

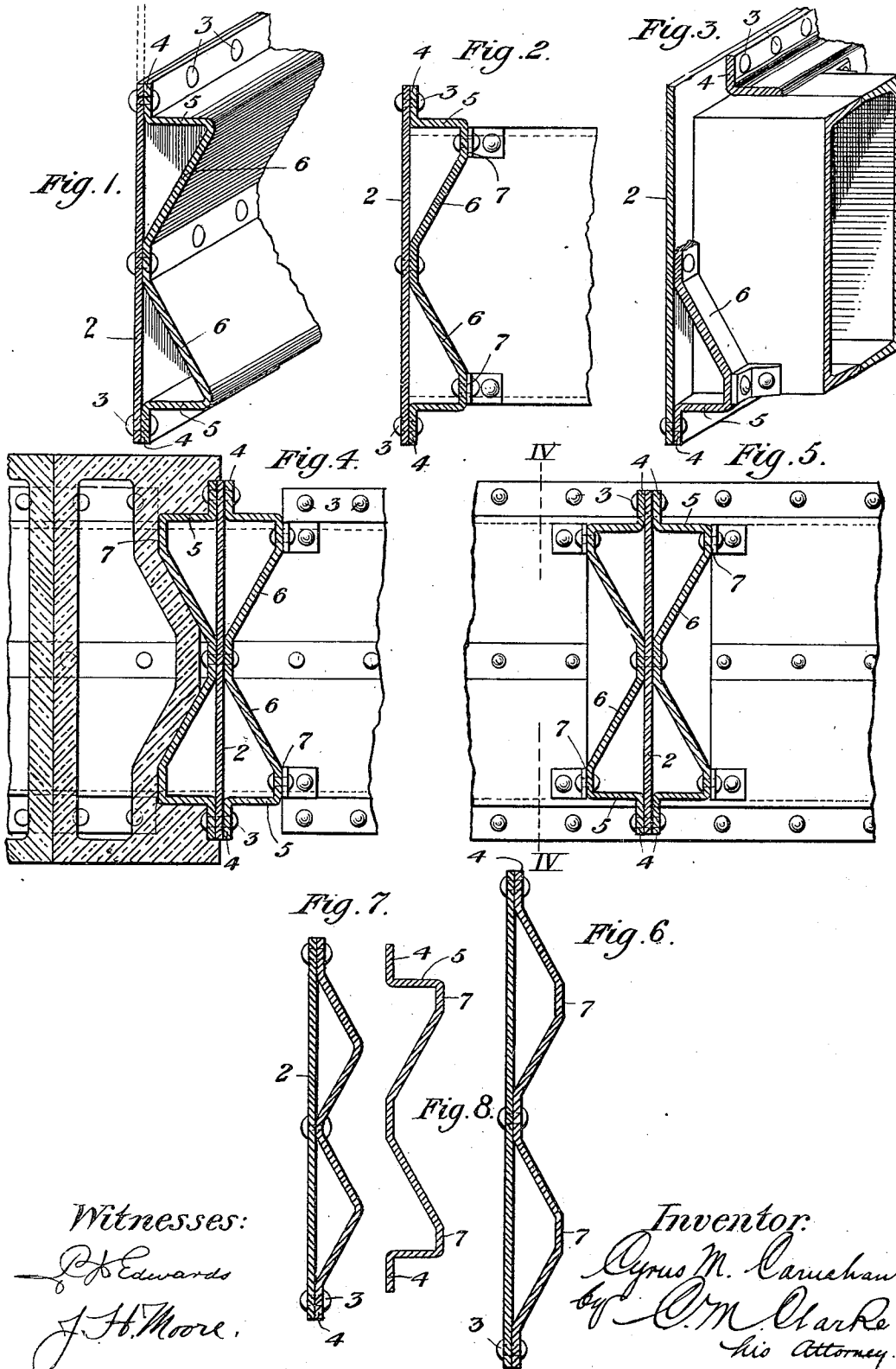
No. 670,309.

Patented Mar. 19, 1901.

C. M. CARNAHAN.
GIRDER CONSTRUCTION.

(Application filed May 1, 1900.)

(No Model.)



UNITED STATES PATENT OFFICE.

CYRUS M. CARNAHAN, OF ALLEGHENY, PENNSYLVANIA.

GIRDER CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 670,309, dated March 19, 1901.

Application filed May 1, 1900. Serial No. 15,155. (No model.)

To all whom it may concern:

Be it known that I, CYRUS M. CARNAHAN, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Girder Construction, of which the following is a specification, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective detail view showing my improved box-girder in cross-section. Fig. 2 is a cross-sectional view illustrating a cross-beam member incorporated with the girder. Fig. 3 is a similar view in perspective. Fig. 4 is a view similar to Fig. 2, illustrating a double-sided construction and showing the manner of mounting the tiling. Fig. 5 is a sectional view at right angles to Fig. 4, illustrating the manner of framing a cross-beam of the same cross-section into the girder. Figs. 6 and 7 are cross-sectional detail views illustrating modified constructions. Fig. 8 is a detail cross-sectional view of one of the lateral members.

My invention consists of an improvement in girder construction wherein I employ two or more members of rolled metal incorporated in such a manner as to provide a hollow-box construction of great stiffness and weight-supporting strength.

The object of the invention is to provide such a girder at low cost which shall be easily applied to the various uses to which such constructions are put and adapted to be connected and incorporated with the other interacting members of such structures in which it may be employed.

Referring now to the drawings, 2 represents a plate of any length desired and a depth suited to the requirements in view and corresponding to the full depth of the finished girder. To one or both sides of the plate 2 I secure by rivets 3 one or two longitudinally-disposed lateral rolled members, bent so as to provide vertical flange portions 4 4, adapted to fit against and correspond to the vertical face of plate 2, lateral portions 5, and intermediate reversed inclined portions 6, extending inwardly toward a point between the vertical flange portions where the member is bent,

such bent portion providing a convenient means for attachment by riveting to the plate 2. I have shown these characteristic elements in various arrangements and amplifications in upper and lower double arrangement on one side and on both sides of the plate, and in all of the forms it will be observed that the lateral members are firmly joined by rivets.

In Figs. 6 and 7 I have shown constructions wherein all of the outwardly-extending faces are inclined, the general principles of construction, however, being closely similar to the form I have described, in that the lateral members are provided with vertical riveting portions and outwardly-extending lateral portions meeting at an angle.

The principal advantage of the horizontal portions 5 is in providing flat bearing-faces for building, erecting, or construction purposes, so that it will be obvious that in the absence of the necessity of such bearing-faces the sides may be disposed at varying angles within the scope of the invention.

In certain of the forms I have also shown the meeting angle of the lateral members somewhat flattened, so as to provide a face 7, thus providing a convenient means for attachment of other constructions by riveted angle-plates, as clearly shown in Figs. 2, 3, 4, and 5. When it is desired to assemble or frame in other members with the girder, the middle portion of the lateral member may be cut out between the upper and lower portions 5 and of the proper width, as shown, permitting the attached member to abut against the plate 2 and to rest firmly within and upon the lateral member.

While I have shown the lateral member as incorporated with the central plate member, it is obvious that the plate member may be dispensed with and two of the lateral members (comprising the vertical attaching portions, the outwardly-disposed lateral portion, and the intervening recessed portion, either flattened or simply rounded) in entirety as single members may be directly connected face to face with good results. Also, as in the case of ship construction, these lateral members may be employed as ribs incorporated in the framework and forming bases for direct attachment of the plates.

Many changes, variations, and adaptations may be made in my invention by the skilled mechanic without departing from it as expressed in the claims, and I desire to include
 5 all such within their scope.

What I claim is—

1. In metallic construction, an integral girder member provided with upper and lower vertical flange portions, outwardly-disposed
 10 lateral portions, and inwardly-sloping intermediate portions with an intervening attaching portion in alinement with the flange portions, substantially as set forth.

2. In metallic construction, an integral
 15 girder member provided with upper and lower vertical flange portions, outwardly-disposed lateral portions, vertical attaching portions, inwardly-sloping intermediate portions with an intervening attaching portion in aline-

ment with the flange portions, substantially
 20 as set forth.

3. A composite girder consisting of a plate member and a lateral member provided with upper and lower vertical flange portions, outwardly-disposed lateral portions, inwardly-sloping intermediate portions with an intervening attaching portion in alinement with the flange portions adapted to make contact with the plate member, and means for securing the flange portions and intermediate con-
 25 30 tacting portions to the plate member, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CYRUS M. CARNAHAN.

Witnesses:

PETER J. EDWARDS,
 C. M. CLARKE.