

(No Model.)

H. C. HODGES.

COMPOSITE BEAM.

No. 385,624.

Patented July 3, 1888.

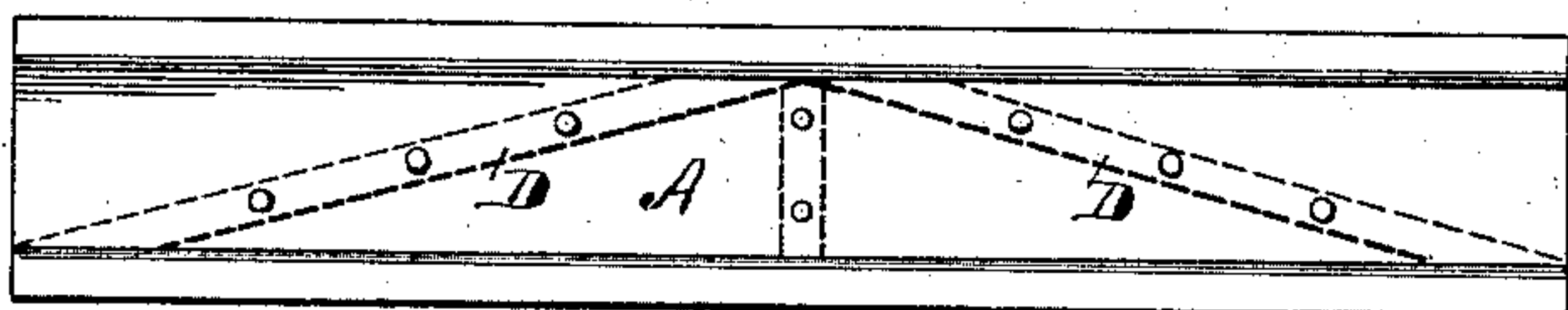
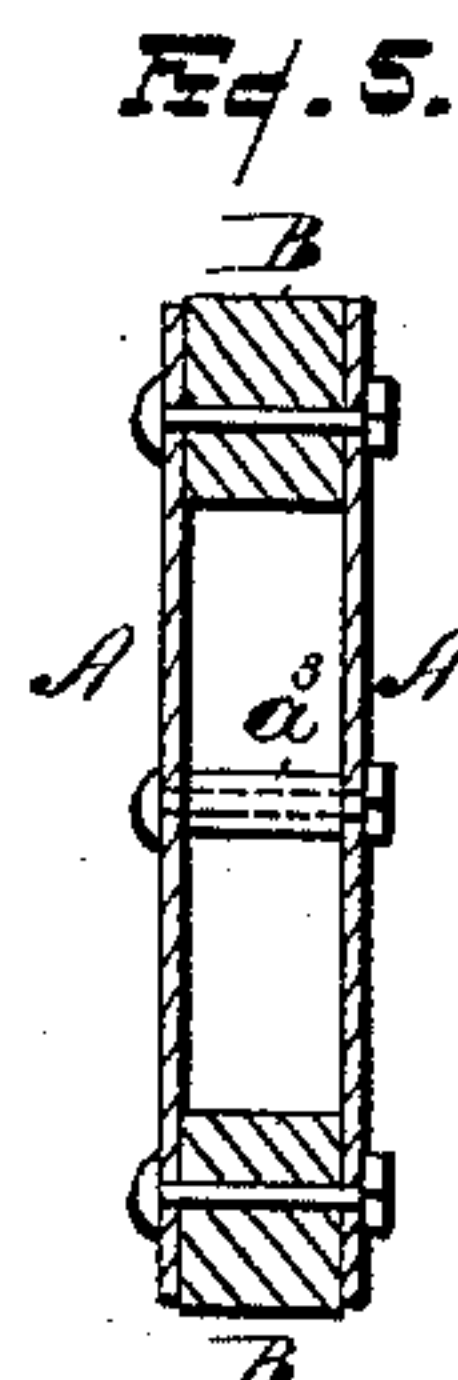
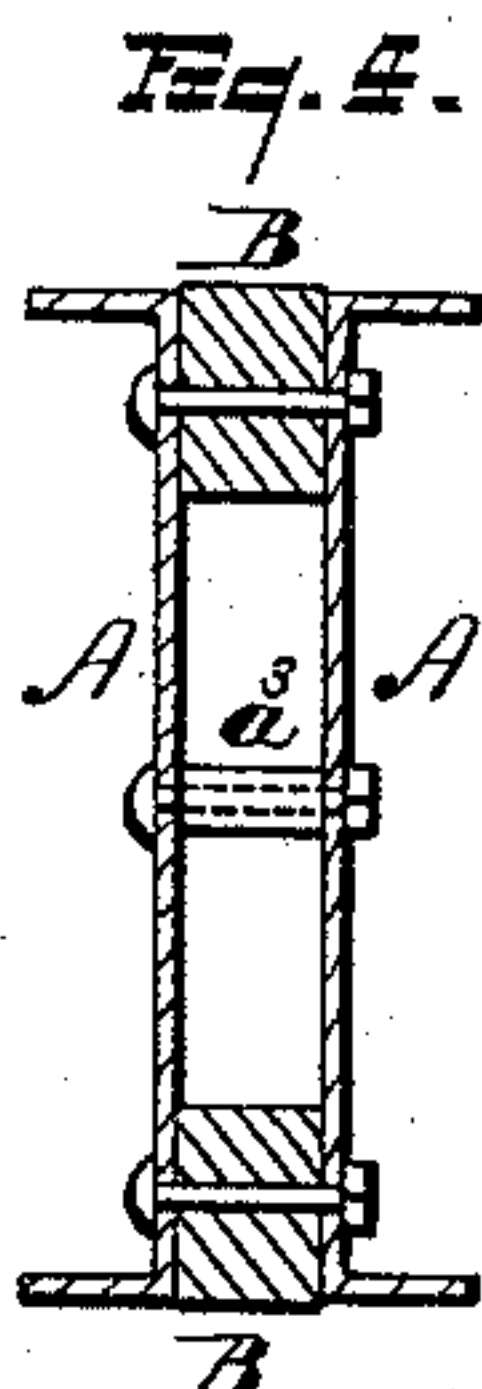
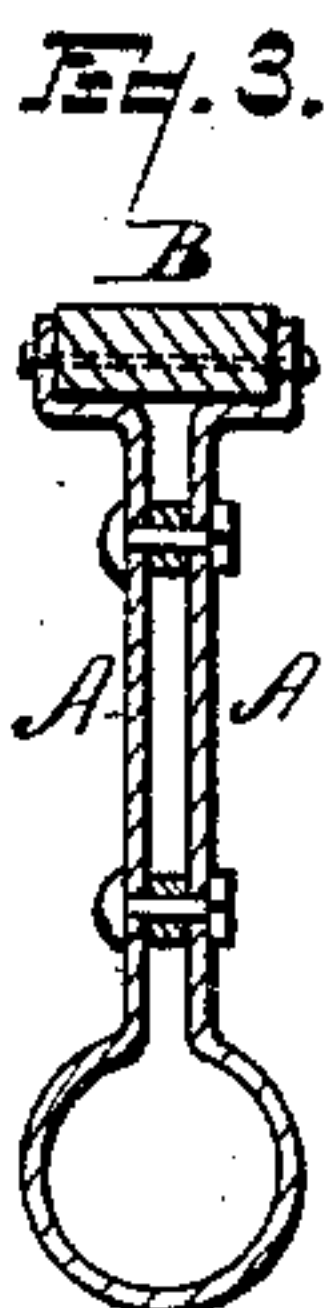
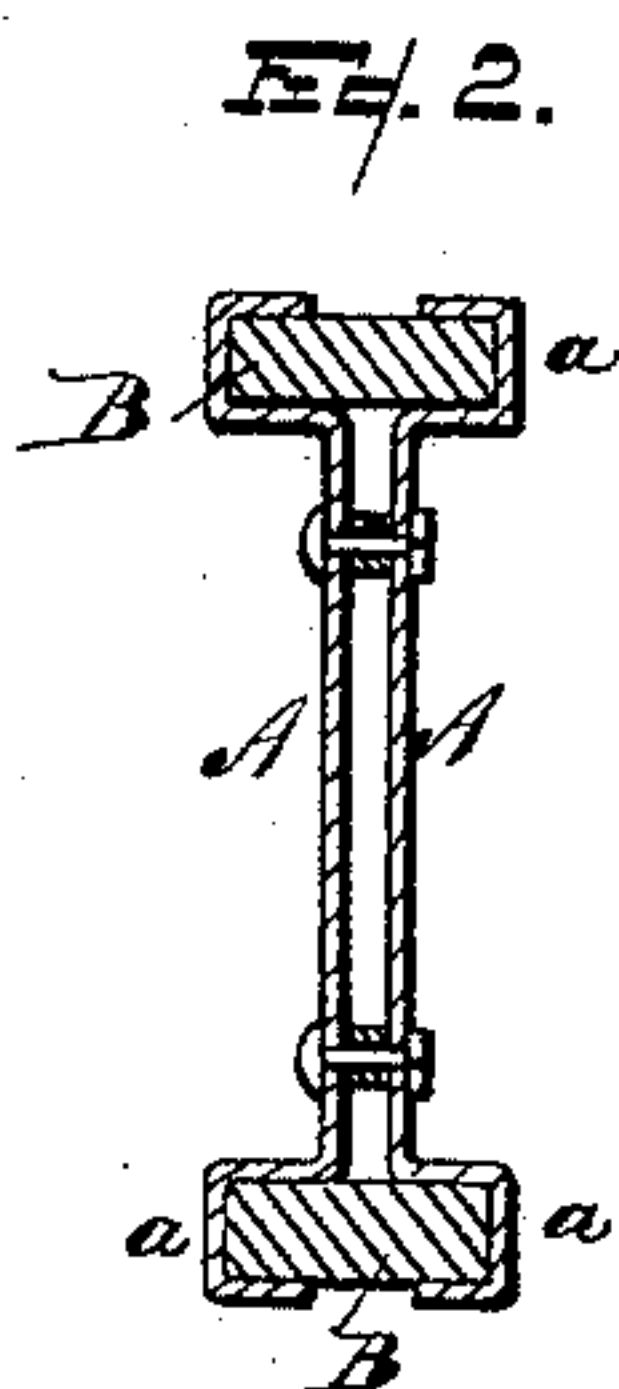
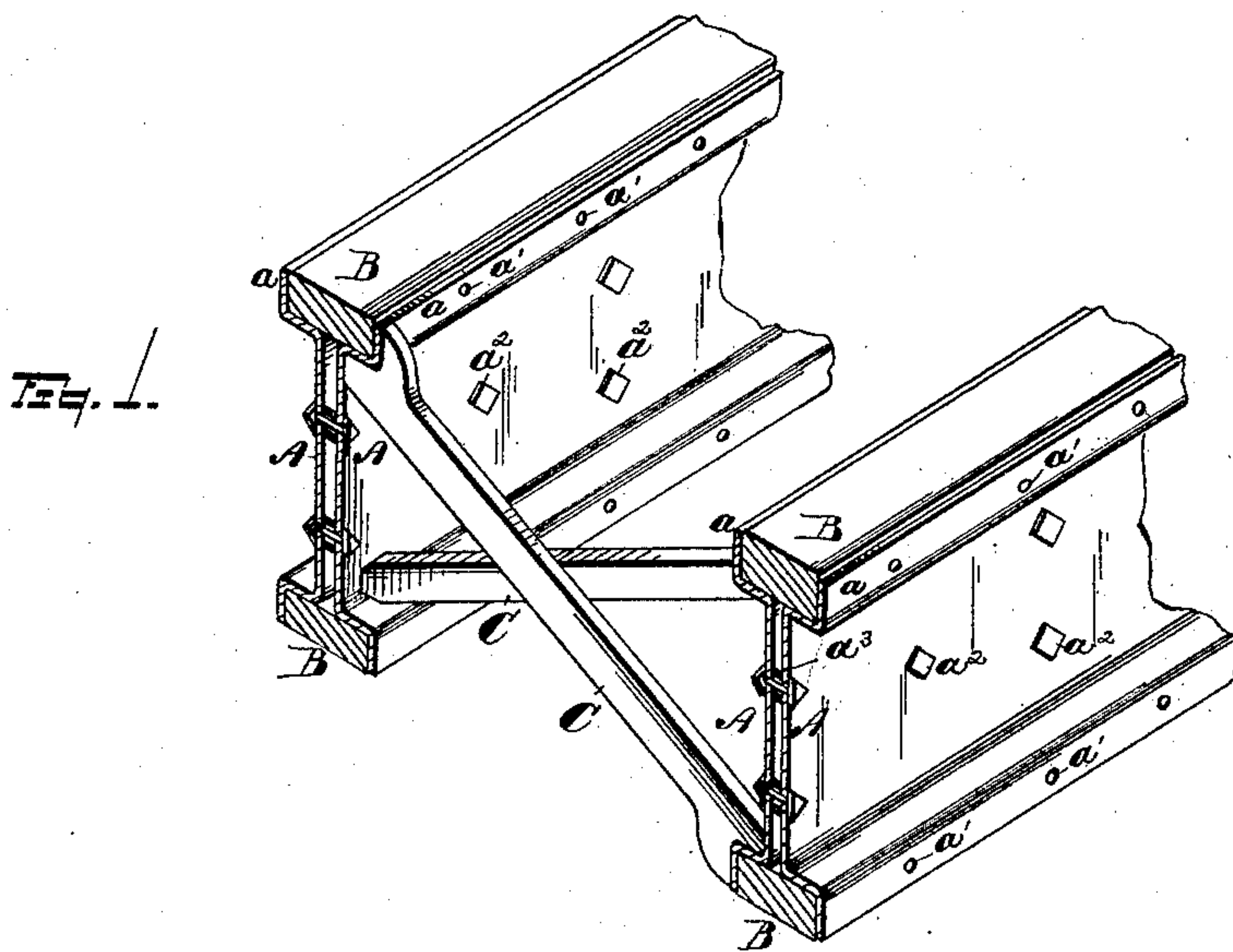


Fig. 6.

WITNESSES

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UNITED STATES PATENT OFFICE.

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COMPOSITE BEAM.

SPECIFICATION forming part of Letters Patent No. 385,624, dated July 3, 1888.

Application filed February 9, 1888. Serial No. 263,410. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. HODGES, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Composite Beams; and I do declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

In the drawings, Figure 1 is a cross section of a composite beam embodying my invention and representing how the same may be employed in connection with bracing as floor-joists. Fig. 2 is a variation in which the metal is made to grasp the outer face of the wood at its edges. Fig. 3 is another variation in which the beam embraces a wood element at one edge, while its other edge is bent into tubular form. Fig. 4 illustrates a variation in which the wood element is embraced between the portions which constitute the web at the upper and lower edges of the beam. Fig. 5 is another variation in which the wood is embraced between the parts which constitute the web at its upper and lower edges, and the usual outstanding flanges at these edges are dispensed with. Fig. 6 is another variation in which the spaces between the two webs are made to contain diagonal braces.

It is the purpose of my invention to produce a composite beam of wood and metal, the said beam designed to rely for strength more particularly upon the metallic web, while the wood is employed to afford convenience for the attachment of flooring, roofing, lathing, &c., by simply nailing thereto.

In carrying out my invention, A A represents two metallic sheets. These sheets are rolled in such form that when placed side by side they will constitute, in general appearance, an eye-beam, the outer edges, *a*, being carried forward parallel with the web, so as to embrace a strip of wood, B. As thus made up, the sheets A A and the wood element B may be fastened together by bolts or rivets *a'*, and there may, in addition thereto, be bolts or rivets *a''*, uniting the sheets along the web, and these are passed through intermediate timbers, *a'''*, or other equivalent metallic separat-

ing part, which will serve to hold the webs apart from each other at the points where they are thus bolted or riveted, and so truss and stiffen the web portion of the composite beam.

It is apparent that a composite beam of this construction is well adapted for all building purposes where strength and cheapness of material are essential. They afford at once the strength of metal beams, while they possess all the conveniences of wooden beams. If used as joists, they afford ready means for nailing to them both the floor and the lathing, and the diagonal bracing C may, if desired, be readily adjusted thereto. If used as studding, they possess the same facilities, affording strength of metal, yet readily adapted for lathing upon both sides—as, for instance, in partitions, or for ceiling upon one side and lathing upon the other. So, also, in roofing-rafters, they afford the same features of strength and convenience. In addition to the strength and convenience of these composite beams, they are in most localities practically fire-proof, since the exposed portions in almost all localities where they would be used would be metal. It is also apparent that a very light metal—such as would be sufficient to give adequate strength along the web—might not be sufficiently strong to give the requisite strength to the upper and lower edges of the beam, which become, respectively, the compression and extension members of the beam. These members, however, are greatly re-enforced by the wood elements, and so the composite beam as a whole, although made of comparatively light material, is exceedingly strong.

The invention admits of many variations without departing therefrom—as, for instance, the metallic sheets may be shaped to embrace and lap over the exposed surface of the wood, as shown in Fig. 2, and so hold the wood without other fastening, it being only necessary to bolt or rivet the web portions of the metallic sheets.

Again, as shown in Fig. 3, the sheet may be bent into a tube at one edge and flanged outward to receive the wood element at the opposite edge. This construction might answer well for roof-girders and in other localities where the lower edge of the beam remains unused and exposed.

Again, as shown in Fig. 4, the metal might

be bent to form web portions and with simply outstanding flanges at their upper and lower edges, and the wood elements be embraced between the webs at the upper and lower edges; 5 or, as shown in Fig. 5, the wood element might be embraced between the web portions of the metal at the upper and lower edges and the outstanding flanges be entirely omitted. This latter form would suffice in very many localities—as, for instance, for studding, flooring, 10 joists, and the like—and would constitute a very cheap and effective beam. This is applicable in all localities where joists, studding, girders, and frame-work of any kind are required; and, instead of fastening the webs together or the wood to the metal by bolts or 15 rivets, they may be fastened in any other convenient way.

It will be understood that instead of wood 20 any other similar substance—such as papier-maché or the like—might be employed, and although wood is doubtless the most convenient for the purpose, I would have such other substances regarded as equivalents.

25 These beams have upon or embodied between their webs braces D, as shown in Fig.

6. These braces will serve to stiffen the beam very materially, either throughout its whole length or at any particular portion of its length where it may be subjected to great strain. The 30 webs are riveted or bolted through the braces.

What I claim is—

1. A composite wood and metal beam consisting of two sheets of metal bent to form, when placed side by side, a web, and in connection therewith wood elements embraced 35 between their edges, said metal sheets being united along their web portions by bolts or rivets passing therethrough and through intermediate metallic separating parts, substantially as and for the purposes described. 40

2. The combination, with a composite wood and metal beam, of diagonal braces upon or embodied between the web and bolted or riveted thereto, substantially as described. 45

In testimony whereof I sign this specification in the presence of two witnesses.

HENRY C. HODGES.

Witnesses:

M. B. O'DOHERTY,
SAMUEL E. THOMAS.