

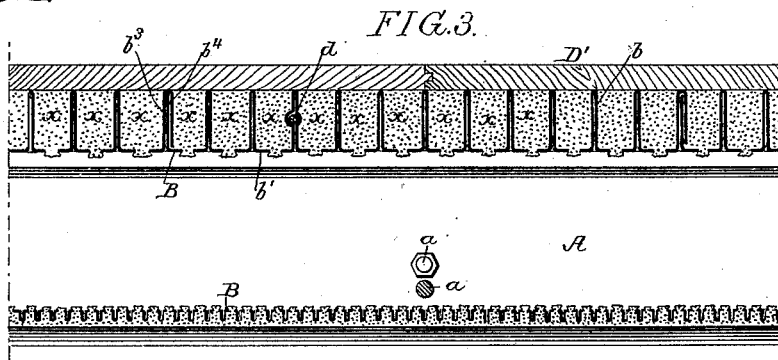
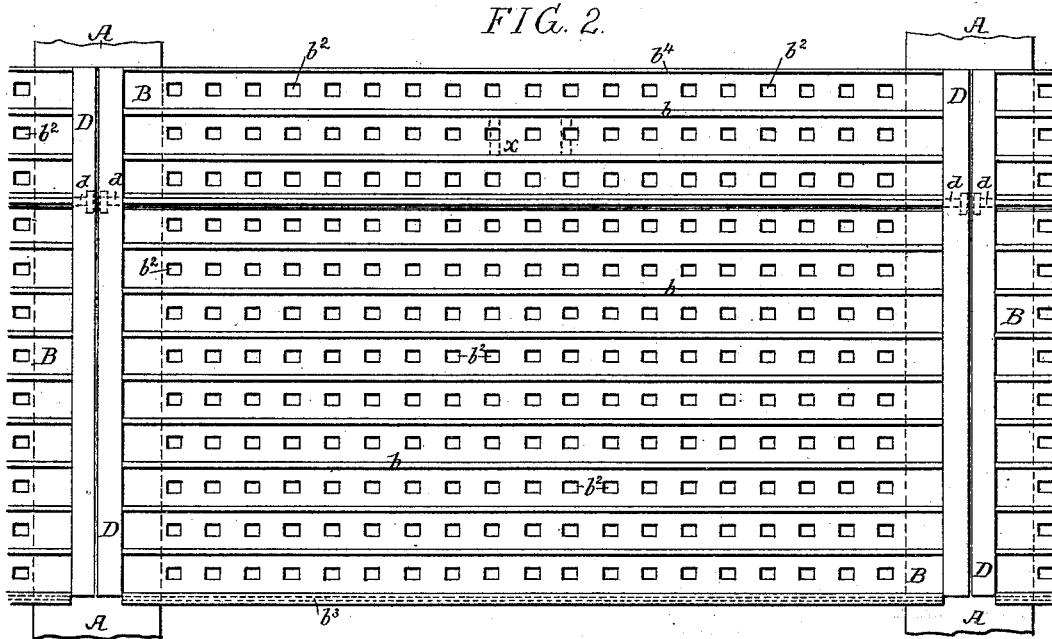
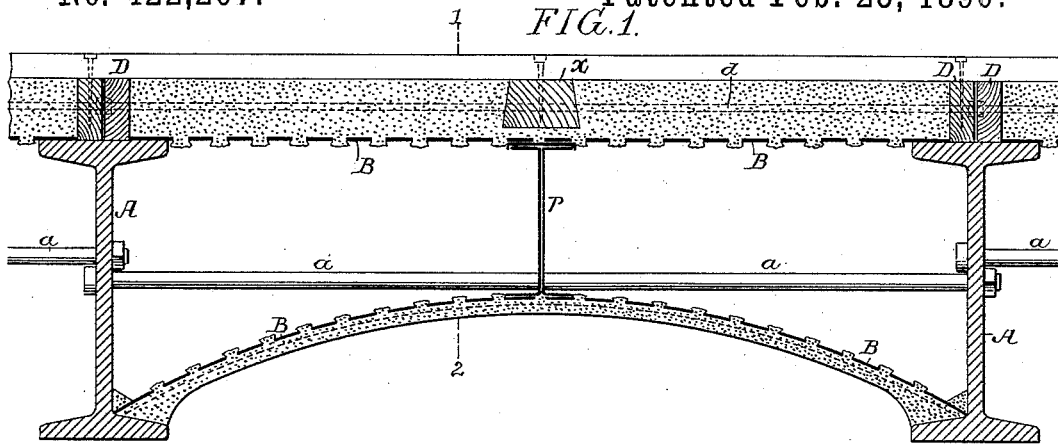
(No Model.)

2 Sheets—Sheet 1.

E. HALLOWELL & L. C. HICKMAN.
FIRE PROOF STRUCTURE.

No. 422,207.

Patented Feb. 25, 1890.



Witnesses:
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Inventors'
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by their Attorneys
Howson & Howson

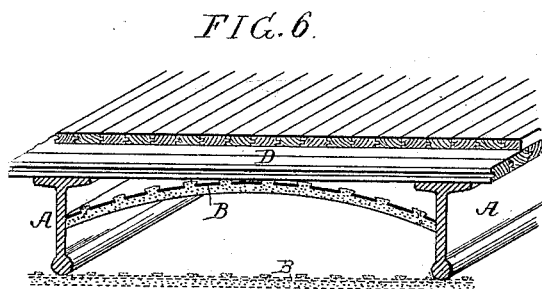
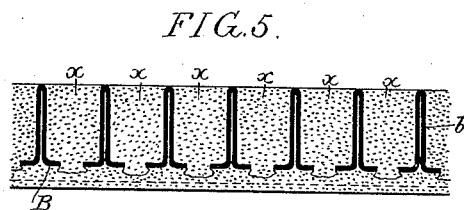
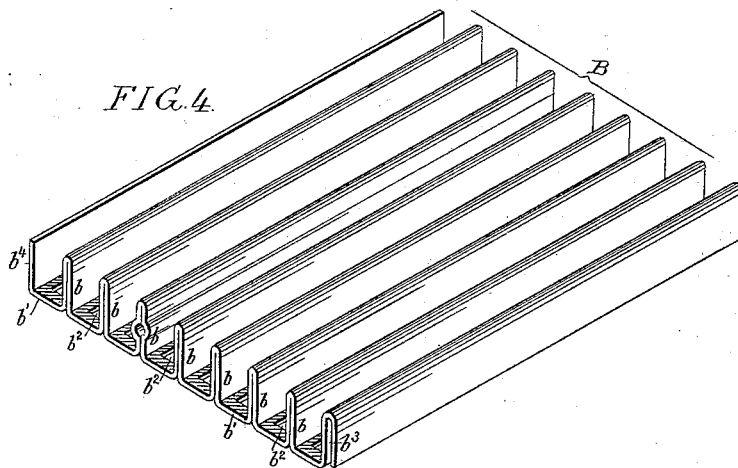
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2 Sheets—Sheet 2.

E. HALLOWELL & L. C. HICKMAN.
FIRE PROOF STRUCTURE.

No. 422,207.

Patented Feb. 25, 1890.



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Inventors:
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UNITED STATES PATENT OFFICE.

ELLWOOD HALLOWELL AND LOUIS C. HICKMAN, OF PHILADELPHIA,
PENNSYLVANIA.

FIRE-PROOF STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 422,207, dated February 25, 1890.

Application filed October 4, 1889. Serial No. 326,005. (No model.)

To all whom it may concern:

Be it known that we, ELLWOOD HALLOWELL and LOUIS C. HICKMAN, residents of Philadelphia, Pennsylvania, both citizens of the United States, have invented certain Improvements in Fire-Proof Structures, of which the following is a specification.

The object of our invention is to provide a cheap and substantial floor plate or lath for fire-proof floors and walls of buildings that can be readily applied and that will become perfectly rigid as soon as the cement or plaster that is applied thereto sets.

In the accompanying drawings, Figure 1 is a transverse section of a portion of the floor, showing the supporting-beams and lathing. Fig. 2 is a plan view, partly in section. Fig. 3 is a section on the line 1 2, Fig. 1. Fig. 4 is a perspective view of the sheet-metal plate or lath in the form of a series of beams. Fig. 5 is a view showing the plate or lath plastered on the underside. Fig. 6 is a view of a modified construction of floor and ceiling.

It will be understood at the outset that our invention is applicable to both floors and walls. We have illustrated mainly floor and ceiling structures in the drawings; but the plate or lath can be readily applied to the walls in a manner common to metallic lathing.

A A are the usual beams or girders used in the construction of buildings, either of metal or wood. The beams are tied together by the tie-rods *a a* in the usual manner. We have shown the beams in the form of I-beams in the present instance. Where the ceiling of the room below is to be arched, I-beams are used; but where the beams are to be exposed we prefer to use ordinary deck-beams.

B is a corrugated plate, as shown clearly in Fig. 3, bent so as to form vertical webs *b b*, tied together at one end by plates *b'*, preferably perforated at *b'*, as shown, to allow the plaster or cement to pass through and key. These keys also form projections or keys when it is desired to plaster on the opposite face of the plate.

We prefer to use thin sheet-iron plates, crimped and bent substantially as shown in Fig. 3, so as to form the vertical webs. When

the plate is used for flooring, it is bound at each end with the cross-bars D D after being crimped, the bars being tied together by a tie-rod *d*, passing between two of the webs of the plate, as shown clearly in Fig. 2. The cross-bars are preferably made of wood, so that the floor-boards can be nailed thereto. Each section is composed of a single crimped plate and the cross-bars, and is filled with cement, which is packed tightly in the space between each vertical rib, so that when the cement sets the webs *b* will be firmly fixed between the two walls of cement, and it will be impossible for the webs to buckle or weaken by being out of line. The end rib *b'* of one plate is formed as shown in Fig. 3, having an overhanging lip, so as to fit over the rib *b'* of an adjoining plate, thus making a secure lock, making the joint also water-proof. The lip and rib of the two plates can be indented, preventing the separation of the plates.

Blocks of wood *x*, preferably tapered, may be let into the cement, as shown in Figs. 1 and 2, to which the flooring-boards are secured. This is especially necessary where the plate bridges over a large span.

If plaster is to be placed directly upon the under side of the plate, we prefer to set the cement first, particles of which pass through the openings *b'* and form keys for the plaster, as shown in Fig. 5.

When the ceiling of the room below is to be arched between the girders, we place a section of the crimped plate B between the two beams, arching it, as shown in Fig. 1, and plaster on the under side of the plate. The webs or ribs in this instance project from the underside instead of the upper side, the plaster filling the openings between the ribs, thus making them perfectly firm and stiff. The arched plate B is consequently stiff, and where an arched span is required we place a made beam of sheet metal or an I-beam between the under side of the upper plate B and the upper side of the arched plate, as shown in Fig. 1. Thus the arched plate takes a portion of the strain from the upper plate B.

Two beams may be used instead of one where circumstances require, the particular

construction depending altogether upon the span between the beams.

In Fig. 6 the flooring is placed directly upon the beams, and the plate secured between the beams directly under the floor and secured thereto by means of suitable fastenings, the cement or plaster being placed upon the plate in substantially the same manner as above described; or the plate may be secured by dotted lines in Fig. 6, and plastered in the usual manner.

We are enabled in carrying out our invention to make a very light flooring, as thin sheet metal can be used. The ribs or webs being perpendicular, the strain will be taken up with the width of the web and not so much by its thickness, and we can use cement of such a character that the flooring can be nailed directly to the cement, there being enough woody matter in the cement to allow for the ready insertion of flooring-nails, although we prefer to use the strips D D where practicable, and wooden blocks can be set in the cement, as described, to nail the floorboards to when desired.

It will be understood that our invention can be used for lathing the side walls of buildings, as well as for a floor or ceiling, the plaster in this case forming the wall between which the ribs are held, preventing them from buckling or twisting.

We claim as our invention—

1. A flooring plate or lath formed of metallic plate crimped to form a series of webs, each consisting of a closely-pressed fold of the plate, substantially as described.

2. The combination, in flooring, of the supporting-beams, the crimped plates forming

vertical ribs or webs, with cross-bars D D, tie-rods connecting said cross-bars together, with cement filled in the spaces between the cross-bars and between the ribs of the plate, substantially as described.

3. The combination, in a floor structure, of the crimped plate forming vertical ribs or webs, with an arched crimped plate directly below the supporting-plate, and with a beam placed between the two plates, so that the arched plate will take a portion of the strain from the top plate, substantially as described.

4. The combination, in a structure for buildings, of the supporting-beams, the crimped plate forming vertical ribs or webs, the horizontal portion of the plate being perforated, said plate being cemented on its raised side, said cement passing through punctures in the plate, forming keys therein for the plaster, substantially as described.

5. A sheet-metal plate ribbed and cemented as described, and having a lipped rib at one side, adapted to pass over and engage with a rib on the adjoining plate, substantially as described.

6. A ribbed flooring-plate, substantially as described, with cement therein, a block embedded in said cement, with flooring-boards secured to said block, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ELLWOOD HALLOWELL.
LOUIS C. HICKMAN.

Witnesses:

R. SCHLEICHER,
HENRY HOWSON.