

No. 793,358.

PATENTED JUNE 27, 1905.

J. DOYLE.  
COMPOSITE BUILDING STRUCTURE.

APPLICATION FILED APR. 21, 1905.

Fig. 1.

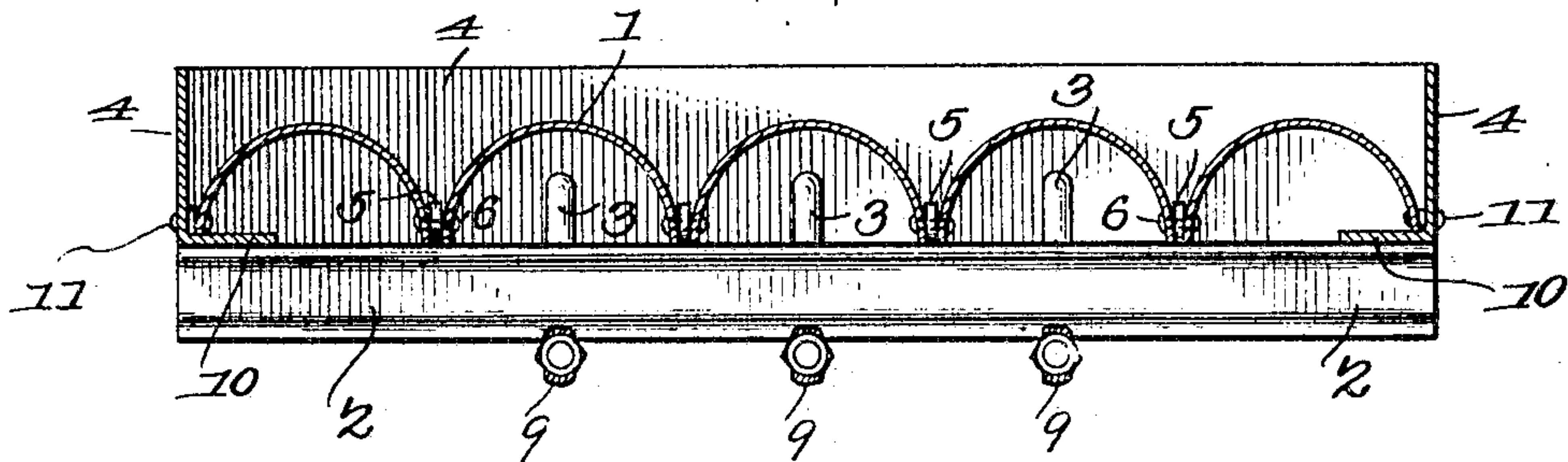


Fig. 2.

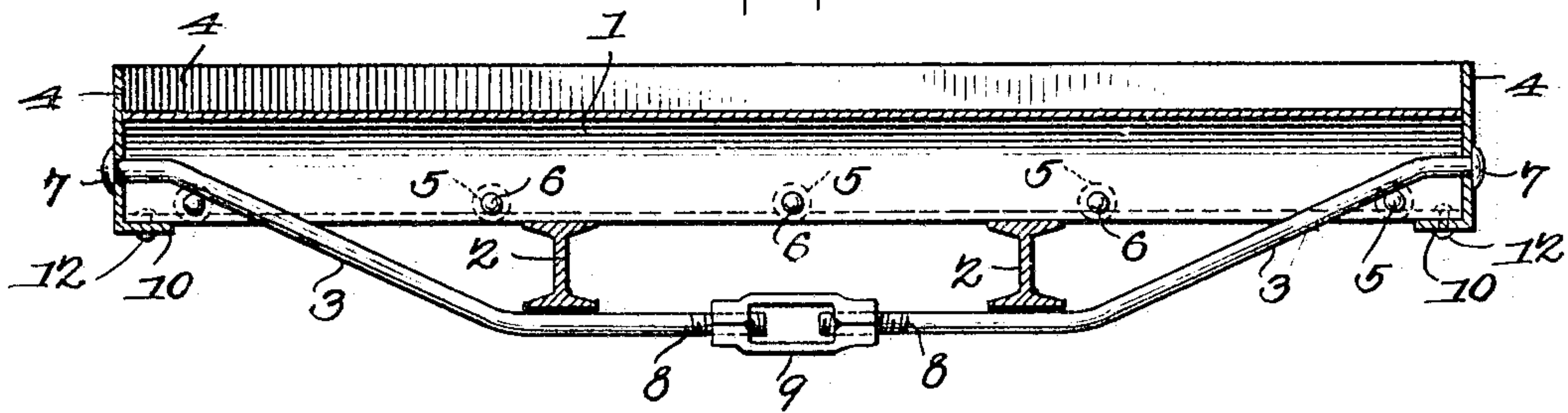
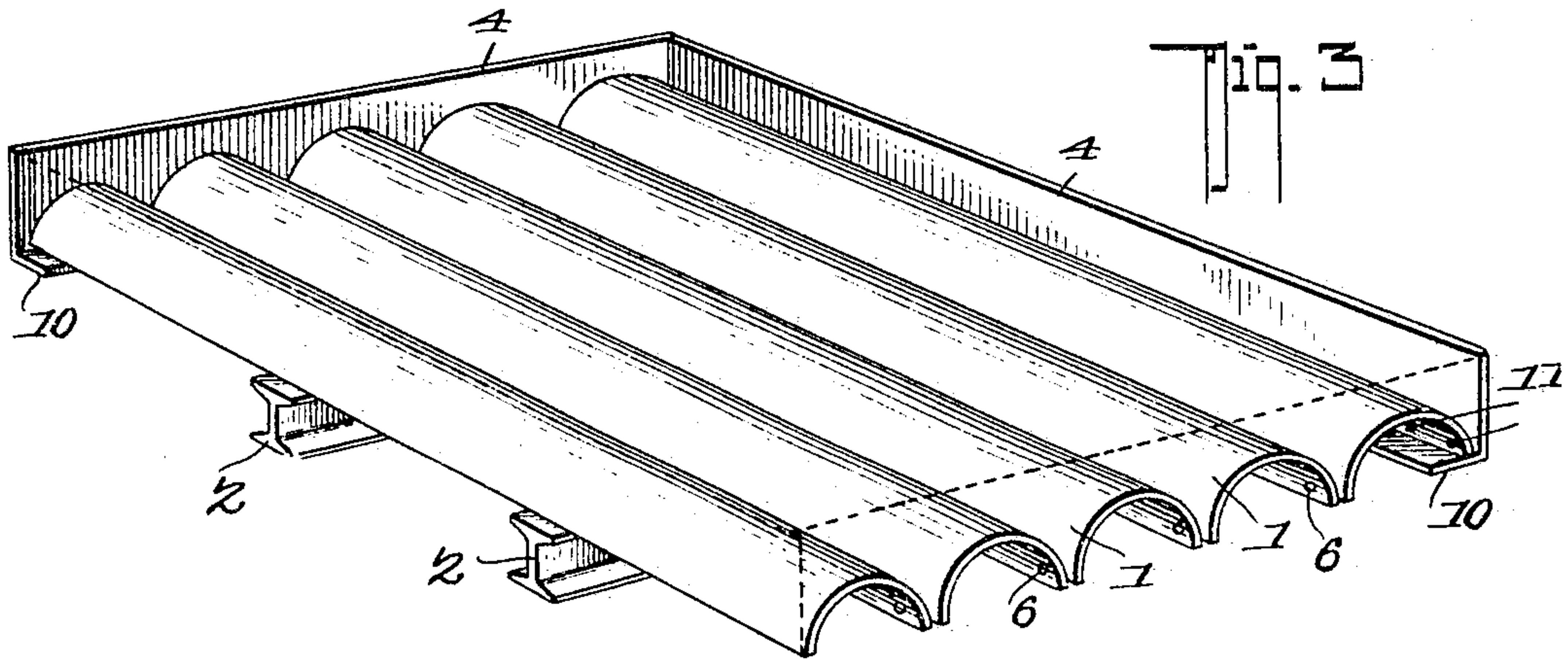


Fig. 3.



Witnesses:

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# UNITED STATES PATENT OFFICE.

JAMES DOYLE, OF HEMLOCK, MICHIGAN.

## COMPOSITE BUILDING STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 793,358, dated June 27, 1905.

Application filed April 21, 1905. Serial No. 256,707.

*To all whom it may concern:*

Be it known that I, JAMES DOYLE, a citizen of the United States, residing at Hemlock, in the county of Saginaw and State of Michigan, have  
5 invented a new and useful Composite Building Structure, of which the following is a specification.

This invention relates to composite building structures.

10 The object of the invention is to provide a structure of this character which shall be readily applicable to use in the construction of floors for buildings or bridges, for culverts across streams or drains, or in any other po-  
15 sition where its use will be practical and of advantage, and which shall be simple of construction, thoroughly efficient and durable in use, light in weight, and capable of withstanding any strain to which it will be subjected in  
20 use.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts  
25 of a composite building structure, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate correspond-  
30 ing parts, there is illustrated one form of embodiment of the invention capable of carrying the same into practical operation, it being understood that the elements therein exhibited may be varied or changed as to shape,  
35 proportion, and exact manner of assemblage without departing from the spirit thereof.

In the drawings, Figure 1 is a view in transverse section through a structure constructed in accordance with the present invention.  
40 Fig. 2 is a view in vertical longitudinal section. Fig. 3 is a view in perspective viewed from the upper side of the structure, a part being omitted to assist in a clear understanding of its construction.

45 The structure embodies a plurality of stringers 1, a plurality of brace-beams 2, a plurality of truss-rods 3, and marginal reinforcing guards or flanges 4.

The stringers are, as shown in Fig. 3, ap-  
50 proximately semicircular in cross-section and

are constructed of metal and may be plain, as shown, or longitudinally corrugated, as preferred, and as this latter construction of stringers is well known detailed illustration thereof is deemed unnecessary. The string- 55 ers are held spaced apart by washers or spacers 5, arranged at desired intervals in their length and are held assembled by rivets or bolts 6, which pass through the stringers and through the washers, as clearly shown in Fig. 1. The 60 object for spacing the stringers is to permit escape of water should the same seep through the covering employed in connecting with the combined stringers, thereby to prevent rusting and eating away of the rivets and of the 65 stringers. The brace-beams, of which there are in this instance two shown, although this number may be indefinitely increased according to the size of the structure, are ordinarily I-beams and are held against the under edges 70 of the assembled stringers by the truss-rods 3, the outer terminals of each pair of which project through the guards 4 and are combined therewith by being upset, as shown at 7, or, if preferred, the terminals may be thread- 75 ed to be engaged by nuts. The inner terminals of the truss-rods are deflected at an angle of their lengths, as at 8, to bear squarely against the under side of the I-beams, and their opposed ends are right and left hand 80 threaded and are engaged by a turnbuckle 9, by which suitable draft may be exerted upon the rods to cause them to force the I-beams against the stringers.

The guards 4 are made of L-shaped or angle 85 iron and are higher than the stringers in order to retain in position the covering applied thereto, which may be cement, dirt, or planks, and, as herein shown, the ends and sides of the stringers rest upon the base-flanges 10 of 90 the guards, and the longitudinal guards are combined with the stringers by rivets 11, and the transverse guards are held in place by rivets 12, that pass through the base-flanges 10.

As herein shown, a truss-rod is omitted from 95 the two outside stringers, as its employment will not under ordinary circumstances be necessary in this position; but, as will be obvious, it may be employed without departing from the scope of the invention. 100



The structure is adapted to be used in connection with any form of abutment where employed for bridge-building or for use with culverts or for constructing roofs for buildings, and as this will be readily understood 5 illustration is omitted.

From the foregoing description it will be seen that the structure of this invention combines in a thoroughly practical manner all of 10 the requisites essential to the production of a thoroughly effective article and, moreover, by the manner in which the parts are combined that the greatest wear-resisting and strain-resisting qualities are secured with the minimum of weight. 15

Having thus described the invention, what is claimed is—

1. A composite structure embodying a plurality of arched stringers, brace-beams disposed beneath the stringers, and truss-rods 20 for holding the brace-beams combined with the stringers.

2. A composite structure comprising a plurality of spaced arched stringers, brace-beams 25 arranged beneath the stringers, and adjustable truss-rods for holding the brace-beams in engagement with the stringers.

3. A composite structure comprising a plurality of arched connected stringers spaced 30 apart at intervals in their length, guards or

flanges surrounding the stringers, brace-beams disposed beneath the stringers, and truss-rods disposed beneath the brace-beams and having their terminals connected with the guards.

4. A composite structure comprising a plurality of arched connected stringers spaced 35 apart at intervals of their length, guards surrounding the stringers and projecting above the upper surface thereof, and adjustable truss-rods disposed beneath the stringers and 40 having their terminals secured to the guards.

5. A composite structure comprising a plurality of arched stringers, spacers disposed between the adjacent edges thereof, rivets passed through the stringers and the spacers, L-shaped guards surrounding the stringers and 45 extending above the upper face thereof, brace-beams disposed intermediate of the ends of the stringers and bearing against the under side thereof, and adjustable truss-rods engaging 50 the under sides of the brace-beams and having their terminals connected with the guards.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 55 the presence of two witnesses.

JAMES DOYLE.

Witnesses:

FRANK KEHO,

GEORGE C. RYAN.