(No Model.)

R. GUASTAVINO, Jr.

COHESIVE COMBINED LINTEL CEILING.

No. 481,755. Patented Aug. 30, 1892.

Fig. 2.

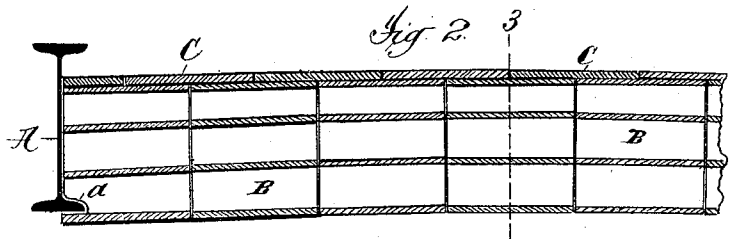


Fig. 2a.

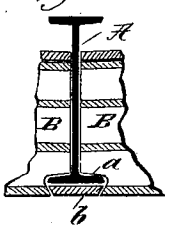


Fig. 3.

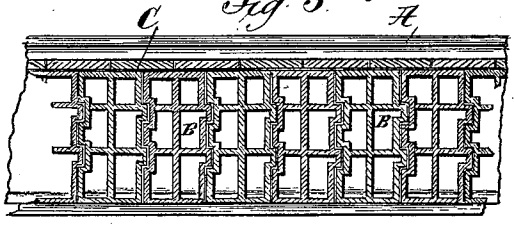


Fig. 4.

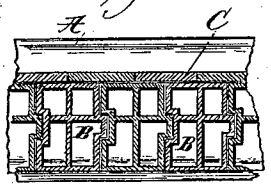


Fig. 1.

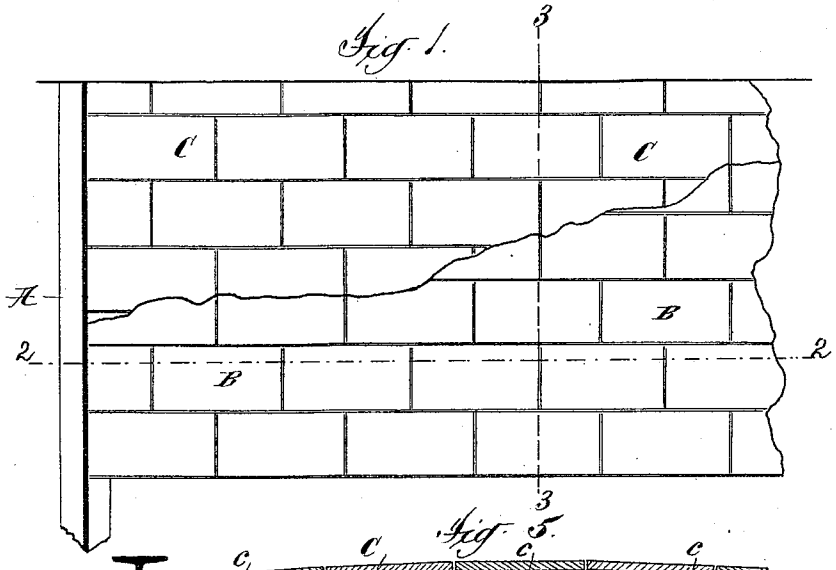
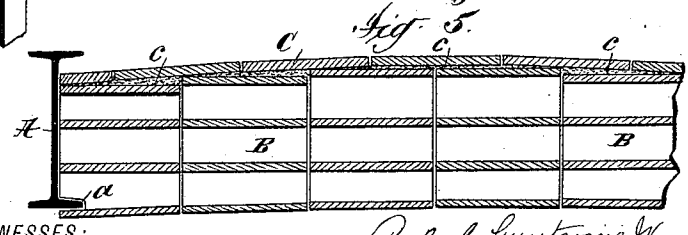


Fig. 5.



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RAFAEL GUASTAVINO, JR., OF BOSTON, MASSACHUSETTS.

COHESIVE COMBINED LINTEL-CEILING.

SPECIFICATION forming part of Letters Patent No. 481,755, dated August 30, 1892.

Application filed June 23, 1891. Serial No. 397,268. (No model.)

To all whom it may concern:

Be it known that I, RAFAEL GUASTAVINO, Jr., a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Cohesive Combined Lintel-Ceilings, of which the following is a specification.

This invention has reference to certain improvements applicable to the construction of the ceilings of fireproof and other buildings. The invention may be employed in the erection of buildings of all descriptions, such as dwellings, public edifices, &c.

The object of the invention is to devise a cohesive flat ceiling which shall possess the qualities of strength, minimum weight, and cheapness, and which I denominate a "combined lintel-ceiling."

The invention, with this object in view, consists of the peculiarities of construction hereinafter described, and particularly pointed out in the claims at the end hereof.

In the accompanying drawings, forming part of this specification, and in which like features are indicated by like letters of reference in the several views, Figure 1 is a plan view of a fragment of a ceiling embodying my present improvements. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 2^a is a detail modification, hereinafter described. Fig. 3 is a section on the line 3 3 of Figs. 1 and 2. Fig. 4 is a fragmentary sectional view of a ceiling embodying my improvements, but of less thickness than the construction shown in Fig. 3; and Fig. 5 is a sectional view of an arch embodying certain modifications hereinafter referred to.

The flat ceilings now commonly employed in fireproofing are composed of hollow clay blocks laid as voussoir, and therefore working on the same principal as ordinary stone arches. Such a construction possesses the condition that part of the material composing such a structure under the curve of pressure is not performing any sustaining function at all, but is simply contributing to the weight of the load, while a part of the material over this curve of pressure is performing only the function of a filling and contributing in no respect to the sustaining function of the structure. Such a construction as described also possesses the undesirable feature that the top of the key and the top of the voussoir adjoining the key, which is that part of the arch requiring the greatest resistance to the pressure, and is therefore the place where the arch should have the largest section of clay, has the same section as the rest of the structure. The spring of such an arch also required great strength, and it was therefore desirable that the first piece of the arch resting against the beam—namely, the skewback—should fit the beam perfectly to give stability to the work; but this result could not always be obtained in burnt clay, and it was therefore necessary to fill up the imperfections with material, making the joint thicker than was desirable. These thick joints at the spring of such arches are the cause of the defects so generally found in such structures. An arch of this construction will therefore always have an excess of joints, and also an excess of material in places where not needed, and in other places where material is needed it will not have sufficient, and as the joints of such an arch are laid in mortar the slightest settlement of the work causes the arch to assume the appearance of hanging in the middle, whereas its proper condition is flat and not convex. This defect is commonly found in finished arches of the type in question and is one very difficult to avoid in practice.

By my invention, as embodied in my cohesive combined lintel-ceiling, I am enabled to overcome the above-enumerated difficulties attending the erection of arches of the type referred to. Instead of arranging the plain-surfaced blocks as a voussoir, I construct the blocks for forming the arch of a special form and so dispose them as to produce a combined lintel, the series of blocks composing this structure interlocking with one another throughout the length of the arch. I also make use of a second course of tiles on top, the compressive parts of the arch being increased and the top surface of the complete structure having a uniform resistance and being practically a continuous arched flagging.

A peculiarity of my cohesive combined lintel-ceiling is that no block of the arch structure can be removed without destroying the block, for the reason that precaution is taken to lay the first line of blocks over a suitable skewback against the wall, and all the other blocks of the arch interlock with one another and with the beams, and thus become, when set in cement, firmly secured to one another, and it would therefore be practically impossible for the structure to fall or rise without destroying a block or blocks.

Referring now to the drawings, A indicates iron beams of small section, preferably in the form of rolled I-beams. These beams extend between the side walls or end walls of the building and, if found desirable, may have supports intermediate of said walls of suitable fireproof construction.

B indicates hollow tile-blocks, which constitute the first or outer surface course of the ceiling. These tile-blocks are of the form shown in Figs. 3 and 4, and are, say, twelve inches long by six inches wide and of variable thickness. Their short sides or ends are square, while their long sides are provided with uniform depressions and elevations of such form as to permit the interlocking of the blocks with one another when placed in position, as shown in Figs. 3 and 4. In Fig. 3 the blocks B are shown provided with a series of such interlocking elements on their long sides, while in Fig. 4 the blocks are provided with a single depression and elevation on their respective long sides, the latter form being employed for ceilings designed to have half the thickness of the ceiling shown in Fig. 3. The top and bottom surfaces of the tiles in either case are square or flat, as indicated in the drawings.

The tile-blocks B are laid in cement or plaster and with their longitudinal sides perpendicular to the beams—that is to say, the holes in the blocks facing the beams—thus making few joints and hence a more stable structure. The blocks B are also laid to break joints with one another, as indicated in the plan view, Fig. 1. It will be readily understood that when this arch is laid between the beams in the manner stated, with the tongue-and-groove joints locking the series of blocks to one another, a structure of great strength and permanency is secured.

The tile-blocks B which are adjacent to the beams A are so formed or cut away at *a* as to incase or overlap the lower flanges of said beams, thus entirely concealing the iron on the ceiling surface; or, if desired, the blocks may be cut or beveled at the bottom in the manner shown in Fig. 2ª and a tile *b*, with beveled sides, placed beneath the lower flange of the beam A between the depending beveled surfaces of the tile-blocks B and secured by cement or plaster.

Referring to Fig. 5 of the drawings, it will be seen that the tile-blocks B are of variable heights or thicknesses, those resting against the beam A being thinnest and the next of somewhat greater height, and so on to the middle or crown of the arch, which is the highest point of all. The series of steps thus formed on the top of the structure, each of an inch or less in height, gives the form of a rough arch on said top. These irregularities are covered by cement *c* to even up the top surface of the arch, and over the whole is laid in cement a course of thin flat tiles C. This construction, which forms a regular arch with increasing moment in the middle, permits the building of larger spans than when employing the form of structure shown in the other views, and any partition or weight in the middle of this arch will not affect its stability. Referring now to Figs. 1 to 4, the course of tile-blocks B, constructed as described, may be reinforced by a course of thin flat tiles C, laid in cement on top of said tile-blocks and so as to break joints with the latter, as indicated in the drawings. As the thickness of the ceiling is less than the vertical measurement of the beams A, there will be a space between the top course of tiles C and the floor which is designed to rest upon the top flanges of said beams. The exposed or ceiling surface of the course of tile-blocks B is without breaks or irregularities and flat.

By this invention I produce a cohesive combined lintel-ceiling that is very simple in construction and cheap and having a uniform top-surface resistance, the said top surface being essentially the same as if it were a single continuous stone or flagging.

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

1. In a cohesive combined lintel-ceiling, a course of hollow tile-blocks provided on their long sides with interlocking tongue-and-groove joints and laid in cement or plaster with their longitudinal sides perpendicular to the supporting-beams and breaking joints and coacting with one another to form continuous grooved joints interlaced with each other to form a lintel from beam to beam, substantially as set forth.

2. In a cohesive combined lintel-ceiling, a course of hollow tile-blocks provided with interlocking tongue-and-groove joints and laid in plaster or cement with their longitudinal sides perpendicular to the supporting-beams and breaking joints with one another and a second course of thin tiles laid flat in cement or plaster on top of said course of interlocked tile-blocks and breaking joints with the latter, substantially as set forth.

3. In a cohesive combined lintel-ceiling, a course of hollow tile-blocks provided with tongue-and-groove joints on their long sides and laid in cement with their longitudinal sides perpendicular to the supporting-beams

and of variable heights or thicknesses from the beams toward the crown of the arch, thus forming a series of steps, a filling of cement to even up the top surface of the structure, and a course of thin flat tiles laid in cement on the top of the whole, substantially as set forth.

Signed at Boston, in the county of Suffolk and State of Massachusetts, this 16th day of May, A. D. 1891.

RAFAEL GUASTAVINO, JR.

Witnesses:

KATIE L. RATIGAN,

JAMES W. BEASLEY.