(No Model.)

E. M. BUTZ.

METAL BEAM OR GIRDER.

No. 304,795. Patented Sept. 9, 1884.

Fig. 1.

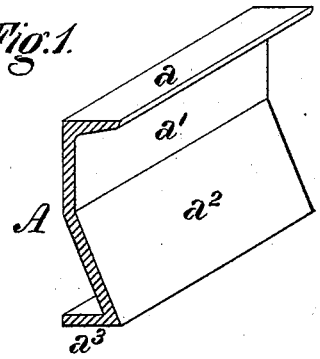


Fig. 2.

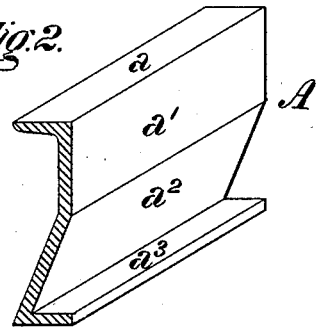


Fig. 3.

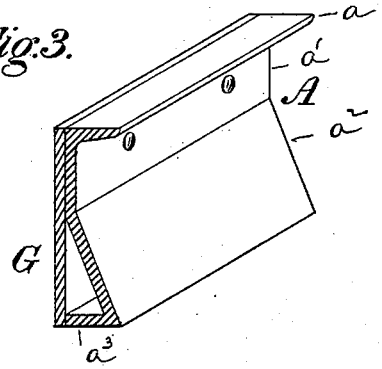


Fig. 4.

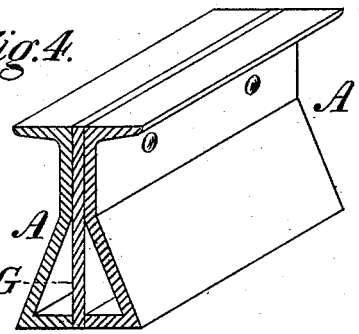
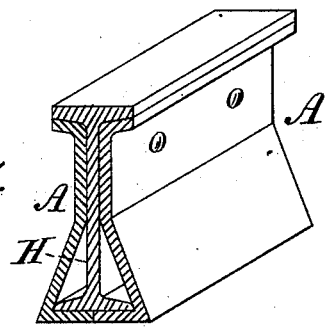


Fig. 5.



WITNESSES:

J. Howden Bell.

R. A. Whittlesey

INVENTOR,

Edward M. Butz.

BY George H. Christy

ATTORNEY.

UNITED STATES PATENT OFFICE.

EDWARD M. BUTZ, OF ALLEGHENY, PENNSYLVANIA.

METAL BEAM OR GIRDER.

SPECIFICATION forming part of Letters Patent No. 304,795, dated September 9, 1884.

Application filed March 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, EDWARD M. BUTZ, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Metal Beams or Girders, of which improvement the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a section in perspective of a metal shape or bar adapted for use in beams or girders embodying my invention; Fig. 2, a similar section of a plate having its inclined portion bent in opposite direction to that of the plate shown in Fig. 1; and Figs. 3 to 5, inclusive, similar sections of beams, illustrating, respectively, different structural applications of said plates.

My invention relates to beams or girders for buildings or other structures, its object being to provide a beam or girder having inclined sides or faces on its web, as is, under certain conditions, desirable, in which the metal shall be so disposed that proper strength and lightness may be attained without undue expense or complication in construction.

The improvements claimed are hereinafter fully set forth.

To carry out my invention, I form of rolled metal a plate, A, of the shape shown in section in the several figures, and as set forth in an application for Letters Patent filed by me December 13, 1883, Serial No. 114,429 (Case B)—to wit, having a continuous body bent into four different planes, the outer portions, a and a^3, of the plate A, adjacent to its opposite longitudinal edges, being substantially parallel, and one or both being about at a right angle to one of the intermedite portions, and the intermediate portions, a' and a^2, being bent relatively at an obtuse angle, or in the form of a flattened **V**, having sides of unequal length, that which is perpendicular, or nearly so, to its adjoining outer portion being the narrower of the two. The plate A is designed to stand vertically, with the portion a^3 at its lower side when in use, and the portion a may descriptively be termed the "upper flange," the portion a' the "vertical web," the portion a^2 the "inclined web," and the portion a^3 the "lower flange." The inclined web a^2 may be bent either to the right, as in Fig. 1, or to the left, as in Fig. 2, the direction of the upper and lower flanges, a and a^3, being correspondingly changed. Under my present invention I employ a plate so shaped as a lateral member in a built or composite beam or girder, instances of different forms of which are illustrated in Figs. 3 to 5 inclusive.

Fig. 3 shows a beam formed of a plain vertical web or plate, G, and a plate, A, of the shape described, connected to one side thereof; Fig. 4, a beam formed of two plates A, having their webs oppositely inclined, and a plain interposed plate or web, G; and Fig. 5 a beam formed of two plates A, having oppositely-inclined webs, and an interposed **I**-beam or web, H.

It will be obvious that the form and section of the member, combined with one or more of the plates described in the construction of a composite beam, may be varied in the judgment of the constructer; and I do not, therefore, limit myself to any specific form of connected web in said combinations.

I claim herein as my invention—

The combination, in a composite beam or girder, of a metal plate of the shape or section described, and a rib or web abutting against the vertical web of said plate, substantially as set forth.

In testimony whereof I have hereunto set my hand.

EDWARD M. BUTZ.

Witnesses:

J. SNOWDEN BELL,

R. H. WHITTLESEY.