W. C. RICHMAN.

CONCRETE BUILDING STRUCTURE.

APPLICATION FILED FEB. 24, 1919.

1,393,966. Patented Oct. 18, 1921.

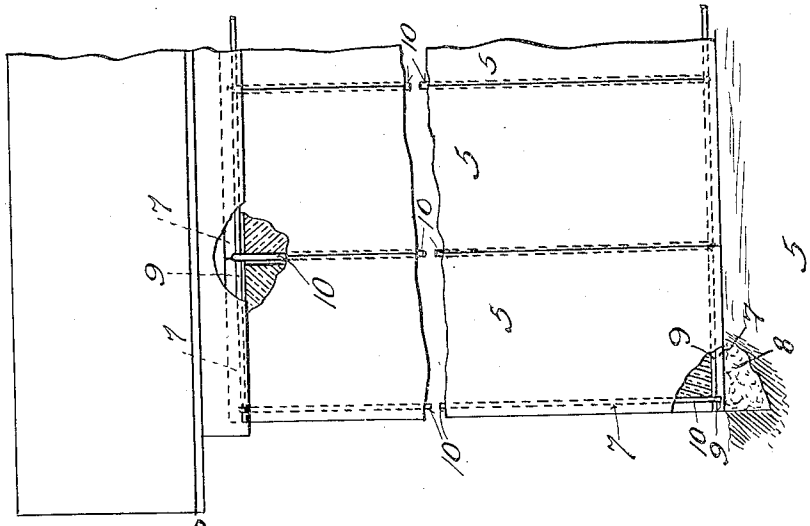


Fig. 2.

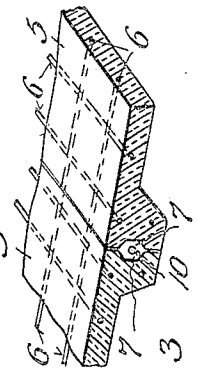


Fig. 3

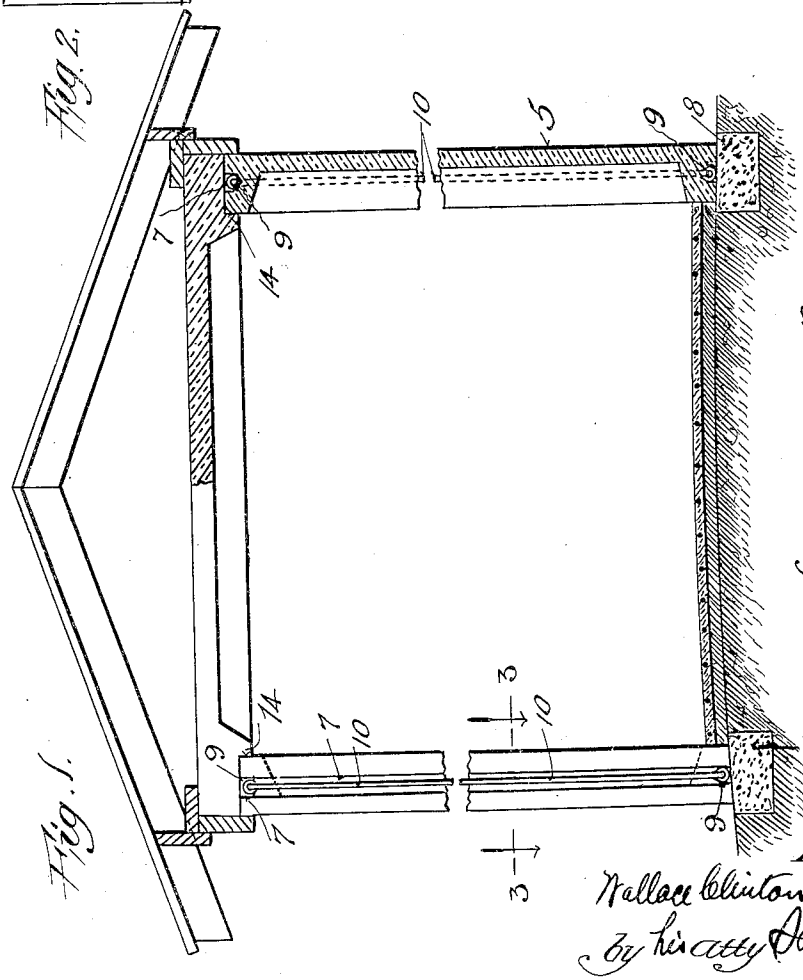


Fig. 1.

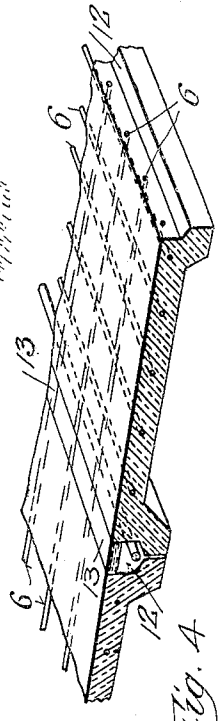


Fig. 4

Inventor
Wallace Clinton Richman
by his atty Samuel Eberly

UNITED STATES PATENT OFFICE.

WALLACE CLINTON RICHMAN, OF BUTTE, MONTANA.

CONCRETE BUILDING STRUCTURE.

1,393,966. Specification of Letters Patent. Patented Oct. 18, 1921.

Application filed February 24, 1919. Serial No. 278,643.

To all whom it may concern:

Be it known that I, WALLACE CLINTON RICHMAN, a citizen of the United States, residing at Butte, in the county of Silverbow, State of Montana, have made a certain new and useful Invention in Concrete Building Structures, of which the following is a specification.

This invention relates to concrete building structures.

The object of the invention is to provide a concrete building structure without the necessity of preparing a special foundation therefor.

A further object of the invention is to provide such a building structure wherein sagging or derangement due to the absence of a special foundation therefor or due to settling or lifting of the usual foundation is prevented.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location, relative arrangement of parts, and mode of operation, all as will be more fully hereinafter set forth, as shown in the accompanying drawing, and finally pointed out in the appended claims.

In the drawing:—

Figure 1 is a view partly in elevation and partly in vertical section of a building constructed in accordance with my invention.

Fig. 2 is a side view of the same, parts broken out and in section.

Fig. 3 is a perspective view parts in section on the line 3, 3, Fig. 1 of adjacent wall slabs or boards of concrete employed in the construction and erection of a building in accordance with the principles of my invention.

Fig. 4 is a view similar to Fig. 3 showing the application of concrete boards or slabs to a floor or ceiling.

The same part is designated by the same reference character wherever the same occurs throughout the several views.

In the erection of buildings employing concrete boards or slabs in the construction thereof it has been the common practice to construct foundations upon which the walls of the building are erected. This practice greatly adds to the cost of construction of the building and sometimes, even when care is taken to construct efficient foundations, such foundations sink or become impaired by the action of frost in the ground, or for other reasons, with the result that the building erected thereon sags, the walls crack and frequently the building collapses. It is among the special purposes of my present invention to provide a structure of concrete building wherein the necessity for constructing a special foundation for the building is avoided and wherein the building is retained against sagging or collapsing, or the walls thereof cracking, even though there should be yielding at one or more points of the base or support of the walls thereof.

In carrying out my invention I employ concrete boards or slabs indicated by reference numeral 5. This slab is formed with concrete in suitable molds, and, if desired, may be reinforced by embedding within the body thereof at various points suitable reinforcing rods as indicated at 6, while in course of being molded into the desired shape. In molding the boards or slabs grooves are formed in the end and edge surfaces thereof as indicated at 7. In the use of concrete boards of this structure, whether reinforced or not, in the erection of buildings, the site for the building or the ground where the walls thereof are to be erected is leveled off, and, if desired, a cinder bed 8 is placed along the line on which the wall is to be erected. The slabs or boards required to form a wall for the building are then stood upon their ends to rest upon the leveled off space, or upon the cinder bed, and side by side with respect to each other. The use of a cinder bed for this purpose, however, is not necessary. A steel rod 9 extending the entire width of the wall is placed within the groove 7 in the lower ends of the slabs or boards. This may be accomplished by placing the rod on the ground or bed, where a bed is used, and then placing the slabs or boards in upright position thereover, the rod occupying the grooves 7 in the lower ends of the boards. A like steel rod 9 is placed in the alined grooves 7 in the upper end surfaces of the slabs or boards forming the wall. In practice the ends of the rods project somewhat beyond the vertical sides of the extreme end boards or slabs of the wall. I also, in accordance with my invention, dispose within the grooves in the vertical side surfaces of the concrete boards, similar steel rods 10, and the ends of these latter rods

are bent or clamped over and around or otherwise secured to the horizontally disposed rods 9 at the upper and lower ends respectively of the vertical slabs or boards. The grooves 7 in the vertical side edges of the boards or slabs containing the vertical steel rods 10 as well as the horizontal end grooves containing the rods 9, may be filled with cement or grout. In this manner the vertical walls of the entire building may be quickly erected, and the interlocking or connecting vertical and horizontal steel rods afford an efficient bracing which resists any tendency of the walls sagging at one or more points even should the foundation on which the wall at that point is erected recede. By constructing the entire building in the manner above described it will be seen and understood that the slabs or boards take the compression strains while the interlocked or interengaged vertical and horizontal rods take the tension strains.

It will be readily seen that in like manner a flooring or roof may also be constructed and its parts united in the manner above described, and the rods of the roof, for example, may be interlocked with the ends of the trussing of the vertical walls of the building by interengaging the tie rods of the roof slabs or boards with the ends of the vertical rods in the wall slabs or boards. It will also be seen that the rods are entirely concealed and protected, being located within grooves formed in the side and end edges or surfaces of the boards or slabs and embedded in the grout with which said grooves are filled. It will also be seen that no special foundation for the building need be constructed.

In Figs. 1 and 4 I have shown an arrangement of the slabs suitable for the flooring or ceiling of a room. In this case the longitudinal grooves 12 in the edges of the slabs are open to the side surface, preferably the upper surface of the slab when applied in a floor or ceiling so that when the two slabs are positioned alongside and adjacent each other an open groove is formed at the meeting edges of the slabs, as shown most clearly in Fig. 4, which groove is partially filled with concrete and the filling is completed with a suitable composition, indicated at 13, of tar pitch, or the like, which forms an excellent finish to render the joint waterproof. In the case of a flooring, these slabs are simply placed on the ground, or other suitable support, within the space inclosed by the walls, and, as above indicated, the tie rods in the end and edge grooves thereof are interlocked or attached together and to the tie rod system of the vertical wall boards.

In the case of a ceiling employing the slabs, the latter are formed adjacent their ends, as indicated at 14, with grooves or seats which receive the upper ends of the wall slabs, as shown in Fig. 1. In this case tie rods, if desired, may be omitted.

Having now set forth the objects and nature of my invention, and a structure embodying the principles thereof, as well as the method of carrying the same into practical operation, what I claim as new and useful, and of my own invention, and desire to secure by Letters Patent, is:—

1. In a concrete building structure, a wall formed of concrete boards or slabs vertically disposed in side by side relation, a tie rod common to all of said boards and disposed beneath the lower ends thereof, a similar tie rod common to all of the boards and carried by the upper ends of said boards and vertically disposed tie rods interposed between and inclosed by the proximate edges of adjacent boards, said vertical and horizontal tie rods being interlocked together.

2. In a concrete building structure, a wall consisting of a plurality of concrete boards disposed in vertical position and in side by side relation, said boards having vertically disposed grooves formed in the side edges thereof and horizontally disposed grooves in the top and bottom ends thereof, a tie rod received in the horizontal grooves at the upper ends of the boards and common to all of said boards, a like tie rod received in the grooves at the lower ends of the boards and common to all of said boards, and vertically disposed tie rods located within the vertical grooves in the side edges of the boards to be inclosed by the side edges of adjacent boards, said vertical and horizontal tie rods interlocking together with each other to form a braced trussed structure.

3. In a concrete building structure, a wall consisting of a plurality of concrete boards disposed in vertical position and in side by side relation, said boards having vertically disposed grooves formed in the side edges thereof and horizontally disposed grooves in the top and bottom ends thereof, a tie rod received in the horizontal grooves at the upper ends of the boards and common to all of said boards, a like tie rod received in the grooves at the lower ends of the boards and common to all of said boards, and vertically disposed tie rods located within the vertical grooves in the side edges of the boards to be inclosed by the side edges of adjacent boards, said vertical and horizontal tie rods interlocking together with each other to form a braced structure, said grooves being filled with grout to embed said tie rods therein.

4. In a concrete building structure, building elements each consisting of a slab or board formed of concrete and having grooves formed in the side edges and end surfaces thereof, said elements disposed side by side in the building structure, tie rods located in the grooves in each end of the boards, each tie rod being common to adjacent boards,

other tie rods located in the grooves in the side edges of the boards to be inclosed by the side edges of adjacent boards, said tie rods interlocking together.

5. In a concrete building structure, building elements, each consisting of concrete slabs or boards, each slab or board having grooves formed in the edge and end surfaces thereof, said elements disposed in sidewise relation with respect to each other with their end and side grooves in register, a tie rod disposed within the registering end grooves of all the boards, tie rods disposed in the registering grooves in the side edges of said boards to be inclosed by the side edges of adjacent boards, all of said tie rods interlocking with each other.

In testimony whereof I have hereunto set my hand on this 17th day of Feb., A. D., 1919.

WALLACE CLINTON RICHMAN.