

No. 719,892.

PATENTED FEB. 3, 1903.

J. T. SIMPSON & M. N. SHOEMAKER.
FIREPROOF FLOOR AND CEILING CONSTRUCTION.

APPLICATION FILED JULY 10, 1902.

NO MODEL.

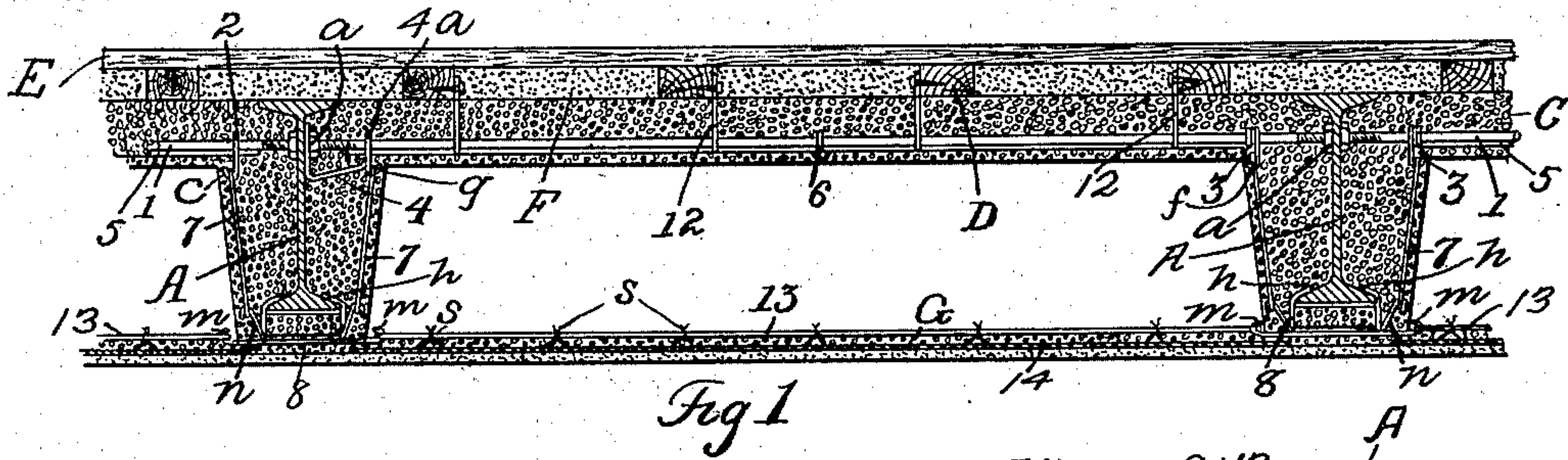


Fig. 1

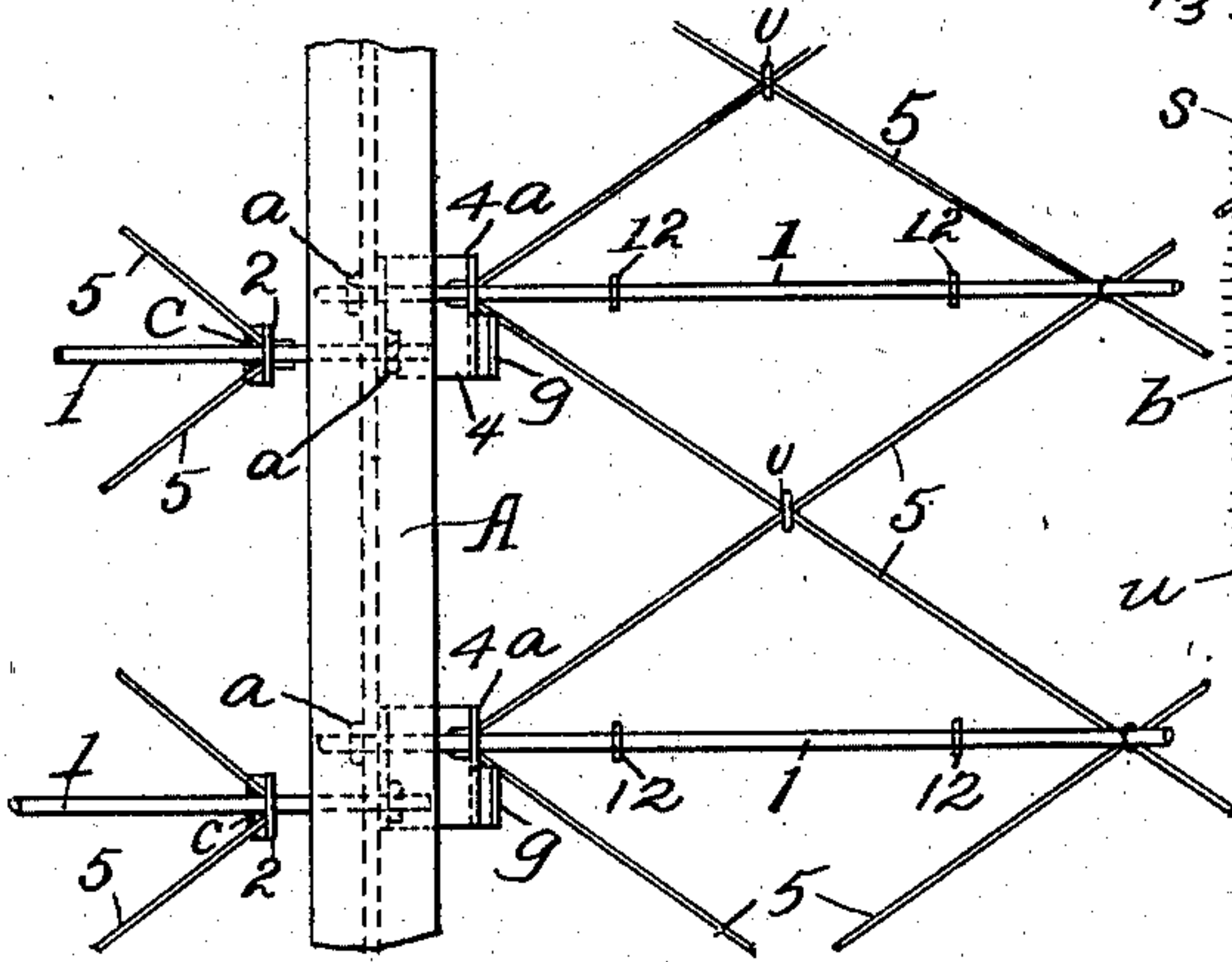


Fig. 2

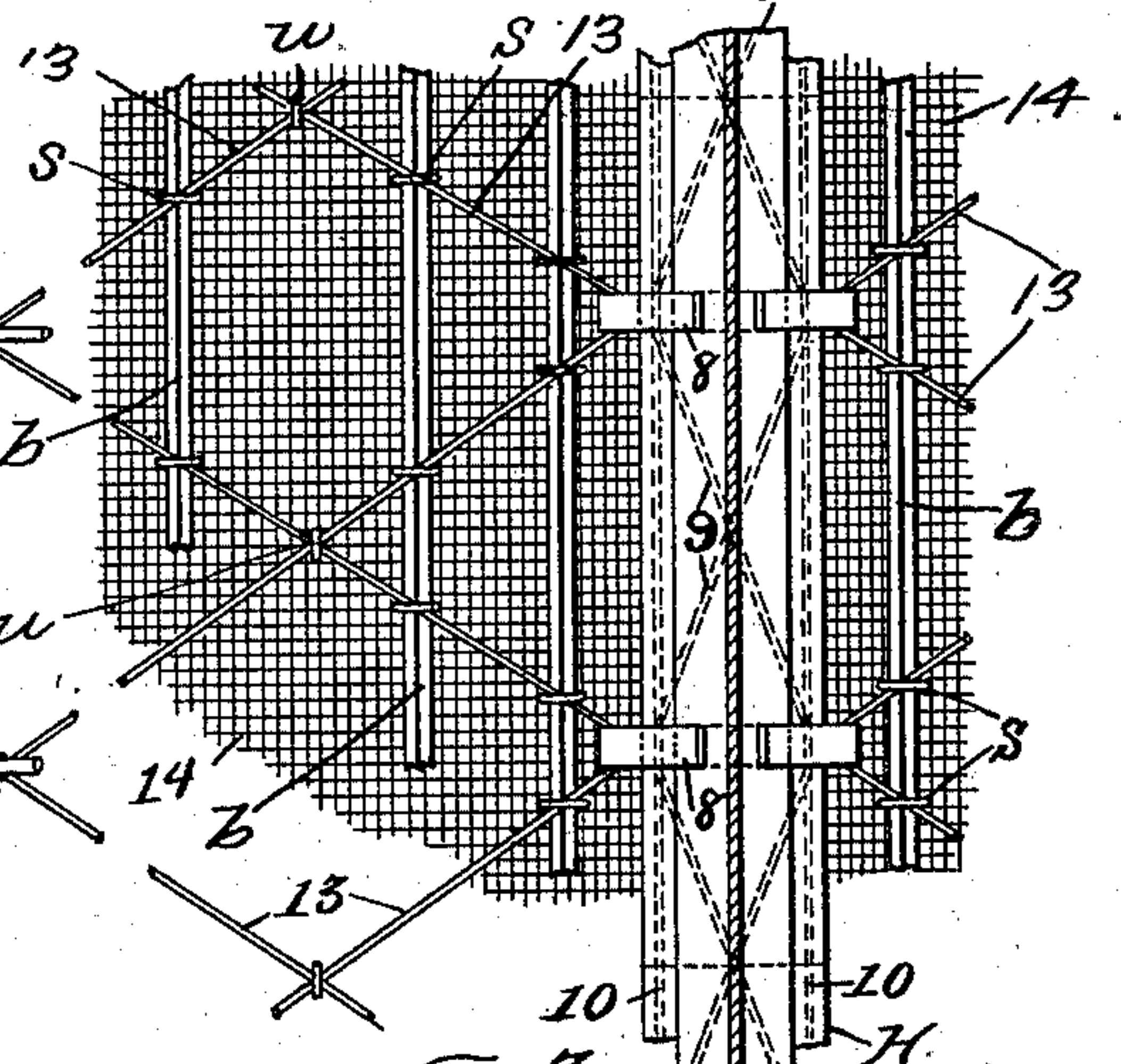


Fig. 3

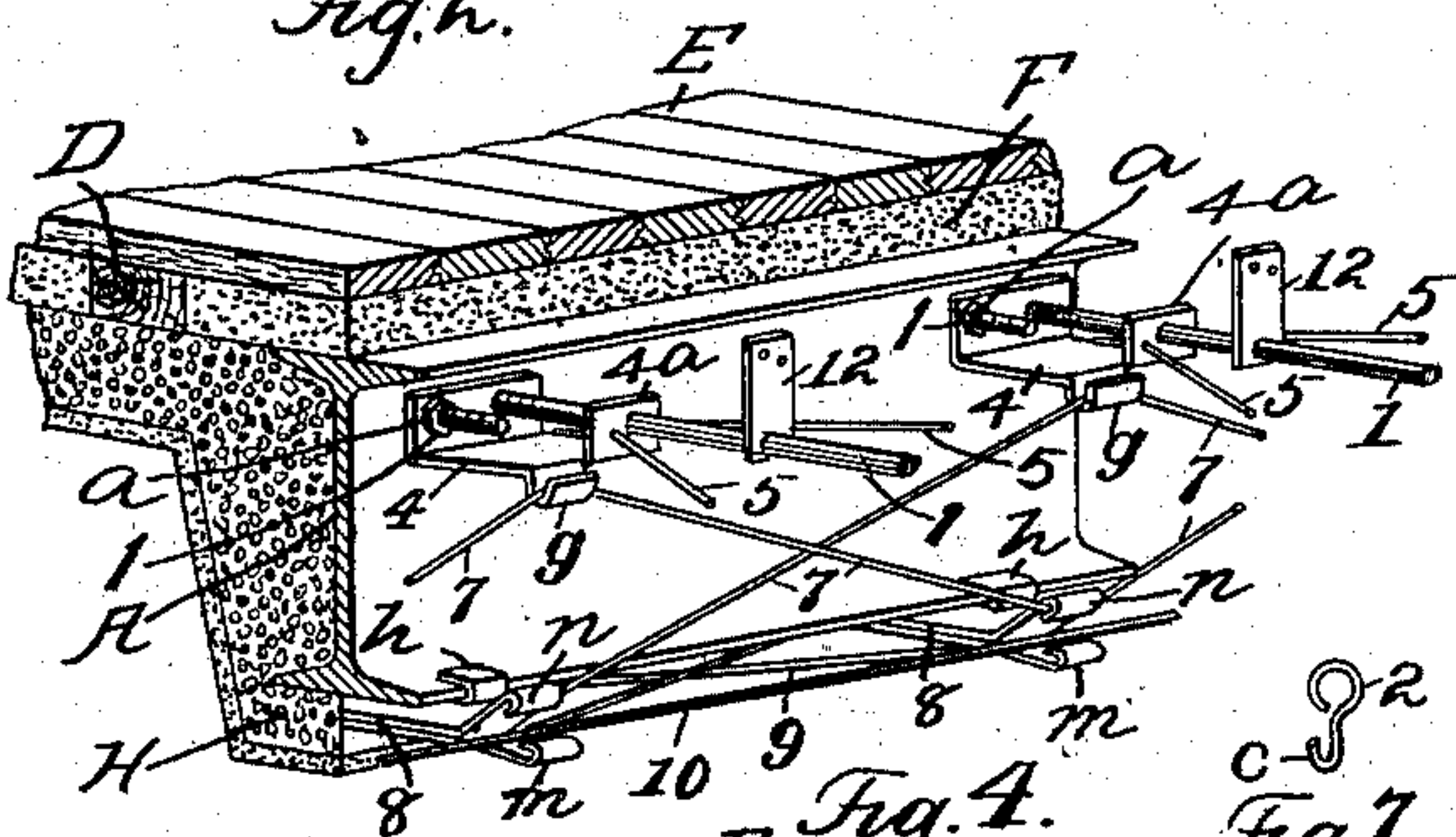


Fig. 4



Fig. 7

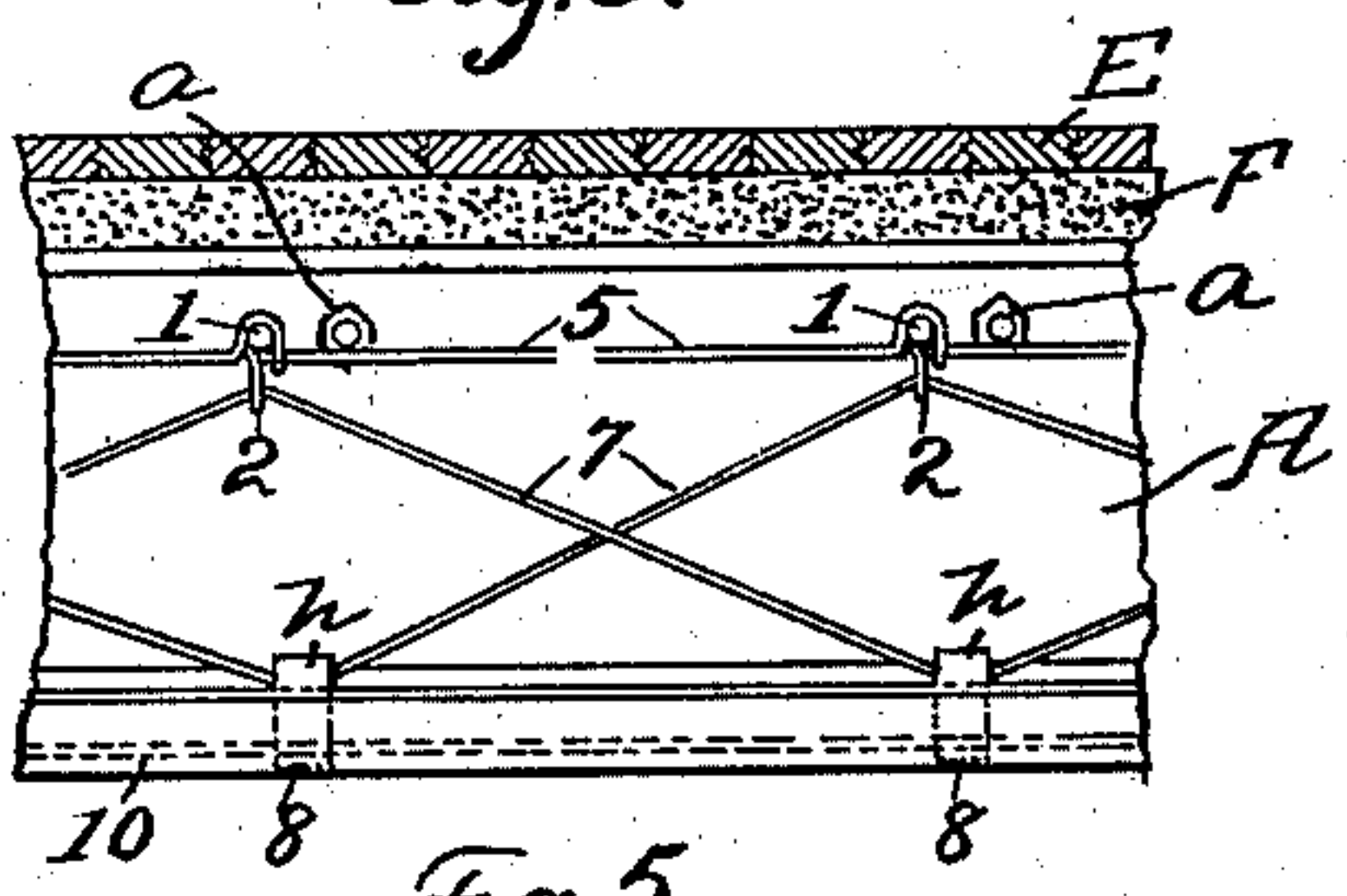


Fig. 5

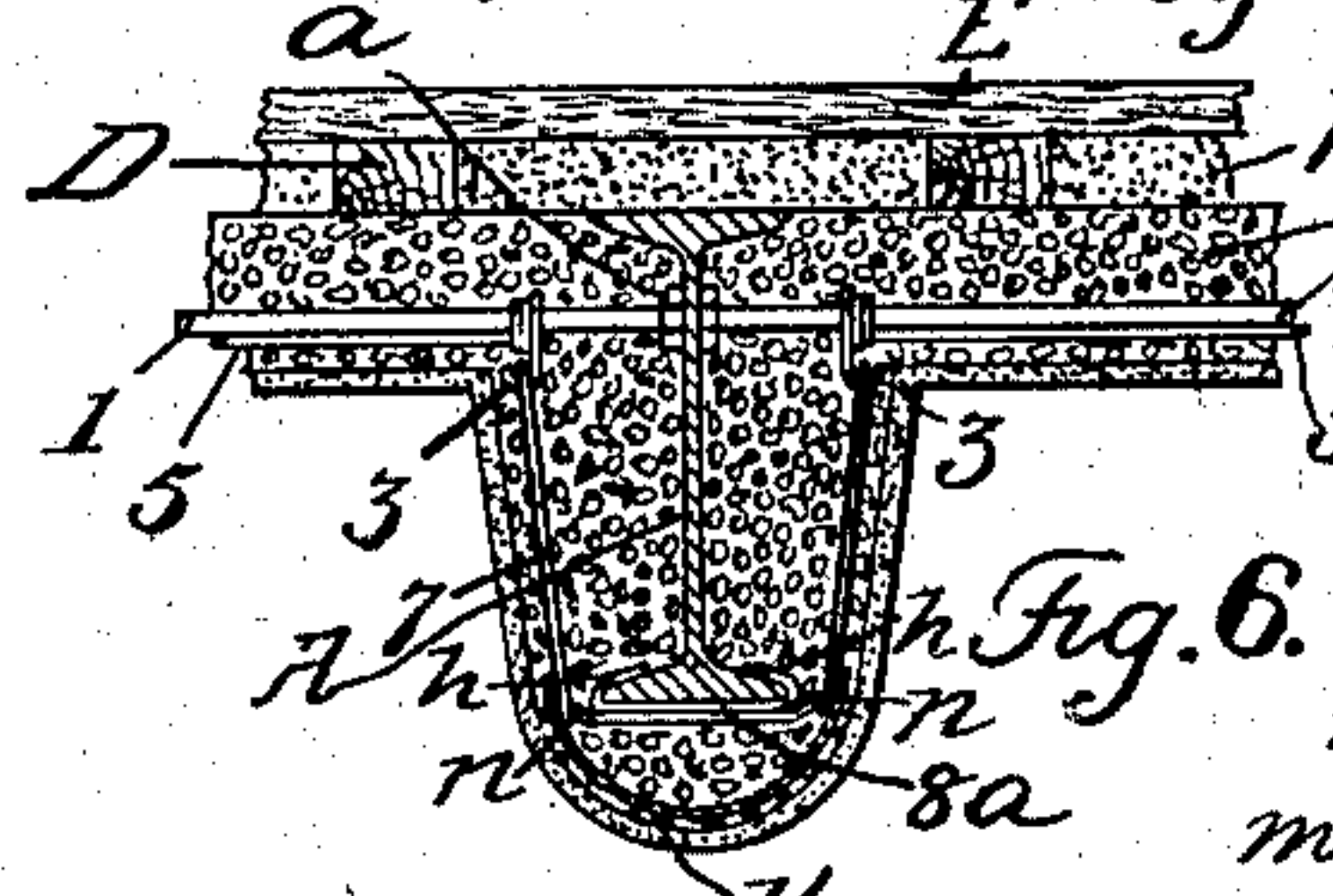


Fig. 6

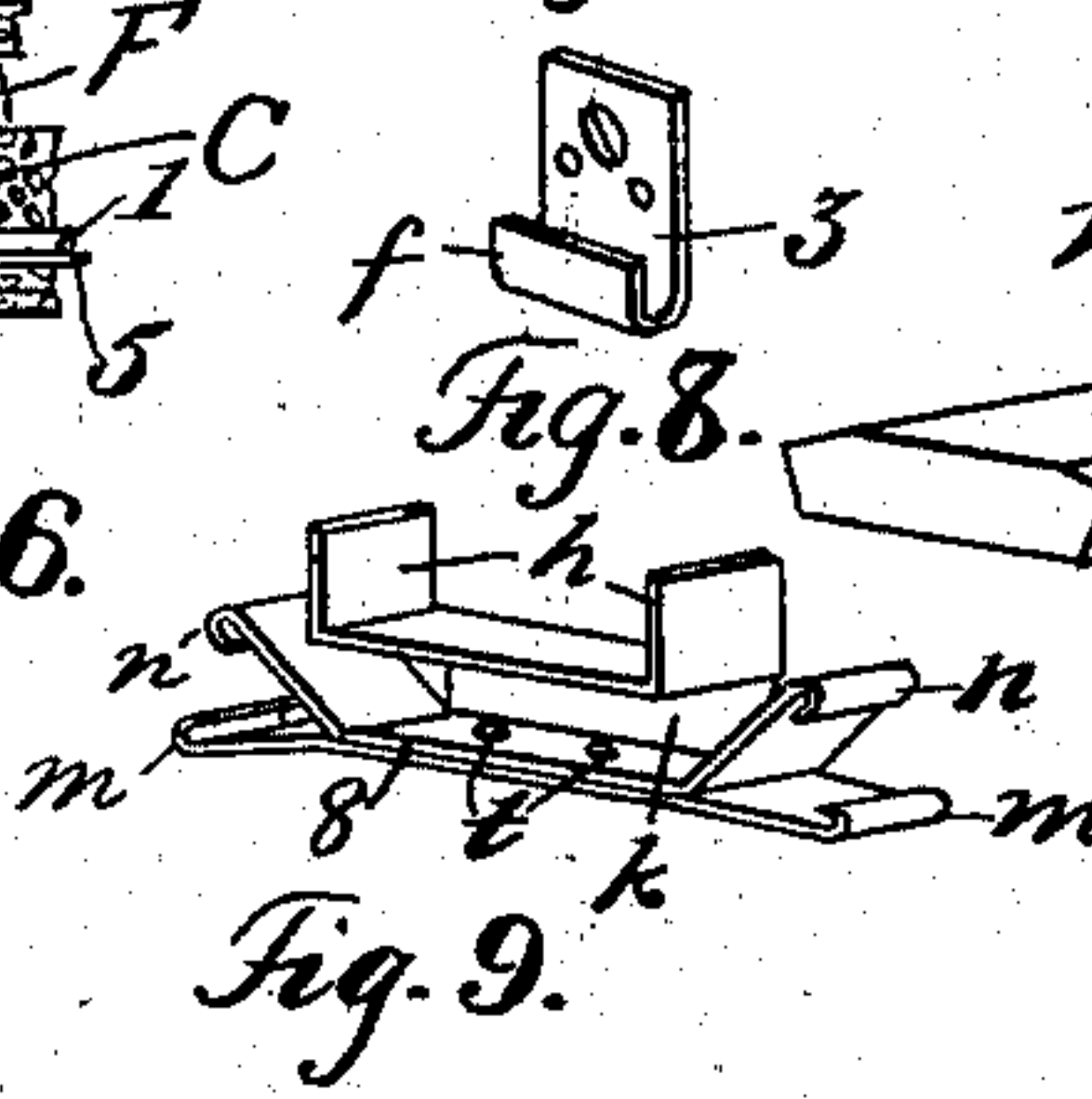


Fig. 9

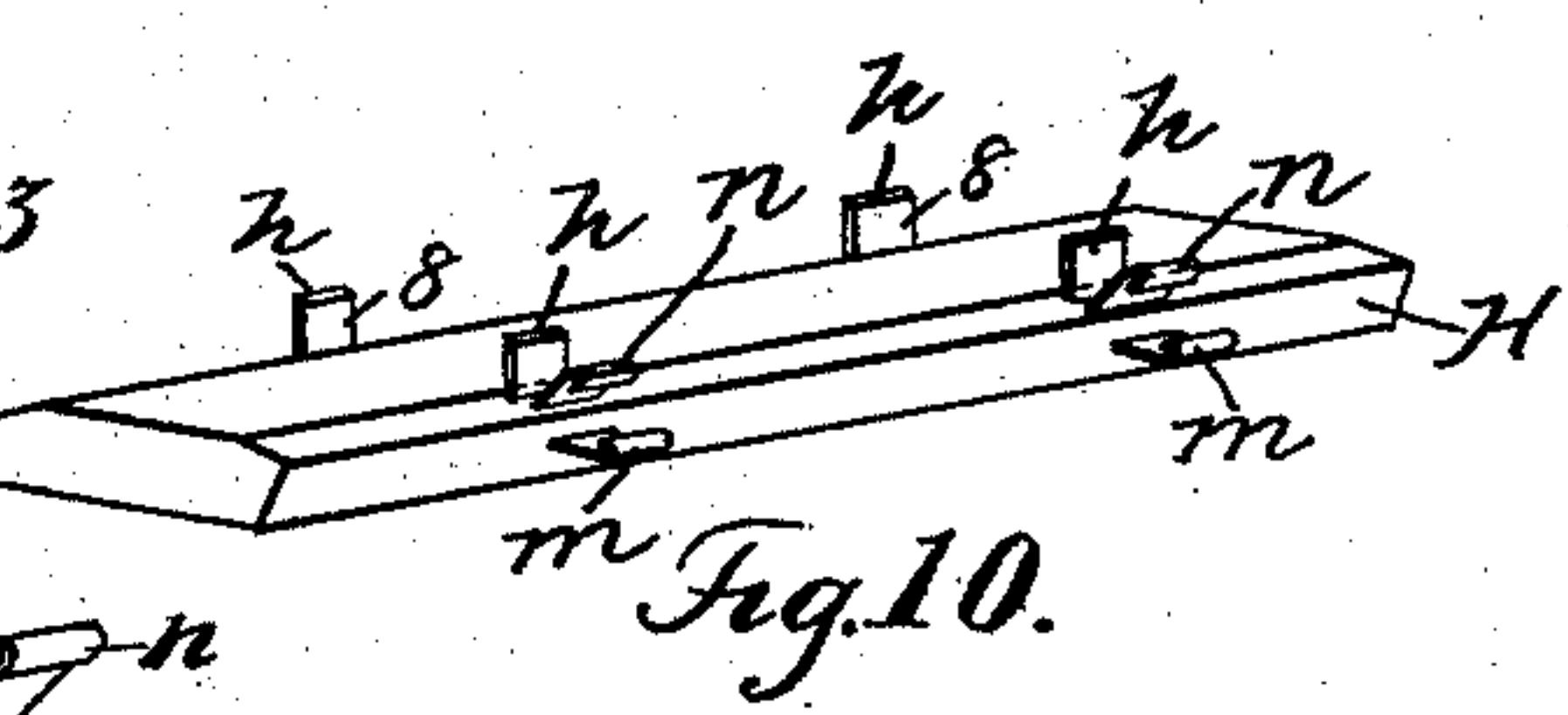


Fig. 10

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UNITED STATES PATENT OFFICE.

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FIREPROOF FLOOR AND CEILING CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 719,892, dated February 3, 1903.

Application filed July 10, 1902. Serial No. 114,998. (No model.)

To all whom it may concern:

Be it known that we, JOHN T. SIMPSON and MARSHALL N. SHOEMAKER, citizens of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Fireproof Floor and Ceiling Construction, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

Our invention consists of an improved fireproof floor and ceiling construction of concrete or similar plastic material reinforced with steel, with or without a wire or metal lath or similar centering for receiving the concrete or other plastic materials, the essential points of this invention being to provide a floor construction in which the floor shall employ the minimum amount of both concrete and steel and to produce the desired strength and fireproof quality and provide an effective lateral bond between the several floor-beams without employing any other materials than those composing the system, thus effecting a saving of the tie-rods usually employed in similar construction without losing the advantages of the same.

A further object of our invention is to provide a means of securing the concrete beam-casing securely to the beam or girder by means of diagonal wires and clips to prevent its being washed away under heavy water-pressure during fire; also, to provide an extension to the clips for securing a suspended ceiling.

Our invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of our improvement are designated by suitable reference characters in each of the views, and in which—

Figure 1 is a section of the floor construction, taken at right angles to the floor-beams; Fig. 2, a plan view showing the supporting members of the floor construction; Fig. 3, a plan view showing the suspended ceiling and supports for the beam-casing; Fig. 4, a perspective view showing a section of the floor

construction and the beam-casing, also the supports for the floor construction; Fig. 5, a longitudinal section of the floor construction, showing the beam and girder casing, also the supports for the floor construction, the concrete being removed to show the construction; Fig. 6, a cross-section of the floor construction, taken at right angles to the floor-beams, same as Fig. 1, but showing a modification. Fig. 7 shows the hook used for supporting the wire of the beam or girder casing. Fig. 8 shows another form of a hook used for supporting the wire of the beam or girder casing and diagonal rods 5. Fig. 9 shows a clip of beam or girder casing and extended to receive the suspended ceiling; and Fig. 10 shows the concrete block used on the bottom flange of the beam or girder, forming a part of the beam or girder casing.

Referring to the drawings, A represents the floor-beams, which are shown as the ordinary I type. Through the web of these beams A, spaced at certain intervals, are inserted the bars 1 of the floor construction, these bars supporting the clips 2, 3, and 4, these clips being made of metal bent into the forms shown, being adjusted to suit the thickness of the beam or girder casing and supporting the diagonal wires 7 of the beam or girder casing. The bars 1, both ends of which are inserted through the webs of the beams A and secured thereto by means of nuts *a* or in other suitable manner, are shown in the preferred form of the ordinary round shape, but may be square, flat, or some other desirable form. To these bars 1 are attached the sleeper-clips 12, as shown, which are made of metal of one piece cut from a flat plate into the form shown. The clips 12 in the preferred form are placed on the bars 1 to suit the spacing of the sleepers supporting the floor-boards and have holes for bar 1 so small as to make it necessary to drive the clips on said bars, and thus secure means for holding the clips in any desired position.

The diagonal rods 5 in the preferred form are made of a round or square bar of ordinary rolled shape or other approved form, but may, however, be made of heavy wire, which passes

through the members 4^a of the clips 4 and is bent around the bars 1. In the preferred form the diagonal rods 5 will be placed under and supported by the bars 1 at the center, as shown.

5 In case wire is substituted for the rods 5 it will be similarly placed; but the extreme ends will be bent back over the bars 1 and twisted around and firmly secured in a suitable manner. The rods 5 extend diagonally across the
10 space between the beams A, being supported by the wire 6 at the center, where they pass under the bar 1. The ends of these diagonal rods 5 will be supported on the two adjacent bars or extend to the other adjacent bars, as
15 the spans between the beams A may require, it being the purpose to keep the angle between the bars 1 and the diagonal rods 5 about constant.

Clips 8, Fig. 9, in the preferred form will
20 be made of small flat wrought iron or steel bars bent into the form shown and secured to each other by means of rivets or bolts *t*, passing through the several members of the same, the ends *h* being bent up and over the bottom
25 flange of the beams A, the bend *k* being made of such size as may be required to suit the thickness of the concrete forming the beam or girder casing on the under side of the bottom flanges, the hooks *n* being formed to re-
30 ceive the diagonal wires 7 of the beam and girder casing, the hooks *m* extending out for a sufficient distance beyond the hooks *n* to permit of the diagonal wires 13 forming the supports of the suspended ceiling being se-
35 cured to them after the concrete is in place.

The supports for the beam and girder casing are formed of diagonal wires 7, passing through the hooks *c*, *f*, and *g* of the clips 2, 3, and 4, passing down and over the next
40 hook *n* of the clips 8, then over and up to the hooks *c*, *f*, or *g* of the next clip 2, 3, and 4, and so on to the end, the end being secured by being twisted around in a suitable manner. The diagonal wires 9, which form the
45 support of the concrete casing under the bottom flanges of the beam A, pass between the hooks *n* and *m* of the clips 8, diagonally across to the next clip 8, and so on to the end, as shown in Figs. 3 and 4. The wires 10
50 (shown in Figs. 3, 4, and 5) pass directly between the hooks *n* and *m*, parallel to the beam A, and so on to the end, being secured at the ends, as described, for the wires 9, these wires 10 forming a part of the support for the
55 beam or girder casing. After the concrete or similar plastic material C has set or become hardened the suspended ceiling is attached to the clips 8. In the preferred form this suspended ceiling consists of wires 13, passing
60 diagonally across the space between the beams A and attached to the hook *m* of the clip 8, (shown in Figs. 1 and 3,) the ends of these wires being secured by twisting same around the hooks *m* of the clips 8 in a suitable man-
65 ner, and where they cross each other are secured together by means of the small wires *u* passing around the same, having their ends

twisted together. To these supporting-wires 13 is secured a wire or metal lathing, expanded metal, or similar material 14, having rein- 70 forcing-bars *b*, and this connection is made by means of the small wires *s*, and upon this material 14 is placed a plaster ceiling G of some suitable material.

The concrete block H shown in Fig. 10 is 75 used as a substitute for protecting the bottom flanges of the beams or girders, this concrete being molded from concrete similar to the concrete of the floor construction and allowed to harden before being applied to the
80 beams, embedded in which are the clips 8 and wires 9 and 10, placed as shown in Fig. 3.

In Fig. 1, D shows the wood sleepers of the ordinary form, placed directly on the concrete C of the floor construction. F shows 85 the cinder-filling between the sleepers and protecting the top flanges of beams A, and E shows the finished floor of the ordinary type, fastened to the wood sleepers D in the usual manner. 90

In Fig. 6 of the drawings we have shown another form of beam or girder casing using an expanded metal holder K, made of metal or other suitable material, bent into the form shown and fastened through the clip 8^a and 95 diagonal wires 7 of the beam or girder casing, the concentric or other plastic material being placed around and about the same, and the clip 8^a being the same as the clip 8, with the hooks *m* omitted. 100

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

1. In a fireproof floor and ceiling construction, the combination with floor beams or gird- 105 ers, of main supporting metal bars extending from beam to beam and attached thereto, clips connected therewith, and diagonally-arranged rods connected with said clips and passing from the end of one bar diagonally 110 across under the next adjacent bar to the end of the second adjacent bar, substantially as shown and described.

2. In a fireproof floor and ceiling construction, the combination with floor beams and 115 girders, of main supporting-bars extending from beam to beam and passing therethrough and connected therewith, clips connected therewith, diagonally-arranged rods connected with said clips and diagonally-arranged 120 wires and clips passing down and about the beams and girders, substantially as shown and described.

3. In a fireproof floor and ceiling construction, the combination with floor beams and 125 girders, of main supporting-bars extending from beam to beam and passing therethrough and connected therewith, clips connected therewith, diagonally-arranged rods connected with said clips and diagonally-arranged 130 wires and clips passing down and about the beams and girders, and arranged so as to support concrete around and about the beams and girders, substantially as shown and described.

4. In a fireproof floor and ceiling construction, the combination with floor beams and girders, of main supporting-bars extending from beam to beam and attached thereto, diagonally-arranged rods connected therewith, diagonally-arranged wires connected therewith and passing down and about the beams and girders, and reinforcements suspended beneath the bottom flanges of the beams and girders all of said parts being adapted to support concrete material, substantially as shown and described.

5. In a fireproof floor and ceiling construction, the combination with floor beams and girders, of main supporting-bars extending from beam to beam and passing therethrough and attached thereto, clips connected therewith, diagonally-arranged rods connected with said clips, other clips connected with said bars, diagonally-arranged wires connected with said last-named clips and passing down and around the beams and girders and adapted to support concrete placed against the clips and flanges of the beams and girders, substantially as shown and described.

6. In a fireproof floor and ceiling construction, the combination with floor beams and girders, of main supporting metal bars extending from beam to beam and attached thereto, clips connected therewith, diagonally-arranged rods connected with said clips, other clips connected with said bars, diagonally-arranged wires connected with said other clips and passing down and about the beams and girders, and reinforcements suspended be-

neath the bottom of the beams and girders, said parts being adapted to support concrete, and a fireproof-ceiling suspended below the bottom flanges of the beams and girders, substantially as shown and described.

7. In a fireproof floor and ceiling construction, the combination with floor beams and girders A of main supporting-bars 1 extending between said beams and attached thereto, diagonally-arranged rods 5 extending diagonally between said beams and under the said bars, and attached thereto, diagonally-arranged wires 7 placed along the sides of and parallel with the webs of said beams, clips 8 secured to the bottom flanges of said beams, diagonally-arranged wires 9 passing between the clips 8 and across and under the bottom flanges of said beams, parallel wires 10 attached to the clips 8 and running parallel with and below the bottom flanges of said beams, clips 2, 3 and 4 attached to the bars 1, supporting-wires 7 connected with said clips and wires 13 passing diagonally between said beams and attached to the clips 8 and connected at their intersection by wires *u*, substantially as shown and described.

In testimony that we claim the foregoing as our invention we have signed our names, in presence of the subscribing witnesses, this 9th day of July, 1902.

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MARSHALL N. SHOEMAKER.

Witnesses:

F. A. STEWART,

C. E. MULREANY.