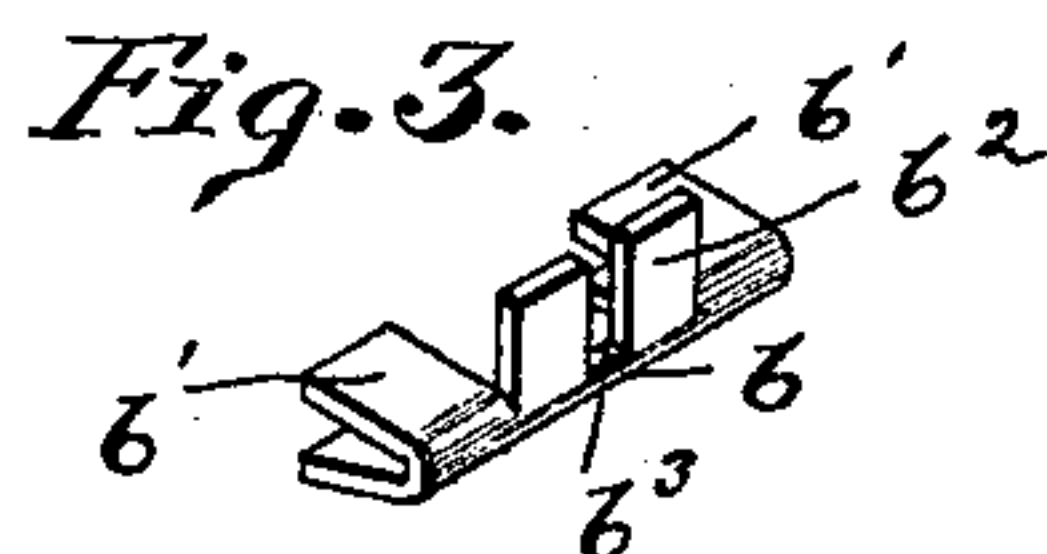
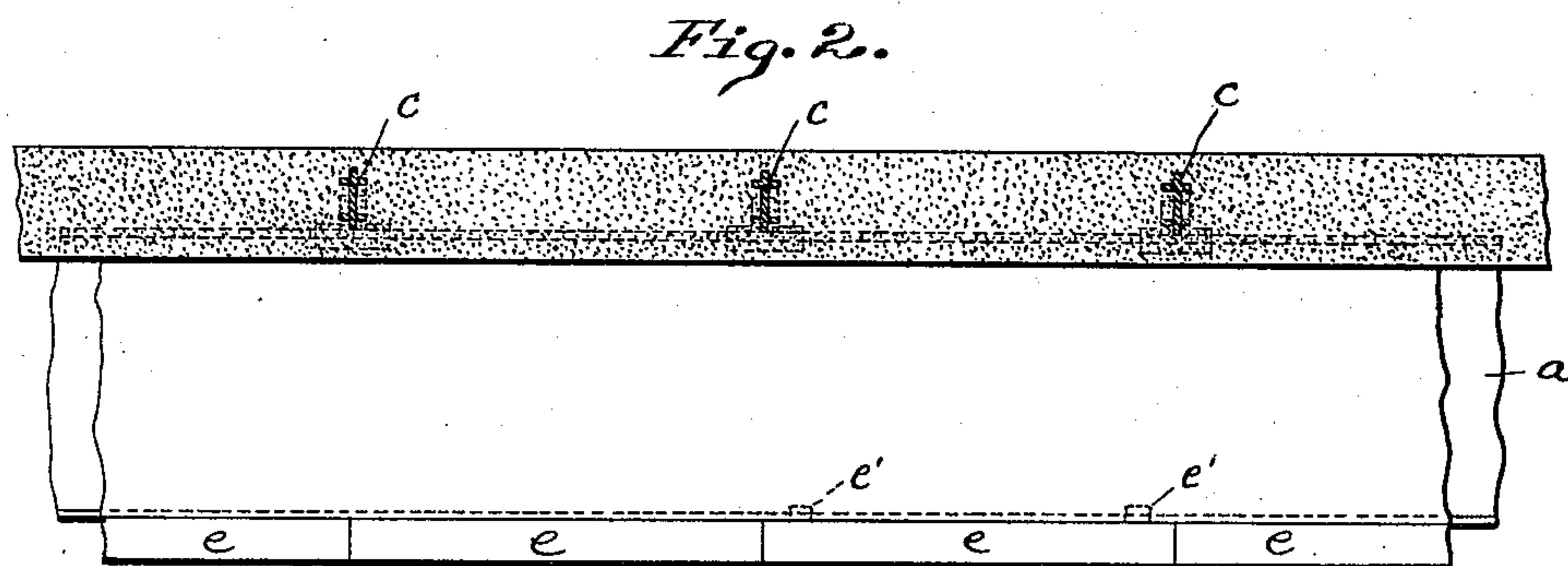
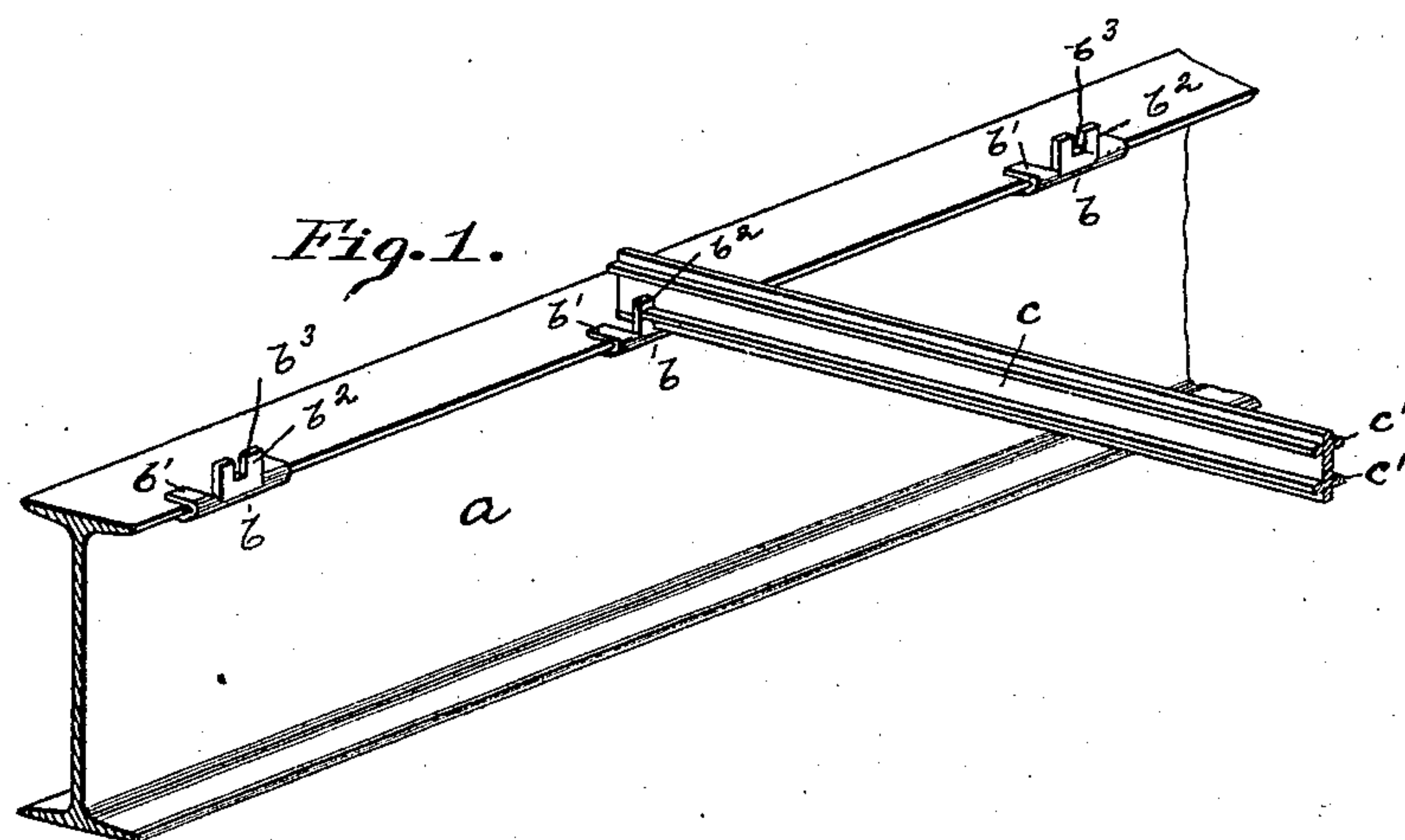


(No Model.)

C. A. BALPH & E. P. S. WRIGHT.  
FIREPROOF FLOOR AND CEILING.

No. 582,384.

Patented May 11, 1897.



Witnesses:

Walter Tamariss  
Robert C. Totten

Inventors:

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Attorneys



# UNITED STATES PATENT OFFICE.

CHARLES A. BALPH, OF PITTSBURG, PENNSYLVANIA, AND ELISHA P. S. WRIGHT, OF NEW YORK, N. Y.

## FIREPROOF FLOOR AND CEILING.

SPECIFICATION forming part of Letters Patent No. 582,384, dated May 11, 1897.

Application filed August 12, 1896. Serial No. 602,476. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES A. BALPH, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, and ELISHA P. S. WRIGHT, a resident of New York, county and State of New York, have invented a new and useful Improvement in Fireproof Floors and Ceilings; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to fireproof floor and ceiling construction, and more particularly to a certain form of such floors and ceilings as is set forth in Letters Patent of the United States No. 527,042, granted to us on the 9th day of October, 1894. In that patent there are metal bars of a length corresponding to the space between the beams and extending transversely of and connected to the beams, said bars being supported on their edges and a filling of concrete completely embedding said bars. The present invention relates to a novel means of connecting said bars to said beams, so that said bars will be supported on their edges.

The invention comprises certain novel features, all of which are set forth and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a portion of a beam, showing the ends of the bars supported in the manner of the invention. Fig. 2 is a like view of the floor with the concrete in position and partly broken away to expose a portion of the bars. Fig. 3 is an enlarged view of one of the metal clips.

Like letters indicate like parts in each of the figures.

The letter *a* designates a suitable metal I-beam, such as employed in fireproof structures. The clip *b* is formed of suitable metal, such as malleable iron. This clip consists of the tongues *b'*, which are pliable, and the upwardly-projecting portion *b<sup>2</sup>*, having the seat *b<sup>3</sup>* formed therein. The clips are arranged at suitable intervals along the beams, and they are connected to the flanges of the beams by means of the tongues, which are bent to engage said flanges.

We have illustrated the invention as applied to that form of floor and ceiling construction in which no air-space is formed between the floor and ceiling, but the floor itself also forms the ceiling. It is apparent, however, that in case the air-space is employed

the same clips may be attached to the lower flanges of the beams.

In the present instance the clips are shown as attached to the upper flanges, and said clips are adapted to support the bars. As set forth in the Letters Patent hereinbefore referred to, one of the chief features of the invention contained therein is the metal bars supported on their edges and embedded in concrete. We prefer to employ metal bars which are ribbed or roughened on their side faces, as by the use of such bars the concrete is bound and held in place more securely. Accordingly the metal bars *c* have the ribs *c'* formed along the sides thereof, the ends of said bars being supported within the seats *b<sup>3</sup>* of the clips *b*. A portion of the lower rib at the end of the bar is cut away to permit said bar to rest in said seat *b<sup>3</sup>*.

When the bars have been arranged in the manner described, a suitable "centering" is erected to support the concrete while it is being packed around the metal bars *c*. This centering is removed after the concrete has set, when the metal bars support said concrete.

The bottom flange of the beam *a* has the tiles *e* attached thereto, said tiles having the pliable clips *e'* projecting therefrom and engaging said flange. This tile is set forth and claimed in an application filed by us on the 21st day of January, 1896, Serial No. 576,290. Concrete *f* may then be used to cover the remainder of the beam.

What we claim as our invention, and desire to secure by Letters Patent, is—

In fireproof floors and ceilings formed of concrete, the combination with the metal I-beams, of metal clips having inwardly-projecting tongues engaging the flanges of said beams and an upwardly-projecting portion having a seat formed therein, metal bars supported on their edges in said seats, and concrete completely embedding said bars, substantially as set forth.

In testimony whereof we, the said CHARLES A. BALPH and ELISHA P. S. WRIGHT, have hereunto set our hands.

CHARLES A. BALPH.  
ELISHA P. S. WRIGHT.

Witnesses:

ROBT. D. TOTTEN,  
ROBERT C. TOTTEN.