

George C. Morgan.

Impts in Bridges

118258

PATENTED AUG 22 1871

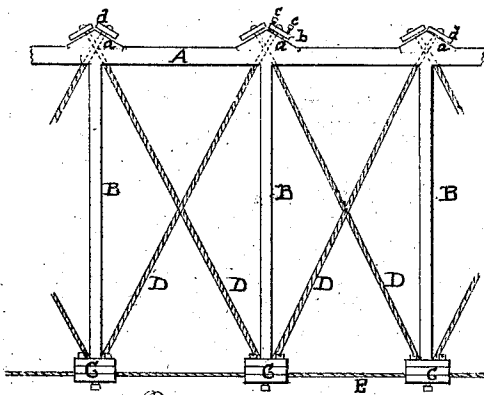


Fig 1 Side Elevation

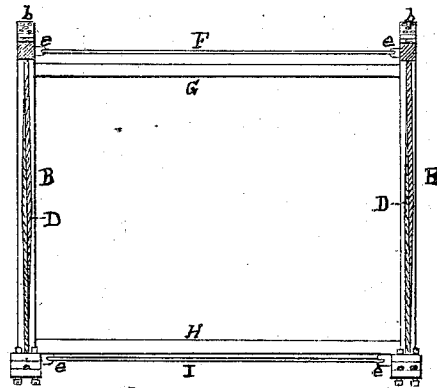


Fig 2 vertical section

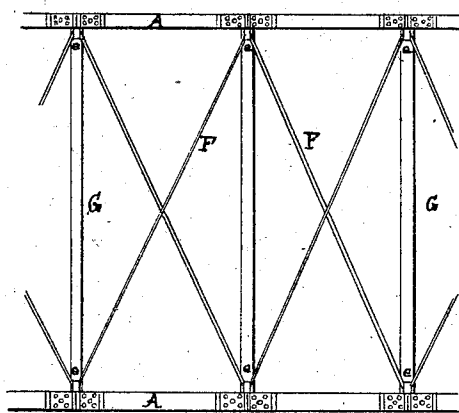


Fig 3 Plan of top

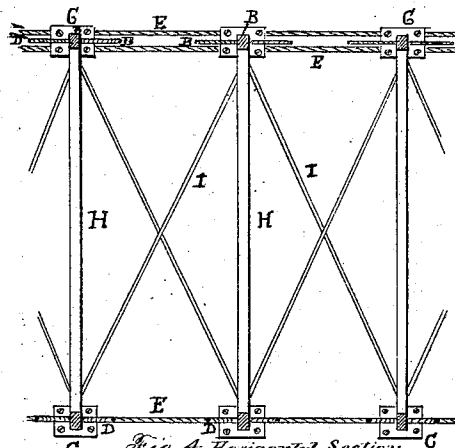


Fig 4 Horizontal Section or plan of bottom

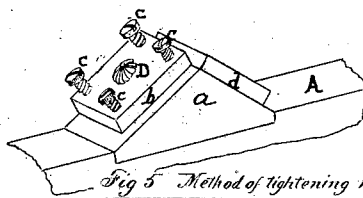


Fig 5 Method of tightening rods

Witnesses
C. A. Webb
O. W. Bond

E
Fig 6

George C Morgan
Inventor

UNITED STATES PATENT OFFICE.

GEORGE C. MORGAN, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN BRIDGES.

Specification forming part of Letters Patent No. 118,258, dated August 22, 1871.

To all whom it may concern:

Be it known that I, GEORGE C. MORGAN, of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in the Construction of Bridges, of which the following is a full description, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 represents a side elevation; Fig. 2, a vertical cross-section; Fig. 3, a top or plan view; Fig. 4, a horizontal section; Fig. 5, a detail, showing the method of tightening the braces, &c.; and Fig. 6, a section of the cable forming the lower cord.

My improvements relate to that class of bridges usually known as trussed bridges; and their nature consists in the application of wire-ropes or cables to the construction of truss-bridges, in the mode of tightening or straining them, and in an improved construction of the lower cables.

To enable others skilled in the art to make and use my invention, I will describe its construction and application with reference to the drawing, in which—

A represents the upper cords; B, the posts; C, the bases of the posts; D, the side braces; E, the lower cords; F, the upper brace-rods or cords; G, the upper cross-ties; H, the lower cross-ties; I, the lower brace-rods or cords; *a*, a triangular block or cap laid on or partially let into the upper cord; *b*, a plate laid on the cap *a*, to which one end of a brace is firmly secured; *c*, screws by which the braces are tightened; *d*, similar plates without tightening-screws; and *e*, eyes or eyebolts through which the cords or ropes F and I pass, or to which they are attached. The upper cords A are made of cast plate or bar-iron, or other suitable material, as are also the posts B and the cross-ties G and H, and of any desired size, form, and dimensions, as my improvements are designed to be applied to trussed bridges of any construction. The lower cords E are made of a single or double wire-rope or cable, as shown at Fig. 4, which passes the entire length of the span and through the base C of each post, as shown, and are properly secured or anchored at the ends. In making the cables for this cord I insert additional strands or wires, varying in length at the middle so as to increase it in size and strength at that point, and from that point diminish it gradually toward each end. The

bases C of the posts are made for convenience in horizontal sections, and are secured together by means of suitable screws or bolts, and the sections are provided with suitable grooves and holes for inserting and securing the cords and braces. The braces D, F, and I are all made of wire-ropes or cords. The side braces D are firmly secured at the bottom to the bases C and pass through the upper cord A, and, when not used with a tightening-plate, are firmly secured to the cord under the cap *a*; but when used with a tightening-plate, *b*, they also pass through the cap *a*, and are firmly secured to a fastening-plate, *b*, and are tightened or strained by means of the screws *c*, and when sufficiently strained to make the rope stiff, like a rigid rod or bar, keys or wedges are driven between the plate *b* and the cap *a*, when the screws may be removed or left as desired.

In order to apply the braces F I attach eyes or eyebolts *e* to the cord A above each cross-tie or beam G, as shown at Fig. 3, and below the beams H, as shown at Fig. 4, and pass the wire-rope through these eyes so as to make them of a continuous rope, and thereby equalize the strain throughout the entire length of the bridge. The lower braces are applied in the same manner through similar eyes attached to or made a part of the bases C below each beam or cross-tie H, and they are strained into place and held in position at the ends by means similar to that shown and described for tightening the braces D, or by any other suitable means, and these braces may be made to run the entire length of the bridge, or they may be applied in section. In order to attach flooring, joists or stringers are laid along on the cross-ties or beams H and the flooring is spiked or nailed to them.

It is well known that wire-rope is much stronger than solid iron of the same size or weight. By its use, therefore, bridges or other structures can be made of equal strength with much less weight of material, or of the same weight of much greater strength. This method of trussing is also applicable to trusses for roofs or other purposes.

I am aware that wire-ropes and cables have been heretofore used in the construction of suspension-bridges, and I do not, therefore, claim, broadly, their application to bridges.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The mode of tightening the vertical braces D by means of the plate *b* and screws *c*, substantially as specified.

2. The braces or stays F and I when made continuous and applied, by means of eyes *e*, so as to make the strain uniform, substantially specified.

3. The wire cords E when made enlarged at

the middle and gradually tapered each way and applied to a truss-bridge, substantially as described.

GEORGE C. MORGAN.

Witnesses:

E. A. WEST,

O. W. BOND.