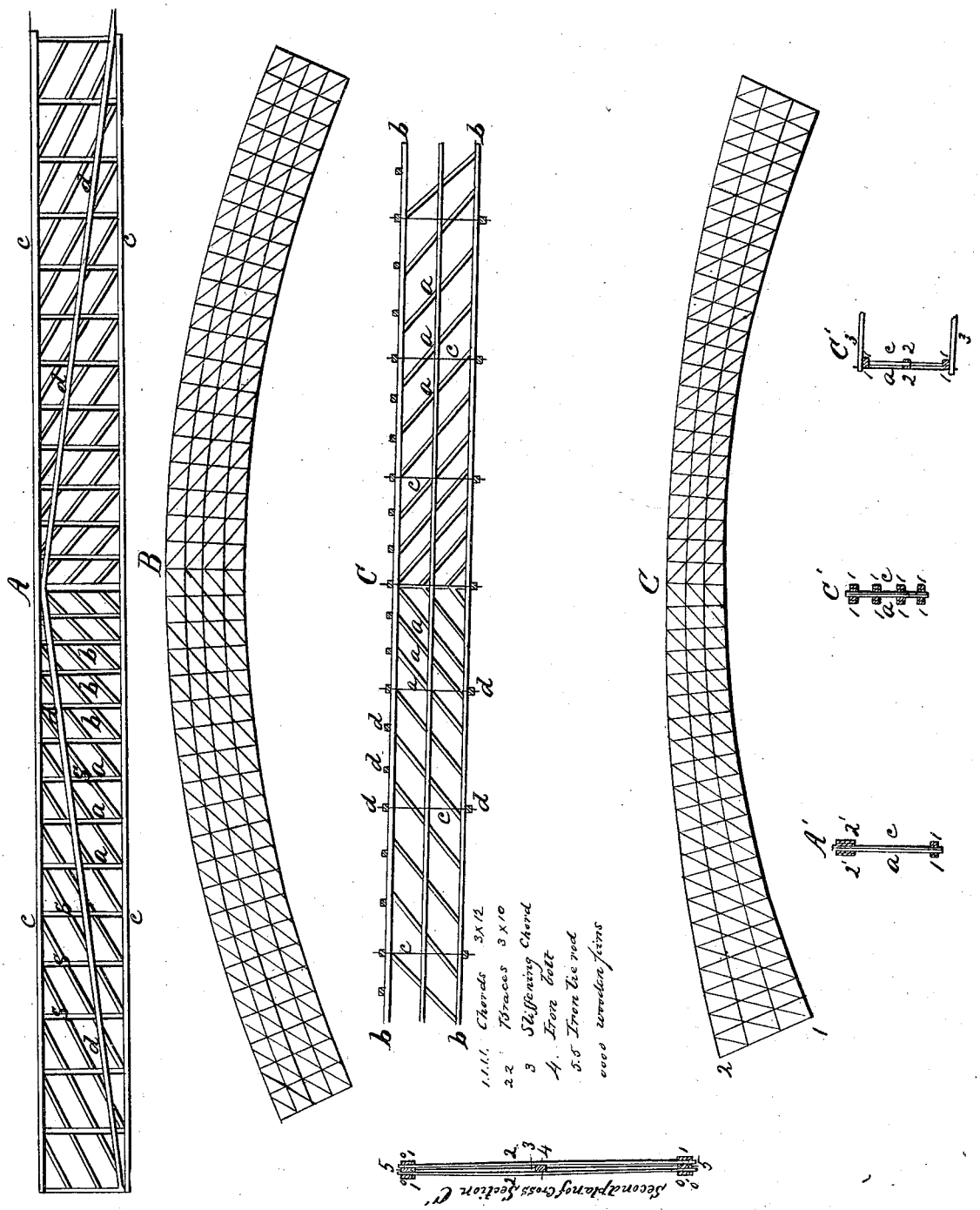
H. Haupt.

Truss Bridge.

No. 1,445. Patented Dec. 27, 1839.



UNITED STATES PATENT OFFICE.

HERMAN HAUPT, OF YORK, PENNSYLVANIA.

LATTICE BRIDGE.

Specification of Letters Patent No. 1,445, dated December 27, 1839.

To all whom it may concern:

Be it known that I, HERMAN HAUPT, of York, Pennsylvania, have invented Improvements in Lattice Bridges, of which the following is a specification.

The improvement for which a patent is requested is confined exclusive to the truss or vertical frame which supports a bridge and does not extend to any other part.

In order to form a proper conception of the nature of the proposed improvement it is necessary that the defects of the combination in general use should be briefly pointed out.

The lattice truss is composed of a system of braces and counterbraces arranged at equal angles in opposite directions and pinned with wooden pins to horizontal chords at top and bottom. Theory, observation, and experiment all agree in favor of the conclusions that one half of the inclined pieces are of no use as counterbraces and badly answer the purpose of ties, that from their inclined position they are exposed to a very considerable cross strain, which tends to split the timbers along the line of pins, and that the pins of the lower intersections are caused to bear a disproportionate share of the weight. In proof of this instances may be cited of bridges on the principal railroads in Penna. in which the lower ends of the series of counterbraces were all split while the braces remained whole.

The proposed improvement which is represented by the diagram marked (A) in the drawing consists in constructing a bridge in a similar manner and with timbers of the same dimensions as those used in lattice bridges, but instead of the counterbraces vertical ties are substituted, by which arrangement the weight instead of exerting a cross strain, as in the ordinary lattice, is made to act in a direction parallel to the fibers of the tie. The truss then will consist simply of the chords (*c*) the braces (*b*) and the ties (*a*) framed precisely as a lattice truss and pinned with wooden pins at every intersection. Trusses with a curved rib, as Burr's plan, derive their strength from an arch of timber combined with a system of uprights and braces. In this plan the depth of the arch is necessarily small. The timbers of the frame are large and the strength of the whole is not in proportion to the quantity of timber employed.

The trusses B and C consist of a series of curved chords which may vary in size according to the pressures connected with braces and ties in precisely the same manner as has been explained for the truss (A). In fact if the truss (A) be supposed bent into a curved form it will become similar to (B) and (C) differs from it only in the chords not being concentric.

What I claim as my invention is—

The construction of a lattice bridge without counterbraces, but consisting simply of braces inclined at any proposed angle and ties which are perpendicular to the lower chord, the chords being either straight or curved.

Your petitioner is aware that a model is in your office similar to a bent lattice in which the inclined pieces act as braces and counterbraces, neither being at right angles to the lower chords and consequently objectionable on the same grounds as in the straight lattice. The distinguishing feature of the proposed improvement is that no counterbraces are used and the ties are in both straight and curved bridges perpendicular to the lower chord, the pieces being of the sizes and the arrangement similar to that which is usual for lattice bridges.

HERMAN HAUPT.

Witnesses:
J. B. BACON,
CHAS. Q. BARRITZ.