from which said form member has been removed so that said part of said tie member is anchored in the mortar between certain courses of the concrete and ties the same to the wall.

7. The method of forming a brick veneered concrete wall which consists in erecting wall forms in spaced relation, applying a tie member to said forms to hold them in said spaced relation and which tie member includes a part arranged at a right angle to the body of the tie member and disposed against the outer face of one of said forms, pouring concrete between said forms, removing said one of said forms and bending said part of the tie member into substantially the plane of the body of said tie member and applying veneering brick and mortar in place with respect to said concrete from which said form member has been removed so that said part of said tie member is anchored in the mortar between certain courses of brick and ties the same to the wall.

8. The method of forming a brick veneered concrete wall which consists in erecting wall forms in spaced relation, applying a tie member to said form to hold them in said spaced relation and which tie member includes a pair of oppositely facing fingers arranged parallel and engaged with the outer face of one of said forms, pouring concrete between said forms, removing said one of said forms, bending both fingers of said tie member into substantially the plane of the body of the tie member and applying veneering brick and mortar in place with respect to said concrete from which said one of said form members has been removed so that said part of said tie member is substantially into the plane of the body of the tie member is anchored in the mortar between certain courses of the brick and ties the same to the wall.
9. The method of forming a brick veneered concrete wall which consists in erecting wall forms in spaced relation, applying a tie member to said forms to hold them in said spaced relation and which tie member includes a pair of oppositely facing fingers arranged parallel with and engaged with the outer face of one of said forms, pouring concrete between said forms, removing said one of said forms, bending both fingers of said tie members into substantially the plane of the body and spreading them slightly laterally and applying veneering brick and mortar in place with respect to said concrete from which said one of said form members has been removed so that said parts of said tie member so bent are anchored in the mortar between certain courses of the brick and tie the same to the wall.

10. The method of building brick veneered concrete walls which consists in erecting wall forms in spaced relation, applying a tie member to said forms to hold them in spaced relation and which tie member includes a part engaging the outer face of one of said forms, positioning reinforcing members in place between said form members and operatively engaging them with said tie member, pouring concrete between said forms to embed said tie member and reinforcing members, removing said one of said forms after setting of the concrete, bending said part of the tie member into substantially the plane of the body of the tie member and applying veneering brick and mortar in place with respect to the concrete from which said form member has been removed so that said part of said tie member bent into substantial extension with the body of the tie member is anchored in the mortar between certain courses of the veneering brick and ties the same to the wall.

11. The method of building brick veneered concrete walls which consists in erecting wall forms in spaced relation, applying a tie member to said forms to hold them in spaced relation and which tie member includes an end part engaging the outer face of one of said forms and intermediate parts adapted for engagement by reinforcing rods, positioning reinforcing rods between said forms in engagement with said intermediate parts of the tie member, pouring concrete between said forms to embed said tie member and reinforcing members therein, removing said one of said forms, bending said end parts of the tie member into substantially the plane of the body of the tie member and applying veneering brick and mortar in place with respect to that face of the concrete from which said form member has been removed so that said end parts of said tie member bent into substantial extension with the body is anchored in the mortar between certain courses of the veneering brick and tie the same to the wall.

12. The method of building brick veneered concrete wall which consists in erecting wall forms in spaced relation, applying a tie member to said forms to hold them in spaced relation and which tie member includes an end part engaging the outer face of one of said forms and having a recess in one of said margins between its ends and which opening may be closed by bendable prongs, positioning a reinforcing rod in said recess and deforming said prongs to retain said rod in said recess, pouring concrete between said forms to embed the tie member and reinforcing rod therein, removing said one of said forms and bending said end part of the tie member into substantially the plane of the body of the tie member and applying veneering brick and mortar with respect to that face of the concrete from which said form member has been removed so that said end part of the tie member bent into substantial extension with the body of the tie member is anchored in the mortar between certain courses of the veneering brick and ties the same to the wall.

13. A brick veneered concrete wall embodying therein, a concrete wall part, insulating material on each side of said wall part, a tie member embedded in said wall part and engaged with said insulating material and veneering brick mortared in courses against the insulating material on one side of said wall part, a part of said tie member extending beyond said insulating material on one side of said wall and being anchored in the mortar between said courses of bricks for tying the same to the wall part.

14. A brick veneered concrete wall embodying therein, a concrete wall part, insulating material on each side of said wall part, a tie member embedded in said wall part and engaged with said insulating material, reinforcing members embedded in said wall part and engaged into said tie member and veneering brick mortared in courses against the insulating material on one side of said wall part, a part of said tie member extending beyond said insulating material upon said one side of said wall part and anchored in the mortar between said courses of brick for tying the same to the wall part.

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