

(No Model.)

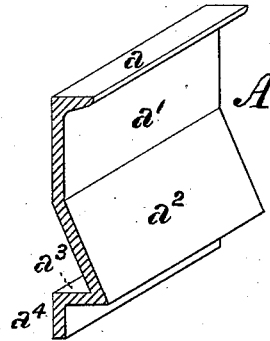
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STRUCTURAL SHAPE FOR BEAMS, GIRDERS, &c.

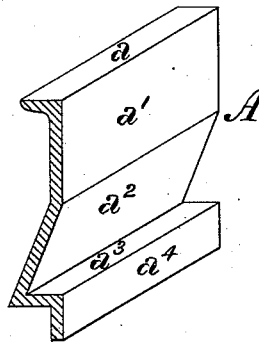
No. 304,784.

Patented Sept. 9, 1884.

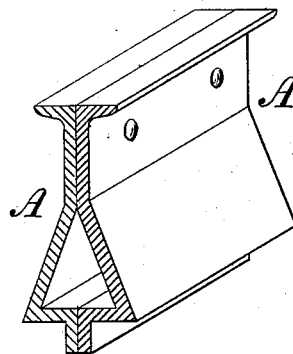
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## STRUCTURAL SHAPE FOR BEAMS, GIRDERS, &c.

SPECIFICATION forming part of Letters Patent No. 304,784, dated September 9, 1884.

Application filed December 13, 1883. (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, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Structural Shapes for Beams, Girders, &c.; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a section in perspective of a metal shape plate 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 Fig. 3, a similar section of a beam formed of two plates of the shape shown in Figs. 1 and 2, united with their inclined portions in reverse directions, respectively.

My invention relates to shapes for metal plates or bars adapted to use in beams or girders for buildings and other structures; and its object is to provide a light and strong beam having inclined sides or faces on its web, and suitable strengthening members above and below said inclined sides.

The improvements claimed are hereinafter fully set forth.

To carry out my invention I form of rolled metal a plate, A, of the shape in section shown in the several figures—to wit, having a continuous body bent into five different planes, arranged relatively as follows: The upper outer portion,  $a$ , of the plate is bent at or about at a right angle to the adjacent upper vertical portion,  $a'$ , which is substantially in line with the lower outer vertical portion,  $a''$ , or in a plane parallel, or nearly so, therewith. The

next adjacent portion,  $a^2$ , is inclined at an obtuse angle to the upper vertical portion,  $a'$ , and the next adjacent portion,  $a^3$ , is bent so as to connect the lower side of the inclined portion  $a^2$  with the upper side of the lower vertical portion,  $a'$ . There are thus provided in the plate an upper transverse member or flange,  $a$ , an upper vertical web,  $a'$ , an inclined web,  $a^2$ , a transverse web,  $a^3$ , and a lower vertical web,  $a''$ . A plate so shaped may be used singly as the web of a beam or girder, but is preferably employed as a member of a built or composite beam or girder, instances of different forms of which are illustrated in Fig. 3, the same being formed by the connection of two plates of the shape above described, with their inclined portions in reverse directions, respectively, and abutting by their vertical webs.

I claim herein as my invention—

1. A structural metal plate of shape or section as described, adapted to use in a beam or girder, the same having a continuous body bent into five different planes, and presenting in succession a transverse flange, an upper vertical web, an inclined web, a transverse web, and a lower vertical web, substantially as and for the purpose set forth.

2. The combination, in a composite beam or girder, of two metal plates of the shape or section described, having their inclined webs bent in opposite directions, respectively, and having their vertical webs abutting one against the other, substantially as set forth.

In testimony whereof I have hereunto set my hand.

EDWARD M. BUTZ.

Witnesses:

J. SNOWDEN BELL,  
R. H. WHITTLESEY.