(No Model.)

W. W. MARTIN.

BEAM, JOIST, &c.

No. 320,079. Patented June 16, 1885.

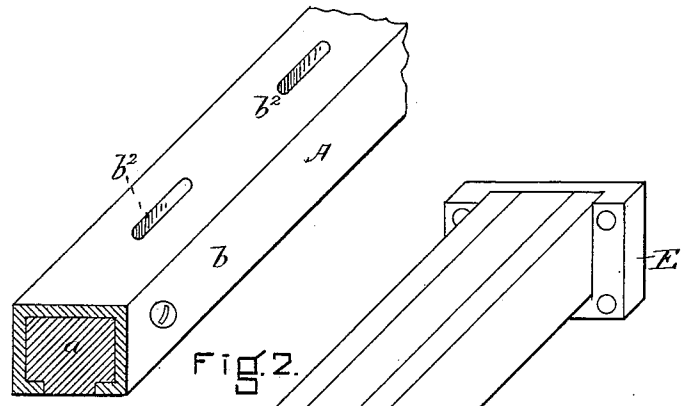


Fig. 2.

Fig. 1.

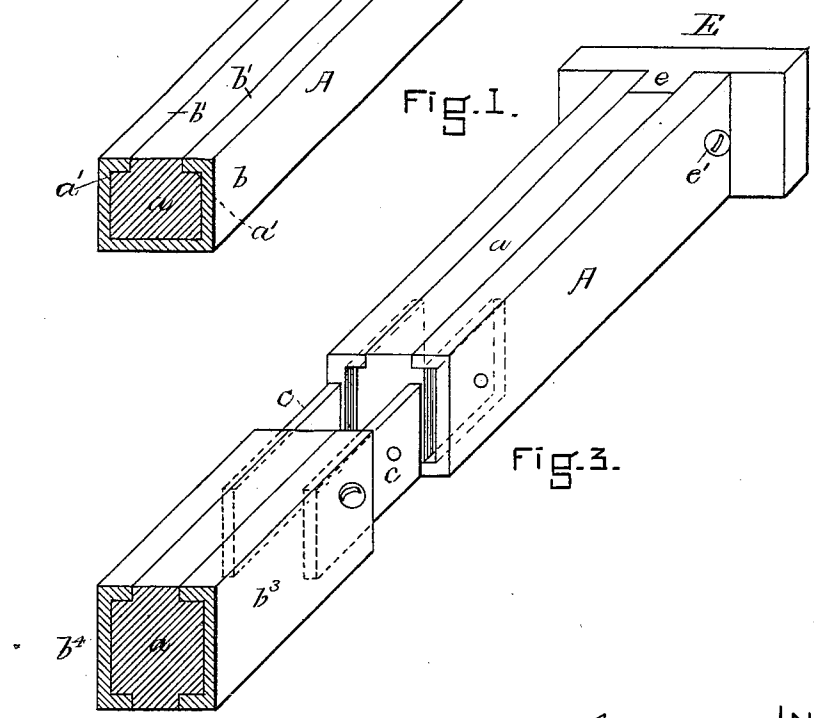


Fig. 3.

WITNESSES

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N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

WEBSTER W. MARTIN, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO THOMAS O. POTTER, OF SAME PLACE.

BEAM, JOIST, &c.

SPECIFICATION forming part of Letters Patent No. 320,079, dated June 16, 1885.

Application filed March 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, WEBSTER W. MARTIN, of Boston, in the county of Suffolk and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Beams, Joists, Stringers, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification in describing its nature, in which—

Figure 1 represents in perspective a beam containing the features of my invention, and Figs. 2 and 3 show details hereinafter especially referred to.

The invention relates to composite beams, joists, stringers, posts, columns, &c., made of wood incased with iron, steel, or other metal arranged in relation to each other to combine strength and comparative lightness, and provision for fastening thereto by nailing or other equivalent fastening.

Referring to the drawings, A represents a beam, joist, or girder containing the features of my invention, and I have represented the one shown in Fig. 1 as having the central portion, *a*, of timber of proper dimensions, and the exterior, *b*, of metal, the metal, however, not inclosing the entire upper surface of the timber, but leaving a portion exposed for the reception of the nails or fastenings used in fastening cross-stringers or boards, flooring, &c., thereto. The metal casing *b* is made quite thin, and preferably is formed by rolling or bending a flat plate so that the sides shall be at right angles to the bottom. The timber is then inserted and the flanges *b'* turned down into recesses *a'* formed in the upper surface of the timber, or the flanges may be first rolled or formed to shape and the timber slid into place, or there may be no flanges, in which case the timber, if desired, may be bolted to the metal sides. The metal shell *b* is provided with suitable holes, b^2, forming mortises for the reception of tenons on uprights, cross beams, stringers, &c.

Instead of making the metal shell of the beam in one part, I may form it in two parts, b^3 and b^4, as shown in Fig. 3, between which the wood section *a* of the beam is placed, and which are bolted together through the wood. These pieces may have flanges which extend into recesses formed in the wood section, if desired.

I have also shown in said drawings means for splicing such beams, consisting of the plates *c*, bolted or riveted to the end of one section and extending within the other section and bolted or riveted thereto.

The beam or joist may have at one or both ends a cross-piece, E, which may be embedded in brick-work or used as a base of a post, and it is secured in place either by means of a screw or bolt passing through the same into the wood section or by means of a projection, *e*, and bolt *e'*, as shown in Fig. 3, or in any other desirable way.

Of course there are many modifications of the form of this invention, and I do not confine myself to the specific forms herein described, the principal purpose of the invention being to provide a combined wood and metal beam, joist, stringer, column, &c., in which the wood shall be inclosed upon two or more sides by a comparatively light metal plate or plates, shaped in the best form to resist strains and give strength, and for the purpose of increasing the strength of beams, &c., while at the same time the advantages of an all-wood beam are preserved, in that one or more sections of wood are left exposed as a means of forming an attachment or fastening by nailing.

It will be observed that for the purpose of providing a composite beam, stringer, rafter, &c., that it will not be necessary that the nailing-surface be flush with the metal shell, and it may be within it, or may extend beyond it. It is also obvious that in lieu of the wood or timber the space within the metal portion of the beam, joist, &c., may be filled with wood pulp, terra-cotta, or other similar material, solidly packed therein, as it is intended to obtain the principal strength of the beam, joist, &c., from the metal portion thereof, and any material which is adapted to receive a nail or fastening of any character can be used in connection with the metal casing or shell.

The metal casing or shell should be made thick enough to obtain all necessary strength, and it may be of the same thickness through-

out, or the sides may be heavier or thicker than the flanges at the top and the bottom, or not, as may be desired, as it is not essential that the metal of the casing be of one thickness; but it is essential to obtain the construction with the least weight of metal. This construction of the composite beam has another advantage in that even when wood or timber is inclosed by a casing it is still substantially fire-proof, and will resist the action of intense heat longer and more uniformly than will solid metal beams.

The wood or other material inclosed by the metal shell or casing will also prevent it from warping or bending when hot, and will strengthen it by holding its sides in place and braced apart.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. A composite beam, joist, stringer, post, or other similar article comprising a central section of wood and a continuous shell or envelope of steel or iron which closely fits the wood, and which has the flanges b', projecting therefrom to inclose the wooden section, all substantially as and for the purposes described.

2. The combination, in a post, beam, stringer, joist, or other similar article, of a central section, a, of wood, and an exterior shell, b, of metal surrounding the wood upon three sides, and having the flanges b', extending upon the fourth side thereof, but not to entirely cover the wood, whereby the strength of the composite post or beam is increased, and a nailing-surface provided, all substantially as and for the purposes described.

3. A combined wood and metal beam, joist, or other similar structural device having the central section of wood, the exterior shell of metal, and the metal cross-piece E, all substantially as and for the purposes described.

4. A combined wood and metal beam, joist, or other similar structural device having one or more mortises or holes, b^2, formed in the metal shell, all substantially as and for the purposes described.

5. The combination of two sections of a combined wood and metal beam, &c., with coupling plate or plates c, substantially as and for the purposes described.

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Witnesses:
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