Aug. 7, 1923. 1,463,841

W. C. RICHMAN

METHOD OF MAKING CONCRETE BUILDING BOARDS OR SLABS

Filed Feb. 24, 1919

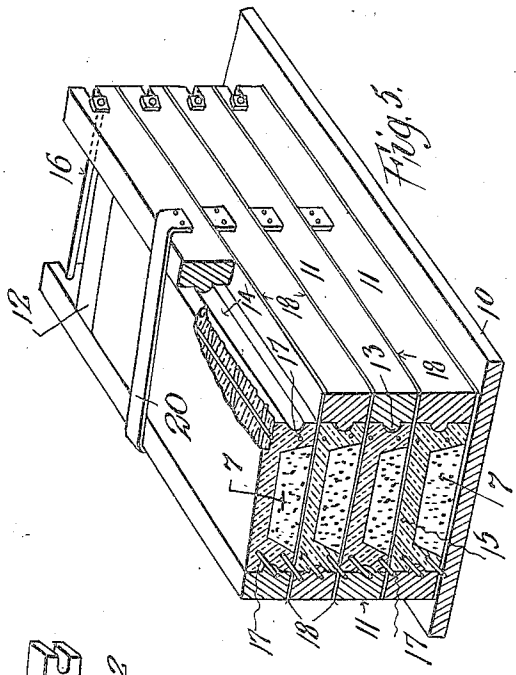


Fig. 5.

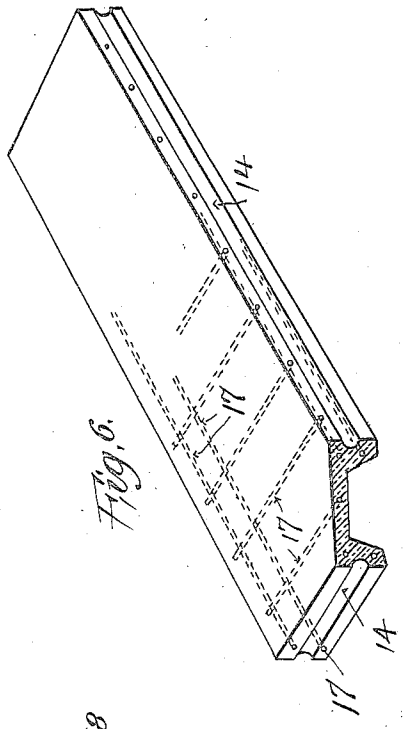


Fig. 6.

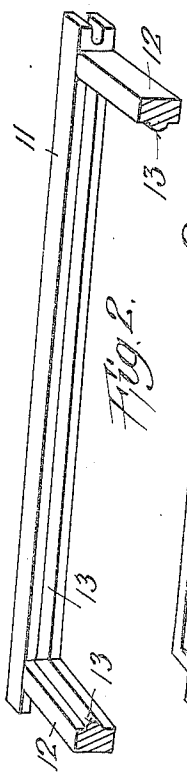


Fig. 2.

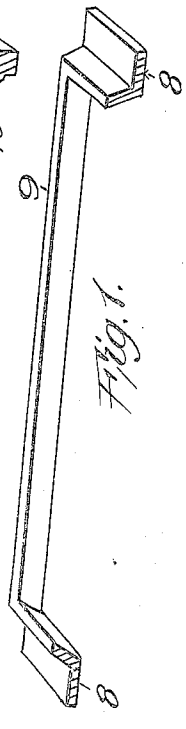


Fig. 1.

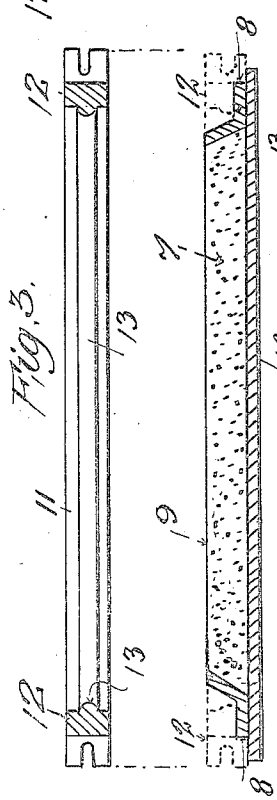


Fig. 3.

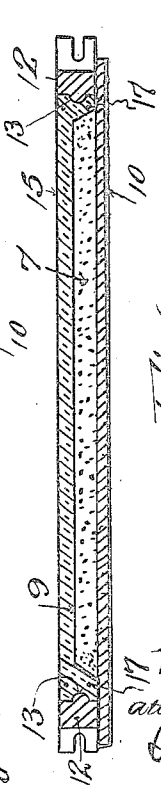


Fig. 4.

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UNITED STATES PATENT OFFICE.

WALLACE CLINTON RICHMAN, OF BUTTE, MONTANA.

METHOD OF MAKING CONCRETE BUILDING BOARDS OR SLABS.

Application filed February 24, 1919. Serial No. 278,644.

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 Silver Bow, State of Montana, have made a certain new and useful Invention in Method of Making Concrete Building Boards or Slabs, of which the following is a specification.

This invention relates to method of making concrete building boards or slabs.

The object of the invention is to provide a simple, efficient, expeditious and economical method of manufacturing concrete boards or slabs for use in the erection of buildings.

A further object is to provide a method of the nature referred to for producing reinforced boards or slabs of concrete, the cement content of which is thoroughly hydrated and the concrete rendered hard and durable, and practically waterproof.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the mode of operation as will be hereinafter set forth, as illustrated in the accompanying drawing, and finally pointed out in the appended claim.

Referring to the drawing:—

Fig. 1 is a view in perspective showing a portion of a mold in which is formed a core for use in carrying out my invention.

Fig. 2 is a similar view showing a portion of a frame for use in connection with a core to form a mold in which the concrete board or slab product is formed in accordance with my invention.

Fig. 3 is a view illustrating and indicating the method of forming the core and replacing the core mold with a frame to form the slab or board mold.

Fig. 4 is a view in longitudinal section showing a slab or board formed in its mold before removal of the core and mold frame.

Fig. 5 is a view in perspective illustrating the manner of building up a stack or pile of slabs or boards.

Fig. 6 is a similar view showing a completed board or slab, broken out to disclose the reinforcements imbedded therein.

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

In carrying out my invention I first form a suitable core 7. In practice I have found that a wet sand core is suitable for the purpose. This core is formed in a mold which consists of a frame 8, which may be of any suitable shape. I have found a rectangular frame constructed of wood not only suitable for the purpose but also inexpensive and easy to construct. This rectangular frame is constructed with upwardly extending end and side portions 9, preferably inclined inwardly, and bounding a central opening or space through the frame. The mold frame 8 is placed on the ground or on a floor or planking 10, see Fig. 5, and the wet molders sand or other core material is packed within this central space of the mold and is smoothed off level with the upper edge of the end and side portions of the mold. After the core material has become set to the form of the mold 8, the latter is removed and a larger rectangular frame is placed so as to surround the formed and shaped core. This last mentioned frame is preferably formed of side and end portions 11, 12, which are detachably held together by means of bolts 16, or otherwise, so that said frame may be quickly assembled or taken apart, and I have found that a simple wooden frame is suitable. Its dimensions should be such that when surrounding and properly centered with reference to the core ample space is left between the frame and the bounding edges of the core, and the upper edge of the frame should extend a sufficient height above the core, to form, with the core, a space to receive the concrete mixture or other composition to form the body of the slab or board desired. In like manner the inner wall surfaces of the surrounding frame are formed with projections indicated at 13, to produce grooves 14 in the sides and ends of the board or slab to be formed. These grooves, and, indeed, the entire slab or board may have any desired configuration. The rectangular form of slab shown is, however, the most suitable for use in the construction of building walls, floors, ceilings, partitions or roofs.

With the core and surrounding frame disposed and centered, as above explained, a molding space is formed into which a concrete mixture or other desired composition indicated at 15 is filled and leveled off on its upper surface. If desired, after leveling off the upper surface of the concrete mixture or composition, said surface may be covered with small stones, pebbles, or other material, or otherwise roughened or scored while

the concrete mixture is still soft, whereby, when the slab is finished and ready for use it will present a rough finished surface which lends itself admirably for receiving and finishing off with plaster, stucco, or the like, or which, as might be desired in many cases, may be left in its roughened or pebbled state according to the taste of the individual. Where plaster or stucco is applied this material attaches itself with substantial homogeneity to the surface of the slab, and the plaster or stucco having approximately the same ratio of expansion and contraction with changes of temperature as the concrete, the facing finish is far less liable to crack than is the case of plaster or stucco applied to clay products, metal or wood laths or surfaces.

If the board or slab is to be reinforced the reinforcing steel rods, indicated at 17, are placed in the concrete or composition mass as the latter is filled into the molding space. After the composition has become sufficiently set and hardened, the mold frame and board are removed leaving the core and the completed and finished slab or board is then ready for use.

Experience has shown that a harder and more durable article is produced if the cement content of the filling is sufficiently hydrated. The moisture of the wet sand core furnishes a means for thoroughly hydrating the cement in the board or slab composition thereby rendering the concrete mixture very hard and strong and practically waterproof, which are characteristics of great importance in slabs or boards employed in building structures. If the moisture in the wet sand core is insufficient to accomplish thorough and perfect hydration of the cement content of the concrete mixture, the board or slab may be sprinkled with water.

The filled mold is allowed to stand a sufficient length of time to permit the concrete to partially set and harden. The mold frame is then removed and the board or slab is allowed to stand or rest in place until it becomes sufficiently hardened and strong to permit it to be handled without danger of breaking, bending or warping it.

Where the concrete boards are to be made in quantity, I have found it convenient and desirable to make them in piles or stacks. Thus, upon the planking, ground, or other support 10, one board or slab is made in the manner above described. Upon this board or slab, and without removal of the mold frame 11 thereof, another board or slab is produced by first forming a core 7 thereon in a core mold, then removing the core mold and applying a mold frame around the formed core and filling in the board or slab mold so formed with the concrete or other composition. This operation is repeated as often as may be convenient, thereby building up a stack or pile of boards or slabs in their molds, the one on top of the other, to the desired number. If desired, sheets or strips of oiled paper, fabric, or the like, indicated at 18, may be interposed between adjacent boards or slabs or the edges and ends thereof, as they are formed. After a stack or pile of boards or slabs has been built up, it is left to stand for a day or more to permit the boards to partially set or harden. The board mold frames are then removed, and, if the wet sand cores do not supply sufficient moisture to thoroughly hydrate the cement, the stack or pile may be sprinkled now and then with water and left to stand until the boards of the entire pile or stack have set sufficiently to be handled without breaking or bending.

Where the slabs or boards are made in built up stacks or piles, as above explained, a tendency might develop to cause the side members of the mold form frames to spread apart, particularly at their middle points by the superposed weight. Should this tendency develop the side members of such mold frames may be suitably tied together to overcome such tendency. This can be accomplished in any suitable or convenient manner. For example, one or more of the transversely extending reinforcements 17, may be utilized for the purpose; or flat strips 20, see Fig. 5, may be laid across the top of each board, as it is formed, and the ends of said strip bent down and secured to the sides of the side members 11 of the mold frames.

The method of manufacturing concrete boards or slabs according to my invention and as above described, is not only exceedingly simple, expeditious and economical, but a very superior building slab or board is produced, which is practically waterproof, hard and durable. The boards may be made at or adjacent to the site where the building is to be erected and only the cheapest kind of equipment is required. The core and board mold frames may be utilized over and over again, and steam curing is avoided. The inclined walls 9 of the core frame, and the dimensions and configuration of the core determine the contour of the depressions formed in the side surfaces of the bodies of the boards.

Having now set forth the objects and nature of my invention and 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:—

In the manufacture of building boards or slabs, the method which consists in forming a core within a core mold, then removing the core mold and surrounding the formed core with a frame to form, with the core, a board or slab mold, then filling the board

or slab mold with concrete, then forming another core on the board thus produced, and applying a frame therearound to form a second board mold and filling the second board mold with concrete and repeating the operation to form a stack or pile of boards within their molds, and permitting the boards to set and harden, then removing the board mold frames and moistening the stack or pile of boards to hydrate the cement content thereof, and finally separating the boards and cores.

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

WALLACE CLINTON RICHMAN.