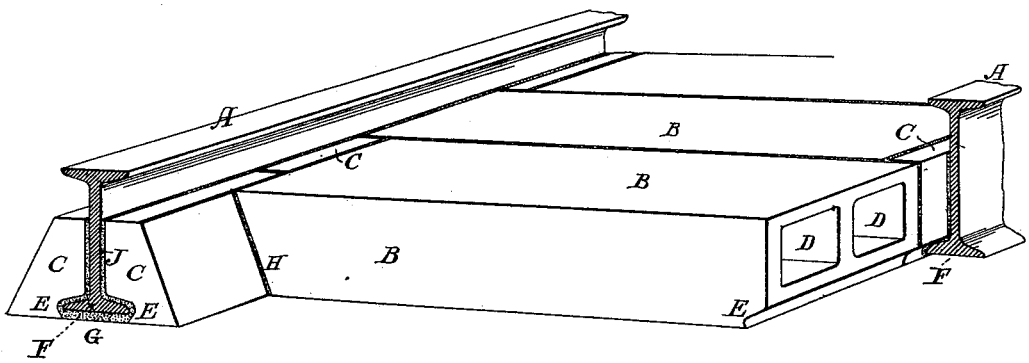
L. F. BECKWITH.
Fire-Proof Floor.

No. 221,501. Patented Nov. 11, 1879.



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LEONARD F. BECKWITH, OF NEW YORK, N. Y.

IMPROVEMENT IN FIRE-PROOF FLOORS.

Specification forming part of Letters Patent No. **221,501**, dated November 11, 1879; application filed October 3, 1879.

To all whom it may concern:

Be it known that I, LEONARD FORBES BECKWITH, of the city of New York, United States, have invented a new and useful Improvement in Fire-Proof Floors, which invention is fully set forth in the following specification.

The invention relates to an improvement in fire-proof floors, consisting of flat or plate band arches between iron beams.

The flat arches hitherto employed consist of voussoirs or blocks made with hollows, the axes of which run either parallel with or perpendicular to the iron beams on which the arches rest. The disadvantage of this system of construction is that the arches require an expensive centering to be either erected from the floor below or suspended by iron hooks from the iron beams to support the arches while the mortar joints are setting. The other disadvantages are the multiplicity of joints, the attending expense of mortar, and the variety of blocks required for making out different spans.

Another method, which avoids the use of centering, has been employed. A single block or tile, with hollows in it, extending from beam to beam, at right angles to the latter, is used. This hollow block rests on the flanges of the iron beams, and can be laid without the use of centers, which saves expense. In order to set this block, one end fits snug against the iron beam, while the other end is usually beveled or chamfered to facilitate its entrance sidewise from above. The space left between the web of the beam and the chamfered end of the block is subsequently filled with mortar from above. The defect of this construction lies in the difficulty of preserving unbroken the acute corner of the hollow block which rests on the beam on one side, and also in adjusting blocks made from the same mold to the varying spaces met with between beams in a building. Thus, if this corner gets knocked off in transportation the block no longer holds on the flange. If the single block is too long for the span, it is shortened by cutting, and can, with care, be made to fit; but if it is slightly too short, by an inch or a fraction thereof, as constantly happens in the irregular setting of beams in a building, the block then has a very slight hold on the flange of the beam, and if it holds at all it is by the adhesion of the mortar of the joints between the block and the beam, which no good construction will admit as sufficient. Finally, with the use of a single block only one good joint is obtainable.

The floor constructed in accordance with this invention overcomes all the different objections above cited.

It consists of one hollow block and one solid. The hollows in the block may be one or more, and of any suitable shape. The axes of the hollows are perpendicular to the beams. One end of the block fits snugly with a mortar joint against the iron beam, resting on the flange, and following the shape of the latter. This block spans the greater part of the distance from one beam to another, and meets a solid skew-back, making therewith a beveled mortar-joint. The skew-back itself rests securely on the flange of the other iron beam. Both skew-back and hollow single block rest securely on the flanges of the iron beams, against which they fit on the whole depth of the block with a tight snug joint, and the mortar joint between the two completes the construction. They both descend about one-half ($\frac{1}{2}$) inch below the level of the lower flange of the iron beams, and form a dovetail, which secures in position the mortar covering the bottom of the lower flanges, and protecting them from the effect of fire from below. The skew-backs and long blocks, laid side by side, or else alternately a skew-back and a long block, so as to cross joints, form a perfect fire-proof floor.

In order to more clearly illustrate the invention and the manner of carrying the same into effect, reference is made to the accompanying drawing, which forms a part of this specification, and which is a view in perspective of a portion of a floor or ceiling constructed in accordance with my invention.

A represents the beams; B, the hollow blocks, C, the solid skew-backs; D, the hollows in the blocks B, extending therethrough perpendicular to the beams; E, dovetail grooves in the

ends of the hollow blocks and solid skew-backs; F, the lower flanges of the beams; and G H I, mortar joints.

The blocks and skew-backs are made of any suitable material, such as terra-cotta, burned clay, cement, plaster, &c. They are formed in any ordinary or suitable way, as will be readily understood. In setting the blocks the skew-backs C are first set with a mortar joint, J, against one of the iron beams A, and held there by the workman while the large hollow blocks B are let in with one end against the mortar joint of the opposite beam and lowered into place, resting on the beveled mortar joint H of the skew-backs. The two series are supported at the joint until the mortar is set. The mortar is filled in at G before or after setting of that at the joint H, as desired. Mortar joints also are made between the blocks.

The skew-backs may be all placed side by side, and also may be placed to form a continuation of the hollow blocks; but it is preferred to place the skew-backs some on one beam and some on the opposite, and also to make the skew-backs and long blocks break joints with each other, as shown on the drawing.

The large hollow blocks are made all of one size for a given span, and a number of different-sized solid skew-backs of increasing widths are used to overcome the small irregularities of space so frequently found in buildings.

The blocks may have corrugations, or not, on their bottoms, to assist the adhesion of plastering, and may have, or not, grooves on their sides to assist the strengthening of the mortar joints between them.

By the means heretofore set forth I have, therefore, overcome the disadvantages first indicated, viz: the expense of centering the imperfect setting of one end of the hollow block when the whole span consists of one block, which may be too short, the danger of destroying the weak corner of the single block, the multiplicity of joints, consumption of mortar, and variety of expensive patterns for blocks.

Having thus fully described my said invention, and the manner in which the same is or may be carried into effect, what I claim as my invention, and desire to secure by Letters Patent, is—

1. A floor-arch adapted to rest between iron beams, consisting of only two blocks, viz: a single hollow block, the hollows of which are perpendicular to the beams, and a single solid skew-back, the whole substantially as described.

2. A fire-proof floor composed of iron beams with bottom flanges, long blocks hollow in the direction of their length, which are supported at one end by flanges of the aforesaid beams, solid skew-backs supported at one edge by flanges of the beams, the distance between two of the beams being spanned by two blocks, a hollow long block, and a skew-back, and both the long blocks and skew-backs being provided with dovetailed grooves at the lower edge, where they rest against the flanges of the supporting-beams, substantially as described.

3. The hollow block for floor-arches, having one end squared over the greater part of its surface, but cut away or grooved at its lower edge and beveled at the other end, the said bevel extending as shown, so that the block is narrower upon the lower than upon the upper side, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

LEONARD FORBES BECKWITH.

Witnesses:

JAMES C. ROSSÉ,

EDW. B. DICKINSON.