No. 614,475. Patented Nov. 22, 1898.

E. V. JOHNSON.

FIREPROOF BUILDING.

(Application filed Apr. 9, 1898.)

(No Model.)

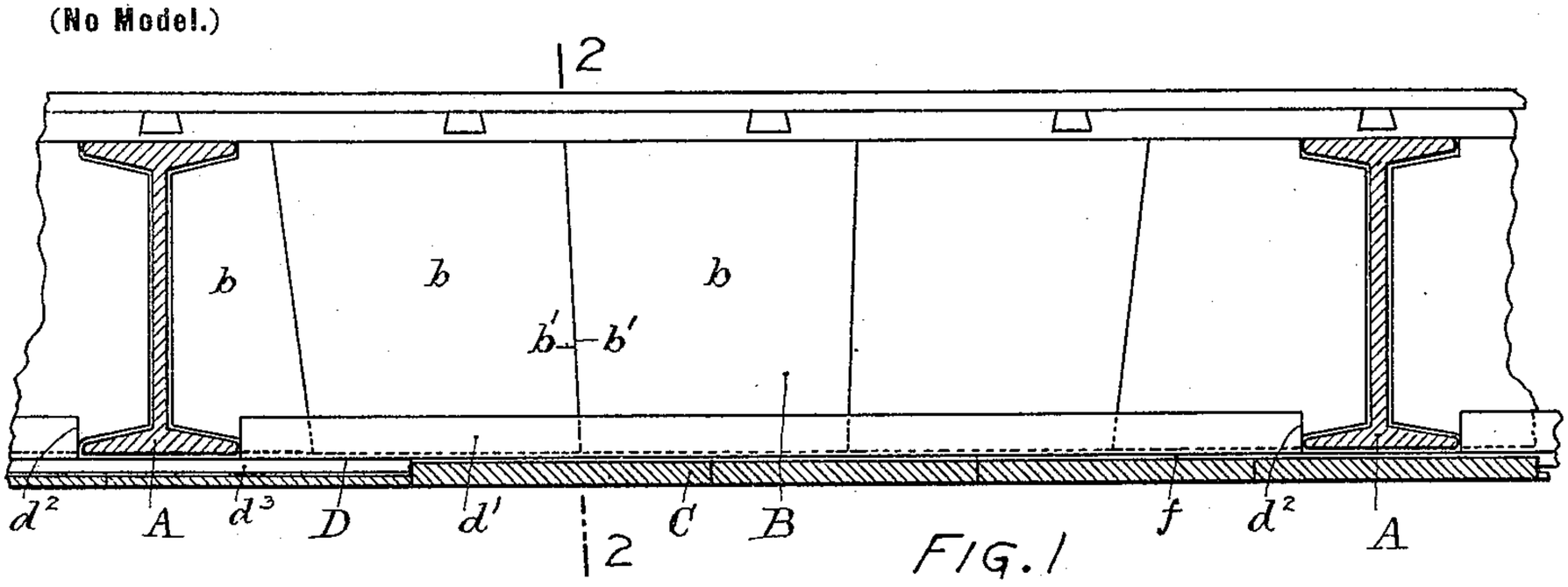

FIG. 1

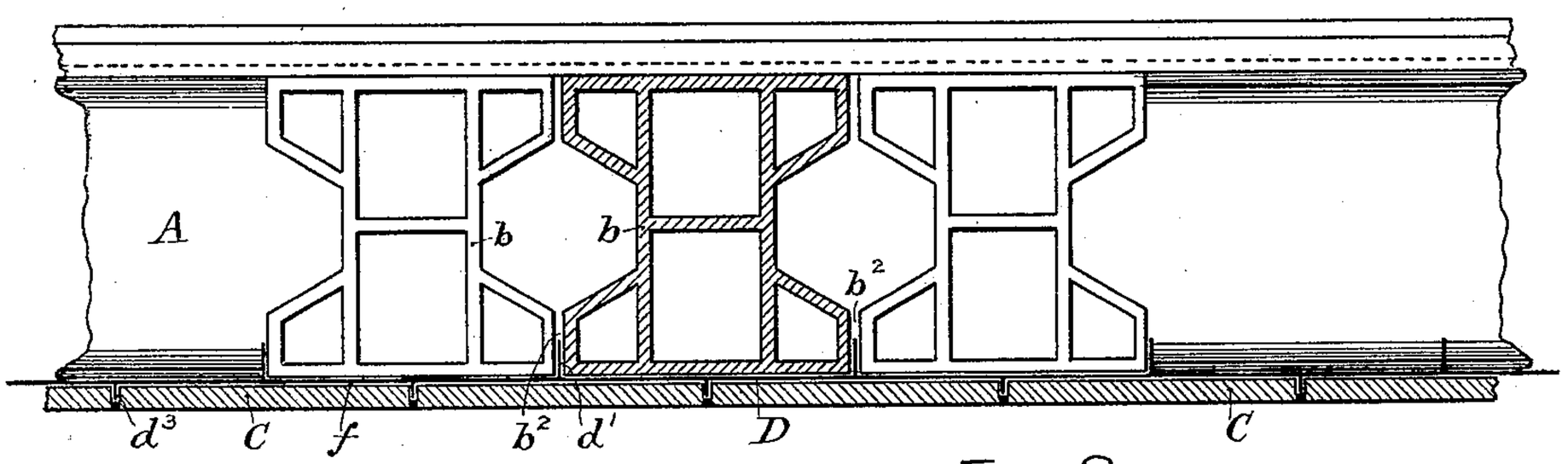

FIG. 2

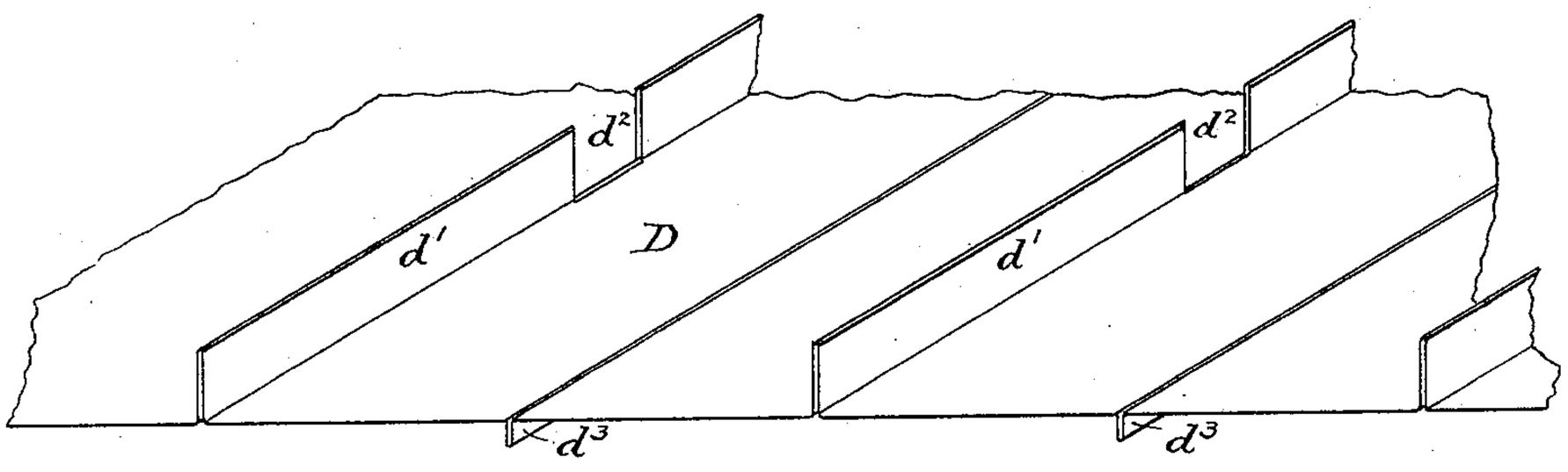

FIG. 3

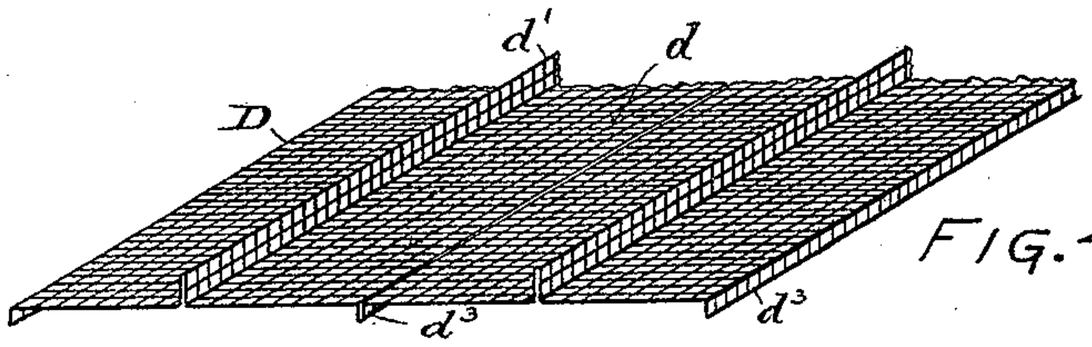

FIG. 4

WITNESSES:
A. W. Mimday.
S. E. Curtis

INVENTOR:
Ernest V. Johnson
By Mimday, Evarts & Adcock
his atty

UNITED STATES PATENT OFFICE.

ERNEST V. JOHNSON, OF CHICAGO, ILLINOIS.

FIREPROOF BUILDING.

SPECIFICATION forming part of Letters Patent No. 614,475, dated November 22, 1898.

Application filed April 9, 1898. Serial No. 677,017. (No model.)

To all whom it may concern:

Be it known that I, ERNEST V. JOHNSON, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Fireproof-Building Constructions, of which the following is a specification.

My invention relates to improvements in fireproof-building constructions composed of a steel framework and a tilework construction filling the space between the steel beams or framework-pieces and surrounding the same. Heretofore in such fireproof-building constructions the flat arch or tile construction fitting the space between the horizontal steel beams and forming the horizontal partitions or floors and ceilings of the building has proven more or less weak, faulty, and liable to destruction, especially in cases of fire where water is thrown upon the heated tilework, thus causing the same to crack, break, and fall, sometimes an upper floor upon the one below, thus breaking it and every succeeding floor below, and causing very great expense in repairing the building.

The object of my invention is to provide a flat arch or horizontal tilework construction of much greater strength than that heretofore in use without materially increasing the thickness and weight of the arch or tilework, which will be efficient and durable, simple and cheap in construction, and which will also be capable of effectually resisting the action of fire and water, and which can be readily and cheaply repaired, and which will effectually prevent all danger from the breaking and falling of one floor upon the one below from breaking and carrying down all the other floors below the falling one.

I have discovered and demonstrated by my experiments a very simple, cheap, and efficient means by which the effective strength of tilework horizontal partitions or floor-arches may be increased many fold; and herein my invention primarily consists—that is to say, it consists in the combination, with the beams of the steel or metal framework of the building and the tilework partition or flat arch filling the space between the metal beams, of a tensile-acting sheet of metal, either a plain metal sheet or a metal-fabric sheet—such, for example, as wire-netting—extending from framework-beam to framework-beam, and to which metal member the tilework partition or flat arch is rigidly cemented. This tensile-acting metal sheet or member extending from beam to beam covers the whole lower or outer face of the tilework partition or flat arch and is provided with integral right-angle folds or bends at intervals to fit between the joints of the separate pieces of tile, these right-angle folds or flanges extending in the direction of the arch or tile courses; and as this tensile-acting metal sheet or member is rigidly connected or cemented throughout its whole surface with the tilework or arch it adds very greatly to the effective strength thereof, my experiments showing that my improved tilework partition or arch is from five to ten times as strong as the same tilework partition or arch is without the tensile-acting metal sheet or member combined therewith. The right-angle flanges or folds in the tensile-acting metal sheet or member serve, by fitting between the joints of the tile courses, not only to more rigidly and firmly unite the tensile-acting member to the tilework, but also to materially increase the strength of the structure as a whole, these flanges or folds being preferably about two inches in width or height. The tensile-acting metal sheet or member is also provided with similar but narrower right-angle folds or flanges projecting from its lower or outer surface, and the space between these lower flanges or folds I fill in with thin supplemental tile firmly cemented thereto, the supplemental tile being preferably composed of a composition of asbestos. The thin supplemental tile is held in place on the lower or outer surface of the tensile-acting metal sheet or member by the cement and by the right-angle folds or flanges projecting from the lower surface of the tensile-acting member or sheet. This supplemental tile layer serves to protect the main tilework structure and the tensile-acting metal sheet or member from fire and heat and from the destructive effects of water in case of fire. If in case of fire the thin supplemental tile layer should be in whole or in part broken, injured, or destroyed, it can be very readily and cheaply repaired whenever injured in whole or in part by simply removing and replacing the broken or injured supplemental tile by new ones.

In the accompanying drawings, forming a part of this specification and in which similar letters of reference indicate like parts throughout all the views, Figure 1 is a vertical longitudinal section through a horizontal tilework partition or flat arch of a fireproof-building construction embodying my invention. Fig. 2 is a transverse section on the line 2 2 of Fig. 1. Fig. 3 is a detail perspective view showing a portion of the tensile-acting metal member, the same being here represented as composed of a plain or solid sheet of metal; and Fig. 4 is a view similar to Fig. 3, but on a somewhat smaller scale, showing the tensile-acting metal sheet or member composed of wire-netting or other metal fabric.

In the drawings, A A represent the steel beams forming a portion of the steel framework of the building.

B is a horizontal tilework partition or flat arch composed, preferably, of hollow tile *b*, laid in the usual courses, extending from steel beam A to steel beam A, the meeting or abutting faces *b'* of the tile *b* in each course being inclined to give the required arch action. The tile *b* may be of any suitable form or construction known to those skilled in the art; but I prefer to employ, and have therefore illustrated in the drawings, the particular form and construction of tile *b* heretofore patented to me in Letters Patent of the United States No. 456,309, of July 21, 1891, although, as before stated, any other suitable construction of tile may be employed in practicing my present invention.

D is the tensile-acting member or sheet. The same may be either a solid sheet of metal, as illustrated in Fig. 3, or a perforated sheet, as illustrated in Fig. 4, the latter being the preferred form, as the perforations *d* give the cement a better action in rigidly uniting the tensile sheet-metal member D with the main tilework B and the supplemental thin tile C. The tensile-acting member or sheet D is provided with longitudinal integral folds *d'*, projecting at right angles from the upper or inner surface of the tensile-acting metal member D and fitting in the joints b^2 of the contiguous courses of tile *b*. The tensile-acting metal member or sheet D extends longitudinally and continuously from beam to beam, and may preferably be made in long strips spanning a large number of the metal beams A A, the upwardly-projecting flanges or folds *d'* having notches d^2 therein to accommodate the beams A. The longitudinal tensile-acting metal member or sheet D may be made of any suitable width that the merchantable metal sheet or fabric ordinarily comes in, although I prefer that the same should not be less than a yard or such matter in width.

The tensile-acting metal member, sheet, or strip D is also provided with longitudinal integral flanges or folds d^3, projecting from its lower or outer face, which fit between the joints of the courses of the thin flat supplemental tile C. The longitudinal flanges or folds *d'*, which fit between the joints of the courses of the main tile *b*, are preferably about two inches in width, so as to give a firm hold of the same in the cement filling the joint between the tile *b* and also to more effectually strengthen the structure as a whole. The lower or outer projecting folds or flanges d^3 are much narrower, the width being preferably somewhat less than the thickness of the thin supplemental tile C.

The thin supplemental tile C may be made of clay or any other suitable material, but, as before stated, are preferably made of asbestos composition. As these supplemental tile are comparatively thin and light, they can be made of this more expensive and more fireproof material without materially adding to the cost of the building.

In constructing my invention or providing a building with it the thin supplemental tile C are first set or put in place under the beams A A and on top of the wood centering or false construction of the arch, said tile being preferably laid dry. The tensile-acting metal sheet or member D, if of the perforated form shown in Fig. 4, is next applied, and then a layer of cement is applied, which fill the interstices or perforations of the metal sheet D and the joints of the tile C. If an imperforate metal sheet D is employed, as indicated in Fig. 3, a cement coating is applied to the tile C before the metal sheet D is laid in place. After the cement becomes set the main tile *b* are next set or embedded in place on top of the metal member in cement *f*, which unites the same to the metal member and fills the joints of the tile.

In constructing my invention the thin supplemental tile C may, if preferred, be entirely omitted and a thick coating of asbestos plastering or other fire-resisting composition be plastered or bedded upon the wood centering or false work before the metal member is applied.

I wish it to be understood that I do not claim as my invention the idea, broadly, of providing a main tile partition or flat arch with a supplemental tilework covering secured to and supported from the main tilework structure.

I claim—

1. The fireproof-building construction, comprising in combination metal-framework beams, a tilework partition or flat arch extending in courses between said beams, and a tensile-acting metal member or sheet extending from beam to beam and covering and cemented to the lower or outer surface of the tilework partition or arch, substantially as specified.

2. The fireproof-building construction, comprising in combination metal-framework beams, a tilework partition or flat arch extending in courses between said beams, and a tensile-acting metal member or sheet extending from beam to beam and covering and

cemented to the lower or outer surface of the tilework partition or arch, said tensile-acting metal member or sheet having longitudinal flanges or folds fitting between the joints of the tile courses, substantially as specified.

3. The fireproof-building construction, comprising in combination metal-framework beams, a tilework partition or flat arch extending in courses between said beams, and a tensile-acting metal member or sheet extending from beam to beam and covering and cemented to the lower or outer surface of the tilework partition or arch, said tensile-acting metal member or sheet having longitudinal flanges or folds fitting between the joints of the tile courses, and thin supplemental tile covering and cemented to the lower or outer surface of said tensile-acting metal member or sheet, substantially as specified.

4. The fireproof-building construction, comprising in combination metal-framework beams, a tilework partition or flat arch extending in courses between said beams, and a tensile-acting metal member or sheet extending from beam to beam and covering and cemented to the lower or outer surface of the tilework partition or arch, said tensile-acting metal member or sheet having longitudinal flanges or folds fitting between the joints of the tile courses, and thin supplemental tile covering and cemented to the lower or outer surface of said tensile-acting metal member or sheet, said tensile-acting metal member or sheet having longitudinal flanges or folds fitting between the joints of the courses of said thin supplemental tile, substantially as specified.

5. The fireproof-building construction, comprising in combination metal-framework beams, a tilework partition or flat arch extending in courses between said beams, and a tensile-acting metal member or sheet extending from beam to beam and covering and cemented to the lower or outer surface of the tilework partition or arch, said sheet-metal member or sheet having perforations through the same to give the cement a better hold thereon, substantially as specified.

6. The fireproof-building construction, comprising in combination metal-framework beams, a tilework partition or flat arch extending in courses between said beams, and a tensile-acting metal member or sheet extending from beam to beam and covering and cemented to the lower or outer surface of the tilework partition or arch, said tensile-acting metal member or sheet having longitudinal flanges or folds fitting between the joints of the tile courses, and said longitudinal flanges or folds having notches to accommodate the metal beams, substantially as specified.

7. The fireproof-building construction, comprising in combination metal-framework beams, a tilework partition or flat arch extending in courses between said beams, and a tensile-acting metal member or sheet extending from beam to beam and covering and cemented to the lower or outer surface of the tilework partition or arch, said tensile-acting metal member or sheet having longitudinal flanges or folds fitting between the joints of the tile courses, said sheet-metal member or sheet having perforations through the same to give the cement a better hold thereon, substantially as specified.

ERNEST V. JOHNSON.

Witnesses:
H. M. MUNDAY,
L. E. CURTIS.