

(No Model.)

2 Sheets—Sheet 1.

W. J. LEE.

COLUMN, STRUT, GIRDER, &c.

No. 412,397.

Patented Oct. 8, 1889.

Fig. 1.

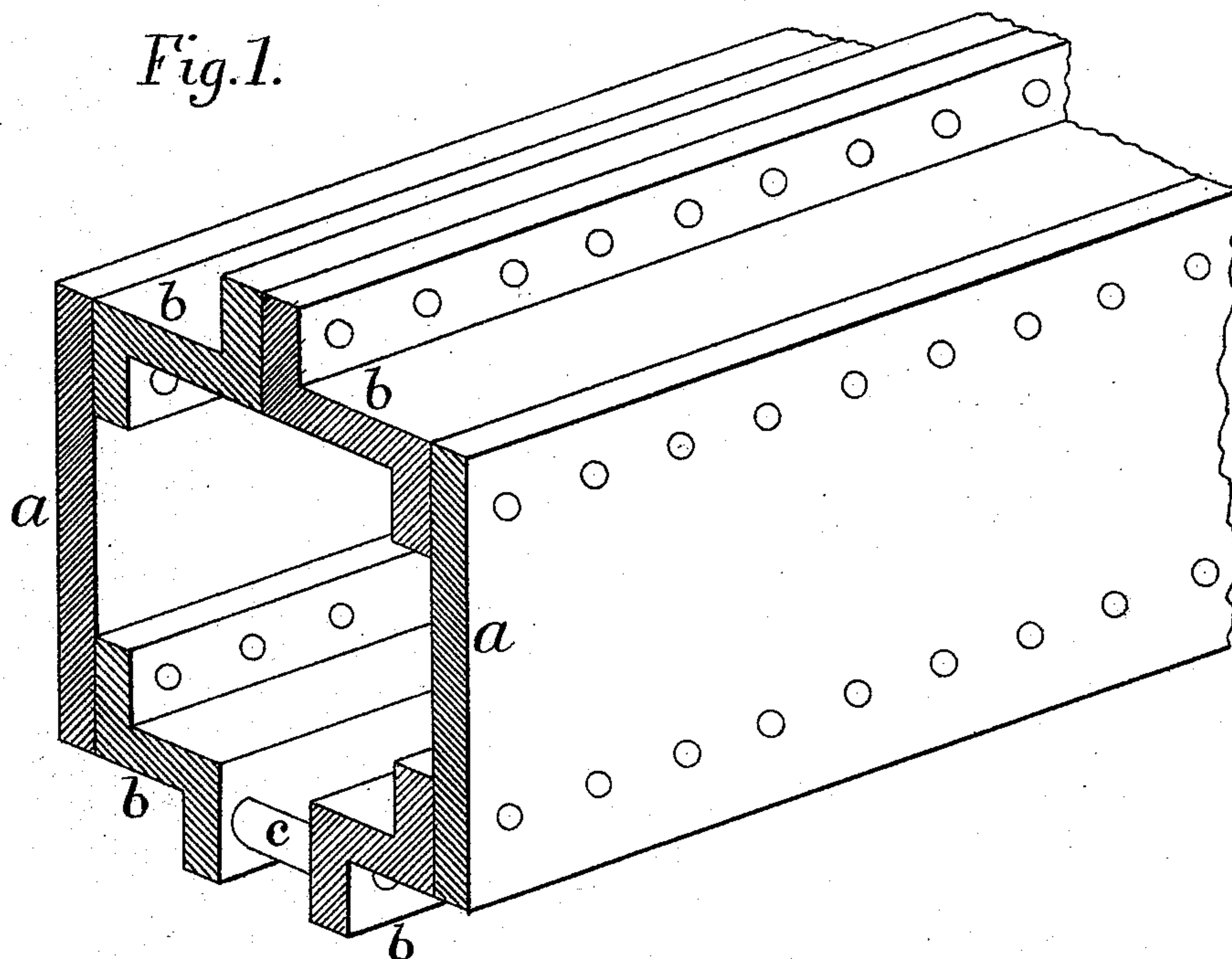
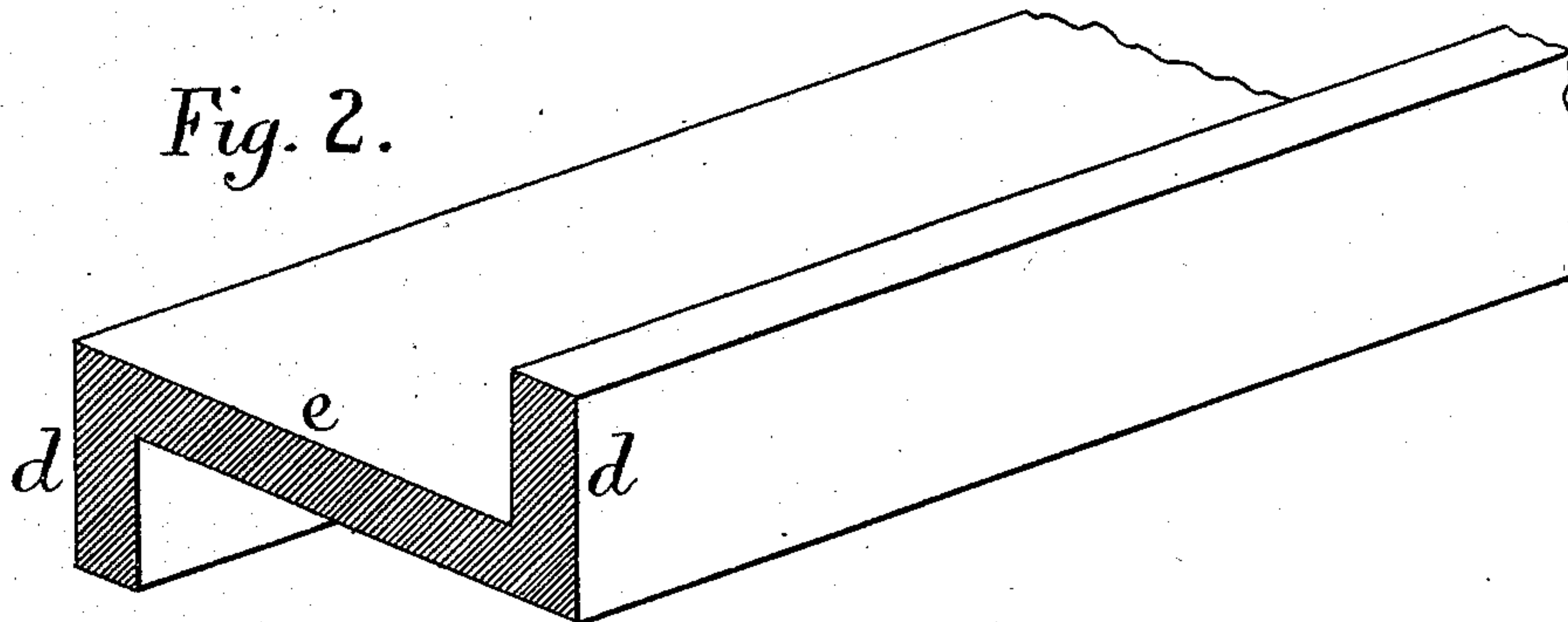


Fig. 2.



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Fig. 3

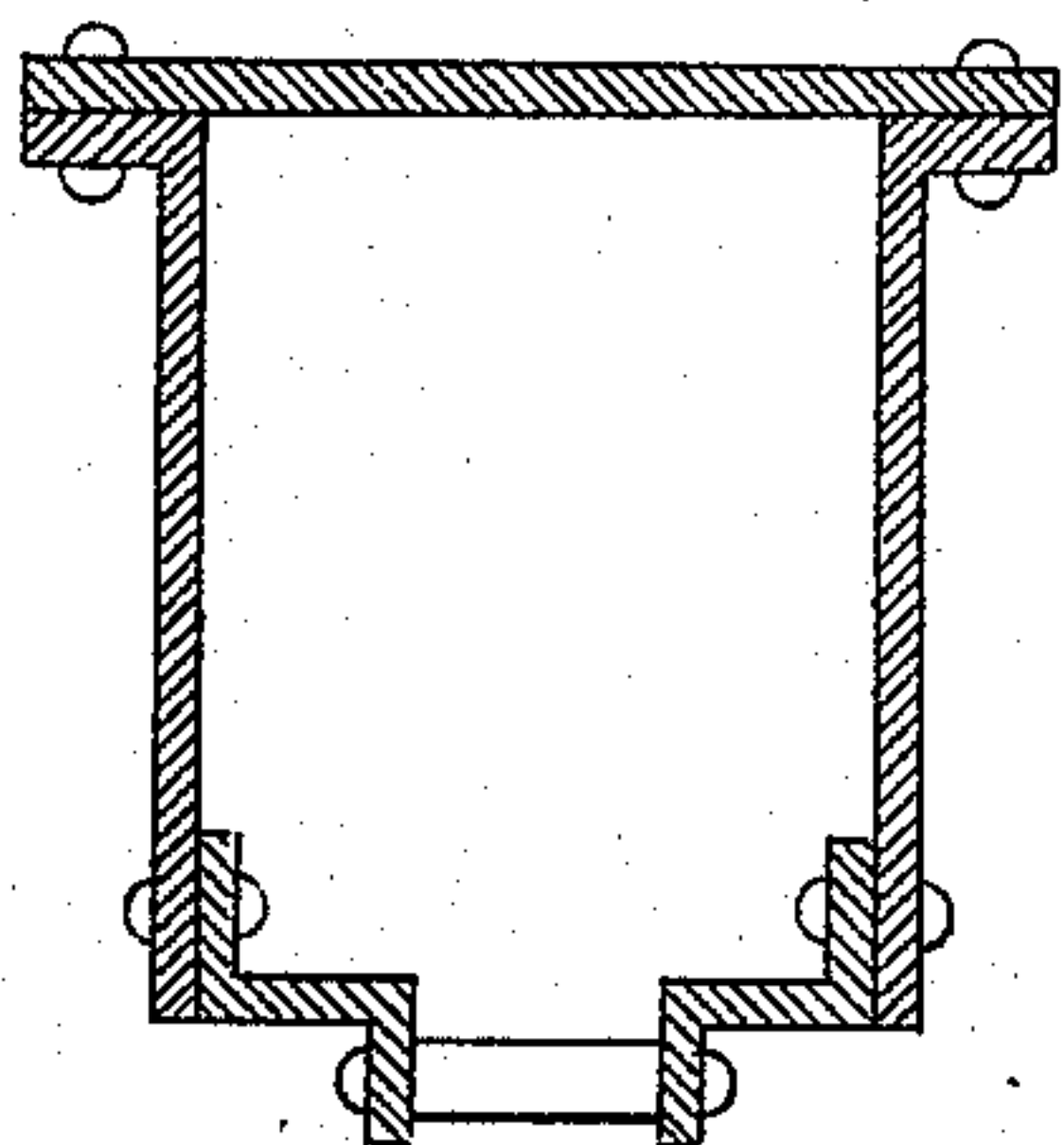


Fig. 4

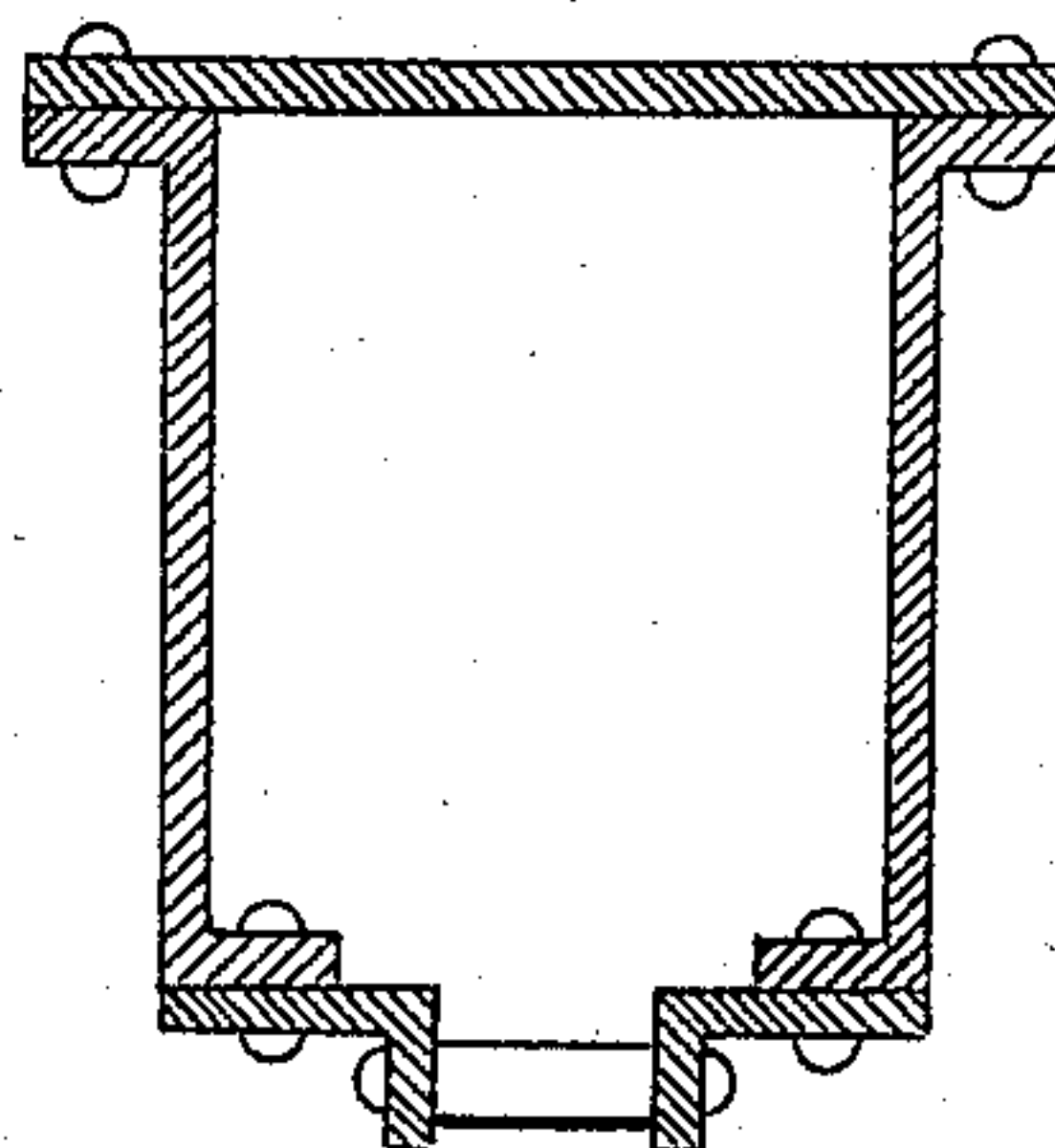
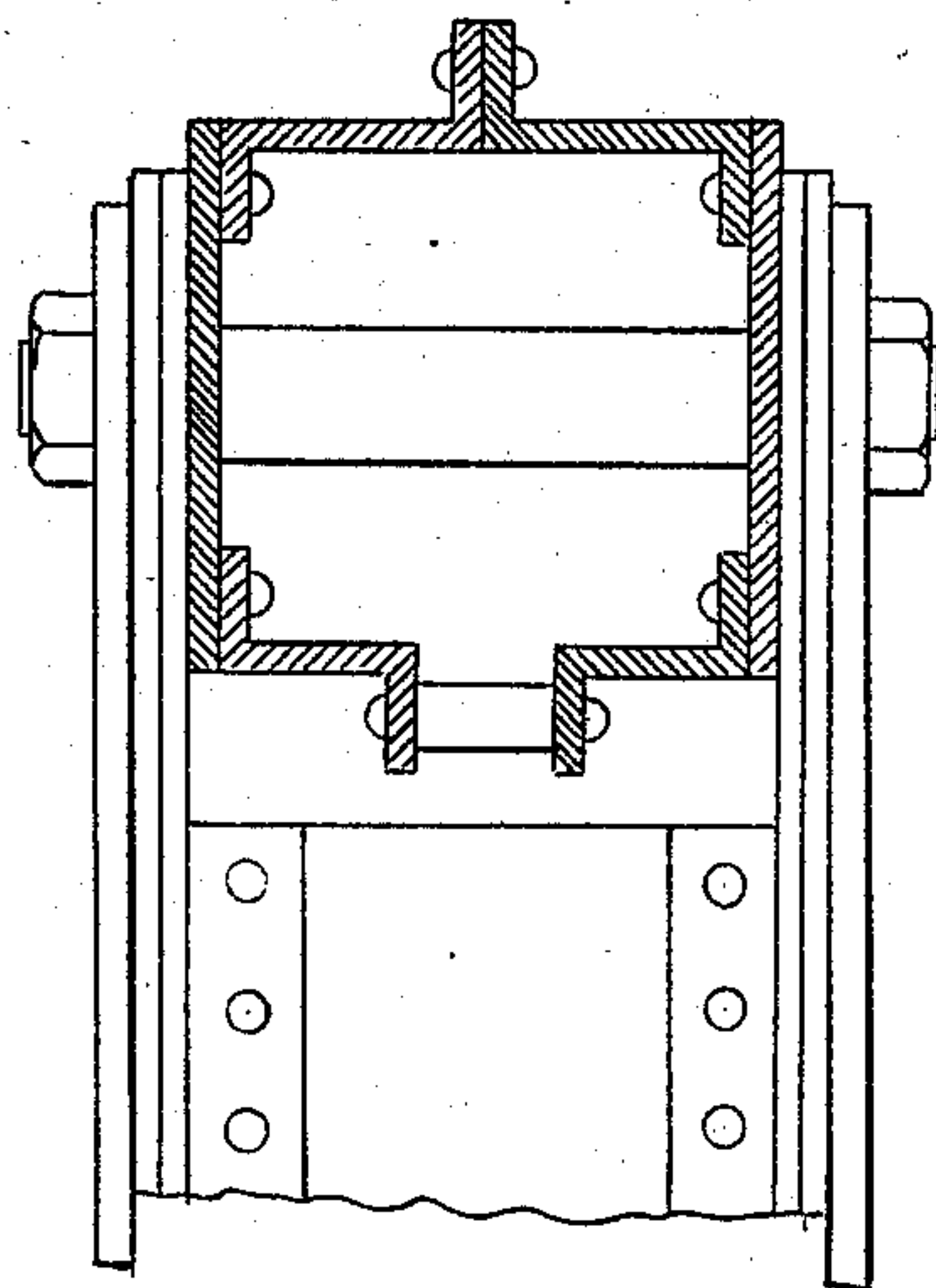


Fig. 5



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UNITED STATES PATENT OFFICE.

WILLIAM J. LEE, OF TRENTON, NEW JERSEY.

COLUMN, STRUT, GIRDER, &c.

SPECIFICATION forming part of Letters Patent No. 412,397, dated October 8, 1889.

Application filed May 10, 1889. Serial No. 310,340. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. LEE, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented a new and useful Column, Strut, Girder, or Similar Structure, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

10 The object of my invention is to form a column (for use principally in bridges, as a chord-piece, post, or strut, but which may be used for other purposes) which will possess the following distinctive features: first, to be
15 accessible to the inside for painting or other purposes; second, to be substantially rectangular in form, having at least two sides, which are straight for a considerable portion of their cross-sectional surface and parallel or nearly
20 parallel to each other; third, all the shapes forming the column to be fastened together by means of rivets or bolts and washers, or similar contrivances, without the use of batten-plates or lattice-bars. I accomplish these
25 objects by a combination of shapes in such a manner that one or more sides of the column or similar structure are left open far enough for access to the inside for painting or other purposes, while at the same time flanges project in such a manner that the shapes forming the column can be securely fastened together by means of rivets or bolts and washers, or similar contrivances.

35 A convenient method of arranging the material is shown in Figure 1, which is a drawing of a column formed of the plate *a* and the Z-shaped bars *b*, riveted, bolted, or otherwise fastened together, as shown, *c* being a washer.

40 Another arrangement is shown in Fig. 3, which is a drawing of a column formed of the plate *a*, the Z-shaped bars *b*, and the angle-bars *d*, *c* being a washer.

45 Still another arrangement is shown in Fig. 4, which is a combination of the plate *a*, the Z-shaped bars *b*, and the angle-bars *d*, *c* being a washer.

Fig. 2 is a drawing of the Z-shaped bar.

50 Fig. 5 shows a convenient connection of the web members to the top chord in a pin-connected bridge, by which will be seen the great advantage possessed by this form of

column over any other form of column used for this purpose. The flanged bars need not necessarily be solid rolled bars. For example, the angle-bars may be constructed by riveting together a plate and a smaller angle-bar, and the Z bars may be constructed by riveting together a plate and two angle-bars, or by riveting together two angle-bars. It is not necessary that the column be perfectly rectangular in form. For example, in Fig. 1 it is apparent that the angle formed by the intersection of the flanges of the Z-shaped bars *b* with the web of the same may be other than a right angle, thus forming a column polygonal in form; or, in Figs. 3 and 4, the plate *a* may be curved or otherwise bent, or any other changes of a similar nature may be made without departing from the principle of the invention.

It is very important that the inside of a column, strut, girder, or similar structure used in a bridge or other exposed position be accessible for painting, because if the iron or steel (the metals generally used) is not frequently repainted it rusts and deteriorates very rapidly. The lattice-bars or batten-plates, which are generally used to connect together the different parts of columns which are accessible to the inside, form a considerable portion of the weight of the column and add nothing to its effective section; hence it is apparent that a column which does not require lattice-bars or batten-plates, and which is accessible to the inside, is a great improvement over a column which does require lattice-bars or batten-plates.

In a chord, post, or strut of a bridge it is important that at least two sides of the section should be straight for a considerable portion of their cross-sectional surface, and parallel or nearly parallel to each other, so that secure connections may be conveniently made.

It will be understood that I do not limit myself to the precise details herein described, as the same may be varied without departure from the principle of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A metallic column, strut, girder, or similar structure substantially rectangular in form, having one or more partly-open sides

formed of flanged bars arranged with flanges projecting so that they may be fastened together by means of rivets or bolts and washers or similar contrivances without the use of
5 lattice-bars or batten-plates, substantially as shown and described.

2. In a metallic column, strut, girder, or similar structure substantially rectangular

in form, one or more sides thereof constructed of angle or **Z**-shaped bars with flanges placed back to back. 10

WM. J. LEE.

Witnesses:

JOHN LEE,
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