

No. 610,832.

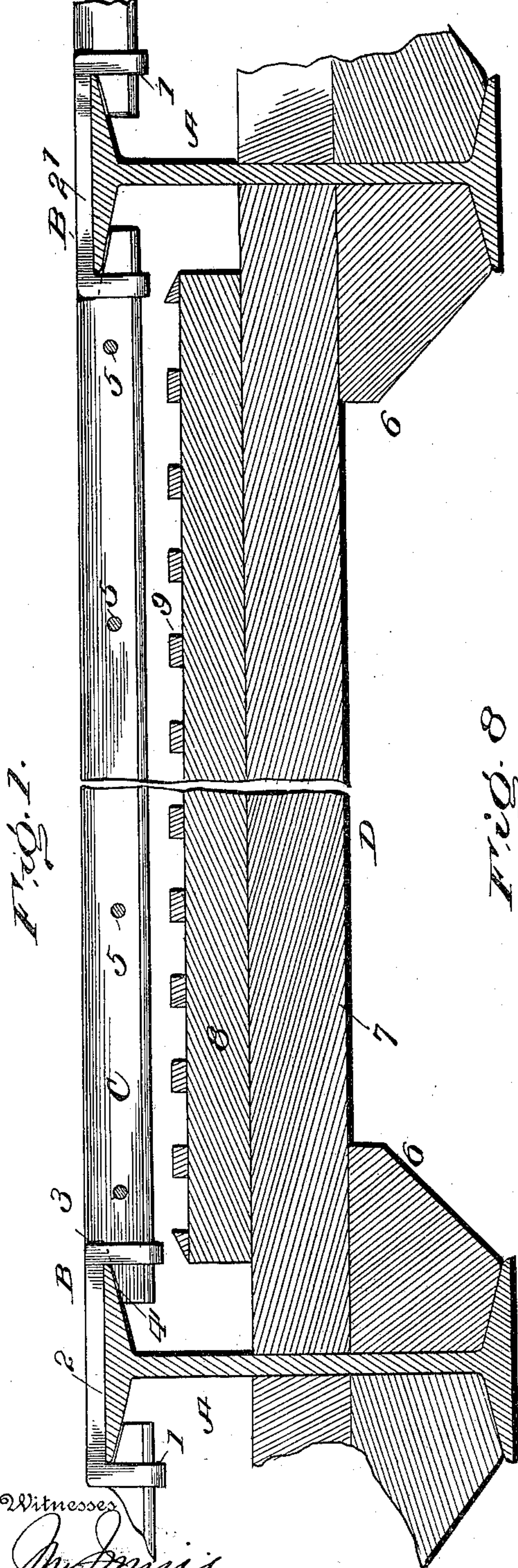
Patented Sept. 13, 1898.

W. R. ROBINSON.
FIREPROOF STRUCTURE.

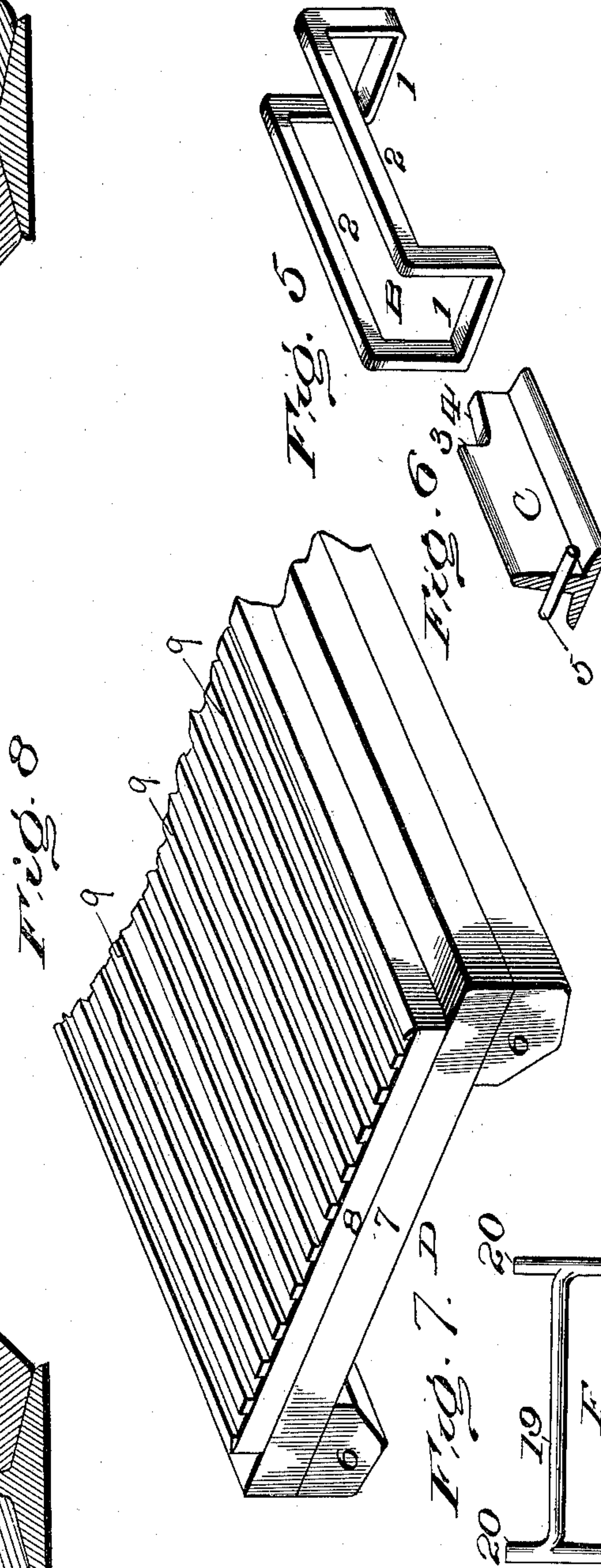
(Application filed Jan. 11, 1898.)

2 Sheets—Sheet 1.

(No Model.)



Witnesses
James D. W. Gould.



Inventor
William R. Robinson
by *W. H. Tallmadge*
His Attorney

No. 610,832.

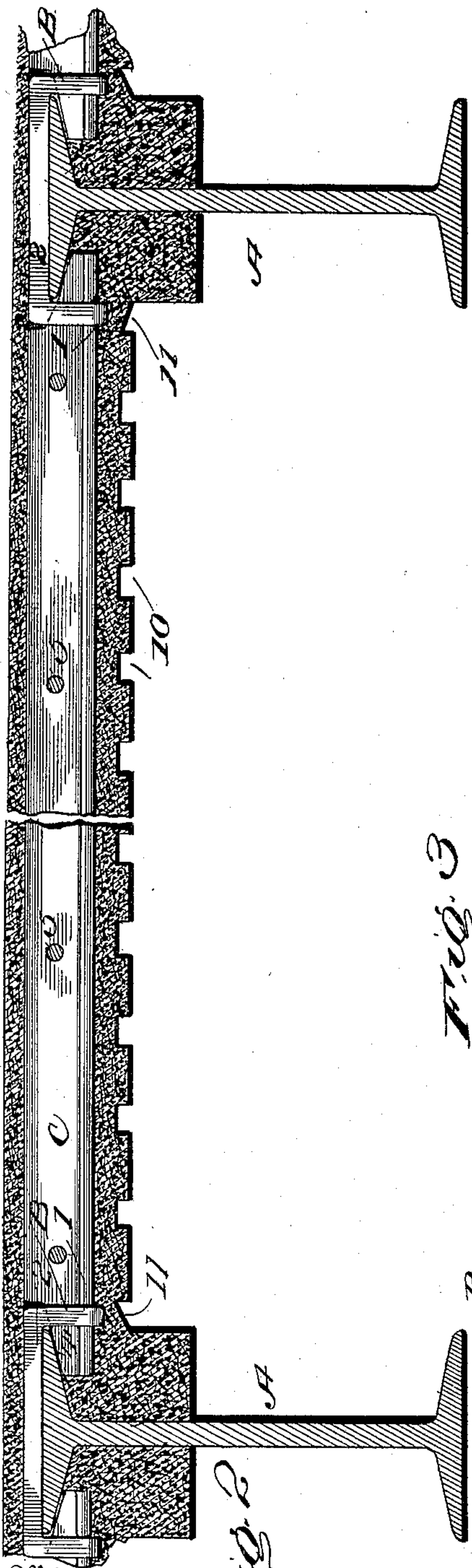
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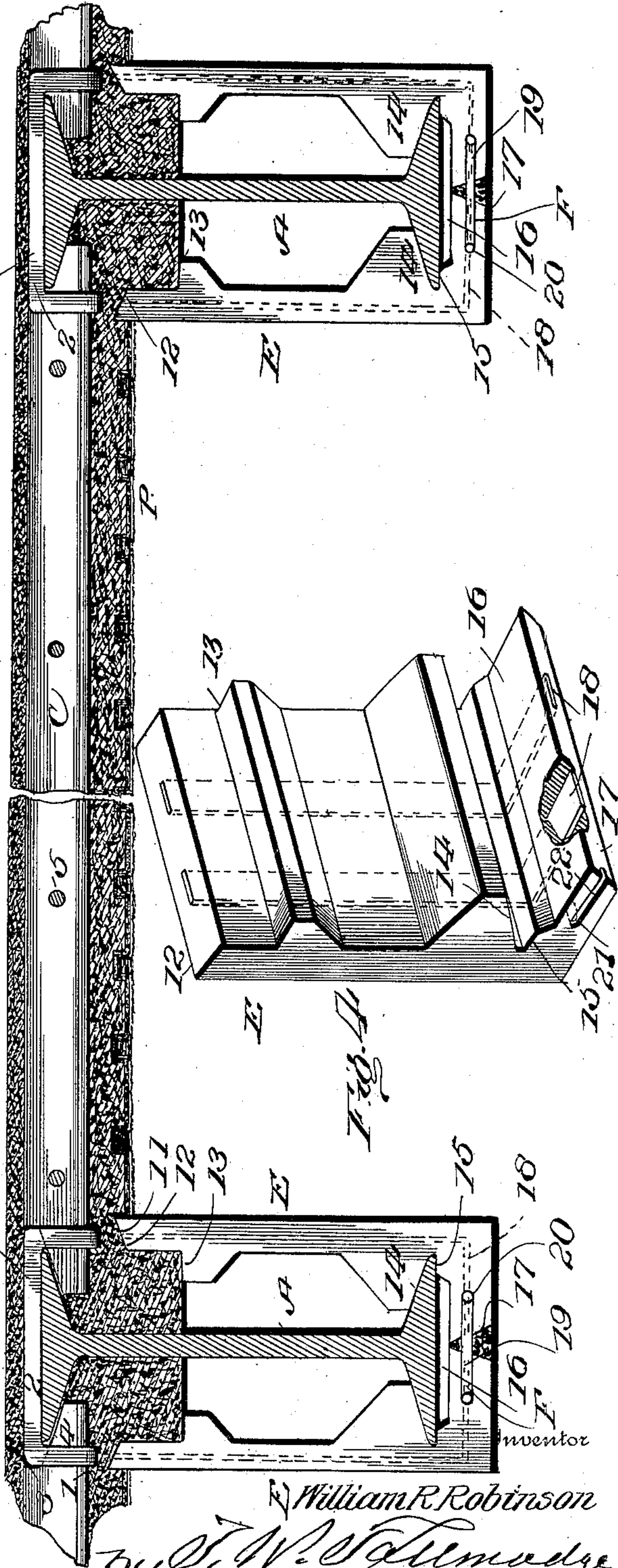
(No Model.)

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Witnesses
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Fig. 3



William R. Robinson
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his Attorney

UNITED STATES PATENT OFFICE.

WILLIAM R. ROBINSON, OF CLEVELAND, OHIO.

FIREPROOF STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 610,832, dated September 13, 1898.

Application filed January 11, 1898. Serial No. 666,329. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. ROBINSON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Fireproof Structures, of which the following is a specification.

My invention relates to an improvement in the construction of fireproof floors and ceilings.

One object of my invention is to provide an improved stirrup and to adapt the supporting-bars to it in such manner as to permit of contraction and expansion of the bars without detriment to the floor or ceiling.

Another object of my invention is to provide improved means for casing the sides of the I-beams, which I do by means of slabs of incombustible material so formed as to leave an air-space on either side of the beam and beneath it.

Another object of my invention is to provide an improved centering for the concrete, one which may be readily put in place and removed.

Other objects will be manifest from the following description.

Figure 1 of the drawings is a broken vertical elevation showing the supporting-bars suspended in stirrups on the I-beams and also the centering in position on the I-beams previous to applying the concrete. Fig. 2 is a like view showing the concrete applied and the centering removed, the supporting-bars and stirrups being shown in elevation for clearer illustration. Fig. 3 is a broken elevation showing a completed panel, the supporting-bars and stirrups being shown in elevation for clearer illustration. In all the above views fragments of adjoining panels are shown. Fig. 4 is a perspective detail view of one of the casing-slabs. Fig. 5 is a perspective view of one of the stirrups. Fig. 6 is a detail perspective of a portion of one of the supporting-bars. Fig. 7 is a plan view of the key which connects the casing-slabs. Fig. 8 is a broken perspective view of the centering-platform.

Referring to the drawings, A are the I-beams, which are placed a suitable distance apart and support the entire floor and ceiling structure. Over the top of each I-beam are placed stirrups B, of novel construction, as shown in detail in Fig. 5. The stirrups are each formed from a rectangular sheet of metal from which a suitable distance from the marginal edges is cut out a rectangular piece of the width of the flange of the I-beam, the plate being then bent up at a right angle at each side, thus leaving a transverse bearing at each end and longitudinal parallel rests at the top.

C represents the supporting-bars, which are of inverted-T-shaped angle-iron. At each end of the bar I cut out a portion of the web in such manner as to leave a square shoulder 3 and a downward incline 4. In the web of the bar at suitable intervals I insert metal pins 5, of a length to project about four inches on each side of the web, as seen in Fig. 6. The stirrups having been placed over the upper flange of the I-beams, the ends of the bars C are inserted therein with the flanges of the bars lying on the bearings 1 of the stirrups, with their inclined ends 4 under the flanges of the I-beams and the shoulders 3 some distance from the edge of the flange of the I-beam.

The centering D for supporting the concrete until dry is composed of stringers 6, which are square on their outer edge, so as to abut against the webs of the I-beams, and upwardly beveled on the bottom, so as to fit closely on the inner portion of the beam-flanges, as clearly seen in Fig. 1. On the stringers is placed a plank 7 of a length equal to the distance between the I-beams, and on the plank 7 is placed another plank 8, shorter than the other, so as to permit the concrete to pass its ends and be supported by plank 7. On the upper surface of the upper plank are secured cleats 9 a short distance apart, all of which, except the side cleats, are designed to form recesses 10 in the concrete to receive the plaster and bind it to the concrete, the side cleats, which are beveled outwardly on their upper surfaces, as clearly

seen in Fig. 8, being designed to form notches 11 in the concrete to receive the upper ends of the casing-slabs.

E represents the casing-slabs, which are molded from any suitable cement. The outer surface of each slab is plane both on the outer side and bottom, the latter portion of which is so shaped as to reach midway beneath the lower flange of the I-beam. The upper end of the slab is beveled inwardly, as at 12, to engage the notches 11, formed in the concrete. The inner surface of the slab is formed with a right-angled shoulder 13, resting under the mass of concrete surrounding the upper portion of the web of the I-beam. It is also formed with an angular shoulder 14, adapted to rest on the upper side of the lower flange of the I-beam, and also with a square shoulder 15, on which the lower surface of the beam-flange rests. Inwardly from shoulder 15 is formed a recess 16, extending to the end of the bottom portion of the slab, so that when the slabs are in position on either side of the beam the recesses will form an air-space beneath the flange of the beam. The end of the under portion of each slab is beveled outwardly, as at 17, for a purpose hereinafter stated. For the purpose of strengthening the slabs E, I embed therein when molding one or more L-shaped strips of metal 18, as shown in Fig. 4.

For the purpose of uniting the two side slabs together at the bottom and also for connecting the adjacent slabs with them I employ a key F, consisting of a small longitudinal rod 19, having transverse dowels 20 at each end, which latter take into holes 21, formed in the ends of the slabs, the rod portion resting when in place in recesses 22, formed in the slabs. It will be seen that the dowels on one side of the rod will hold the facing-slabs together and that the dowels on the other side will connect the adjacent slabs. By filling in the inverted-V-shaped recess formed by the bevels 17 on each pair of facing-slabs with cement the key will be held firmly in position. By my construction of the casing-slabs I inclose the I-beams on the sides and bottoms by two slabs instead of by three, as has been heretofore customary, and I also form air-spaces around the web and beneath the flange of the I-beam.

As will be evident, when the structure is arranged as shown in Fig. 1 the concrete is applied from above, filling the spaces at the ends of plank 8 and completely enveloping the bars C as the completion of the sections advances, after which the centering-platform D is taken down and erected in a new position. After the concreting is completed the plastering P is applied, filling the recesses 10 and binding it to the concrete, as above described.

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

1. In a fireproof structure, the combination, with the I-beams and stirrups mounted thereon, of inverted-T-shaped bars supported by the stirrups, each bar being provided with a series of pins inserted transversely through the web.

2. In a fireproof structure, the combination, with I-beams and stirrups mounted thereon, of inverted-T-shaped bars supported by the stirrups and having the ends of their webs cut out so as to pass beneath the flanges of the I-beams, each of said T-bars being provided with a series of pins inserted transversely through the web.

3. In a fireproof structure, the combination, of an I-beam, and concrete surrounding its upper flange and a portion of the web, a casing for the bottom and the remainder of the web of the I-beam, said casing comprising oppositely-disposed slabs of plastic material shaped so as to leave an air-space around the greater portion of the beam, the upper portion of each slab extending beyond the concrete filling for the I-beam, and formed with a shoulder for supporting said concrete filling.

4. In a fireproof structure, the combination, with an I-beam and concrete surrounding its upper flange and a portion of the web, of two slabs of plastic material enveloping the remaining portion of the beam, each of said slabs being formed near its upper edge on the inner side with a shoulder for supporting the concrete surrounding the web of the I-beam and near its lower edge with a shoulder adapted to rest on the lower flange of the I-beam, the upper portion of the slab projecting beyond the concrete surrounding the web of the I-beam and entering the notch formed in said concrete.

5. In a fireproof structure, the combination, with an I-beam and concrete surrounding the upper flange and a portion of the web, of a casing for the bottom and the remainder of the I-beam, said casing comprising oppositely-disposed slabs of plastic material shaped so as to leave an air-space around a greater portion of the beam, each of said slabs being formed near its upper edge on the inner side with a shoulder for supporting the concrete surrounding the web of the I-beam and near its lower edge with a shoulder adapted to rest on the lower flange of the I-beam, the upper portion of the slab projecting beyond the concrete surrounding the web of the I-beam and entering the notch formed in said concrete, and means for securing the lower ends of the slabs together.

6. A casing-slab for partially incasing an I-beam having one or more integral L-shaped strips of metal embedded therein, as and for the purpose stated.

7. The combination, with an I-beam, of a plurality of casing-slabs adapted to incase the greater portion of the I-beam, a key for securing the lower ends of adjacent slabs to—

gether, said key being also adapted to secure together the slabs on opposite sides of the I-beam, and a recess at the abutting ends of the slabs adapted to be filled with cement for securing the key in place.

5 8. In the construction of fireproof structures, a centering for temporarily supporting the concrete, said centering consisting of stringers adapted to rest on the lower flanges

of the I-beams, and a suitable concrete-supporting platform erected on said stringers.

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

WILLIAM R. ROBINSON.

Witnesses:

W. V. SMITH,
C. H. BALL.