

G. H. JOHNSON & W. FREEBORN.

Improvement Fire-Proof Floors.

No. 132,292.

Patented Oct. 15, 1872.

FIG. I.

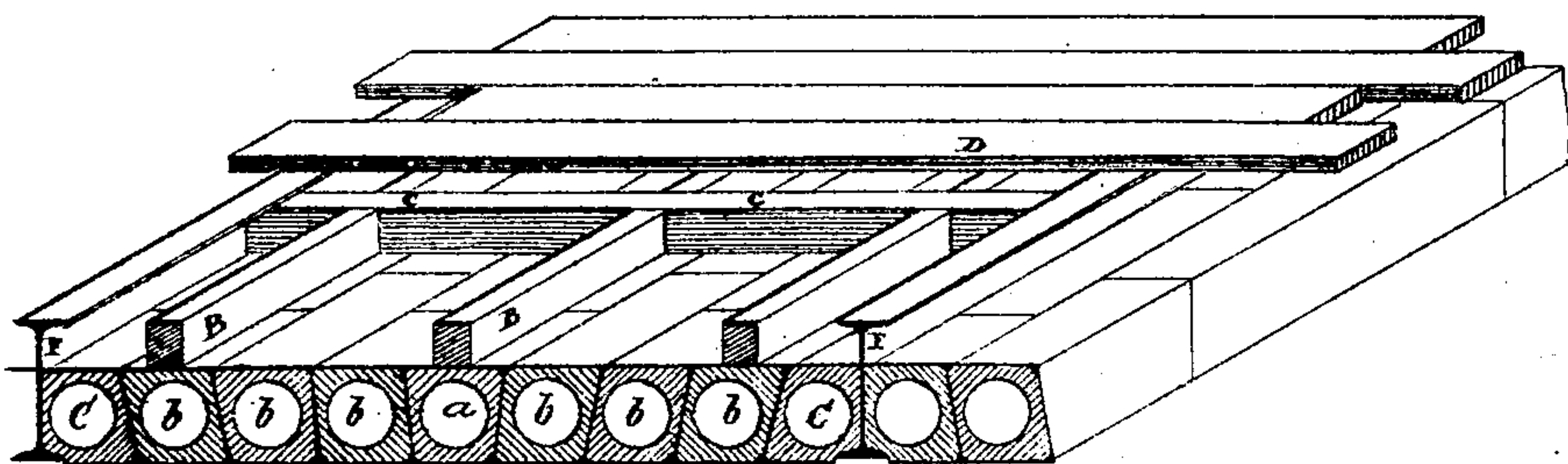


FIG. II.

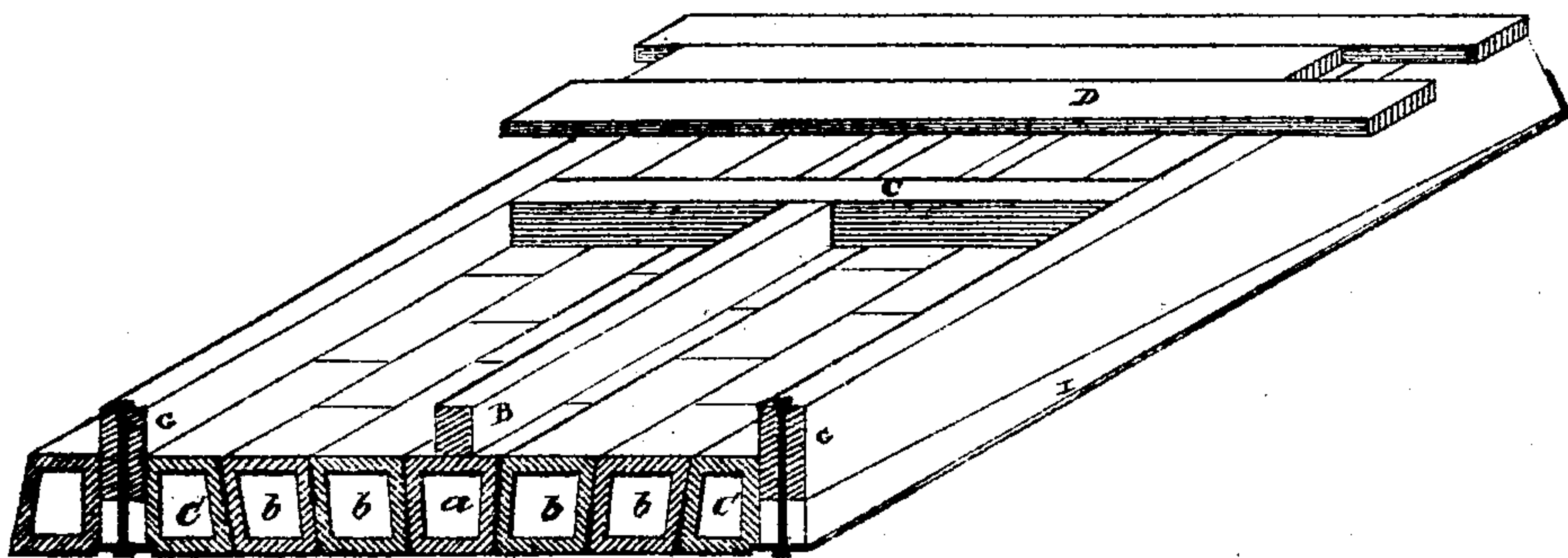
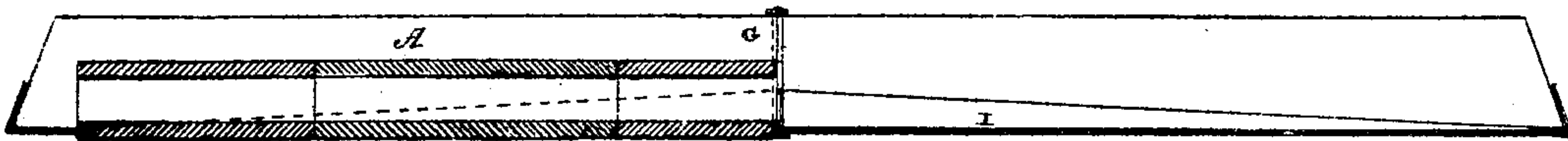
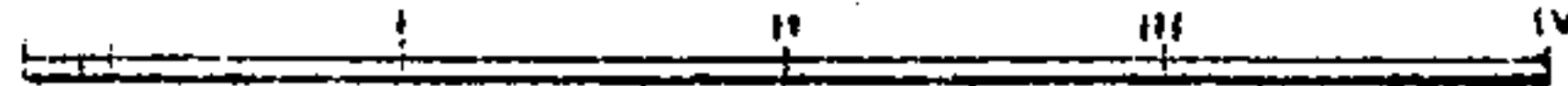


FIG. III.



SCALE OF FEET



WITNESSES:

*Edw. P. Hall*  
*Wm. A. Kerfoot*

INVENTORS:

*Geo. H. Johnson*  
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# UNITED STATES PATENT OFFICE.

GEORGE H. JOHNSON AND WILLIAM FREEBORN, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN FIRE-PROOF FLOORS.

Specification forming part of Letters Patent No. 132,292, dated October 15, 1872.

*To all whom it may concern:*

Be it known that I, GEO. H. JOHNSON and WM. FREEBORN, of Chicago, in the county of Cook and State of Illinois, have invented an Improved Construction of Fire-Proof Floors, of which the following is a specification:

Our invention is an improvement on the construction of hollow-tile floors, invented by George H. Johnson and B. Kreischer, patented March 21, 1871, No. 112,926 and No. 112,930.

The aim of the architect, in the construction of fire-proof as well as other buildings, particularly those of the larger and more imposing kind, is chiefly to secure the maximum of strength, durability, and compactness consistent with the greatest economy of labor and material.

In previous inventions in the line of hollow-tile floors we have secured this result but imperfectly or in part, since it has been demonstrated by practical test that the desired measure of economy of space, material, and labor was largely wanting. In the present instance, we have devised a floor or ceiling which occupies much less space vertically than the width of ordinary small-sized flanged iron beams or girders, and is composed of separate tiles aggregating a less mass and weight than a brick or stone arch of equal width, while capable of supporting an equal or greater strain, presenting a smoother surface, and rendering grouting unnecessary, besides possessing greater fire or heat resisting qualities.

Referring to the accompanying drawing, Fig. 1 is an isometrical view of a section of a floor and ceiling, constructed after our plan, and supported by iron beams; Fig. 2 is a similar view, wooden truss-beams being substituted for the iron; and Fig. 3 is a longitudinal section thereof.

We construct the floor of tubes or hollow tiles, which are of equal vertical thickness and preferably arranged so as to "break joints." These tubes are of irregular form, but present in every case four sharp edges or corners. The central tube *a* is the key, and the two outer tubes *c c* are grooved or rabbeted to form a shoulder which rests on the lower flange of

the beam or girder *F*. Between the key *a* and each of these (*c*) we insert tubes *b*, which are of a rhombic form in cross-section. The number of these tubes *b b* will in every case correspond to the distance between the beams or girders. Any one of them may be substituted for any other, being all made in the same die or mold. Thus the only tube or tile composing the floor, which will in any case need change of form, is the key *a*, and that only in respect to width to accommodate any possible variations of space between the beams *F*, where it happens that the other parts, *b b c c*, do not fill the space with exactness. To provide for this contingency, in practice-keys *a* of various thicknesses will be manufactured and furnished in suitable number with the tubes *b b* and *c c*.

This construction and arrangement of tiles provides a flat surface on both sides of the ceiling or floor, and admits of the wooden flooring-strips *B C* being laid thereon without the aid of grouting or filling, as is the case when the old form of arch is used. The end of the joists *C* fit under the upper flange of the girders *F*, and thus the whole of the flooring, including the boards *D*, is also held down without the necessity of nails or spikes, or other means of securing it. This statement does not so well apply to the construction shown in Fig. 2, where wooden truss-beams *G* are employed, the same resting on iron plates *I*, which form the shoulder-supports of the tubes *c c*.

It will be observed that, when desired or necessary, particularly in the class of smaller buildings, the wooden flooring *B C D* may be dispensed with, and a smaller-sized girder employed, so that the upper and under surface of the tiles will constitute the floor and ceiling, respectively, of two apartments, one above the other. In any event, no lathing of any kind will be required, a thin coat of hard finish being alone applied to the under surface of the tubes.

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

1. The combination, with flanged girders, of

the grooved or shouldered outer tubes *c c*, key *a*, and the intermediate tubes *b b*, all of the form shown, and arranged as herein described, whereby they form a flat surface on the upper and under side, and are adapted to fill different spaces between the girders, as specified.

2. The combination, with the double-flanged girders *F*, of the tubes *a b b c c*, constructed

and arranged to form a flat upper and under surface of the strips *B* and joists *C*, as shown and described, for the purpose specified.

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WM. FREEBORN.

Witnesses:

EDWIN ROBT. HALL,

WM. B. KERFOOT.