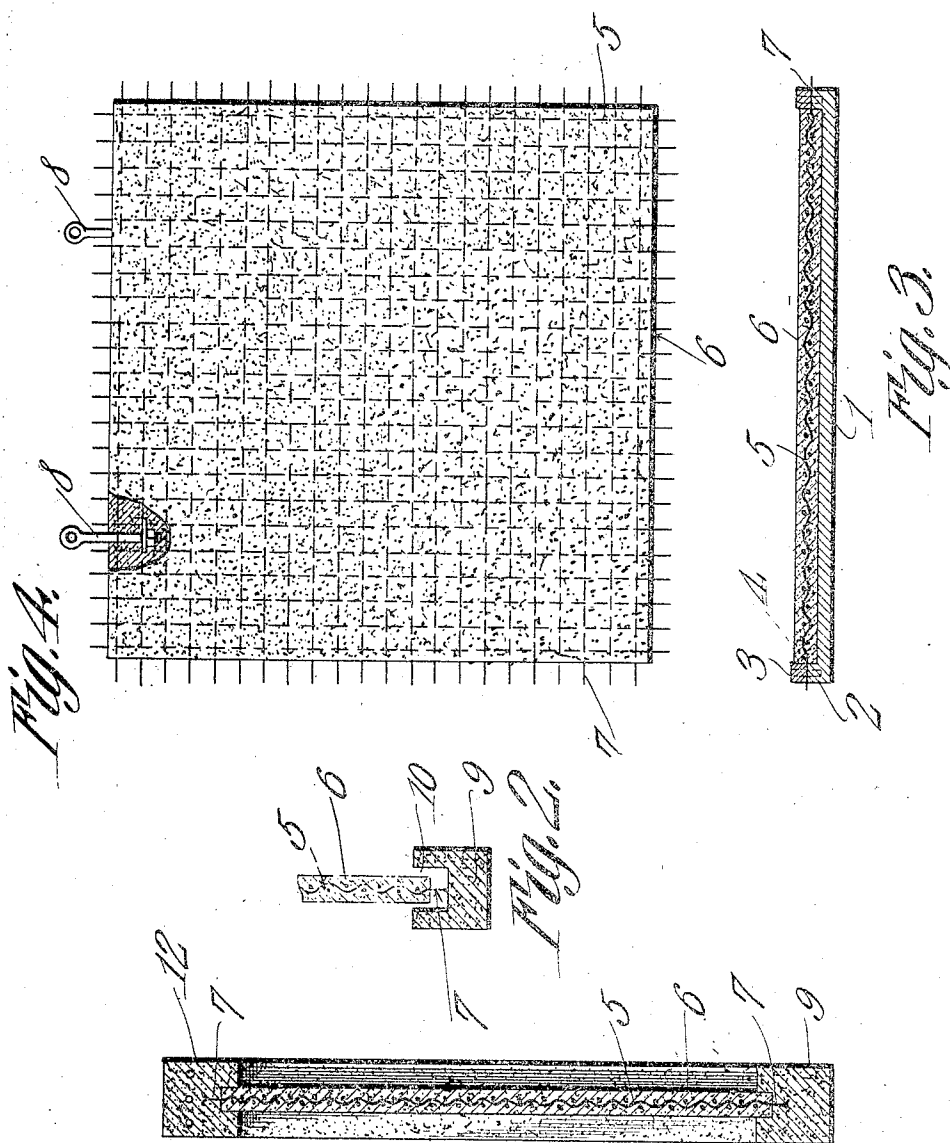


G. E. RICHMOND.
METHOD OF CONSTRUCTING CONCRETE BUILDINGS.
APPLICATION FILED SEPT. 8, 1908.

984,491.

Patented Feb. 14, 1911.

2 SHEETS—SHEET 1.



Witnesses
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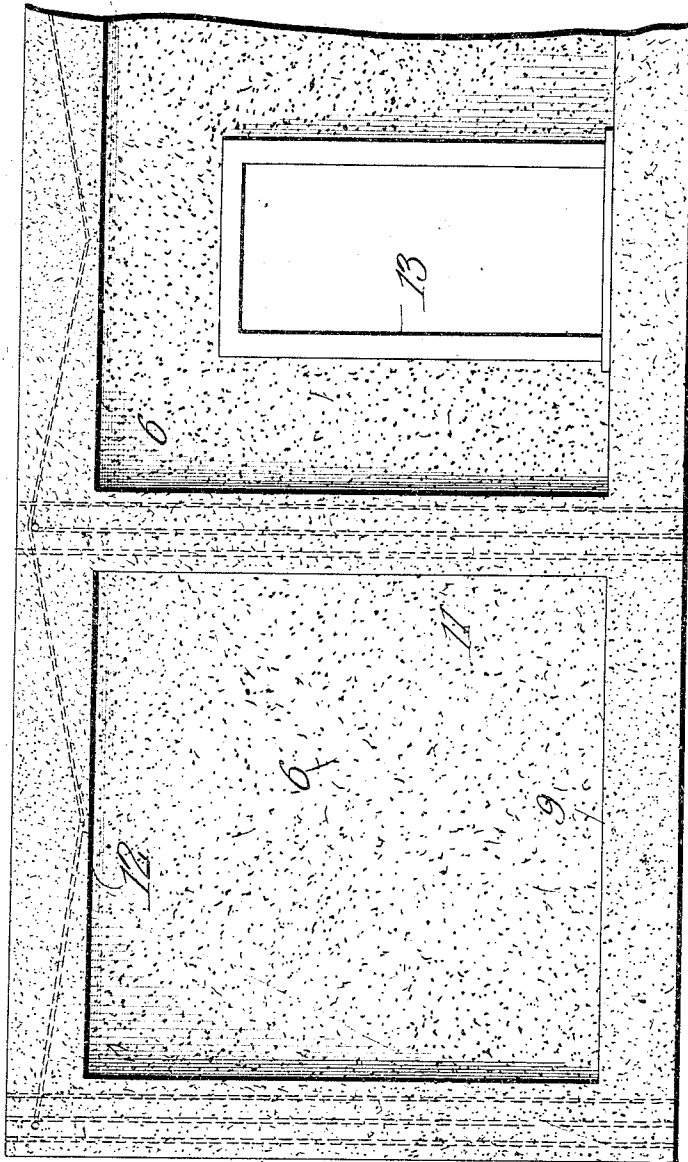
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Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE E. RICHMOND, OF HOUSTON, TEXAS.

METHOD OF CONSTRUCTING CONCRETE BUILDINGS.

984,491.

Specification of Letters Patent.

Patented Feb. 14, 1911.

Application filed September 8, 1908. Serial No. 452,049.

To all whom it may concern:

Be it known that I, GEORGE E. RICHMOND, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented a new and useful Method of Constructing Concrete Buildings, of which the following is a specification.

This invention has reference to improvements in the method of constructing concrete buildings, and its object is to produce walls wherein the greater portion of the surface of the wall is made up of thin panels of reinforced concrete, thus economizing both in labor and material in the production of concrete buildings.

It has been practically impossible, heretofore, to cast a thin wall of reinforced concrete, because the reinforcement interfered with the flow of the concrete in the molds and irregular castings with pits or pockets in the exposed surface of the walls, caused by the retardation of the flow of the concrete composition by the reinforcement, are found when the molds are removed.

When the walls are thick of course the reinforcement does not interfere with the flow of the cement composition, but such walls must be made much thicker than is actually necessary.

Because of the inherent difficulty of casting paneled walls it is customary to make such walls of hollow tile, or brick, or other material, which, in time, shrinks from the reinforced concrete columns' girt, and base block, which structures may be successfully formed.

I overcome the difficulties stated, and likewise very materially reduce the cost of construction, while still producing a perfect wall, by casting the thin slabs constituting the panels in horizontal molds. A reinforced concrete slab, of almost any desired thickness, say from an inch to an inch and a half upward, may be readily formed.

The base-blocks are cast with a groove or seat for receiving one edge of the panel, which latter, after hardening, may be raised to an upright position and be seated in the groove in the base, to be thoroughly anchored therein by cement embedding the corresponding edge of the panel and the projecting portions of the reinforcement, left for the purpose. The side columns and top girder may now be molded about the sides and top of the panel, being reinforced in the usual manner. By this means all the

parts are perfectly bonded, and the whole structure is as though molded in one solid piece.

The invention will be best understood from a consideration of the following detail description, taken in connection with the accompanying drawings, forming a part of this specification, in which drawings:—

Figure 1 is a vertical cross section of a wall of panel construction built in accordance with the present invention. Fig. 2 is a detail section illustrating one of the steps in the process of construction. Fig. 3 is a vertical section through the mold for constructing the panel, showing a panel already cast therein. Fig. 4 is an elevation of a finished panel, removed from the mold, and also showing inserted eye-bolts, for facilitating the handling of the panel. Fig. 5 is an elevation of a portion of a completed structure to illustrate the present invention.

Referring to the drawings, there is shown a mold-box 1, which will be of a size commensurate with the desired panel, and this box is provided around the edges with a ledge 2, which may be as high as the point of reinforcement. The desired depth of the mold is obtained by strips 3 applied to the ledges 2 and united thereto by dowel pins 4, or otherwise.

The reinforcement is illustrated as netting 5, which may be the steel netting usually employed in reinforced concrete construction, or any other type of reinforcement suited for the purpose may be used.

The ends of the strands of the reinforcement are carried through and beyond the edges of the mold, as indicated.

After the netting has been drawn tight in any desired manner, the strips 3 are brought down upon the ledges 2, and engage the projecting portions of the reinforcement, holding the latter in position. The cement is now poured into the mold, and easily finds its way through the meshes of the netting to the bottom of the mold, and the mold is ultimately filled to the desired depth, thoroughly embedding the reinforcing netting, and avoiding the formation of pockets or holes, since the composition has a minimum distance to flow, and is not interfered with by the drag of the reinforcing netting. Thus, a perfect slab, of uniform thickness throughout, and of homogeneous structure, with the embedded reinforcement, is produced, and this may be successfully produced in thick-

nesses from an inch, or an inch and a half, upward. When the slab, which is indicated at 6, has properly hardened, then the strips 3 may be removed from the ledges 2, thus releasing the projecting ends 7 of the reinforcing strands, and the finished slab may be removed from the mold.

In order to facilitate the handling of the slab, eye-bolts 8 may be cast in one edge thereof, so that the slab may be conveniently handled by means of a crane or derrick, and be readily set up on edge.

In Fig. 2 there is shown a base block 9, which may be as long as desired, and may, if the length of the wall permits, include many panels. This base block 9 is formed in its upper surface with a longitudinal groove 10, wider than the thickness of the panel 6, and of such depth as to receive the lower edge of the panel for a distance and the projecting ends 7 of the reinforcing strands along the same edge. When the panel has been properly located in the groove 10, then cement, or cement mortar may be poured in the groove 10, and will embed the lower edge of the panel and the reinforcement strands projecting therefrom and firmly unite the panel to the base block, the appearance of the finished structure being shown in Fig. 1. Now, by means of suitable molds, reinforced columns 11 are cast about the upright edges of the panel 6, and finally, or at the same time with the casting of the column, the top edge of the panel is embedded in a girder 12, which may also embed the eye-bolts 8, the said girder 12 being reinforced in the usual manner. The panel is united to the columns and girder not only by the natural adhesion of the cement, but also by the embedded ends of the reinforcing strands, as indicated in Fig. 1. The girder 12 may of course be as long as the base-block 9, if the complete structure admits of such length of girder, or it may be cast in shorter lengths, if desired.

When it is desired to form openings in the panels then the mold will be suitably shaped for the purpose. In Fig. 5 one of the panels 6 is shown with a door-way opening 13, and it will be understood that other openings,

such as window openings, may be likewise formed in the panels.

Since the panels need not support any great weight, and since the main weight of the building can be supported on the columns 11 and the girder 12, the panels may be made quite thin, thereby very materially saving in the cost of construction, while, at the same time, the advantages of the concrete construction are maintained, and the difficulties heretofore encountered in the endeavor to produce thin walls in the form of panels between supporting columns, is obviated, and the necessity of using other material, such as tiling, or brick, with the attendant disadvantages, is entirely avoided.

It will be understood, of course, that the panels may be cast in any desired shape in addition to the rectangular shape shown in the drawings, and also that these panels may vary in thickness in different parts thereof. Furthermore, any desired ornamentation may be applied, or formed directly in the mold. Also the panel may be formed with openings of any shape desired, for any purpose whatsoever.

What is claimed is:—

The herein described method, which consists in forming panels in the shape of slabs with reinforcing strands projecting from all the edges thereof, placing the panels on edge in grooves formed in a concrete base block, then uniting the panel and base block with cementing material introduced into the groove in the base block and about the projecting ends of the reinforcing strands, and finally casting reinforced concrete columns at the sides of the panel and a reinforced girder of concrete across the top of the panel, both the side columns and top girder embedding the edges of the panel and the reinforcing strands projecting therefrom, the whole forming an integral mass.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

GEORGE E. RICHMOND.

Witnesses:

E. H. RICKER,
E. E. REED.