

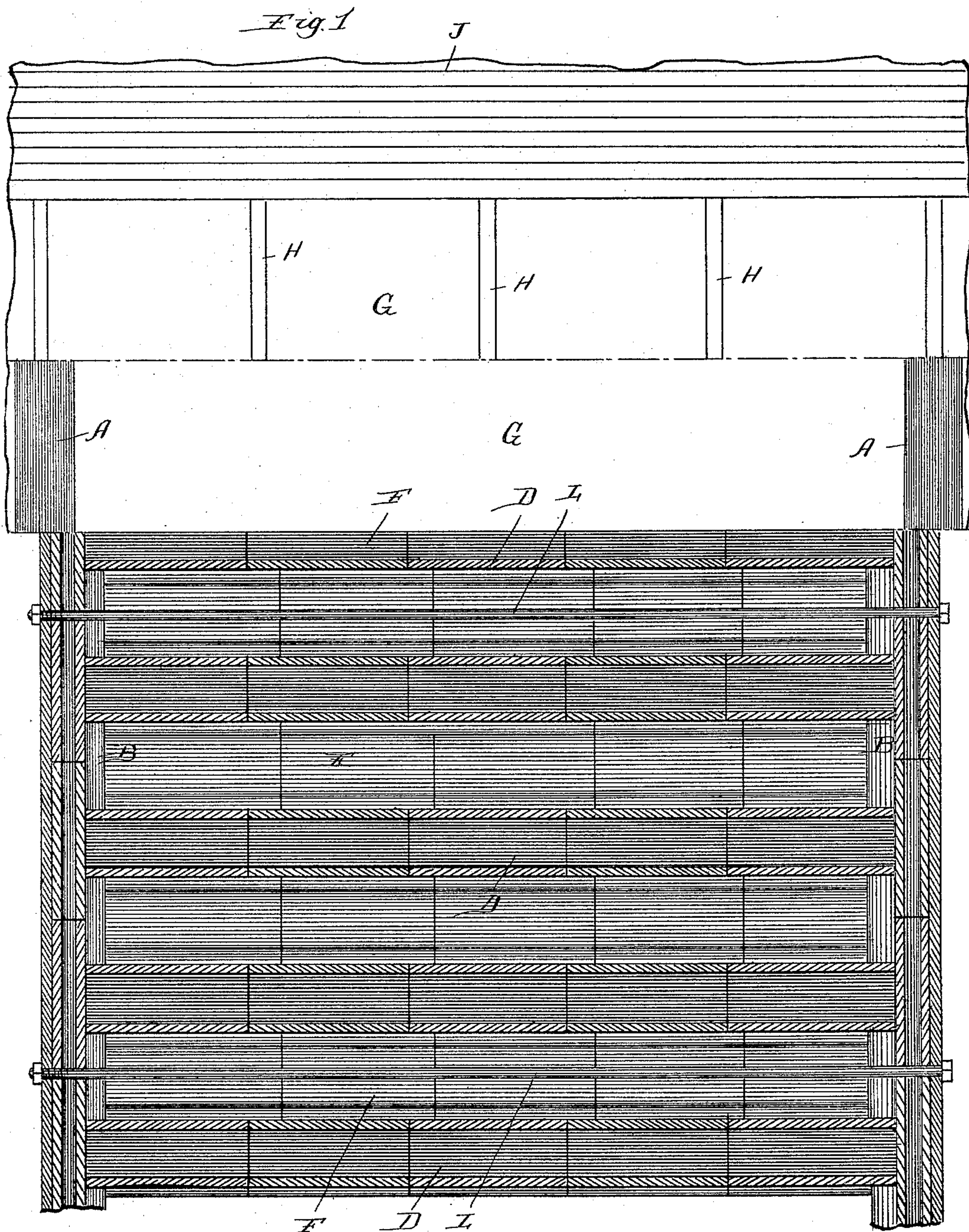
(No Model.)

2 Sheets—Sheet 1.

E. V. JOHNSON.
CONSTRUCTION OF BUILDINGS.

No. 495,634.

Patented Apr. 18, 1893.



Witnesses:

Levi C. Curtis

Geo. W. H. H. H.

Inventor:

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By Munday, Everts & Adcock
His Attorneys

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Fig. 2.

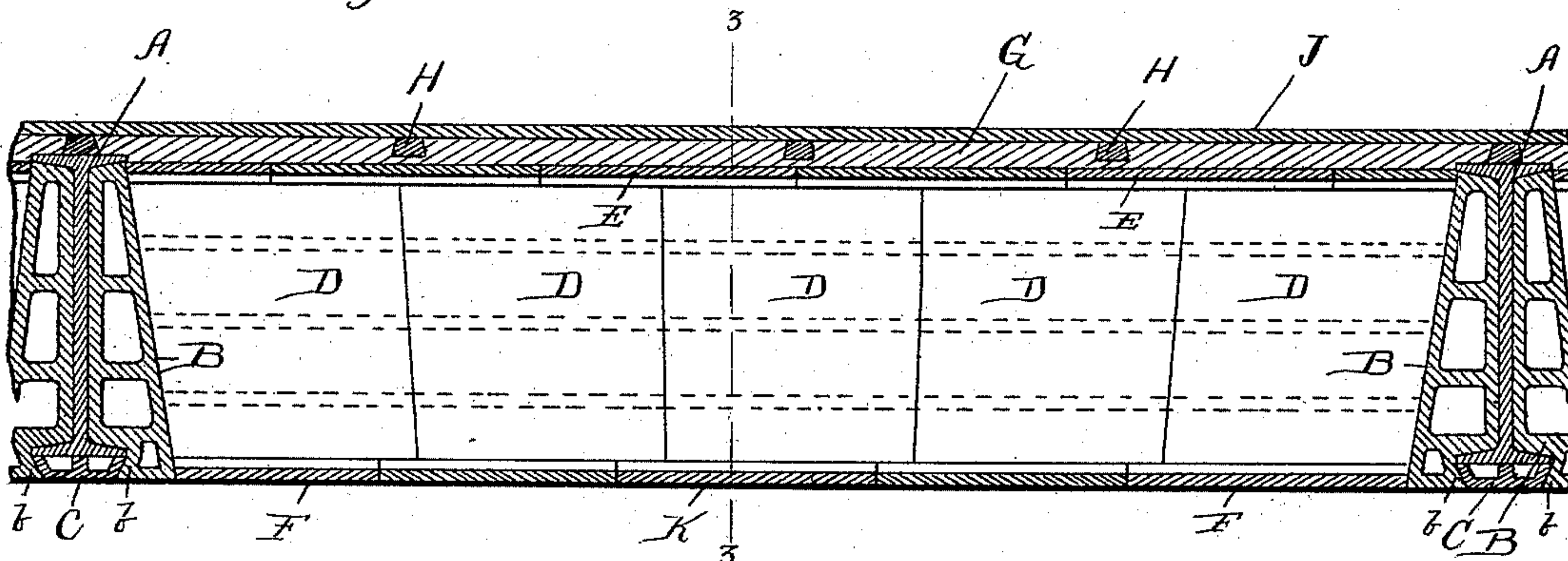
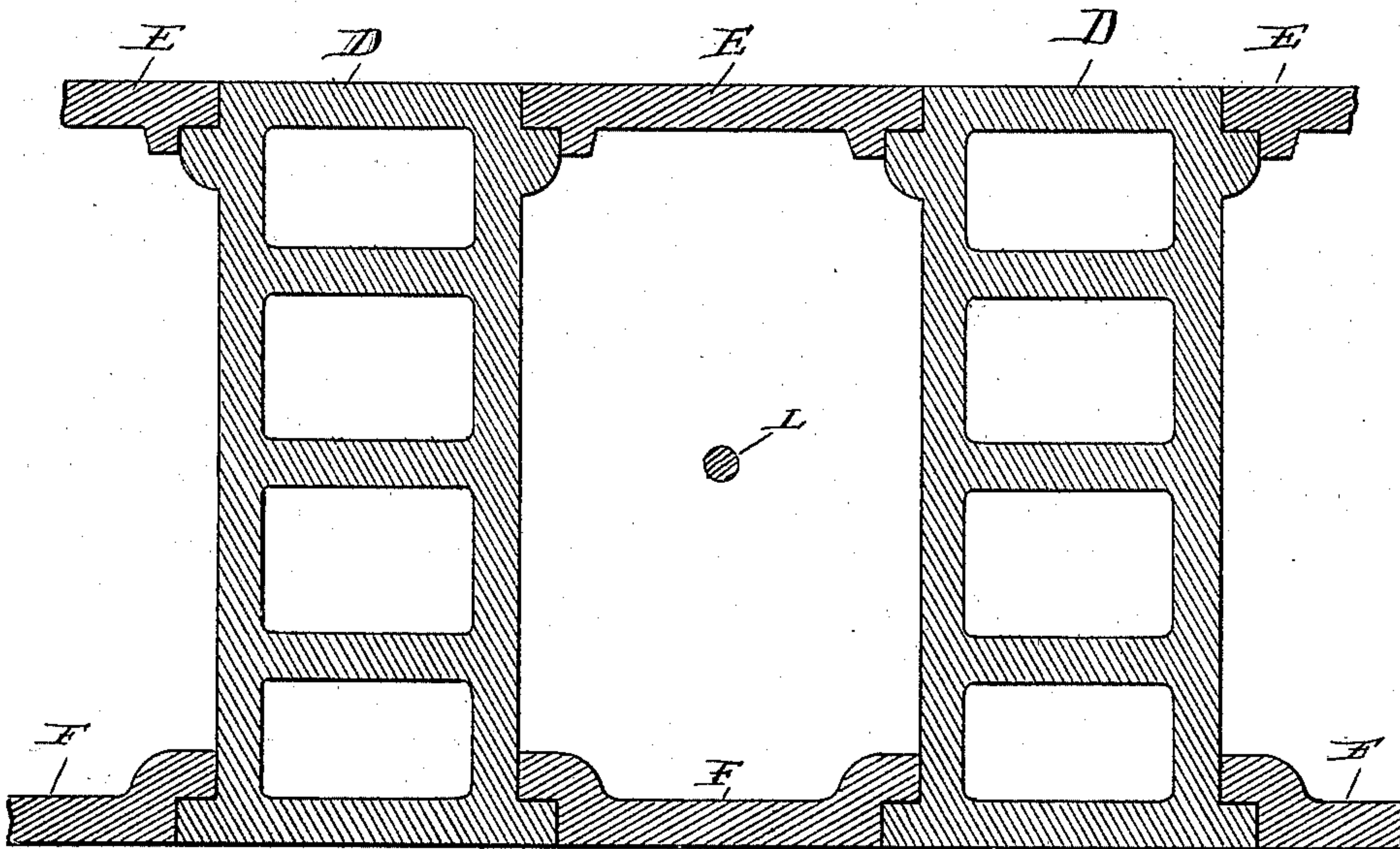


Fig. 3.



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UNITED STATES PATENT OFFICE.

ERNEST V. JOHNSON, OF CHICAGO, ILLINOIS.

CONSTRUCTION OF BUILDINGS.

SPECIFICATION forming part of Letters Patent No. 495,634, dated April 18, 1893.

Application filed January 12, 1891. Serial No. 377,423. (No model.)

To all whom it may concern:

Be it known that I, ERNEST V. JOHNSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in the Construction of Buildings, of which the following is a specification.

This invention relates to a manner of making fire proof floors for buildings. The object sought to be attained is to lessen the weight and cheapen the cost of the hollow tile and metal beam flooring now so extensively employed, especially in high buildings. The diminishing of the weight of these fire proof floorings is a matter of special importance in large buildings because it affects the cost of the entire structure, as the foundation, walls, beams, columns, &c., are all taken carefully into consideration and their strength and resistance adapted to the whole weight of the structure to be carried. In contriving the present construction the problem presented to me was, how to make a flooring, which should present all of the fire-proof, sound deadening, non-conducting properties of the ordinary hollow tile flooring; having the straight upper and lower surface to receive the wood and concrete of floor and plaster of ceiling, be strong enough to resist great weights and falling blows; and yet at the same time be far lighter than any previous structure. In this I have so far succeeded as to reduce the weight of material required fully one third, in addition to greatly cheapening the cost and making the construction such as to be more readily and easily handled and built.

By proper test and experiment I have ascertained that a floor may be built of iron beam and hollow tile cross girders of great strength when the latter are separated at considerable distance from each other and the inter-spaces between the hollow tile girders bridged by flat filling tablet tiles at top and bottom, when the tile girders are properly constructed and supported. For some reason those skilled in the art have entirely overlooked or underestimated the great strength to resist weights and falling blows of an individual hollow tile girder, when properly constructed, securely supported at its end thrust at each end and continuously braced later-

ally at each side. And by reason of this failure to appreciate such strength it has heretofore been customary to form the flooring of girders laid side by side in close juxtaposition.

My invention consists in constructing the flooring of hollow tile girders separated from each other laterally by interspaces which are bridged by tablets, whereby the entire structure is lightened and cheapened. These tablets may be hollow or solid according to the length they have to span.

It further consists in certain minor features of construction germane to the principal object which are more fully explained hereinafter and indicated in the claims. These tile can be made according to my invention of common or fire clay, porous terra cotta, lime of teil, plaster of paris and various mixtures of cement and sand or other suitable material.

In the accompanying drawings which form a part of this specification, Figure 1 is a plan view of a flooring constructed in accordance with my invention, the same being partly in horizontal section at different levels to indicate the construction. Fig. 2 is a vertical section of the structure shown in Fig. 1 taken parallel with the length of the hollow tile girders. Fig. 3 is a transverse section upon a somewhat larger scale, taken on the line 3—3 of Fig. 2, the upper covering of cement and flooring boards and the coating of plaster beneath being omitted.

In said drawings A A are two parallel iron beams of the ordinary "I" beam type, and in the illustration given are shown as being separated from each other by an interval of six feet from center to center.

B B are abutment tile formed to fit the sides of the beam A, and having a suitable abutment face to receive and support the hollow tile girders. The lower end of these abutment tile B may be carried down below the bottom of the beam A to form a bevel projection b, which together with the similarly oppositely inclined bevel projections of the tile B fitted to the other side of the same beam, will form a dovetail cavity to receive and support the beam tile C which covers the lower surface of the beam A. The form of the abutment tile as indicated is such that they may be conveniently made in the ordinary tile ma-

chine by forcing them through a die of the proper cross section in the direction of their length, which length in the drawings is parallel to the length of the beam A.

- 5 D D are the hollow tile girders shown in cross section at Fig. 3, and which may be conveniently made in an ordinary tile machine, the contour lines and dimensions running in the direction of the length of the girder.
- 10 When thus made by the ordinary tile machine the entire length of the girder may be formed by forcing the plastic clay through a die of suitable cross section, and the plastic material cut by wires at the ends to fit the
- 15 abutments and between the ends into a suitable number of segments in converging lines proper to constitute the joints of a flat arch structure, as shown. The abutment pieces being bedded with mortar or cement to the
- 20 "I" beams. The girder is then built into place, its joints being suitably formed with mortar or cement in the usual manner of constructing flat arches, a flat support being employed beneath to retain the structure while
- 25 the cement or mortar is setting. The abutment tiles B may be applied continuously along the whole length of the beams A which construction I prefer, or they may be applied only at intervals where needed to support the
- 30 girders.

In the drawings I have indicated the girder tile as having a width of about six inches, and separated from each other by an interspace of about eight inches. Such a construction would lessen the weight of the tiling over that of a flooring composed of similar girders placed side by side, about one-third; but it should be understood that this interspace may be increased or diminished as the

35 constructor desires, owing to the amount of weight to be carried by the floor. Between each pair of the girders are placed bridge pieces E, which may be suitably bedded with mortar or cement, and also the row of bridge

40 pieces F. These bridge pieces produce both above and below a continuous flat surface suitable to sustain below the plastering of the ceiling K, and to support above the cement filling G, wooden floor strips H and wooden

45 flooring J. By reason of the bridge pieces not only is a smooth surface obtained, but also the girders are held rigidly top and bottom at both sides against lateral displacement, and any weight on the floor above which

50 does not come directly over a girder is distributed to a pair of girders. The cement filling, the floor strips and the flooring boards also tend to distribute any weight or the force of any falling blow to a number of the gird-

ers. One of the conveniences of this structure is the fact that the ordinary tie rods L, which extend from beam to beam ordinarily at intervals of four or five feet, may be accommodated in the interspaces between the girders, and the usual cutting and fitting of the tile occasioned by the pressure of these beams wholly avoided. Another convenience is the opportunity afforded by the construction for running gas and water pipes, and electrical conduits in the interspaces between the girders without the necessity of the cutting and fitting of the tile, and which may be made accessible without destroying the tiling by a simple removal as occasion requires of such portion of the bridging pieces as are necessary together with the wooden and cement covering above them.

Having thus described my invention, what I claim is—

1. The fire proof flooring body for buildings consisting of a series of hollow tile girders separated by interspaces from each other, in combination with bridge pieces extending from girder to girder, and located between the same substantially as specified.

2. The fire proof flooring body for buildings consisting of a series of hollow tile girders separated by interspaces from each other, in combination with bridge pieces extending from girder to girder, said bridge pieces being placed between the girders both above and below to form a surface for the ceiling and floor, substantially as specified.

3. The fire proof flooring consisting of a series of metal beams supporting a series of tile girders separated by interspaces bridged and covered by tile bridge pieces, located between the girders substantially as specified.

4. The fire proof flooring consisting of a series of metal beams supporting a series of tile girders separated by interspaces bridged and covered by tile bridge pieces, located between the girders said bridge pieces being applied both above and below for bracing and forming a surface for the floor and ceiling, substantially as specified.

5. The hollow tile girders provided with shoulders to receive and support interposed bridge pieces, substantially as specified.

6. The hollow tile girders provided with shoulders to receive and support interposed bridge pieces, both at top and bottom substantially as specified.

ERNEST V. JOHNSON.

Witnesses:

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