

(No Model.)

C. C. GILMAN.
FIRE PROOF FLOOR.

No. 338,510.

Patented Mar. 23, 1886.

Fig. 1.

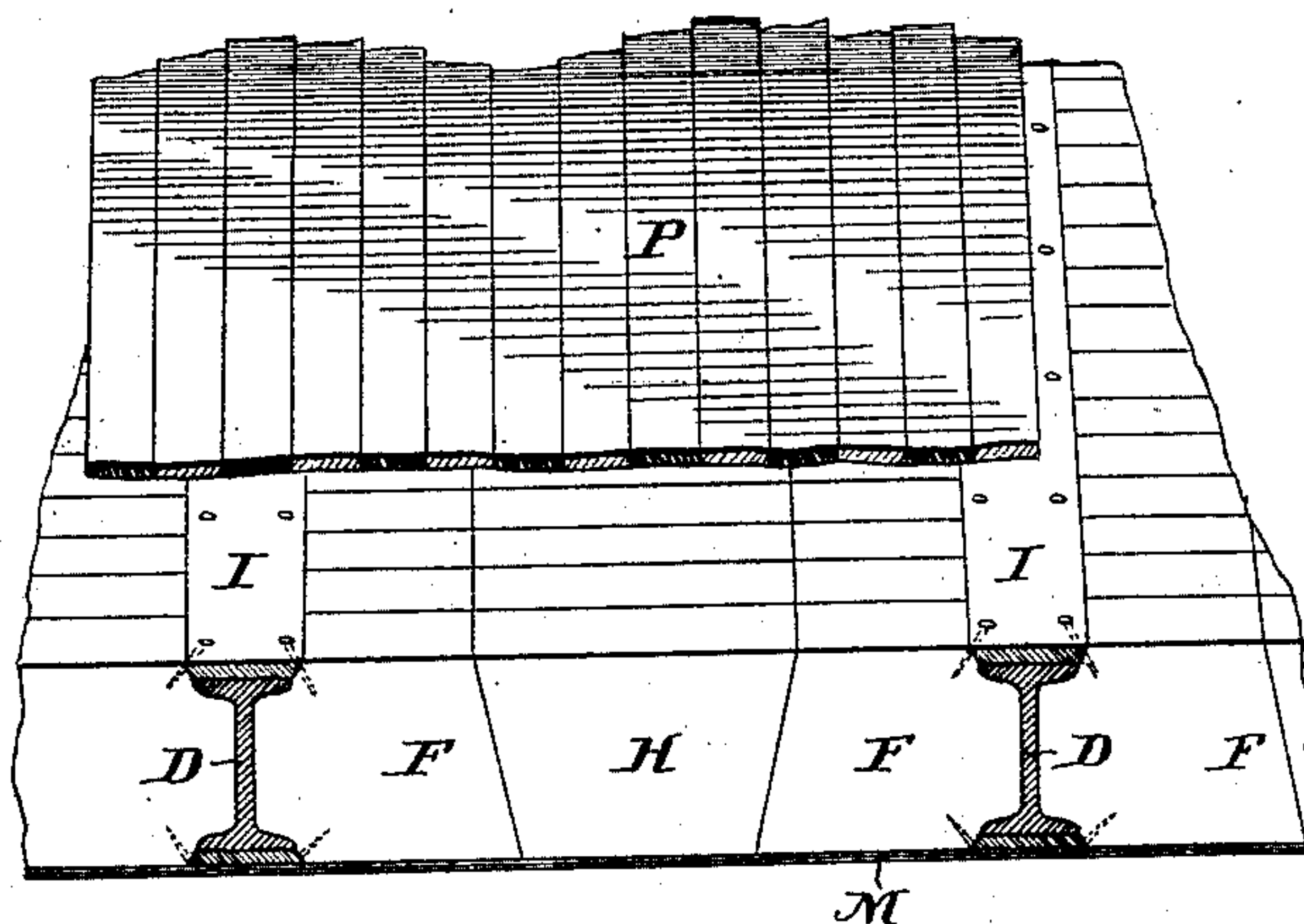


Fig. 2.

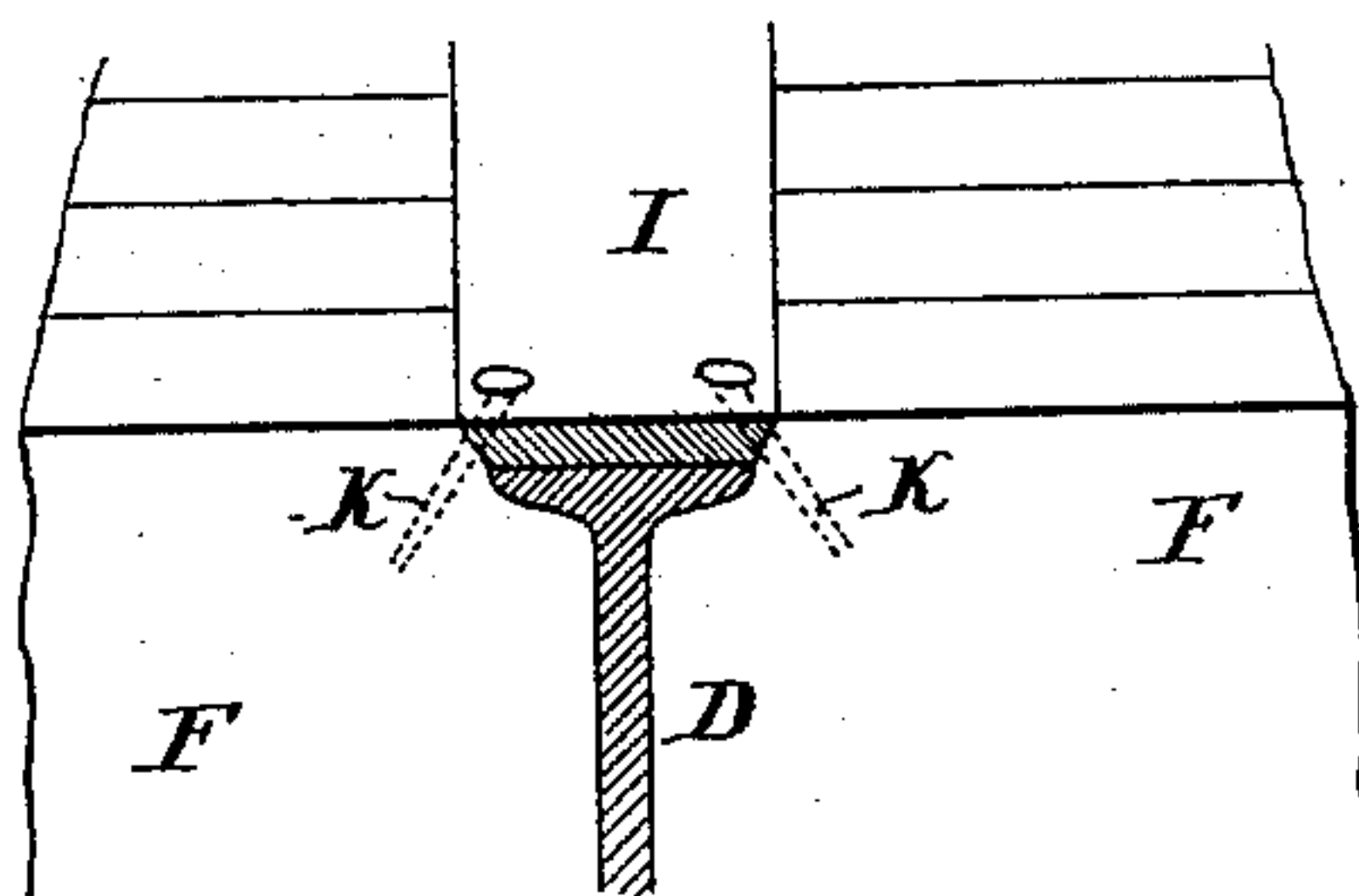
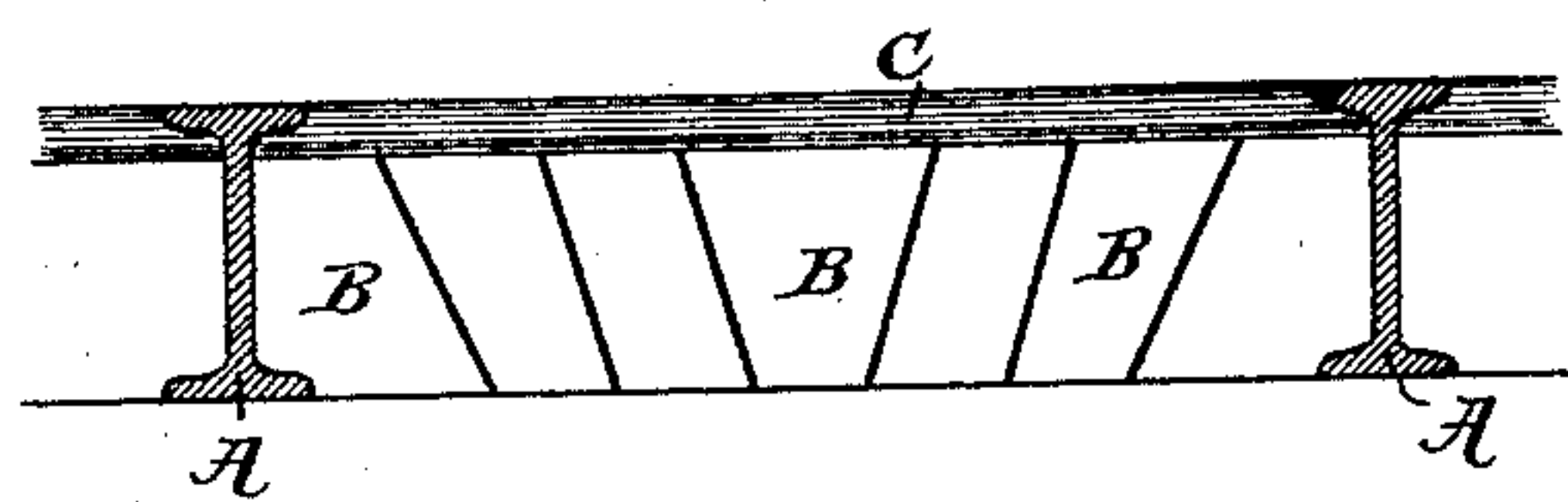


Fig. 3.



Attest:

Geo. H. Graham

Geo. H. Botts.

Inventor:

Charles C. Gilman.

Wm. C. Behrens.
att'y.

UNITED STATES PATENT OFFICE.

CHARLES CARROLL GILMAN, OF ELDORA, IOWA.

FIRE-PROOF FLOOR.

SPECIFICATION forming part of Letters Patent No. 338,510, dated March 23, 1886.

Application filed March 18, 1885. Serial No. 159,233. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CARROLL GILMAN, a citizen of the United States, residing at Eldora, Hardin county, Iowa, have
5 invented a new and useful Improvement in the Construction of Fire-Proof Floors, of which the following is a specification.

My invention relates to improvements in the construction of fire-proof floors and roofs, the
10 beams and rafters whereof are of iron or steel; and it consists in the combination of such a metal frame-work with terra-cotta lumber or porous burned-brick material applied as hereinafter described and claimed.

15 In the accompanying drawings, which form a part of this specification, Figure 1 is a perspective view of a fire-proof floor embodying my invention. Fig. 2 is an enlarged detail view of the beam-protecting strip and the
20 means for holding the same in position. Fig. 3 represents a floor as commonly constructed with voussoir-blocks of hollow pottery.

The fire-proof floors of iron-framed buildings are at present generally constructed as
25 illustrated in Fig. 3. In such construction the iron I-beams A, twelve inches in depth, are placed five feet apart. The space between the said beams is filled with voussoir-blocks of hollow pottery B, bonded together with a
30 stiff mortar of lime or cement. The upper surface of said blocks is a considerable distance below the upper surface of said beams, and in this space between the beams is spread a layer of rough concrete, C, as shown in said
35 figure. To construct such a floor, a platform or support is erected on a level with the under surface of the iron beams to temporarily support the voussoir-blocks, and as these are placed in position they are cemented together
40 by a thick layer of mortar. The said support or platform must remain in position until the mortar or cement has hardened, which takes from six to ten weeks, according to the condition of the atmosphere, for until then the so-
45 constructed arch cannot maintain itself in position, much less sustain a weight thereupon. The voussoir-blocks, owing to their density, are of great weight and are good conductors of heat, so that while such a floor is incom-
50 bustible, it will, if subjected to great heat, explode or disintegrate, and thus imperil the

whole structure. It will also be noticed that the iron beams are unprotected on the upper and lower sides, except as protection is afforded by the floor above and the ceiling of plaster below. (Not shown.) 55

Referring to Figs. 1 and 2 of the drawings, which illustrate my invention, D designates the iron beams supported by iron girders. (Not shown.) Said beams are of the usual I form
60 in cross-section, have a depth of about ten inches, and are placed five feet apart from center to center. Between said beams I fit what I designate "joists," of terra-cotta lumber or of a porous burned-brick material. 65 Said joists have a depth of twelve inches, or two inches in excess of the depth of the iron beams, and are so constructed and arranged as to project one inch above the top and the same distance below the bottom flange of said
70 beams. Each joist consists of three parts, two haunches, F F, and a key, H.

The joists may be divided into a greater number of parts; but as the material thereof can be made in long pieces and can be sawed to
75 effect tight-fitting joints, the division into three parts affording greater strength, is preferred. The ends of the haunches which abut against the beams are, preferably, given the proper form, while the material of which they are
80 made is in a plastic state, though this may be done subsequently to firing, since the material can then be readily worked with edged tools. The opposite ends of the haunches, as also the
85 opposing ends of the key, are sawed diagonally to the proper angle after the material has been burned, so as to insure closely-fitting joints.

The sections composing the joist can be cut or trimmed by the use of edged tools to the exact size required, and the parts can be du-
90 plicated so exactly as to be interchangeable. The said joists are placed side by side, so as to touch each other and fill the space between the beams. They can be rapidly placed in position in the following manner: The haunches
95 are first adjusted to the iron beams, and their free ends supported by a platform or temporary scaffolding erected from the floor below. The key is then inserted between the haunches
100 from above and driven firmly into position by the use of a heavy mallet.

To obviate the tendency of the key to draw

or rebound (which occasionally happens) when being driven to place, I preferably apply a very thin layer of lime, mortar, or cement or melted asphaltum to the impinging edges thereof.

Owing to slight inaccuracies in the adjustment of the beams, which cannot be guarded against, it occasionally occurs that the key, after having been driven firmly into place, will project below the haunches to the extent of about an inch, (more or less,) and in order that the key may not be impeded in its downward movement the platform supporting the haunches must be so arranged and placed as not to interfere therewith. The projecting part of the key may subsequently be trimmed off with an adz.

The blocks composing the sectional joists may be solid or hollow and from three to six inches in width.

To perfectly fire-proof the top and bottom of the iron beams I apply thereto the beveled protecting-strips I, which match the beveled haunches F, and are fastened thereto by nails K. These protecting-strips are about one inch in thickness, formed of the same material as the said joists. A lumber floor may be laid upon and nailed to said joists, and a ceiling of plaster applied without the use of laths.

As the terra-cotta lumber weighs much less than the voussoir-blocks of hollow pottery, iron beams of lighter construction may be employed, and as the said material is a very bad conductor of heat it is proof against the joint action of fire and water, and thus completely protects the iron beams from the action of said elements. The cost of said material and that of erection is considerably less than that of the construction first described. Such a floor may be profitably erected in cold weather, and is ready for the application of boards P and plaster M, immediately after erection, which is a work of carpentry rather than masonry, for its retention in position is not dependent upon the hardening of mortar joints. The thin film of mortar, which I preferably employ, does not perform the function of an ordinary mortar joint, as in the floor of voussoir-blocks, but serves to prevent rebound of the key. If it served the function of a mortar joint it would be necessary to await the hardening of the same before removing the support, which in practice is not done, for the support is generally removed immediately after the joists are in position.

The construction herein described may also be employed in the construction of roofs of iron-framed buildings.

The expression or term "terra-cotta lumber," as used in the specification and claims, is to be understood as including any porous

burned-brick material possessing the qualities herein set forth.

I am aware of the patent to S. E. Loring, No. 156,361, October 27, 1874, the patent to L. Hornblower, No. 177,516, May 16, 1876, and the patent to Johnson & Hall, No. 133,448, November 26, 1872, and what is shown and described in said patents I hereby disclaim.

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

1. The combination of iron beams with sectional joists of a porous burned-brick material, said joists consisting of three blocks, the opposing edges of which have been sawed to the proper angle, and are closely fitted together without the intervention of the ordinary mortar joint, substantially as described.

2. The combination of iron beams with sectional joists of a porous burned-brick material, said joists projecting beyond the top and bottom of said beams, and each joist consisting of three blocks, the opposing edges of which have been sawed to the proper angle, and which blocks are closely fitted together without the intervention of the ordinary mortar joint, and protecting-strips applied to the upper and lower surface of said beams and secured to said joists, substantially as described.

3. The combination of iron beams with blocks of fireproofing material occupying the space between said beams, said blocks projecting beyond the top and bottom thereof, and protecting-strips applied to the top and bottom of said beams and secured to said blocks, substantially as described.

4. The combination of iron beams with blocks of fireproofing material occupying the space between said beams and projecting beyond the top and bottom thereof, and having beveled corners adjacent thereto, and beveled protecting-strips laid on the top and bottom of said beams and secured to said blocks, substantially as described.

5. The combination of iron beams with sectional joists of fireproofing material supported between the same and projecting beyond the top and bottom thereof, protecting-strips covering the top and bottom of said beams and secured to said sectional joists, and with a floor applied to the top and a ceiling of plaster to the bottom of said strips and joists, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES CARROLL GILMAN.

Witnesses:

EDMUND RICE,

CHARLES CARROLL.