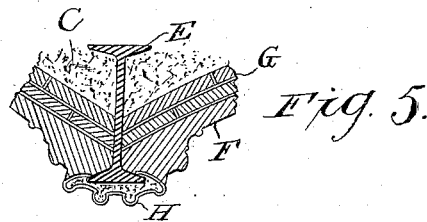
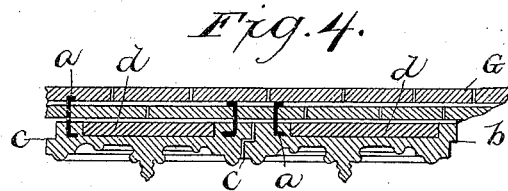
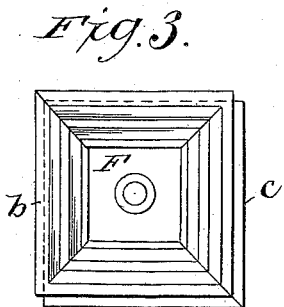
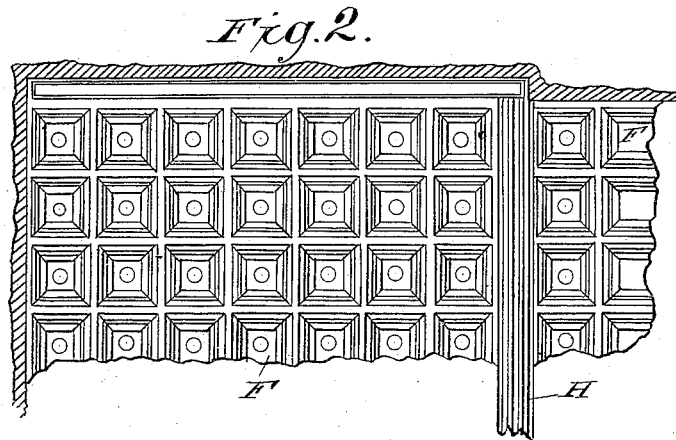
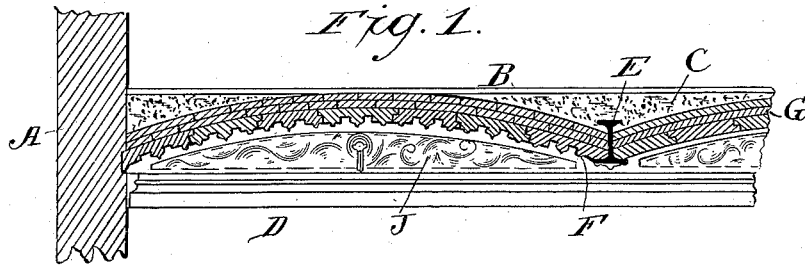


(No Model.)

R. GUASTAVINO.  
FIRE PROOF BUILDING.

No. 383,050.

Patented May 15, 1888.



Witnesses,

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# UNITED STATES PATENT OFFICE.

RAFAEL GUASTAVINO, OF NEW YORK, N. Y.

## FIRE-PROOF BUILDING.

SPECIFICATION forming part of Letters Patent No. 383,050, dated May 15, 1888.

Application filed February 25, 1887. Serial No. 228,862. (No model.)

*To all whom it may concern:*

Be it known that I, RAFAEL GUASTAVINO, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Fire-Proof Buildings, of which the following is a specification.

My present invention relates to the construction of buildings, and especially to fire-proof buildings; and the improvements herein described have reference to the ceilings, partitions, and staircases of such buildings, and are applicable to private dwellings, theaters, churches, school-houses, public halls, &c.

The object of the invention (said invention being adapted for use in conjunction with the inventions heretofore patented by me on August 11, 1885, and February 9, 1886) is to devise a ceiling, partition, or staircase which shall possess the elements of incombustibility and substantiality, as well as a high degree of ornamentation. In the present instance I make use of the brick tiles described in my patents above referred to for the construction of the vaults comprising the ceilings, partitions, and staircases, and combine therewith an outer layer of specially-constructed cement-faced tiles whose exposed surfaces are appropriately formed with ornamentation. By this construction I produce a structure which, aside from its inherent strength and security, requires no finishing—such, for instance, as plastering—or the addition of raised plaster or cement embellishments.

The features of novelty for which in this instance I desire protection, are set forth in the claims at the end of this description.

In the accompanying drawings, which form part of this specification, and in which like features are indicated by like letters, Figure 1 is a transverse section of a portion of a ceiling embodying my invention. Fig. 2 is a plan view of a portion of a like ceiling. Fig. 3 is a detached plan view of one of the ornamented cement tiles which constitute the exposed surface or face of the structure. Fig. 4 is a transverse sectional view of a portion of the ceiling shown in Fig. 2, on a somewhat enlarged scale; and Fig. 5 is a transverse sectional view of a portion of two vaults at a point where one of the longitudinal tie-beams is located, showing a method of concealing the lower surface of said tie-beam.

The brick tile that I use for forming the layers of the vault are about three-fourth ( $\frac{3}{4}$ ) of an inch thick by four (4) to six (6) inches wide, and from eight (8) to twelve (12) inches long. These tiles are built up into two or more rings or layers for each vault, and are set in cement or plaster of paris, and when such tiles are united together face to face in such manner as to break joints a structure is produced with a surface without solution of continuity, resembling a large stone three or more inches in thickness. These vaults may be flat or curved, and when curved they may be constructed in one or more oppositely-directed arches or risers.

As fully explained in my patents herein mentioned, vaults built on this principle possess great elasticity, and they resist pressure both by compression (the same as brick) and cohesion, (the same as stone or cast-iron.) To avoid the necessity of plastering the outer or exposed surface of the structure constructed on this plan, I now propose to add an outer or finishing layer of cement-faced decorated tiles; and in order that the requisite ornamentation may be embodied in the structure at the same time, and without the trouble and expense of placing it in position as a special finishing operation, I cast the said cement decorations on the tiles by means of a suitably-constructed mold, all of which is more specifically herein-after set forth.

Referring to the drawings, the letter A indicates one of the side or divisional walls of a building, B the floor or top of the ceiling below the roof, and C concrete or other suitable filling between the top of the vaults and the floor B.

D is the molding generally employed in finishing off the top of the walls where they join the ceiling.

The letter E indicates the tie-beams, which extend longitudinally of the room, there being as many used in the construction of a ceiling as may be required, (they may be arranged five, seven, nine, or more feet apart, as the construction of the building may require,) and I spring the risers of the vaults from the tie-beams each way. The tie-beams E are of course firmly secured into the divisional walls, and are preferably composed of wrought-iron.

The letter F indicates my cement-faced deco-

rated tiles, which form the outer or exposed surface of the structure. These tiles are designed to be squares, from six inches to twelve inches on the sides and from two and a half to  
 5 four inches in thickness. To give these tiles a suitable configuration, I cast the decorated face upon the brick tile in a mold constructed to attain that result.

I make no claim for the mold, and hence do  
 10 not show the same in the drawings.

In the formation of the decorated tile the cement face is cast upon the brick tile in such a manner as to leave the surface of the brick tile exposed at the back, as shown in Fig. 4, in order  
 15 that the same may be secured by cement or plaster-of-paris to the layer or ring of brick tiles against which they abut in the completed vault. In the process of preparing the cement-faced tile the small anchors *a* are cast in the tile, as  
 20 shown in the drawings. The object of the anchors *a* is to assist in holding the decorated tiles in place, as shown in Fig. 4. The mold in which the tiles *F* are prepared produces upon the latter the flanges *b* and *c*, as shown,  
 25 which assist in an obvious manner in securing the series of tiles constituting the ring or layer in position one to the other.

After the exterior ring or layer of a riser of the vault, composed of the decorated tiles *F*,  
 30 has been placed in position between the longitudinal tie-beams *E*, or between the side wall and said tie-beam, a ring or layer of brick tiles, *G*, is placed upon the layer of cement-faced decorated tiles, and laid in cement or  
 35 plaster-of-paris and in such manner as to preferably break joints with the ring of decorated tiles. The projecting portions of the anchor-irons *a* pass through this layer of tiles *G*, and thus assist in securing the decorated tiles *F*  
 40 against displacement. Upon the top of the first layer of brick tiles *G* a second (and third, if deemed necessary) layer of like tiles is laid in cement or plaster-of-paris and preferably in such manner as to break joints with the  
 45 layer immediately beneath. The filling of concrete or like material *C* is then placed in position, and upon the whole the floor may be laid.

The exposed lower surface of the tie-beams  
 50 *E* may be concealed in the course of building

up the vault by having applied thereto an ornamental cap-piece, *H*, of bronze or brass or other suitable metal, which is held in place by the adjacent decorated tiles resting thereupon,  
 as shown in Fig. 5, and cement or plaster-of- 55 paris must be applied between the surface of the brass cap and the lower surface of the beam as an insulator between the two to prevent the beam becoming heated in a fire.

The spaces between the molding *D* and the  
 60 risers may be supplied with appropriate ornamentation, as shown in Fig. 1 at *J*.

The vaults may be composed of single risers, of appropriate width, or of a series of short  
 65 risers, either transverse or longitudinal of the structure.

It is obvious that a structure constructed as above defined possesses superior fire-proof qualities and is of great strength, also that when completed it requires no plastering. It  
 70 may or may not be painted or otherwise appropriately decorated.

Having thus described my invention, what I claim as new, and desire to secure by Letters  
 Patent, is— 75

1. A ceiling, partition, or staircase composed of two or more layers or rings of brick tiles and an outside layer or ring of cement-faced tiles with raised decorations thereon, the whole set in cement or plaster-of-paris, substantially  
 80 as set forth.

2. A ceiling, partition, or staircase comprising rings or layers of brick tiles, the tiles of the outer layer being cement-faced and provided with raised ornamentation, and tie-  
 85 beams having their exposed surfaces covered with metal caps, substantially as set forth.

3. A tile for the vaults of fire-proof buildings, having cast upon its face cement ornamentation and provided on its edges with  
 90 flanges, substantially as and for the purposes set forth.

Signed at New York, in the county of New York and State of New York, this 23d day of February, A. D. 1887.

RAFAEL GUASTAVINO.

Witnesses:

QUINTIN GARRETA,  
 J. E. M. BOWEN.