No. 607,224. Patented July 12, 1898.

A. DE MAN.

FIREPROOF FLOOR CONSTRUCTION.

(Application filed July 14, 1897.)

(No Model.)

Fig. 5.

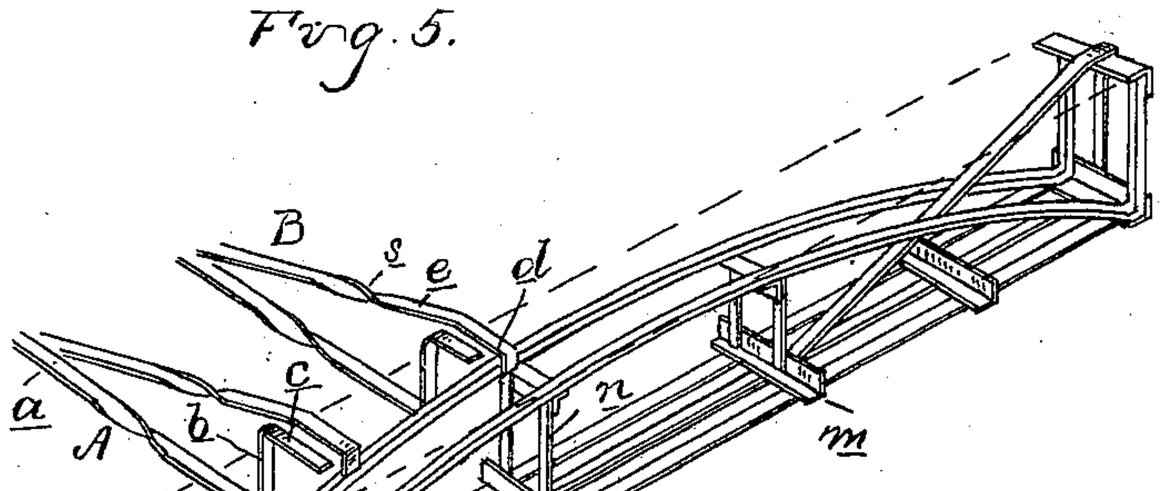


Fig. 1.

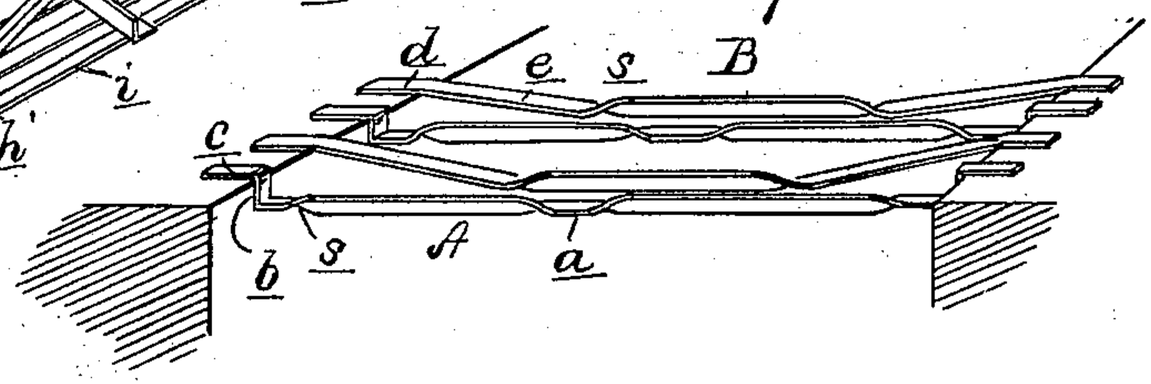


Fig. 4.

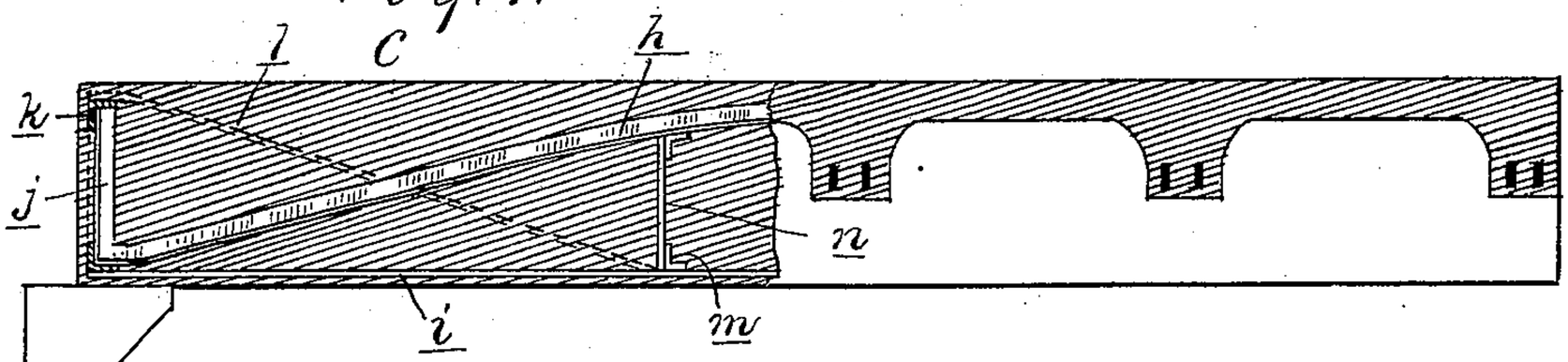
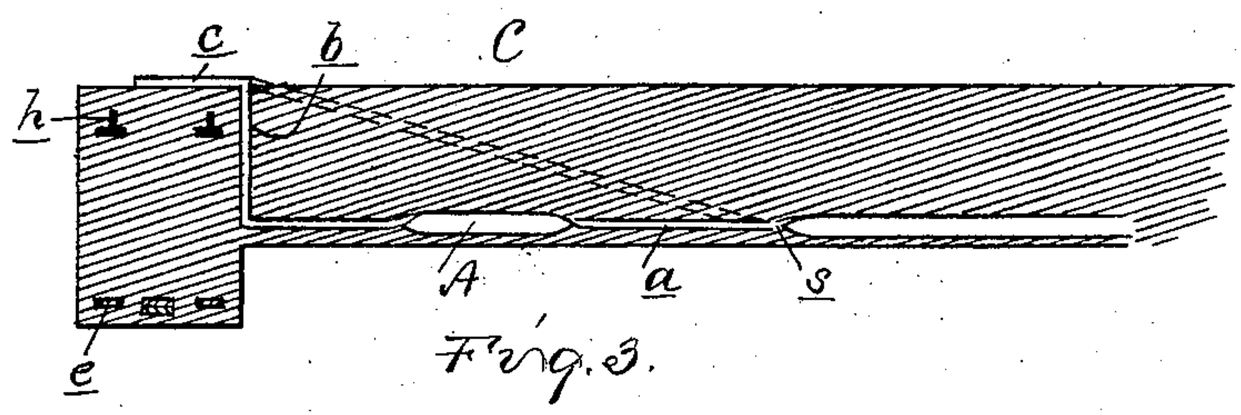
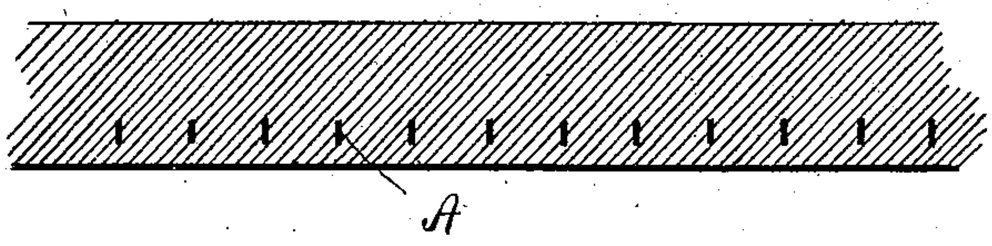


Fig 2.

Fig. 3.





Witnesses.
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UNITED STATES PATENT OFFICE.

ALPHONSE DE MAN, OF DETROIT, MICHIGAN.

FIREPROOF FLOOR CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 607,224, dated July 12, 1898.

Application filed July 14, 1897. Serial No. 644,559. (No model.)

To all whom it may concern:

Be it known that I, ALPHONSE DE MAN, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Fireproof Floor Construction, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a fireproof floor construction in which floor-spans of a composite construction are employed and in which, if desired, the usual metallic beams and girders may be dispensed with. The invention consists in the peculiar construction of these composite spans; further, in the peculiar construction of composite beams or girders used in connection with said spans, and, further, in the peculiar construction, arrangement, and combination of parts, as more fully hereinafter described and claimed.

In the drawings, Figure 1 is a perspective view of the metallic tension members of my composite spans laid in position ready to receive the body of artificial stone. Fig. 2 is an enlarged cross-section of the span complete. Fig. 3 is a section at right angles to Fig. 2. Fig. 4 is a section in part through a modified construction. Fig. 5 is a perspective view of the metallic parts of Fig. 4.

The composite spans employed in my floor construction comprise a body of artificial stone and metallic tension members embedded therein, which furnish to the structure the required tensile strength.

A are tension members, formed of metallic bars bent into a substantially U-shaped form, having the horizontal portion *a* adapted to extend across near the bottom of the floor-span, the upturned ends *b*, and the laterally-extending supporting arms or hooks *c*, adapted to rest on the supporting walls or beams. These tension members may be arranged side by side, spaced a short distance apart, and will serve to support and strengthen the artificial-stone body, the horizontal portions *a* being placed where the greatest tensile strain is exerted below the vertical line of the body and the upturned ends *b* forming anchors abutting against the ends of the body, while the arms or hooks C form the supports.

I preferably also employ in connection with the members A the members B, which consist of metallic bars having the end-supporting arms or hooks *d*, similar to the arms *c*, and the inclined portions *e* extending downward toward the center and the bottom of the span. These, when arranged alternately with the members A, will greatly strengthen the structure. The bars from which the members A and B are formed are preferably flat and comparatively thin, the portions extending across the span being arranged on edge, so as to leave between as large a space as possible for the artificial-stone body as well as thereby securing great lateral rigidity. The bars are also preferably twisted at intervals, as shown at *s*, so as to form a better hold or anchor in the body and prevent slipping.

A floor-span thus formed may be of considerable extent without the necessity of strengthening beams or girders; but where the space is too large for a single span girders may be used, for which I preferably employ a composite girder (shown in Figs. 2, 4, and 5) constructed as follows:

C is a metallic skeleton frame preferably comprising the longitudinal bow-string trusses having the upwardly-bowed compression members *h* and tension bars or cords *i*. The ends of the compression members are bent upwardly at *j* and are connected at their ends by the cross-bars *k*. *l* is another tension member connected to the bars *k*, which is inclined downward and passes under the cross-bars *m*, which are connected to the cords *i* and by the struts *n* to the bars *h*. The ends of this skeleton frame rest upon the supporting walls or columns, and the tension members A and B of the floor-spans are arranged in position to have their arms C and *d* supported in the girder. The body material, for which I preferably employ the ordinary concrete, is then filled in, being supported while in a plastic state by a suitable slagging or flooring beneath the metallic skeleton.

Thus when complete I have a monolith floor which, while possessing all the requisite strength, contains only comparatively small metallic members which are so distributed as to avoid any great mass of material at any one point and are thus less liable to be damaged by heat in case of a fire.

What I claim as my invention is—

1. A composite floor-span comprising a body of artificial stone, and independent horizontal and double-inclined tension members embedded therein, the horizontal member being located below the neutral line and the double-inclined member extending from at or below the neutral lines in the central portion of the span diagonally upward to the ends of the span.

2. A composite floor-span comprising a body of artificial stone and metallic tension members embedded therein consisting of alternate horizontal bars located below the neutral line and double-inclined bars extending from below the neutral line in the central portion of the span diagonally upward to the ends of the span.

3. A composite floor-span comprising a body of artificial stone and the alternately-arranged metallic tension members A and B embedded therein, the former consisting of U-shaped bars having the horizontal portions *a* the upturned portions *b* and the outwardly-extending end portions *c*, and the latter consisting of the central horizontal portion, the upwardly-inclined portions *e* and the outwardly-extending end portions *d*, the portions *c* and *d* forming supporting arms or hooks for the span.

4. A monolith floor construction comprising a composite beam or girder having a skeleton trussed metallic frame, composite spans supported at one end on said beams or girder, having the alternate metallic tension members A and B, and a body for said beam or girder and spans formed of artificial stone in which said metallic members are embedded.

5. A composite floor-span comprising a body of artificial stone and metallic tension members embedded therein, consisting of flat thin bars arranged side by side having their ends projecting beyond the ends and near the upper face of the body and forming supporting arms or hooks therefor, the portions of said bars extending across the body being arranged on edge and twisted at intervals for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

ALPHONSE DE MAN.

Witnesses:
P. M. HULBERT,
M. B. O'DOGHERTY.