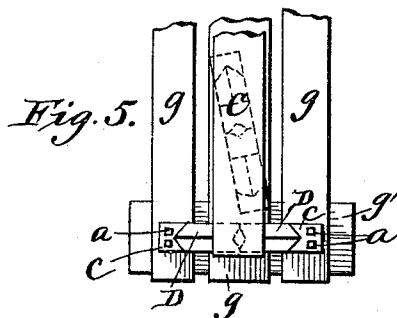
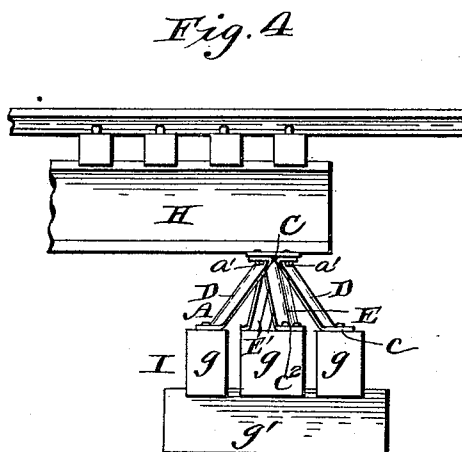
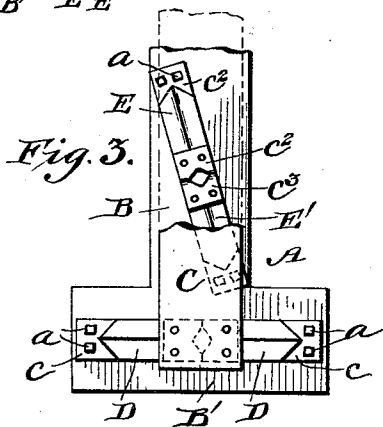
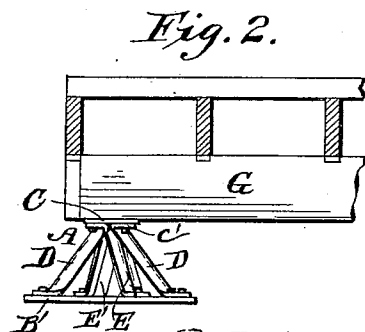
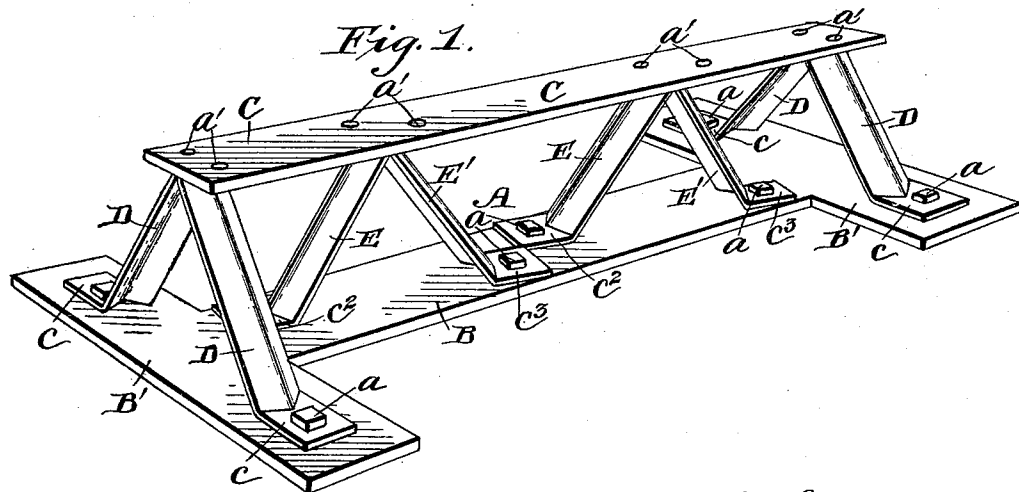


(No Model.)

G. T. HAWES.
TRUSS FOR BRIDGES.

No. 499,631.

Patented June 13, 1893.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE T. HAWES, OF OWENSBOROUGH, KENTUCKY.

TRUSS FOR BRIDGES.

SPECIFICATION forming part of Letters Patent No. 499,631, dated June 13, 1893.

Application filed February 17, 1893. Serial No. 462,707. (No model.)

To all whom it may concern:

Be it known that I, GEORGE T. HAWES, a citizen of the United States, residing at Owensborough, in the county of Daviess and State of Kentucky, have invented certain new and useful Improvements in Trusses for Bridges and other Structures; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to trestles, abutments or piers constructed of metal entirely, or mainly of metal supported by a wooden foundation. The object of my invention is to secure great strength with lightness and simplicity of construction.

My invention will be fully understood from the following specification and claims, and the accompanying drawings, in which latter—

Figure 1 is a perspective view of an abutment constructed in accordance with my invention. Fig. 2 is a detail view, showing an end elevation of an abutment such as is adapted for rock foundations, and a portion of an ordinary bridge resting thereon. Fig. 3 is a detail plan view of a portion of the abutment shown in Fig. 2. Fig. 4 is a similar view showing in elevation the abutment as adapted for timber foundations, and having a portion of a railroad bridge resting upon it, and Fig. 5 is a plan view of a portion of the abutment shown in Fig. 4.

A in the drawings represents my trestle, abutment or pier, comprising a strong metal base piece B, a similar metal cap piece C, inclined angle iron counter, end struts D, and inclined, intermediate angle iron counter struts E E', all firmly screwed together, as indicated at *a a'*. The base piece has its ends made in the form of a T-head so as to give broad bolting supports B' for the lower, horizontally bent ends *c* of the end struts to rest upon. The cap piece C is made broad enough to afford a bearing on its under side for the upper horizontally bent ends *c'* of the end struts to bear against. The intermediate struts are arranged in pairs, and are set so that they incline inward from near the edges of the base piece to the center of the cap piece, and so that the struts E shall stand in counter bracing style to the struts E'. These struts,

like the struts D, are provided with horizontal bolting ends *c² c³*, and all of the struts are made of plate metal, and in cross or horizontal section are approximately of triangular form. The intermediate struts are screwed to the base plate B by the screws or screw bolts *a*, and to the cap piece by the screws or screw bolts *a'*. In setting the struts in position, the upper bolting ends, at the angles formed by the pairs of struts, are made to abut against one another, and they thus materially sustain one another when strain comes upon the trestle. The intermediate struts E are set so that below their upper bolting ends or flanges, they stand longitudinally of the plate B out of line with the intermediate struts E' and thus the cap-plate or piece is firmly sustained by the struts and piece or plate on both sides of its center.

In applying the invention for supporting a roadway bridge, as illustrated in Fig. 2, the stringer G of the bridge is made to rest upon the cap plates of several trestles, and firmly secured to said plates; and the base plates of the trestles are made to rest upon a suitable rock or other foundation, and anchored or secured in any known appropriate way. If the invention is used on a railroad bridge as illustrated in Fig. 4, the girder H is made to rest upon the cap plates or pieces C of several trestles, and properly secured thereto, and the struts are bolted to a wood foundation I, comprising timbers *g* and a mud sill *g'*. In this last structure, the metal base plate or piece B may be omitted if deemed best.

The trestles may be made from two to thirty feet high, and still have the requisite strength for supporting any reasonable load passing over the bridge, while by reason of its construction it is every light, symmetrical, and, comparatively, of slight cost. If necessary, brace rods may be passed through the struts to keep them from deflecting from their normal positions—either inward or outward.

What I claim as my invention is—

1. In a trestle, abutment or pier, the combination of the metal cap piece, the inclined, counter, end struts, made of plate metal of approximately triangular form in cross section, and having horizontal bolting ends or flanges, inclined intermediate struts formed of plate metal of the same form as the end

struts, and applied in pairs and as counter
braces, and against the cap plate or piece, and
those of each pair diverging from the cap-
plate out of line with one another longitudi-
nally of the base plate, downwardly and lat-
5 erally, so that their proximate lower ends
stand out of line with one another longitudi-
nally of the base plate, substantially as de-
scribed.

10 2. In a trestle, abutment or pier, the com-
bination of the cap plate or piece, the base
plate or piece widened at its ends, the in-
clined counter end struts having an approxi-
mately triangular cross sectional form, and
15 provided with upper and lower horizontal
bolting ends, the intermediate counterstruts
having an approximately triangular cross
sectional form, and provided with horizontal
bolting ends or flanges, and set to abut against
20 one another and bear against the cap-plate or
piece and to diverge from the cap-plate down-

wardly and laterally out of line with one an-
other longitudinally of the base plate, sub-
stantially as described.

3. The counter end and intermediate tri- 25
angular struts, formed with bolting flanges
which abut against one another, in combina-
tion with the cap and base plates, substan-
tially as described.

4. In a trestle, counter intermediate struts 30
formed of angle iron and with horizontal bolt-
ing ends, and abutting at the center of the
base plate, and diverging downward, and lat-
erally and attaching to the base plate near
its edges, substantially as described. 35

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

GEO. T. HAWES.

Witnesses:

G. H. SIMMONS,
L. L. MCADAMS.