No. 692,309.

Patented Feb. 4, 1902.

G. KNOCHE.

FIREPROOF FLOOR.

(Application filed June 6, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

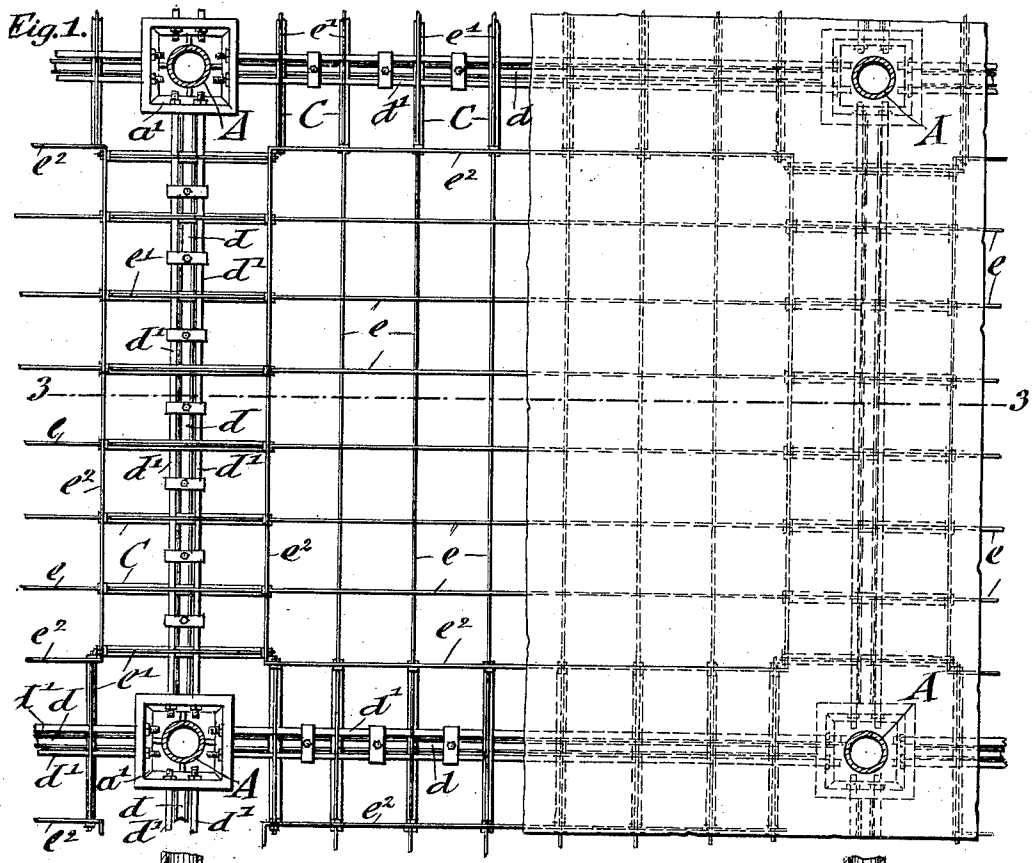


Fig. 2.

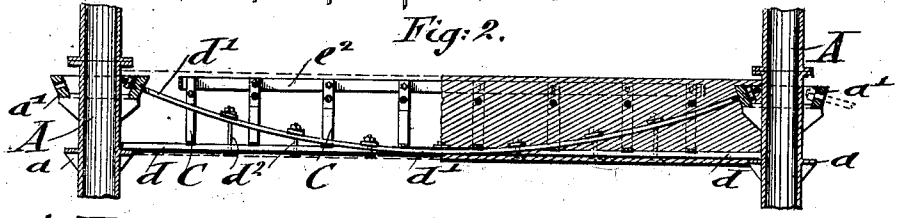


Fig. 3.

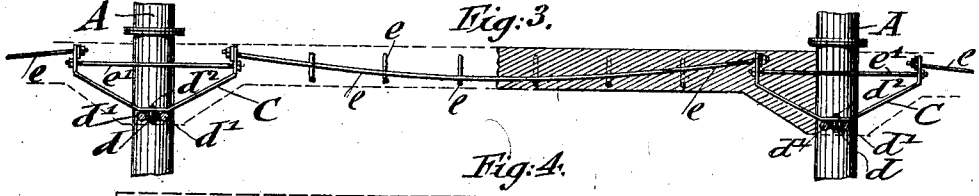
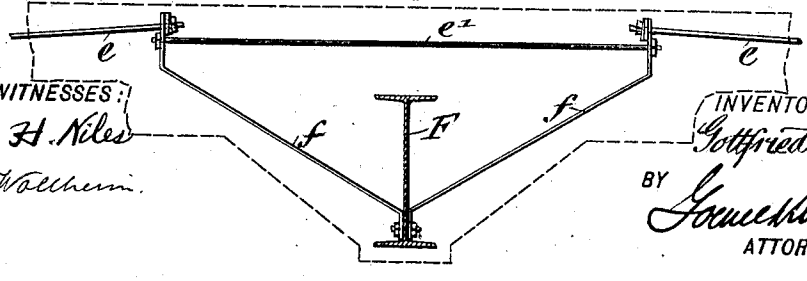


Fig. 4.



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(No Model.) 3 Sheets—Sheet 2.

Fig: 5.

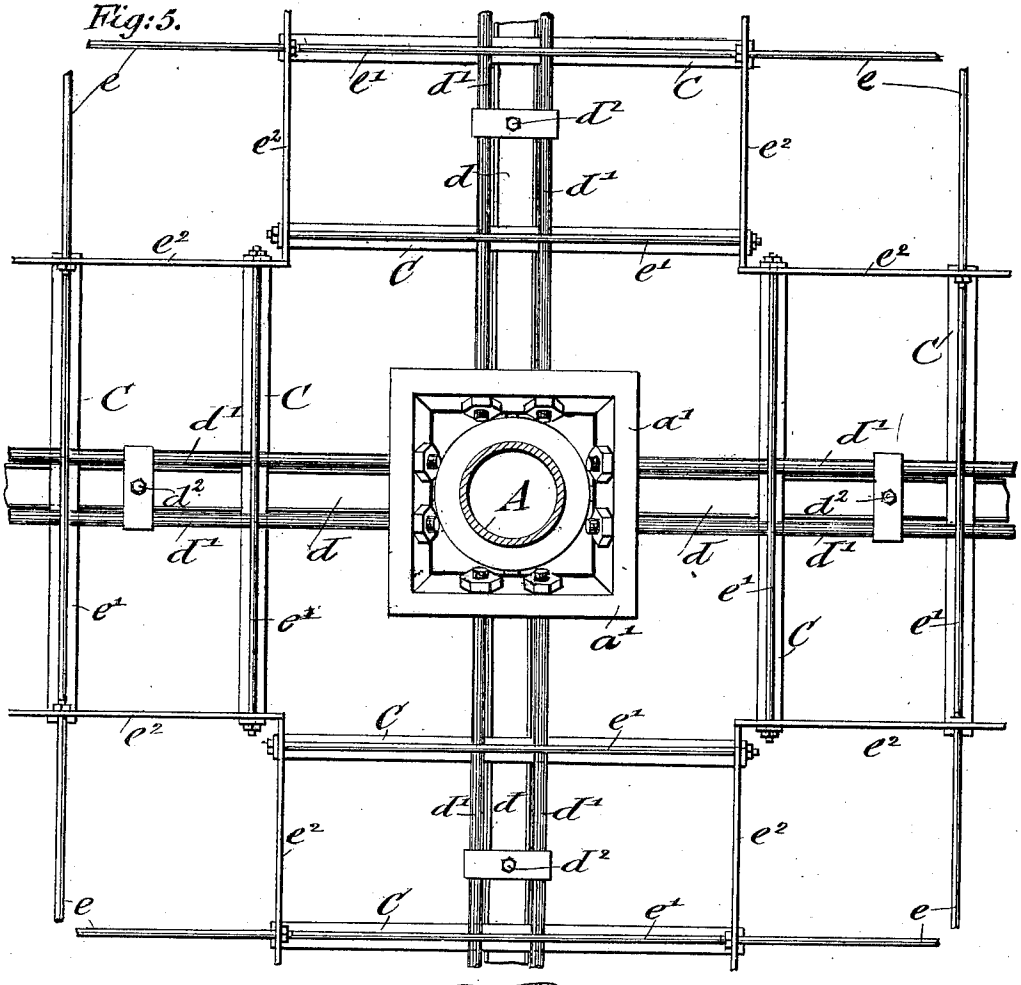
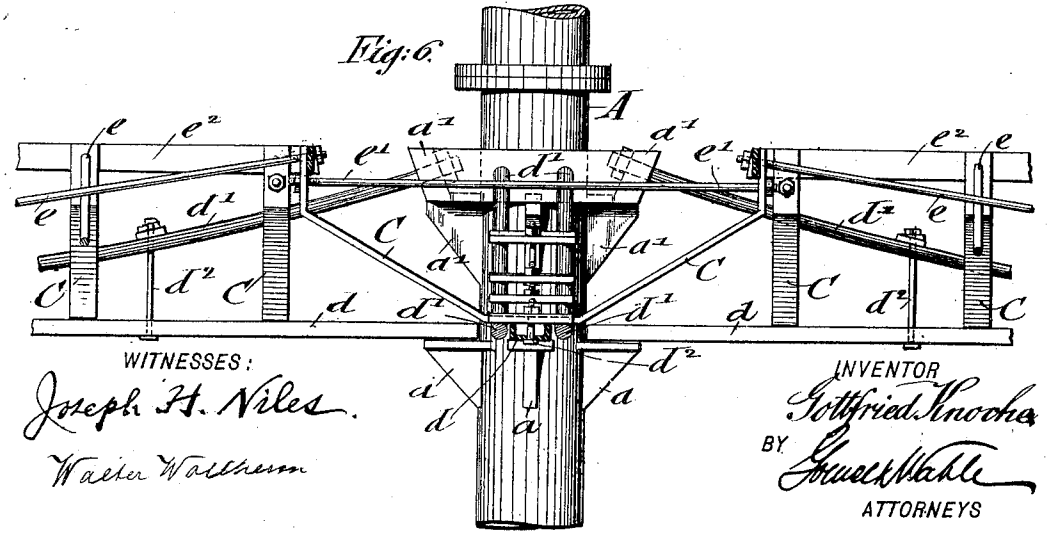


Fig: 6.



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(No Model.) 3 Sheets—Sheet 3.

Fig: 7.

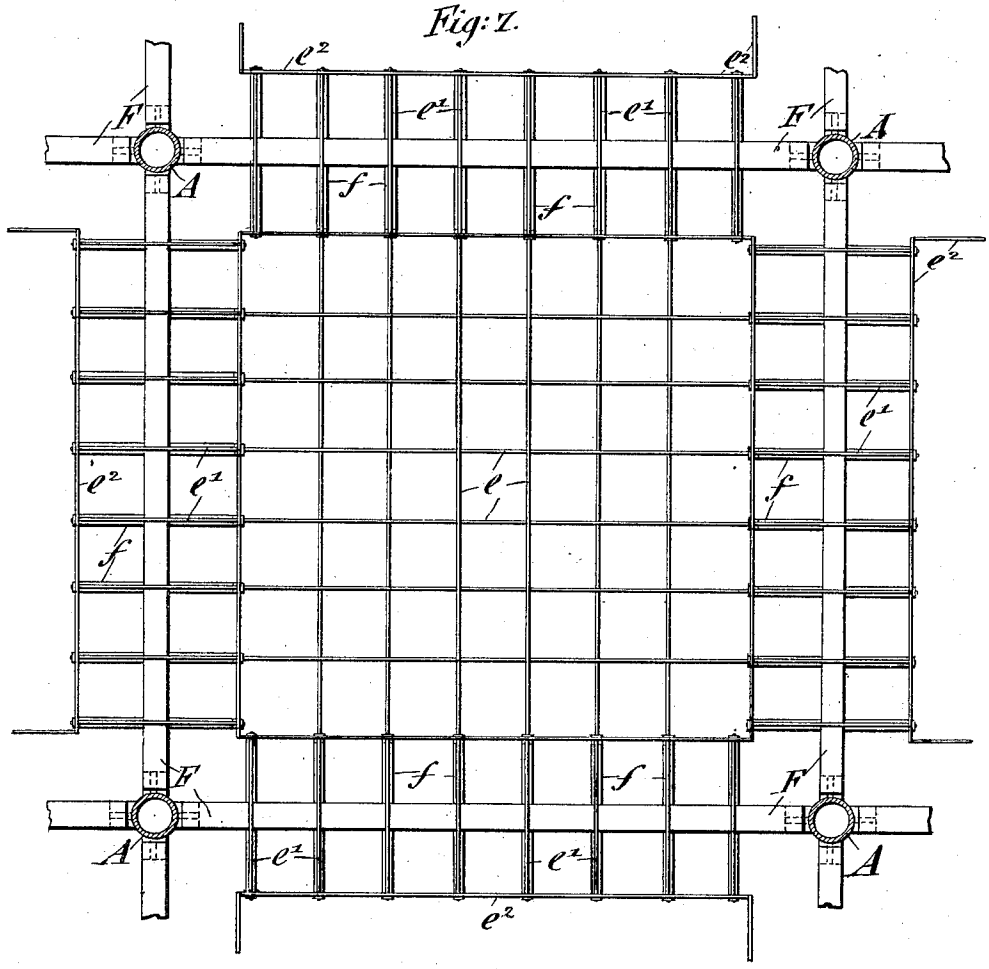
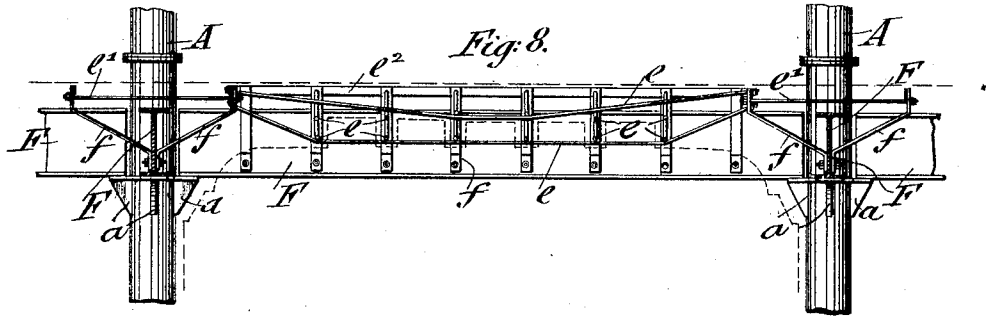


Fig: 8.



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UNITED STATES PATENT OFFICE.

GOTTFRIED KNOCHE, OF NEW YORK, N. Y.

FIREPROOF FLOOR.

SPECIFICATION forming part of Letters Patent No. 692,309, dated February 4, 1902.

Application filed June 6, 1901. Serial No. 63,400. (No model.)

To all whom it may concern:

Be it known that I, GOTTFRIED KNOCHE, a citizen of the United States, residing in New York, borough of Manhattan, in the State of New York, have invented certain new and useful Improvements in Fireproof Floors, of which the following is a specification.

This invention relates to an improved construction of fireproof floor resting at its four sides on girders between the supporting-columns and in which the floor-body of concrete is supported partly or entirely on intercrossing rods that are suspended from the girders on an iron frame fastened to the ends of the brackets supported and connected to the girders supported on the columns, so that a light yet strong floor construction is obtained, in which the ironwork is calculated and dimensioned to carry the entire weight of the floor and its superimposed load, the concrete acting only for fireproofing the ironwork and filling in, thereby giving additional safety and strength.

The invention consists of a fireproof floor comprising girders resting on columns, brackets extending transversely from said girders, a frame connecting the inner ends of said brackets, and tie-rods suspended from said brackets and frame and intercrossing with each other for supporting the weight of the floor and load.

The invention consists, further, of certain details of construction and combinations of parts, which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a plan view of my improved fireproof floor. Fig. 2 is a vertical longitudinal section through one of the girders of the same. Fig. 3 is a vertical longitudinal section through the center of the floor on line 3 3, Fig. 1. Fig. 4 is a vertical transverse section through the girder, showing a modified construction as applied to an I-beam. Fig. 5 is a plan view of one of the supporting-columns and girders supported thereon, drawn on a larger scale. Fig. 6 is a side elevation of Fig. 5, and Figs. 7 and 8 are a plan view and a vertical section of a modified construction of my improved fireprooof floor.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A A represent the supporting-columns of the floor. The columns A are provided with two sets of bracket-shaped projections $a\,a'$, on which the lower channel-iron and the upper suspension-rods of the girder are supported, the lower rods d of the girder D extending straight between the lower brackets a, while the upper arc-shaped rods d' extend between the upper brackets a', as clearly shown in Fig. 2. The channel-iron d and suspension-rods d' are connected by tie-rods d^2. Each girder D is formed of a channel-iron and two suspension-rods, the latter arranged parallel with each other, as shown in plan view in Figs. 1 and 5. On the two suspension-rods of each girder are supported transverse brackets C, which extend equidistantly at both sides of the girder, said brackets being formed of wrought-iron bars bent into flat V shape, with vertical portions at the ends, said vertical portions being connected by horizontal tie-rods e'. The upper ends of the brackets carry a square frame e^2, of flat iron, which forms the support for the curved suspended tie-rods e, these intercrossing rods forming the support of the concrete body of the floor, as shown in Fig. 3. The girder, with the brackets, is likewise filled up with concrete, so as to form one solid structure, from which the brackets extend at both sides. The concrete filling of the girder, which may be strengthened by embedding wire-netting in the concrete, holds the brackets firmly in position, so as to reduce the span between the girders and form a rigid support for the section of the floor which is supported by the iron frame and the intercrossing rods on and between the brackets.

In place of the girder formed by suspended rods suspended L-beams or I-beams may be used, in which case the brackets f are bolted to the lower part of the web of the beam F, as shown in Fig. 4, the suspended rods e being attached to the upper ends of these brackets, which are tied together by the tie-rods e' in the manner before described. The filling of the girder with concrete is readily accomplished and also the filling of the floor-body by means of a false frame arranged below the girder and floor and filling the outlines and imparting the contour of the same, as shown in Fig. 3. The concrete filling for the brack-

ets may be provided with suitable metallic molding, if desired, so that an ornamental appearance is imparted to the floor.

The system of intercrossing tie-rods can be considerably simplified by dropping the central tie-rod to a greater depth than the intercrossing tie-rod next adjacent. In this case the tie-rods form, with the body of concrete surrounding them, rigid cross-ribs or panels between the ribs, as shown in Fig. 8.

The construction described forms a very strong and substantial fireproof floor, in which all the tension is wholly within the iron rods, reducing the concrete filling to a minimum thickness, owing to the intercrossing suspension-rods connected with the ends of the brackets, the floor being supported on all four sides. Each floor-section between four columns forms an independent structure that is firmly connected with the brackets and girders, so that when the concrete filling is placed over the suspended rods, brackets, and girders a strong and fireproof floor is obtained without any strain or tension in the concrete.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A fireproof floor, consisting of girders supported on columns, brackets extending transversely from said girders, an iron frame connecting the ends of said brackets, arc-shaped tie-rods suspended from the opposite sides of said frame and intercrossing with each other, and a concrete body embedding said girders, brackets and suspended tie-rods, substantially as set forth.

2. A fireproof floor, consisting of supporting-columns, girders connecting said columns, brackets extending transversely from said girders, an iron frame connecting the ends of said brackets, intercrossing tie-rods suspended from opposite sides of said frame, and a body of concrete in which said girders, brackets and tie-rods are embedded, substantially as set forth.

3. A fireproof floor, consisting of girders, each formed of a pair of arc-shaped tie-rods, resting on projections of the supporting-columns, and a channel-bar below said tie-rods also supported on projections of the columns, brackets extending transversely from said girders, an iron frame connecting the inner ends of said brackets, intercrossing tie-rods connecting the opposite sides of said frame, and a concrete body surrounding the girders, brackets and tie-rods, substantially as set forth.

4. A fireproof floor, consisting of girders resting on supporting-columns, brackets extending transversely from said girders, intercrossing tie-rods connecting said brackets, the inner tie-rods being suspended at greater depth than the outer ones, and a concrete body inclosing said tie-rods and forming ribs and intermediate panels, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

GOTTFRIED KNOCHE.

Witnesses:
PAUL GOEPEL,
GEORGE GEIBEL.