March 13, 1934. C. T. CAHILL 1,950,397

WALL STRUCTURE AND BUILDING UNIT

Filed July 25, 1930

Fig. 2.

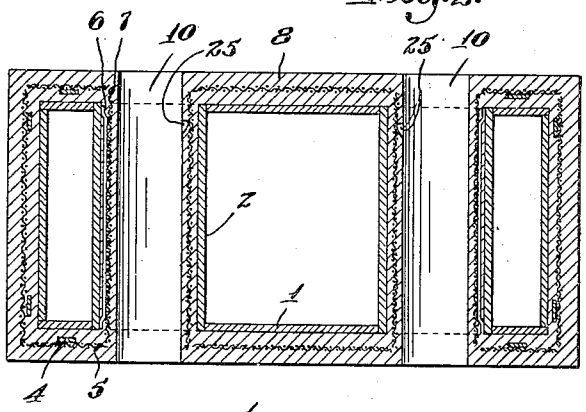


Fig. 4.

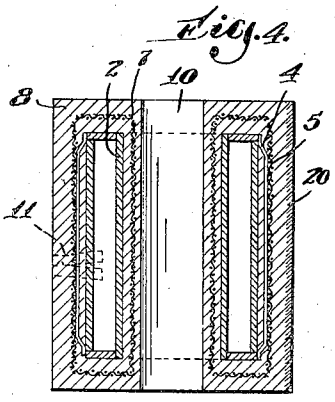


Fig. 3.

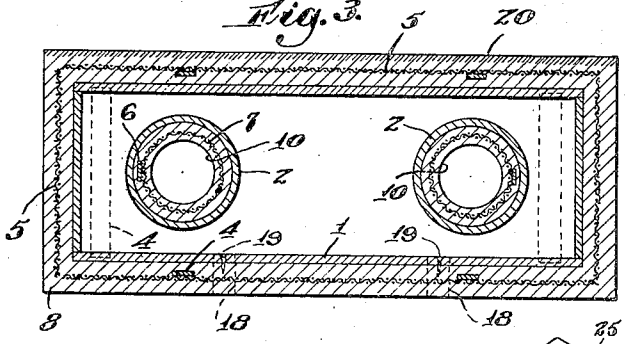


Fig. 7.

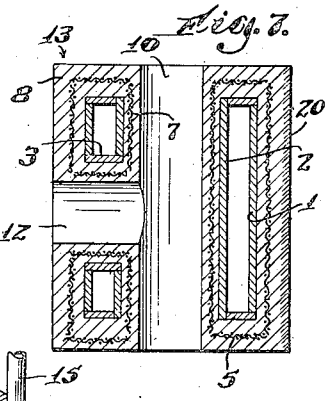


Fig. 5.

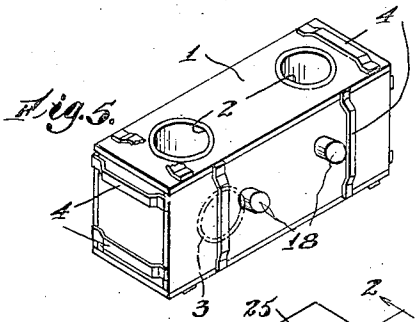


Fig. 6.

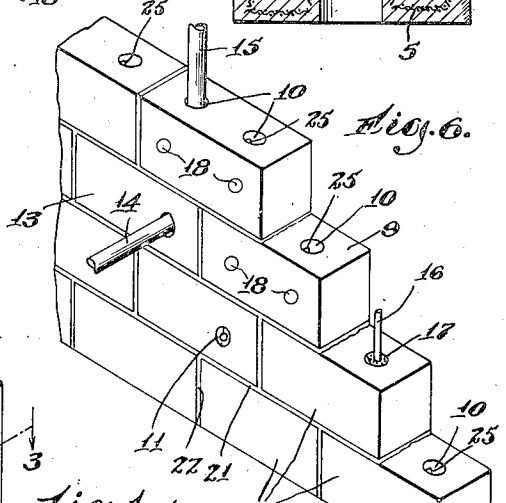
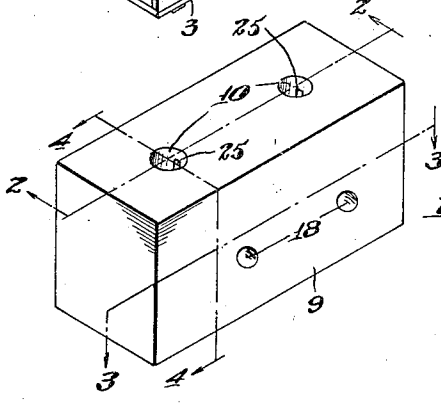


Fig. 1.



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UNITED STATES PATENT OFFICE

1,950,397

WALL STRUCTURE AND BUILDING UNIT

Charles T. Cahill, Boston, Mass.

Application July 25, 1930, Serial No. 470,597

4 Claims. (Cl. 72—41)

My present invention relates to wall structures, and also to a novel and improved building unit for use in constructing said walls.

An important object of the present invention resides in the provision of a building unit constructed around a light frame, composed of wood, fibre, or the like, and having a hollow interior.

Another feature of the invention resides in providing reenforcing means, such as wire meshes, screens, or the like, spaced a predetermined distance from said frame and embedded within the concrete of the block.

Another object of the invention resides in providing the said block with one or more vertical apertures through which interlocking reenforcing rods, shafts, or pillars, may be fitted. Transverse apertures communicating with said vertical apertures may also be provided, to enable the carrying of wires, conduits, plumbing and the like in the blocks or units.

Another object of my invention resides in providing the blocks or building units with means to which may be attached metallic meshing, or other material to receive the usual plaster.

These building units, because of the lightness of their construction, may be made in relatively large sizes, while still being easy to handle and lay up. A wall or building constructed of these units, and in which the units are interconnected by reenforcing bars, rods, or pillars, will have the advantage of lightness, coupled with great strength, and will be desirable for use in localities which are subject to earth tremors, earthquakes, or the like. Such wall will also be substantially fireproof, and because of the dead air spaces provided will constitute an efficient insulation against heat and cold.

Other features and objects of the invention reside in the particular construction and arrangement of my novel blocks or building units, and such features and objects, together with other elements, advantages, and the like, will be hereinafter more fully pointed out, described and claimed.

Referring to the drawing, illustrating a preferred embodiment of the present invention,

Fig. 1 is a perspective view of a completed block according to my invention;

Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a plan sectional view on the line 3—3 of Fig. 1;

Fig. 4 is a vertical sectional view on the line 4—4 of Fig. 1;

Fig. 5 is a perspective view of the frame or core about which the concrete portion of my block is formed;

Fig. 6 is a fragmentary perspective view of a wall built of my novel units; and

Fig. 7 is a vertical sectional view similar to Fig. 4, but illustrating a transverse aperture communicating with the vertical aperture through the building unit.

Referring now to the drawing, for a particular description of the invention, its construction and assembly, my novel building unit comprises a frame or core 1 formed as a hollow box, and may be constructed of wood, fibre, mesh, or any other desired material.

Built in the box 1 are a pair of tubes 2, these tubes being for the purpose of forming the vertical apertures through the block, as will be hereinafter more fully explained, said tubes being of wood, fibre, or any other suitable material.

If a transverse aperture is to be provided in the resulting block, a transverse tube 3 may be provided as illustrated in dotted lines in Fig. 5.

Secured to the core or frame 1 are a plurality of metal straps 4, the ends of these straps being affixed to the frame, but said straps throughout the major portion of their length being spaced a predetermined distance from the surfaces of said frame 1.

Fixed to the straps 4 are metallic screens or meshes 5, these screens or meshes being thus spaced a predetermined distance from the surfaces of the frame 1. Similar straps 6 are affixed to the interior of the tubes 2, and a mesh or screen 7 is fixed to said strap 6 in the same manner as the meshes 5 are affixed to the straps 4.

The framework as thus far assembled, is then supported in a suitable mold, such as illustrated in my co-pending application, Serial No. 470,598, filed July 25, 1930. Cement or concrete 8 is then poured in the mold, flowing through and around the meshes 5 and 7, and straps 4 and 6. Thereafter, on setting of the concrete, a finished block 9 is formed, having vertical apertures 10 extending therethrough.

While these concrete blocks will have the appearance and substantially the strength of a solid block, because of the presence therein of the reenforcing elements, said blocks will nevertheless be considerably lighter in weight than a solid block, and may, therefore, be made of considerably larger size than standard building blocks, thus requiring a lesser number of blocks in a wall of a given size.

If desired, expansion bolts 11 may be molded

in the blocks, for the purpose of receiving any desired girders, stringers, or the like.

Fig. 7 illustrates, in vertical section, the construction of a block having a transverse aperture 12 formed by the tube 3, a block of this type being illustrated at 13 in Fig. 6. These transverse apertures may be utilized for the passage of pipes or conduits 14 transversely through the wall, to communicate with vertical pipes or conduits 15 extending through the vertical apertures 10. The principal province of the vertical apertures 10, however, is to receive reenforcing rods or pillars 16, around which concrete or cement 17 may be poured to anchor said reenforcing rods 16 in rigid position. Horizontal and vertical mortar beds or courses 21 and 22 respectively are provided as the bonding means between the individual units 9 in the wall.

If desired, also, wooden plugs 18 may be secured to one side of the box 1 by nails or the like 19, these plugs being of a length equivalent to the thickness of the concrete 8, so that said plugs be flush with the surface of the finished blocks, as clearly illustrated. These plugs would be on the inner sides of the blocks 9, and to the same could be affixed screens, mesh, or the like, for the purpose of receiving and holding the usual plaster.

If desired, also, when the block is being formed, a layer of cement or concrete 20 of a different color or texture to the concrete 8 could be lined against one side or the bottom of the mold, before pouring the concrete 8 therein. This would result in the formation of a block or building unit, having a finished face of suitable or desirable color, finish or texture.

Walls constructed of these building units would have all the strength, load carrying capacity, and other advantages of a solid wall, but would be possessed of the advantage of lightness not present in a solid wall. Resistance to earth tremors, earthquakes, winds, or other undue stresses would be amply afforded by the reenforcing rods or pillars 16 embedded and anchored in the vertical apertures 10. Walls constructed of said novel units, because of the dead air spaces in said units, will present efficient insulation against heat and cold, and the said walls also will be substantially fireproof.

Recesses 25 are preferably formed in the through tubular channels 10 with which recesses suitable grappling or lifting hooks may engage to raise or lift the building units. These recesses 25, being located on the interior of the channels 10, are substantially out of sight, and, therefore, do not mar the appearance of the building units, nor do they detract from the strength thereof.

I believe that a building unit constructed according to my present invention is novel, and have, therefore, claimed the same in the present application.

I also believe that a wall constructed of these units and united and reenforced in the manner above described is novel, and have likewise claimed said wall herein.

While I have necessarily described my present invention somewhat in detail, it will be appreciated that I may vary the size, shape, and arrangement of parts within reasonably wide limits, without departing from the spirit of the invention.

My invention is further described and defined in the form of claims as follows:

1. A building unit comprising a hollow frame, metallic straps fixed to said frame, portions of said straps being spaced a predetermined distance from said frame, reenforcing mesh fixed to said straps and spaced thereby from the surfaces of said frame, cementitious material completely surrounding said frame and said mesh and extending through said mesh, a plurality of tubes constructed in said frame, a metallic strip fixed to the interior of each of said tubes and spaced a predetermined distance therefrom, and a cylindrical mesh fixed to the strap in each tube, the cementitious material of the unit being molded within said tube and through said mesh, said unit being provided with apertures therethrough defined by the cementitious material in said tubes.

2. A building unit comprising a hollow frame, metallic straps fixed to said frame, portions of said straps being spaced a predetermined distance from said frame, reenforcing mesh fixed to said straps and spaced thereby from the surfaces of said frame, cementitious material completely surrounding said frame and said mesh and extending through said mesh, a plurality of tubes constructed in said frame, a metallic strip fixed to the interior of each of said tubes and spaced a predetermined distance therefrom, and a cylindrical mesh fixed to the strap in each tube, the cementitious material of the unit being molded within said tube and through said mesh, said unit being provided with apertures therethrough defined by the cementitious material in said tubes, said unit also being provided with an aperture transversely thereof and communicating with one of said first apertures.

3. A building unit comprising a hollow frame, metallic straps fixed to said frame, portions of said straps being spaced a predetermined distance from said frame, reenforcing mesh fixed to said straps and spaced thereby from the surfaces of said frame, cementitious material completely surrounding said frame and said mesh and extending through said mesh, and a plurality of tubes constructed in said frame, said unit having a plurality of apertures therethrough defined by said tubes, said unit having a plurality of recesses therein adapted to be engaged by lifting devices for handling of said unit.

4. A building unit comprising a hollow frame, metallic straps fixed to said frame, portions of said straps being spaced a predetermined distance from said frame, reenforcing mesh fixed to said straps and spaced thereby from the surfaces of said frame, cementitious material completely surrounding said frame and said mesh and extending through said mesh, and a plurality of tubes constructed in said frame, said unit having a plurality of apertures therethrough defined by said tubes, said unit having a plurality of recesses therein and located in said apertures, adapted to be engaged by lifting devices for handling of said unit.

CHAS. T. CAHILL.