

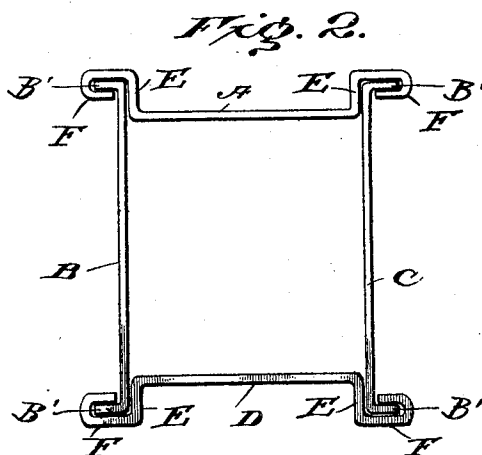
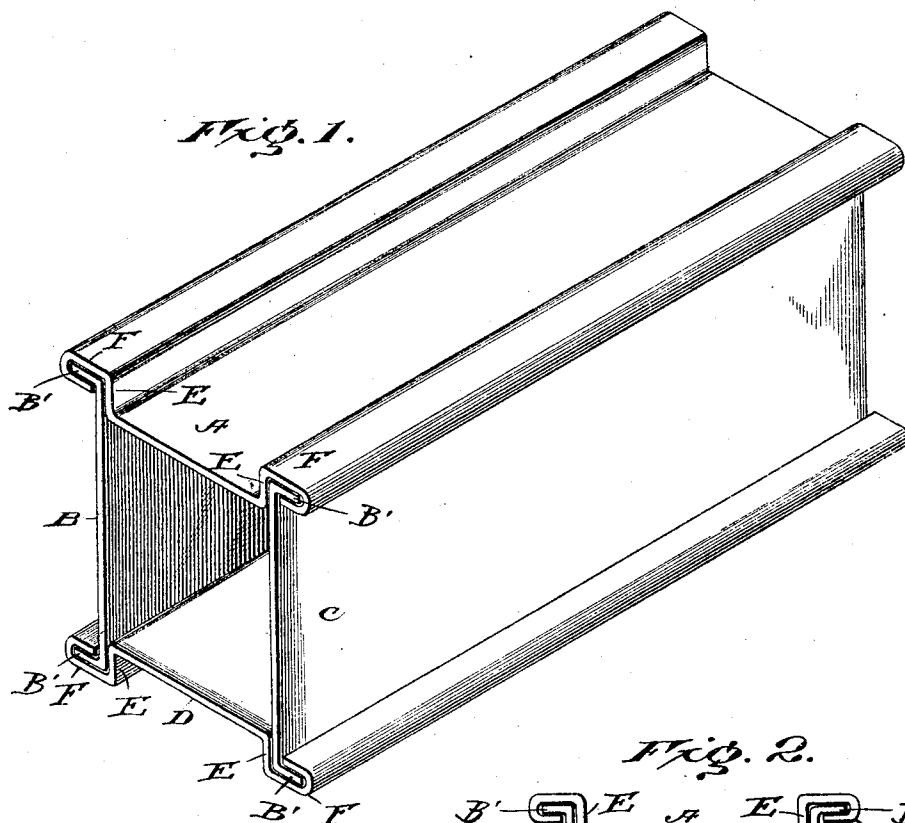
No. 799,320.

PATENTED SEPT. 12, 1905.

O. G. FRANKS.
METAL COLUMN, GIRDER, AND BEAM.

APPLICATION FILED FEB. 9, 1904.

2 SHEETS—SHEET 1.



Witnesses.
Stewart Rice
J. R. Martin

Inventor.
Oscar G. Franks
by *Cyrus Kehr*
Attorney

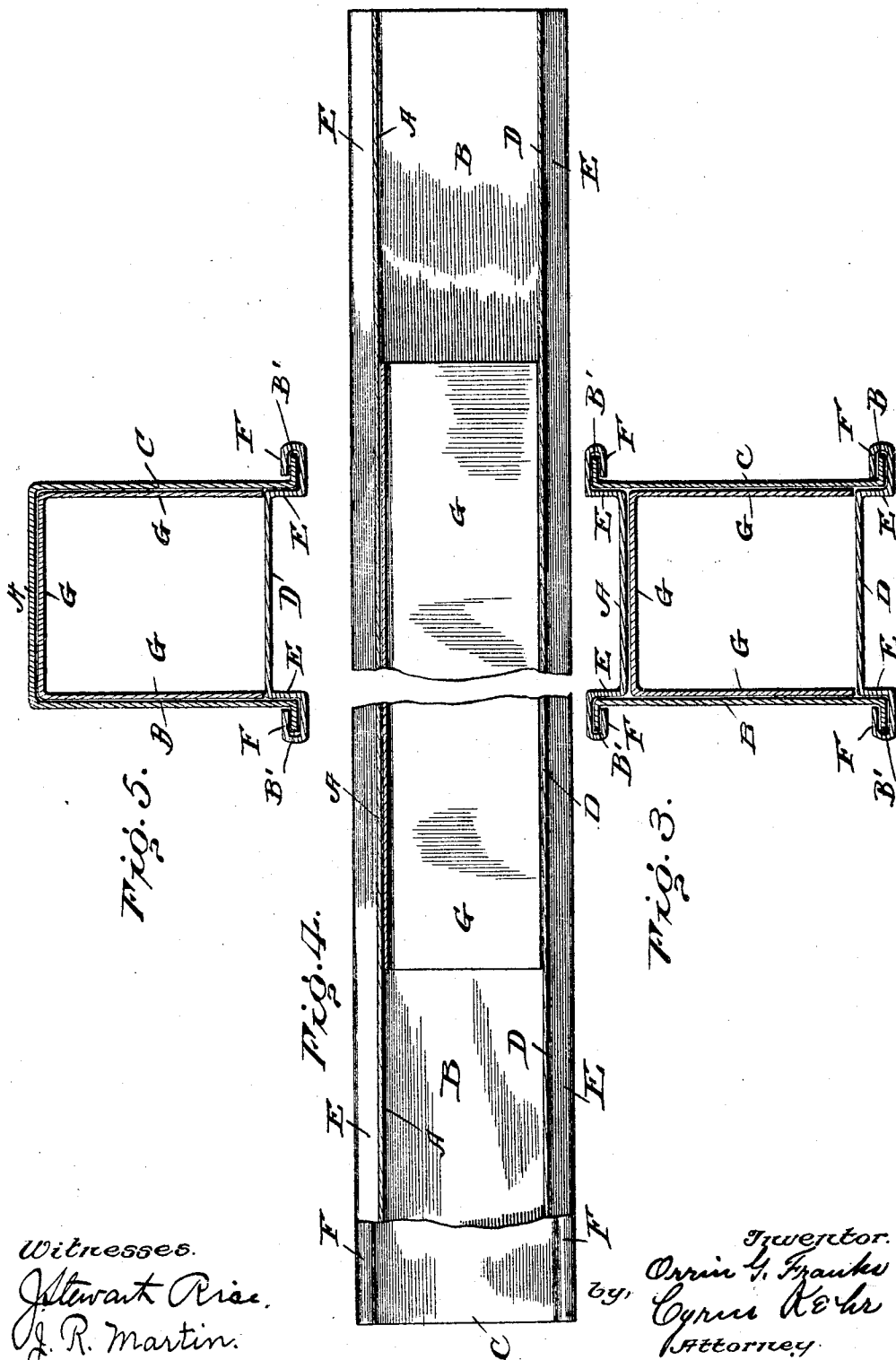
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2 SHEETS—SHEET 2



Witnesses.
Stewart Rice.
J. R. Martin.

Inventor.
Orrin G. Franks
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UNITED STATES PATENT OFFICE.

ORRIN G. FRANKS, OF SPRINGFIELD, OHIO.

METAL COLUMN, GIRDER, AND BEAM.

No. 799,320.

Specification of Letters Patent.

Patented Sept. 12, 1905.

Application filed February 9, 1904. Serial No. 192,827.

To all whom it may concern:

Be it known that I, ORRIN G. FRANKS, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented a new and useful Improvement in Metal Columns, Girders, and Beams, of which the following is a specification, reference being had to the accompanying drawings.

My improvement relates particularly to metal columns, girders, or beams formed of sheet-metal pieces extending lengthwise of the column and joined by their edges.

The object of the invention is to provide such a column or beam which shall embody a maximum of strength with a minimum of metal used in forming the structure.

The column or beam is designed to be used in various structures, particularly those requiring a combination of strength and lightness.

In the accompanying drawings, Figure 1 is a perspective view of a portion of one form of a column embodying my improvement. Fig. 2 is an end view of the same column. Fig. 3 is a transverse section of a modification. Fig. 4 is a longitudinal vertical section of the form shown in Fig. 3. Fig. 5 is a transverse section of another modification.

In the forms illustrated by said drawings the column or girder is substantially a four-sided rectangular prism. The four walls are designated, respectively, by the letters A, B, C, and D, the walls A and D being opposite each other, and the walls B and C being opposite each other. The walls B and C have at their free lateral edges an outward-directed flange B'. The said walls A and B are bent inward a short distance between the walls B and C, so as to form portions E of the walls A and D bearing flatwise against the inner faces of the walls B and C, and said walls A and D have at each lateral edge a flange F, which embraces and interlocks with the adjacent flange B' of the walls B and C, each of the flanges F having an inner portion which extends outward parallel with the adjacent flange B' and an outer portion which extends inward around the adjacent flange B'.

The flanges F may be suitably pressed into engagement with said flanges B', and, if so desired, the flanges F may be joined to said flanges B by soldering, brazing, or otherwise.

It will be understood that the column, girder, or beam may be made of metal of any suitable quality or thickness and that the structure

may be varied in dimensions or proportions or other details.

In the modifications illustrated by Figs. 3, 4, and 5 a reinforcing-section G is applied within the girder or beam along the length of any portion of the girder or beam which is to be subjected to transverse strains. For example, if the structure is to be used as a beam or girder supported at its ends and taking a load between the ends such reinforcing-section should extend along the middle of the length of the beam or girder. Said reinforcing-section is U-shaped in cross-section, as clearly shown in Fig. 3, and the two parallel walls thereof are to be set parallel or approximately parallel to the direction of strain.

In Fig. 5 the reinforcing-section is applied to a beam or girder constructed like the form shown in Figs. 1 and 2, excepting that the walls A, B, and C are integral.

It will be observed that said reinforcing-section may be so formed as that the two parallel walls thereof will be firmly engaged by the outer walls of the column, and thus held against lateral bending. By the use of said reinforcing-section maximum strength may more readily be combined with a minimum of metal. In other words, by this construction I make a distribution of strength in a beam or girder according to strains, and yet the beam or girder is made out of commercial sheet metal of uniform thickness.

I claim as my invention—

1. A metal column, girder, beam or the like comprising opposite walls having outwardly-directed edge flanges, and connecting-walls having inbent portions arranged between said first-mentioned walls and flanges which embrace and interlock with the flanges of the first-mentioned walls, substantially as set forth.

2. A metal column, girder, beam or the like, comprising opposite substantially parallel walls having outwardly-directed edge flanges, and substantially parallel connecting-walls having inbent portions arranged between said first-mentioned walls, and flanges the inner portions of which extend outwardly parallel with the flanges of the first-mentioned walls and the outer portions of which extend inwardly around the flanges of the first-mentioned walls, substantially as set forth.

3. A metal column, girder, beam or the like, comprising opposite substantially channel-shaped members having outwardly-directed

flanges, and connecting members of substantially uniform thickness throughout having inbent portions which extend in between the body portions of said channel-shaped members to hold the latter from inward movement, and flanges which embrace and interlock with the flanges of said channel-shaped members, substantially as set forth.

4. A metal column, girder, beam or the like comprising opposite walls each having an outwardly-directed edge flange, and a connecting-wall having an inbent portion arranged between said first-mentioned walls and flanges which embrace and interlock with the flanges of the first-mentioned walls, and a U-shaped reinforcing-section located within said column, girder, or beam, substantially as set forth.

5. A metal column, girder, beam or the like, comprising opposite, substantially parallel walls each having an outwardly-directed edge flange, and substantially parallel walls connecting said first-mentioned walls, one of said connecting-walls having an inbent portion arranged between said first-mentioned walls and flanges the inner portions of which extend outwardly parallel with the flanges of the first-mentioned walls and the outer portions of which extend inwardly around the flanges of the first-mentioned walls, and a U-shaped reinforcing-section located within said column, girder, or beam, substantially as set forth.

6. A metal column, girder, beam or the like, comprising opposite sheet-metal walls each having an outwardly-directed edge flange, and a sheet-metal connecting-wall having inbent portions arranged between said first-mentioned walls and flanges which embrace and interlock with the flanges of the first-mentioned walls, and a U-shaped reinforcing-section located within said column, girder, or beam, substantially as set forth.

7. A metal column, girder, beam or the like, comprising opposite sheet-metal walls, each having an outwardly-directed edge flange, and a sheet-metal connecting-wall having an inbent central portion which extends in between

the body portions of said first-mentioned walls and flanges which embrace and interlock with the flanges of said first-mentioned walls, and a U-shaped reinforcing-section located within said column, girder, or beam, substantially as set forth.

8. A metal column, girder, beam or the like comprising opposite walls having outwardly-directed edge flanges, and connecting-walls having inbent portions arranged between said first-mentioned walls and flanges which embrace and interlock with the flanges of the first-mentioned walls, and a U-shaped reinforcing-section located within said column, girder, or beam, substantially as set forth.

9. A metal column, girder, beam or the like, comprising opposite substantially parallel walls having outwardly-directed edge flanges, and substantially parallel connecting-walls having inbent portions arranged between said first-mentioned walls, and flanges the inner portions of which extend outwardly parallel with the flanges of the first-mentioned walls and the outer portions of which extend inwardly around the flanges of the first-mentioned walls, and a U-shaped reinforcing-section located within said column, girder, or beam, substantially as set forth.

10. A metal column, girder, beam or the like, comprising opposite substantially channel-shaped members having outwardly-directed flanges, and connecting members of substantially uniform thickness throughout having inbent portions which extend in between the body portions of said channel-shaped members to hold the latter from inward movement, and flanges which embrace and interlock with the flanges of said channel-shaped members, and a U-shaped reinforcing-section located within said column, girder, or beam, substantially as set forth.

In testimony whereof I have signed my name, in presence of two witnesses, this 2d day of February, in the year 1904.

ORRIN G. FRANKS.

Witnesses:

HORACE C. KEIFER,
WM. W. KEIFER.