No. 702,332.

Patented June 10, 1902.

E. W. SAMEN.

METAL TRUSS.

(Application filed Jan. 15, 1902.)

(No Model.)

2 Sheets—Sheet 1.

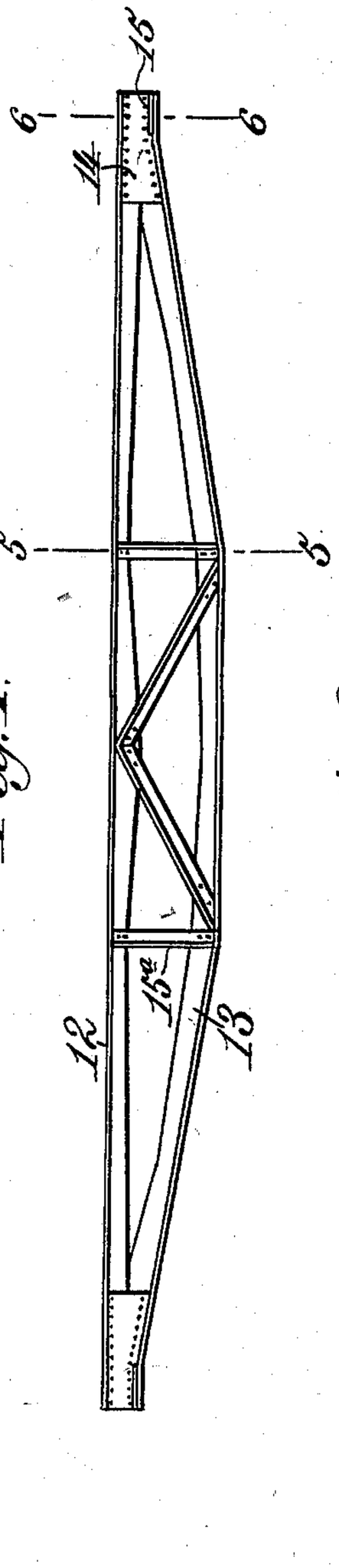

Fig. 1.

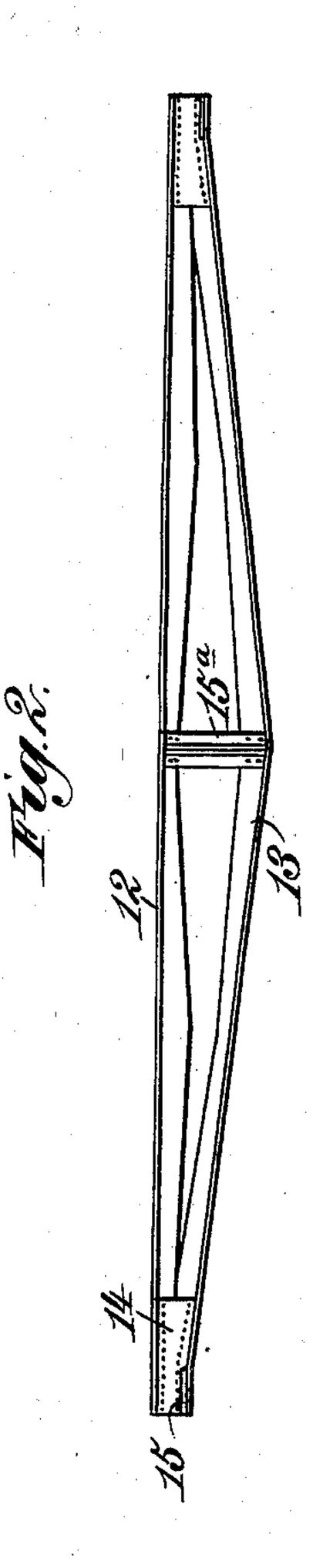

Fig. 2.

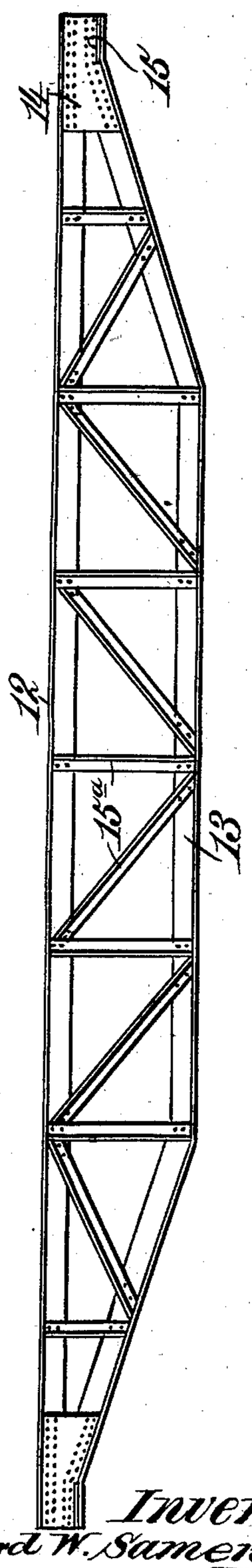

Fig. 3.

Witnesses.
Robert Ewalt.
Dennis Lumby.

Inventor:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C

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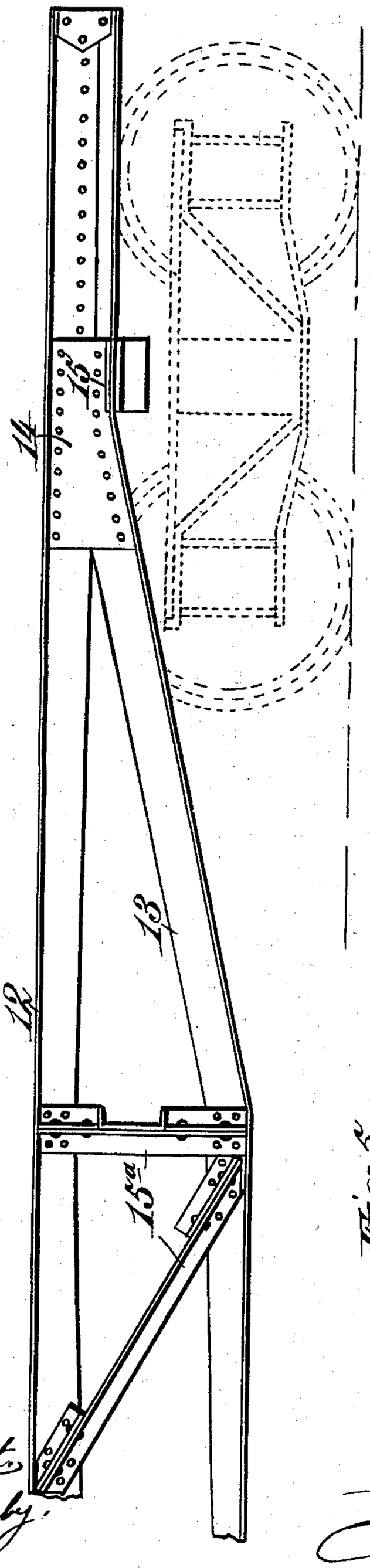

Fig. 4.

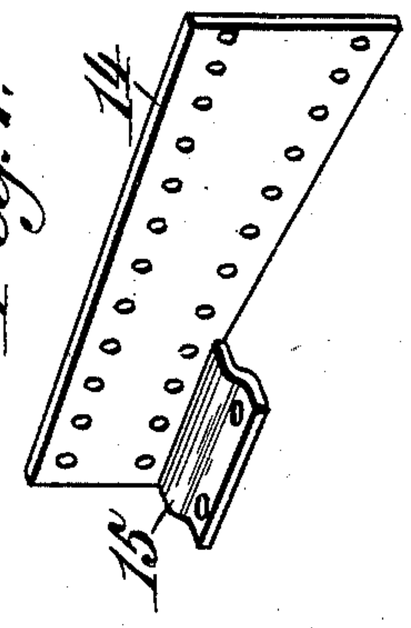

Fig. 7.

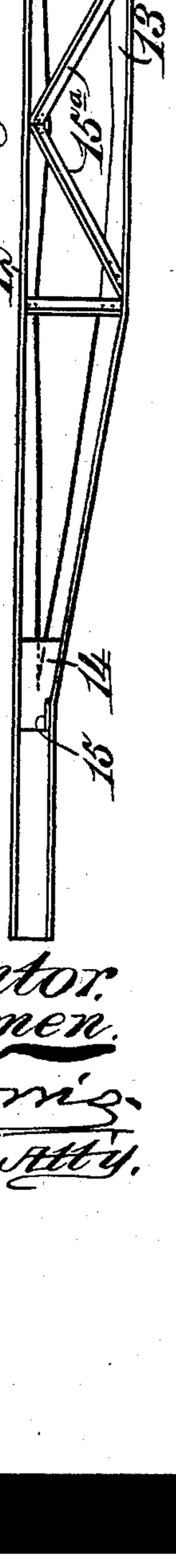

Fig. 8.

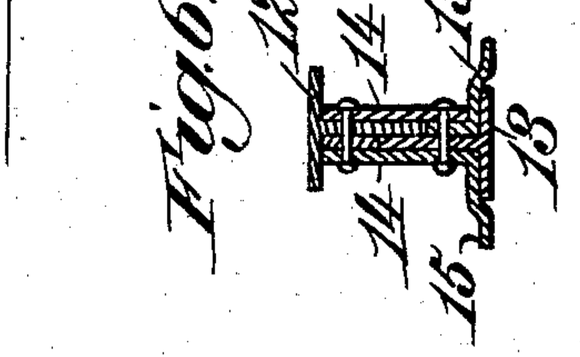

Fig. 6.

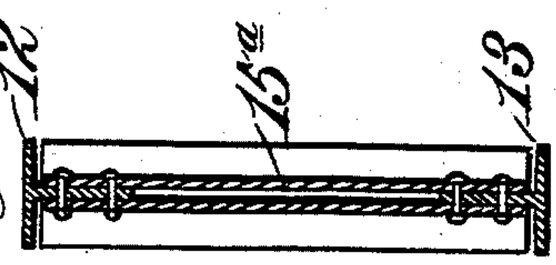

Fig. 5.

Witnesses.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWARD WM. SAMEN, OF LASALLE, ILLINOIS.

METAL TRUSS.

SPECIFICATION forming part of Letters Patent No. 702,332, dated June 10, 1902.

Application filed January 15, 1902. Serial No. 89,918. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WM. SAMEN, a citizen of the United States, residing at Lasalle, in the county of Lasalle and State of Illinois, have invented new and useful Improvements in Metal Trusses, of which the following is a specification.

This invention relates to metal trusses, and it is capable for advantageous use in many connections—such as roof, bridge, railroad-car, and ship construction and other like purposes—and the article is comparatively light, yet of sufficient strength to withstand without rupture or breakage strains put upon the same in operation.

My improved truss includes in its construction a tension member and a compression member, and these parts may be made from angle or T or channel or I section of metal, and the compression member is situated above the tension member, and the webs or vertical legs of these parts at the opposite ends of the compression member overlap, and at such places they are secured together by welding, rivets, or in some other suitable way. At the lap-joints plates are provided, and they may be located upon one or opposite sides of the truss, and intermediate these plates, either upon one or both sides of the truss, are located vertical or diagonal struts or braces riveted or otherwise united to the webs of the tension and compression members, respectively. In the present instance the truss, in order to secure economy in manufacture, has the metal composing the same as far from its center of gravity as possible, and for this reason the webs or legs of the tension and compression members are made as thin as possible consistent with the retention of the proper strength, so that when the holes are punched through said webs for riveting on said struts the members composing the truss will not be materially weakened. The webs of the tension and compression members, respectively, are preferably of variable depth, thereby securing strength and stiffness where it is most needed, as will hereinafter more particularly appear.

The invention includes other objects and advantages which, with the foregoing, will be set forth in detail in the following description, and I desire at this point to state that the invention is not limited to the precise construction and arrangement of parts disclosed by the description and drawings forming a part of this specification, for divers changes may be adopted within the scope of the claims succeeding said description.

In the drawings, Figures 1, 2, 3, and 4 are side elevations of a truss including my improvements, showing different arrangements of struts or braces. Fig. 5 is a transverse section in the line 5 5, Fig. 1. Fig. 6 is a similar view, the section being taken in the line 6 6 of said Fig. 1. Fig. 7 is a detail view of a plate. Fig. 8 is a side elevation corresponding to Figs. 1 to 4, inclusive, of a modified form of truss.

Like characters refer to like parts in all figures of the drawings.

The improved truss includes in its construction an upper or compression member 12 and a lower or tension member 13, and said truss is adapted for use in various arts, the forms shown in Figs. 1 to 3, inclusive, being especially adapted for roof, bridge, and ship construction and like purposes, while that shown in Fig. 4 shows it as adapted for use as a car-sill side or intermediate. The tension and compression members may be made of I or T shaped section of metal or of channel, and in the case of I or channel the web is cut through from end to end in order to secure a leg of proper depth. The webs or legs of the parts 12 and 13 extend toward each other, the flanges of the compression member 12 and tension member 13 being horizontally disposed, while it will be seen on reference to Figs. 1, 2, and 4 that the lower edge of the leg or web of said compression member is formed along an irregular or somewhat serpentine line, while the same applies with respect to the upper edge of the tension member, the purpose of which will hereinafter appear. The tension member is situated below the compression member, and it is depressed for nearly its entire length, as shown in Figs. 1 to 4, inclusive, and the ends of the said compression member overlap the tension member for a desired distance, thereby forming a joint, and the overlapping portions of the parts at the joints may be held together by welding, rivets, or in any other desirable manner.

To secure rigidity of the structure at the joints between the respective sections of the truss, I provide plates, as 14, adapted to fit against the opposite faces of said parts or against only one face thereof, as may be deemed desirable, and said plates can be riveted or similarly held in position. The plates 14 are shaped along their upper and lower edges to agree with the corresponding portions of the flanges of the compression and tension members at the places where said last-mentioned parts overlap. Said plates are provided at their outer portions with feet or flanges 15, approximately horizontally disposed and which project beyond the flange of the tension member and have perforations or holes to receive rivets or similar fastenings by which the truss can be connected to a car body-bolster. In this way it is not necessary to rivet the tension member directly to the said bolster, as in case it is the strength of said tension member, and hence the truss, would be impaired. The stability of the structure is further increased by struts or braces, each denoted by 15^a, which may be of any suitable cross-section, either of angle, channel, or other form, and the struts are preferably held in place by being riveted, the rivets passing through holes in the web or legs of the tension and compression members, respectively. In Fig. 1 I have shown two vertical struts and intermediate diagonal struts, while in Fig. 2 I have shown but a single vertical strut. In Figs. 3 and 4 the struts are otherwise arranged.

In forming the webs of the channel or **I** beam 12 and 13, constituting the truss, I follow irregular lines in cutting the adjacent edges thereof, whereby the depth of the same is variable, that of the tension member being greater than corresponding points on the web of the compression member, so that the tension member will have equal areas at its weakest points, which is naturally where holes are punched through the webs, and in forming the beams in this way the compression-member web or vertical leg is deepest between connecting points of the truss, where the strength is most necessary to carry the loads between the supports on the compression member and give additional vertical stiffness to the same at such points.

In the form of the truss shown in Fig. 4, which is especially adapted as side or intermediate sill for railroad-cars, the struts or braces consist of angle-irons riveted to the tension and compression members, respectively, and with the flanges of the struts riveted face to face. Said struts, it will be seen, consist in each case of a long and two short irons, the short irons being separated or spaced, and the ends of transverse braces (not shown) can be set in such spaces.

In the truss shown in Fig. 8 the compression and tension members are made in one piece, the said truss being formed from channel or **I** metal. In this case the web of the channel or **I** is cut lengthwise parallel with the flanges thereof for a suitable distance or, for example, equaling the length of the tension member. The lower portion of the channel or **I** thus cut is then depressed the requisite extent—for example, as shown—thereby forming the tension member of the truss. At the points where the parts of said truss merge they have a web in common, it being clear that to make this form of truss the web is not cut entirely lengthwise of the same, said web being uncut at its ends. This one-piece truss is very strong, and to enhance its stability I may apply struts 15, as shown in Fig. 1.

From the preceding description it will be understood that the improved truss is made from channel or **I** metal, the web of which is cut for a portion of its length to thereby form compression and tension members, and that one of the latter is curved.

I do not, of course, limit the invention to the use of any particular materials or shapes thereof or disposition of parts.

Having described my invention, what I claim is—

1. A truss consisting of a tension member and a compression member, the ends of the compression member being lapped over the tension member to form joints, and said parts being suitably secured together at the joints, plates fastened to the tension and compression members, respectively, said plates having feet projecting beyond the flange of the compression member, and struts secured to the webs of the tension and compression members respectively.

2. In a truss, tension and compression members, the webs of each being of variable depth, and the ends of the compression member overlapping the tension member and secured thereto and struts secured to the webs of the said tension and compression members.

3. In a truss, tension and compression members, the webs of each being of variable depth, and the ends of the compression member overlapping the tension member and secured thereto, struts secured to the webs of the said tension and compression members, and plates secured to the truss where the parts thereof overlap.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EDWARD WM. SAMEN.

Witnesses:
HENRY C. NICHOL,
JOHN H. DIGGLE.