

No. 621,446.

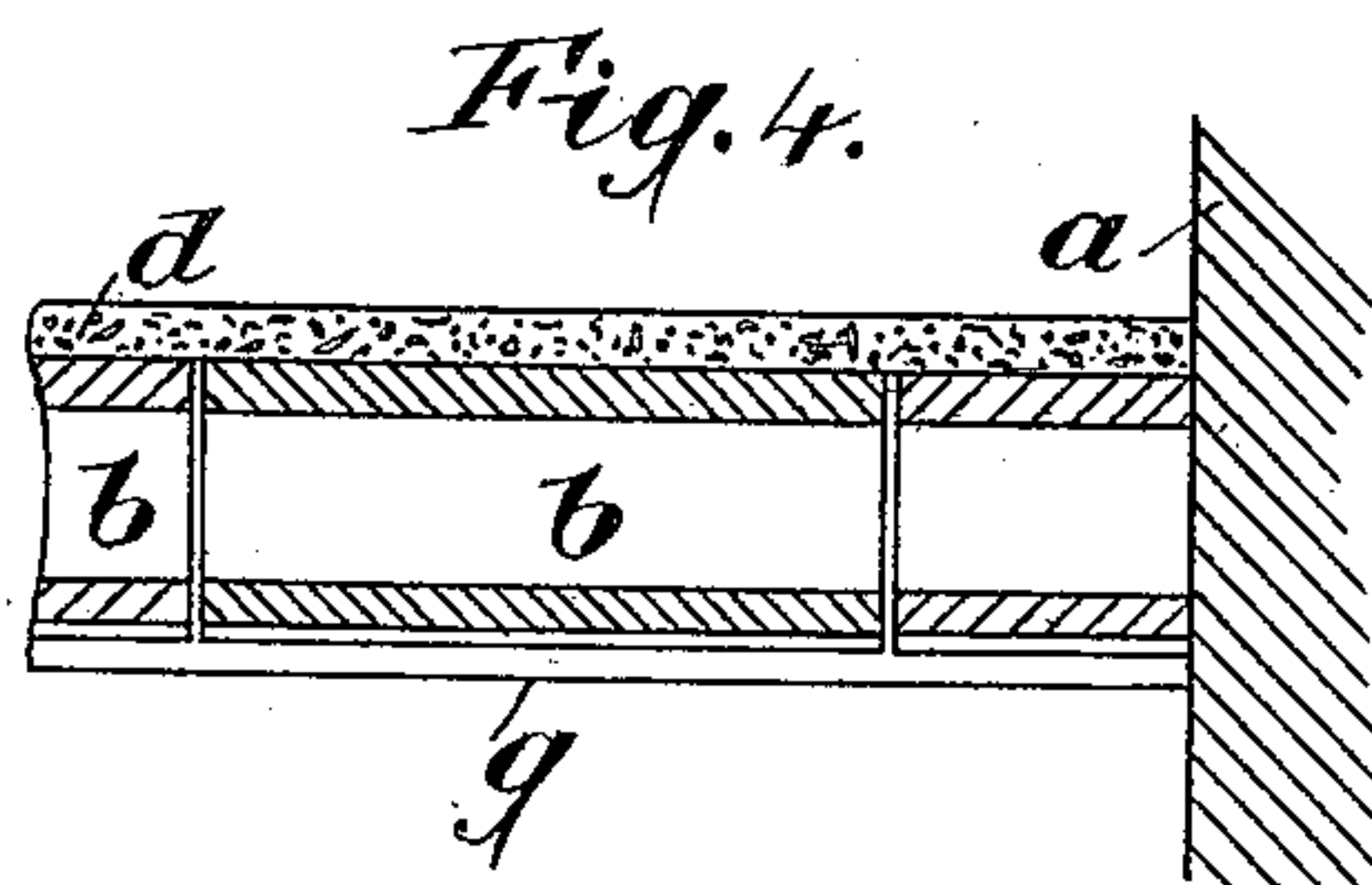
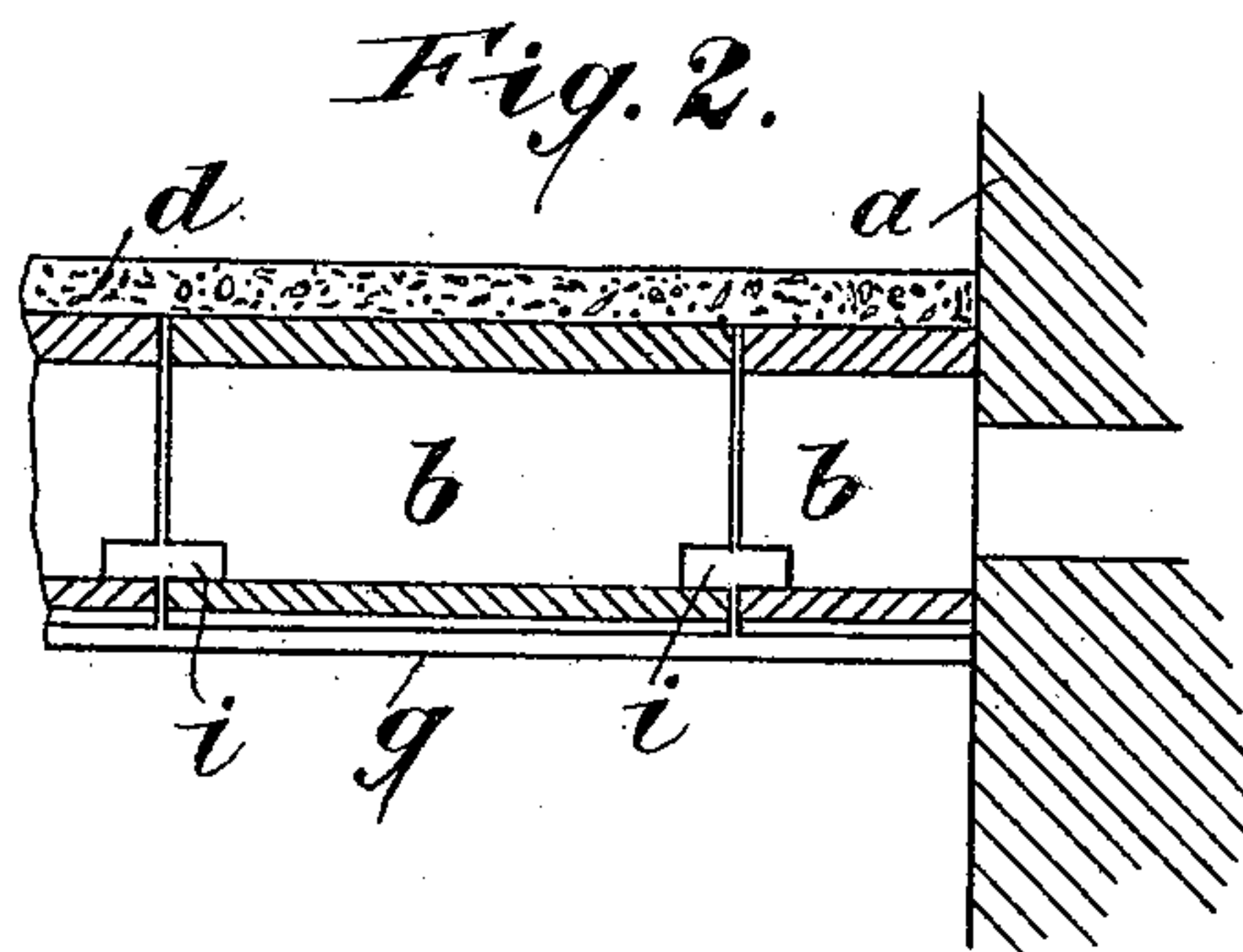
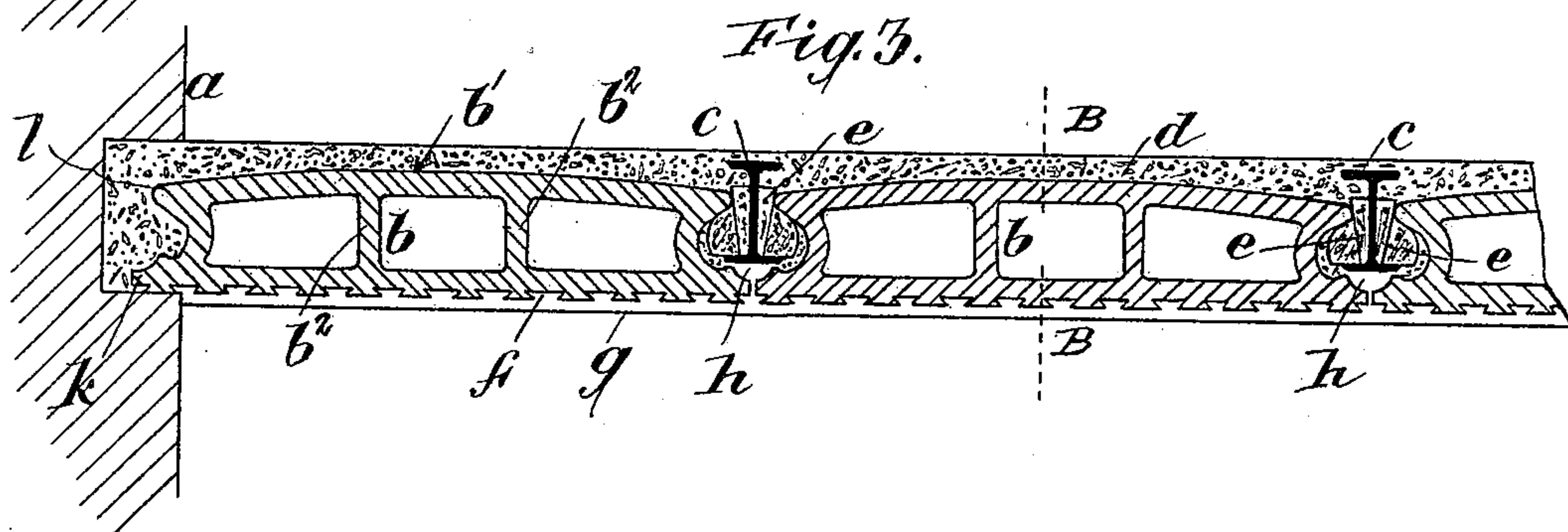
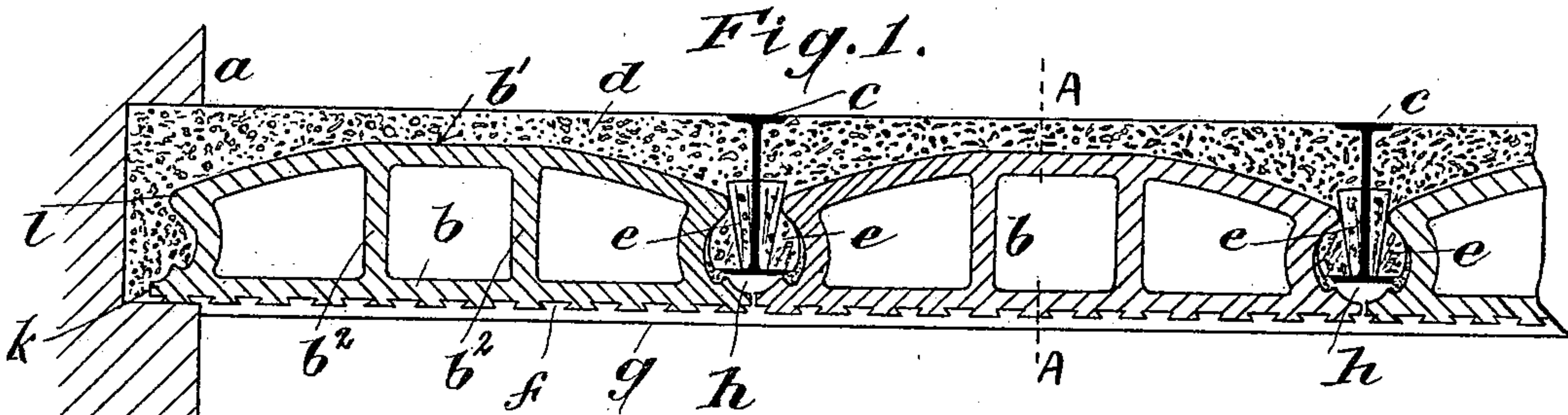
Patented Mar. 21, 1899.

A. H. CRAWFORD.
FIREPROOF FLOOR FOR BUILDINGS, &c.

(Application filed Jan. 5, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 6.

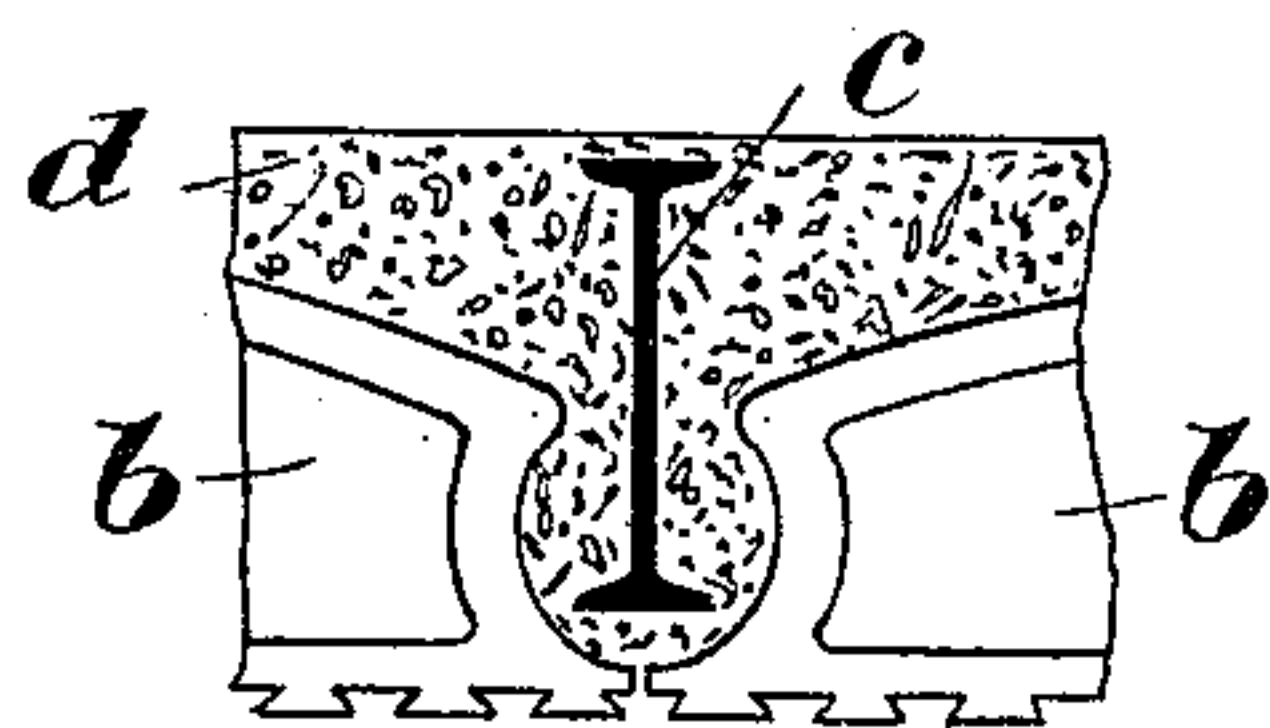
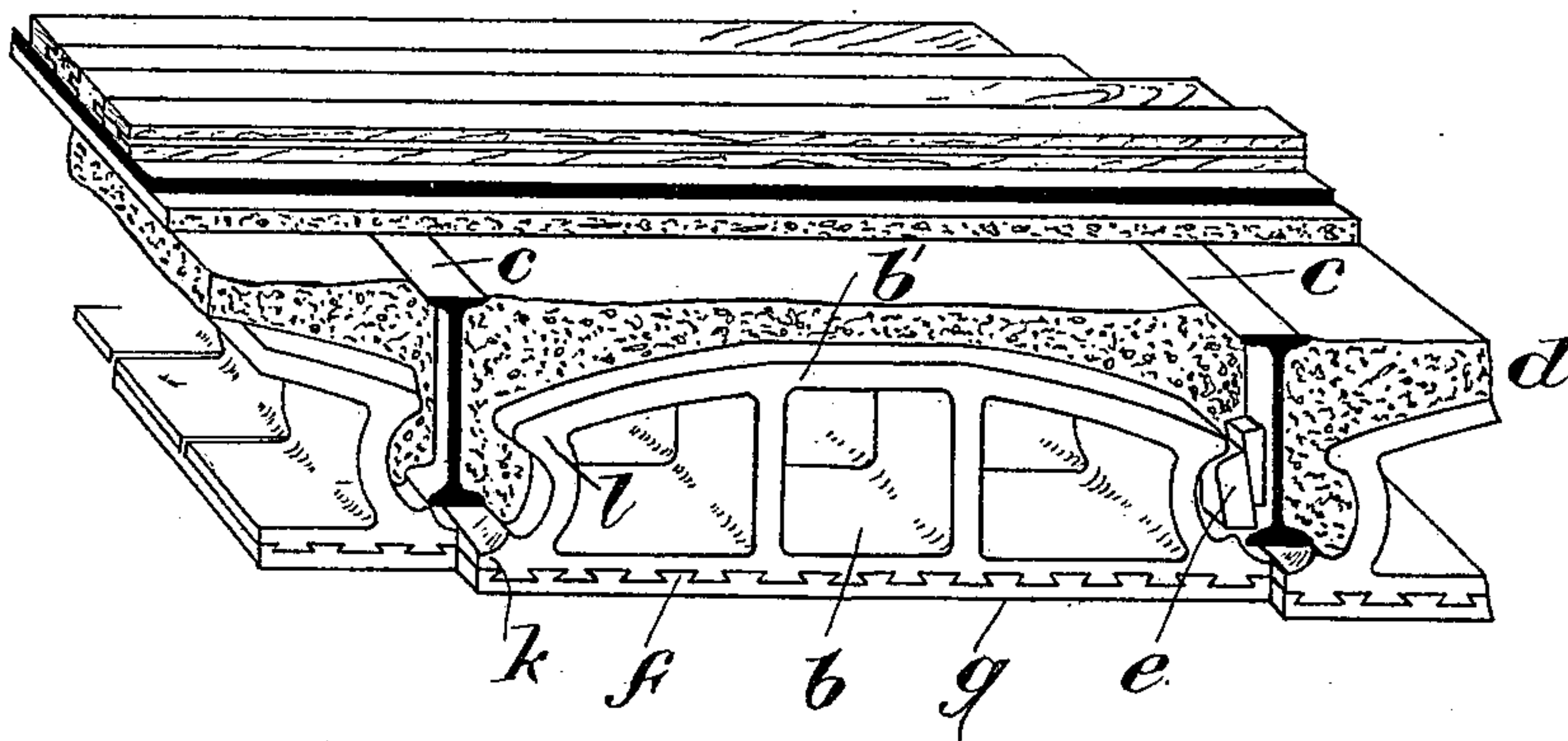


Fig. 5.



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UNITED STATES PATENT OFFICE.

ALEXANDER HUNTER CRAWFORD, OF EDINBURGH, SCOTLAND.

FIREPROOF FLOOR FOR BUILDINGS, &c.

SPECIFICATION forming part of Letters Patent No. 621,446, dated March 21, 1899.

Application filed January 5, 1899. Serial No. 701,185. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER HUNTER CRAWFORD, architect, a subject of the Queen of Great Britain, residing at 39 York Place, Edinburgh, Scotland, have invented a certain new and Improved Fireproof Floor for Buildings and other Structures, of which the following is a specification.

This invention relates to fire-resisting or fireproof flooring for buildings and other structures.

The flooring consists of fire-clay or other tubes, or "hollow blocks," as they are sometimes termed, having their center compartments so shaped that when being made they can be adjusted in width. These tubes are fixed between and below steel or iron joists by means of cement, fire-clay, or other like fire-resisting wedges and concrete in such a manner that the joists are wholly embedded in the concrete or left with an air-space below the bottom flange. The tubes are fixed in position without the aid of supporting scaffolding or centering and are sustained and the levels adjusted by the wedges until grouted at the sides with concrete.

By using tubes slightly cut at the ends cross ventilation can be established below the joists.

In order that my said invention may be properly understood, I have hereunto appended an explanatory sheet of drawings, whereon—

Figure 1 is a cross-section of a floor, showing the tubes and joists in position. Fig. 2 is a longitudinal section taken at the line A A, Fig. 1. Fig. 3 is a cross-section of another floor which is not quite so deep as the floor shown in Fig. 1. Fig. 4 is a longitudinal section on the line B B, Fig. 3. Fig. 5 is a perspective view of a section of flooring. Fig. 6 is a section of flooring in which the metal joists are wholly incased in concrete.

Referring to the drawings, whereon the same reference-letters wherever repeated indicate the same parts, *a* are walls. *b* are the fire-clay tubes. *c* are the metal joists. *d* is concrete. *e* are cement or fire-clay wedges. *f* are the usual dovetail key-grooves made on the under side of the tubes in order to retain the plaster *g* in position. *h* are air-spaces.

The tubes *b* are made of fire-clay of the sec-

tion shown—*i. e.*, with a flat under side and an arched upper side, the center part of which is flat, as shown at *b'*, Figs. 1, 3, and 6. As will be seen, each tube is divided by the partitions *b²* into three compartments, the center one of which is more or less rectangular in shape. The tubes, which are preferably made about two feet in width and eighteen inches in length, are inserted between the steel joists *c* from below and the small wedges *e* are slipped in at the ends in order to hold the tubes in position, and these wedges are also useful for adjusting the level of the tubes, so that a true surface can be obtained for the ceiling. The spaces between the sides of the tubes and the steel joists are then grouted with concrete and the whole thereafter covered on top with concrete to a level surface.

As will be seen, each side of each tube *b* has a broad projecting flange *k* at the bottom and a narrower projecting flange *l* at the top, so that when the concrete sets in the spaces between the tubes and these flanges and around the joists the tubes are solidly keyed or locked in position. The wedges are not removed, but the concrete is allowed to set about them, so that the whole floor becomes practically one solid structure.

The wedges *e* are clearly shown on the drawings, and, as will be seen, there are two at each side of each joist. One wedge of each pair fits into the space between the flanges of the tube and practically forms a key between which and the joists the other wedge is inserted.

In Figs. 1 and 2 an air-space *h* is shown as being left below each joist, the tubes being channeled for the purpose. In Fig. 5 the channels are not made on the tubes, the grouting being allowed to fill up the space at the bottom of the joist, so as to more thoroughly protect it against fire. As shown in Fig. 2, the ends of the tubes can be cut away at *i*, so as to form channels for cross-ventilation.

As the center compartment of each tube is level at both the top and bottom the dies for making the tubes of varying widths are more easily made, because the side compartments remain the same, while the center compartment alone requires to be, as required, reduced or extended when being manufactured.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a fire-resisting floor the combination
5 of metal joists, fire-clay tubes fitted between and below the joists, wedges for temporarily supporting and adjusting the tubes in position and concrete which is allowed to set above and between the tubes and around the
10 wedges substantially as set forth.

2. In a fire-resisting floor the combination of metal joists, fire-clay tubes fitted between and below the joists, fire-resisting wedges for temporarily supporting and adjusting the
15 tubes in position and concrete which is allowed to set above and between the tubes and around the wedges substantially as set forth.

3. In a fire-resisting floor the combination of metal joists, fire-clay tubes fitted between
20 and below the joists, cement wedges for temporarily supporting and adjusting the tubes in position and concrete which is allowed to set above and between the tubes and around the wedges substantially as set forth.

25 4. In a fire-resisting floor the combination

of metal joists, fire-clay tubes made with three compartments the central one of which is rectangular in shape fitted between and below the joists, fire-resisting wedges for temporarily supporting and adjusting the tubes in
30 position and concrete which is allowed to set above and between the tubes and around the wedges substantially as set forth.

5. In a fire-resisting floor the combination of metal joists, fire-clay tubes made with three
35 compartments the central one of which is rectangular in shape and having end flanges $\frac{1}{2}$ and $\frac{1}{4}$ fitted between and below the joists, fire-resisting wedges for temporarily supporting and adjusting the tubes in position and
40 concrete which is allowed to set above and between the tubes and around the wedges substantially as set forth.

Signed at Edinburgh, Scotland, this 16th day of December, 1898.

ALEXANDER HUNTER CRAWFORD.

Witnesses:

A. KINNOCK-ANDERSON,
ANDW. J. S. HUNTER.