(No Model.)

2 Sheets—Sheet 1.

G. N. CLYMER.

BRIDGE.

No. 534,032. Patented Feb. 12, 1895.

FIG. 6.

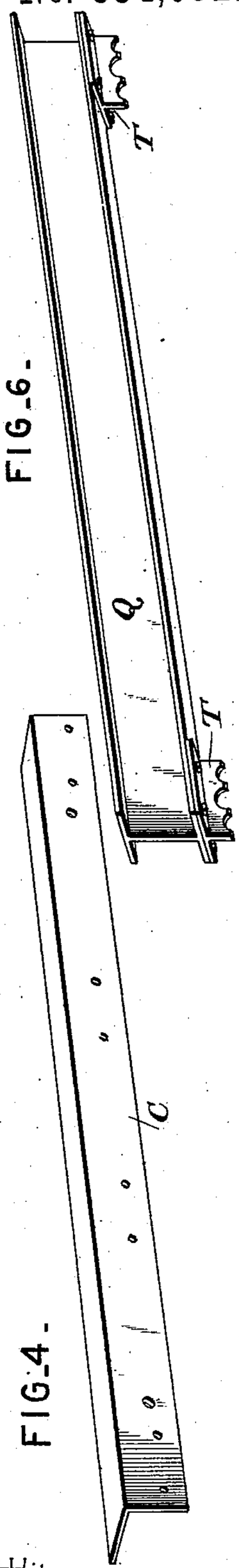


FIG. 1.

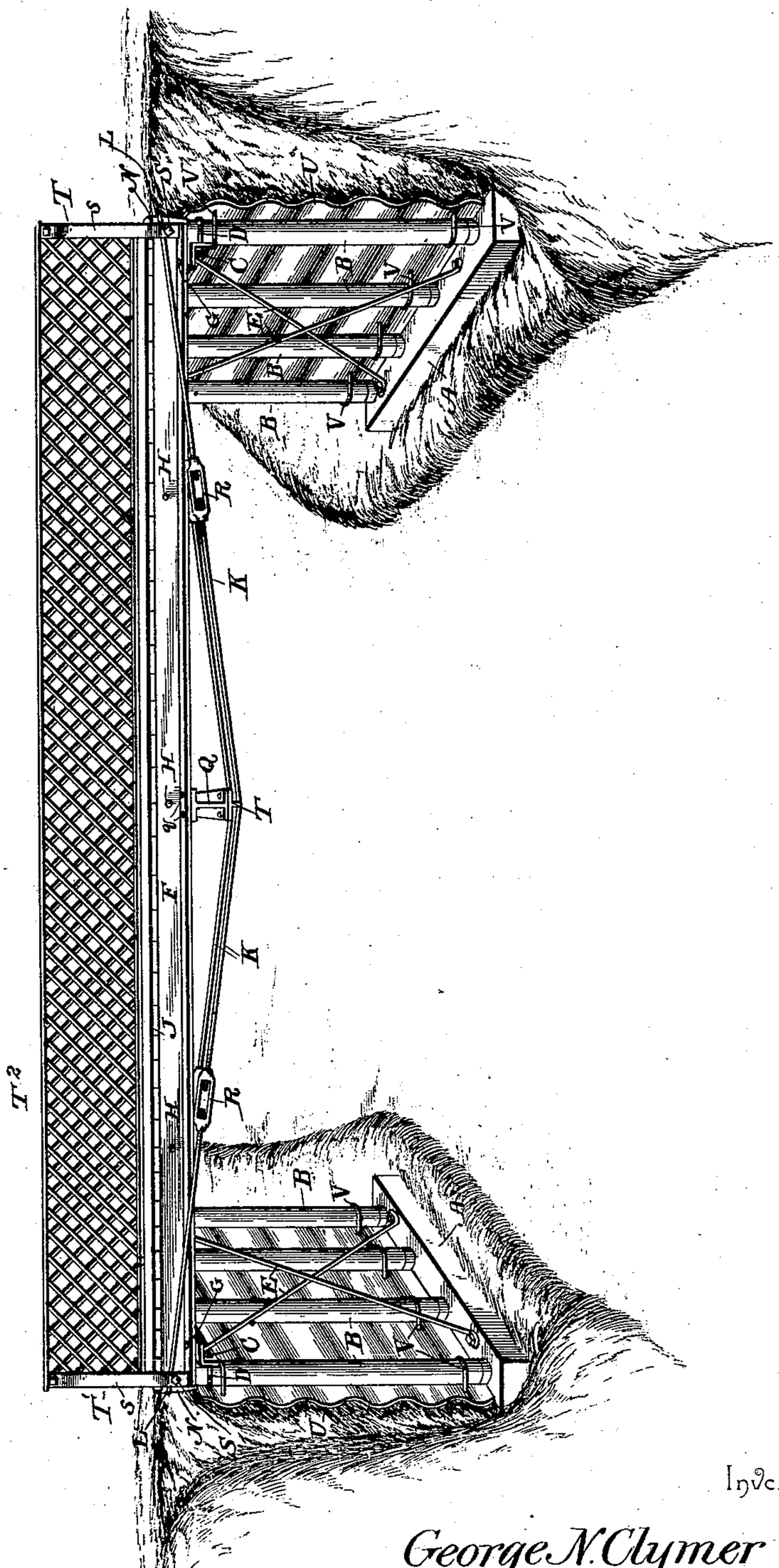


FIG. 4.

Witnesses

Jas. K. McCathran

S. O. Hollingsworth

Inventor

George N. Clymer

By his Attorneys.

C. A. Snow & Co.

(No Model.) 2 Sheets—Sheet 2.

G. N. CLYMER.

BRIDGE.

No. 534,032. Patented Feb. 12, 1895.

FIG_2_.

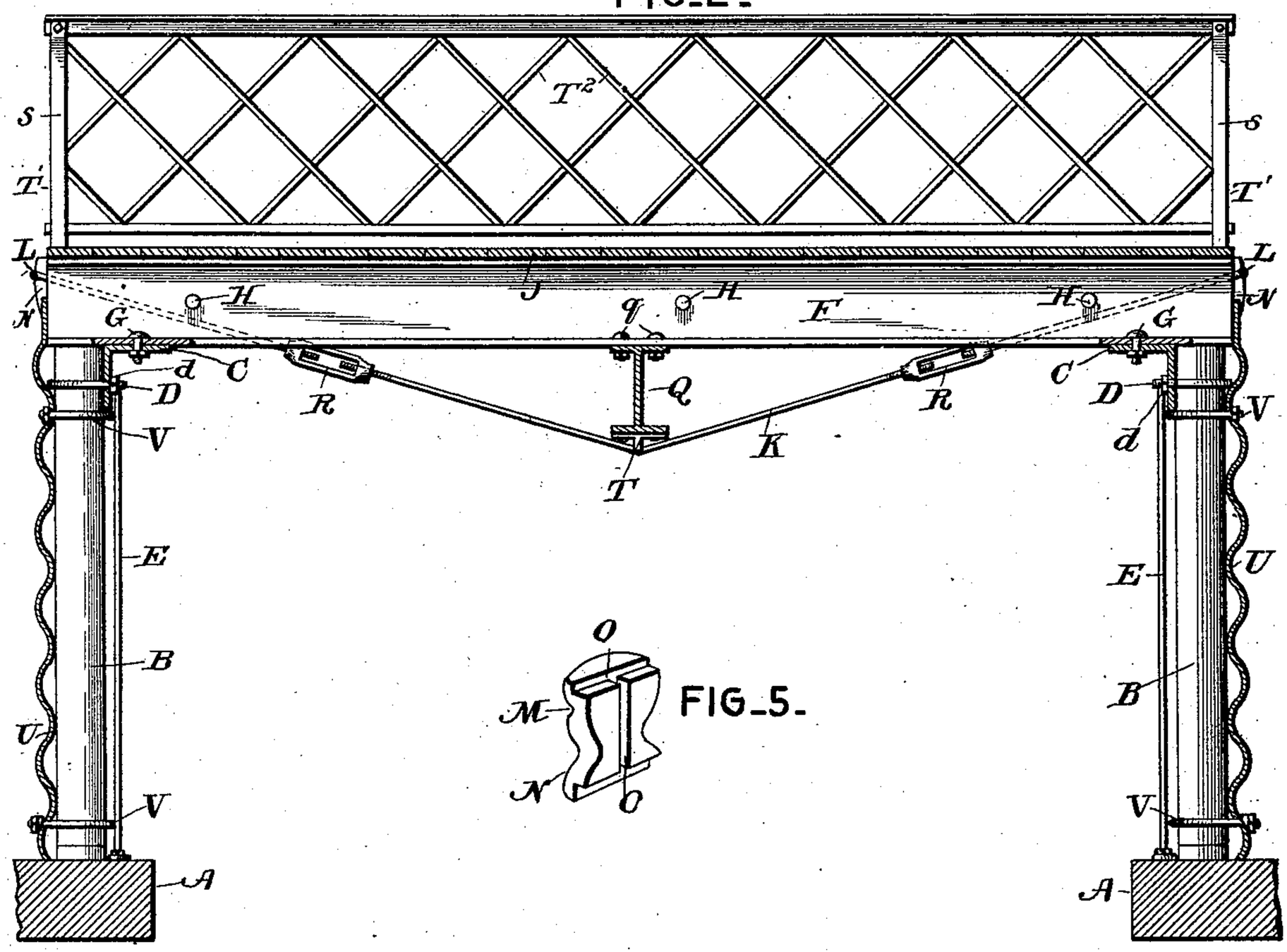
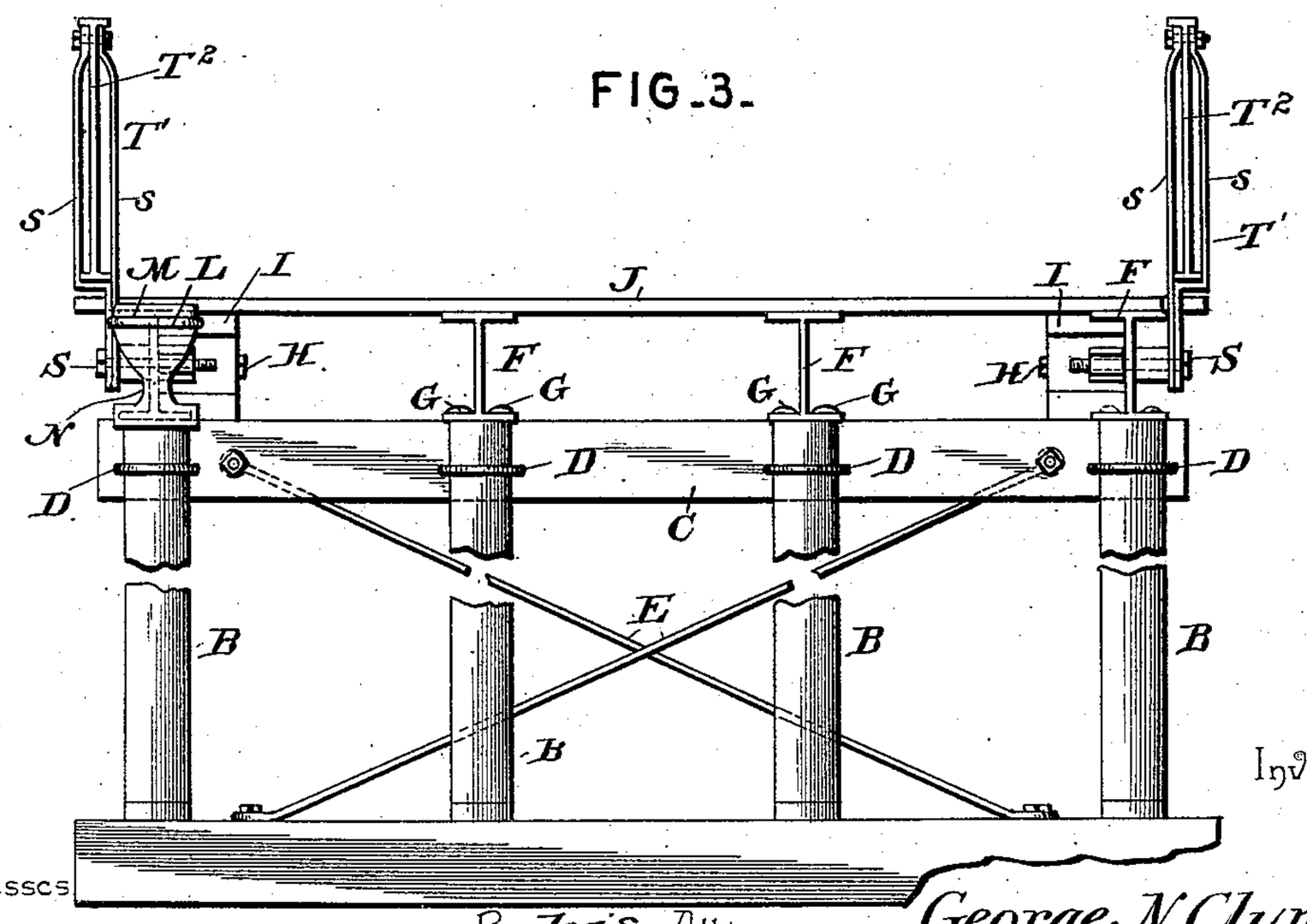


FIG_5_.

FIG_3_.



Witnesses

Jas. K. McCathran

L. B. Washington

Inventor

By his Attorneys. George N. Clymer

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

GEORGE N. CLYMER, OF BLOOMINGSBURG, INDIANA.

BRIDGE.

SPECIFICATION forming part of Letters Patent No. 534,032, dated February 12, 1895.

Application filed February 13, 1894. Serial No. 500,003. (No model.)

To all whom it may concern:

Be it known that I, GEORGE N. CLYMER, a citizen of the United States, residing at Bloomingsburg, in the county of Fulton and State of Indiana, have invented a new and useful Bridge, of which the following is a specification.

This invention relates to bridges; and it has for its object to effect certain improvements in that class of bridges which are made in short spans adapted for spanning small creeks, ditches, gorges, streams, &c., ranging from about ten to forty feet in width, and to this end the invention contemplates a short-span bridge which shall possess exceptional merit for its durability and strength.

With these and other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a perspective view of a bridge constructed in accordance with this invention. Fig. 2 is a central vertical longitudinal sectional view thereof. Fig. 3 is an end view with one of the abutment plates removed and also one of the end truss saddles removed. Fig. 4 is a detail in perspective of the angled or L-shaped connecting beam for the pillars. Fig. 5 is a similar view of one of the endless truss rod saddles. Fig. 6 is a detail elevation of the central needle-beam with the depending truss brackets attached thereto.

Referring to the accompanying drawings, A A represent the opposite mud sills which are adapted to be placed in front of the usual bridge abutments at the opposite sides or banks of the stream or depression to be spanned by the bridge, and arising from the mud-sills are a transverse series of tubular supporting pillars B.

The supporting pillars B, are secured at their lower ends to the mud-sills in any suitable manner, and are connected at their upper inner ends by the transverse angled or L-shaped connecting beams C. The upper transverse connecting beams C, are arranged with their vertical flanges disposed at the upper inner ends of the supporting pillars, and are securely clamped or bound thereto by means of the U-shaped clamping bolts or stirrups D, the threaded extremities of which extend through the vertical flanges of said connecting beams and receive the securing nuts *d*. This connection firmly braces and connects the several transverse supporting pillars together, and the beams securing this connection are additionally strengthened and braced in position by means of the diagonal bracing rods E, bolted at their upper ends to the vertical flanges of the connecting beams near the opposite ends thereof, and at their lower ends suitably secured to the mud sills at correspondingly opposite points.

The supporting pillars B, and the horizontal flanges of the connecting beams C, form a support or rest for the opposite ends of the longitudinal I-beams F. The longitudinal I-beams have their opposite ends rest directly on top of the upper ends of the supporting pillars, and their lower flanges are securely bolted to the horizontal flanges of the transverse connecting beams on the lower clamping bolts G, which serve to securely position the said I-beams.

The longitudinal I-beams F, are arranged parallel with each other in any desired number and span the run or depression over which the bridge is to be placed, and the side ones of such beams have bolted to the inner sides thereof on the bolts H, the wooden floor beams I, which project sufficiently inward from the said side beams to receive the nails or bolts of the planking forming the floor J, of the bridge. This construction substantially completes the main structure of the bridge, which is strengthened and braced by two or more pairs of endless truss rods K. The endless truss rods K, are provided at opposite ends of the bridge with the looped or stirrup ends L, which rest in the stirrup grooves M, formed in the outer upper end of the end truss saddles N. These end truss saddles N, are formed of suitable iron or steel castings and are provided in their inner faces with the I-grooves O, which register with the ends of the longitudinal I-beams over which they are fitted, and by reason of this construction the said saddles are firmly held in position at the ends of the I-beams where they are placed.

The endless truss rods K, are preferably arranged at opposite sides of the bridge span

and are looped over and around the extreme side beams, while the central portion of said rods are passed under the depending notched truss brackets T, bolted to the lower flanges of the needle I-beam Q, the upper flanges of which are bolted on the bolts *q*, to the lower flanges of the longitudinal I-beams F. The said needle beam is arranged transversely under the center of the several longitudinal I-beams, and not only serves to connect and brace these beams together, but forms a central truss support therefor by reason of the disposition of the truss rods under such beam, and said truss rods are provided at points connecting their stirrup ends and central portions with the turn-buckles R, to provide means for maintaining the same at the proper tension. The opposite extremities of the side I-beams are further adapted to receive the bracket bolts S, which securely fasten in position the lower ends of the vertical rail brackets T', extending above the floor of the bridge and consisting of the parallel arms *s*, between which are secured the opposite ends of the longitudinal rail panels T^2, which are disposed over the opposite side edges of the bridge floor to inclose the sides of the same and protect passengers or vehicles from falling off, and these rail panels may be open work panels or of any desired shape and configuration. The same bolts that secure the arms, *s*, together clamp the panels therebetween.

The bridge improvements herein-described are completed by the employment of the corrugated abutment plates U, which are arranged against the outer sides of the opposite rows of supporting pillars, and are securely fastened thereto on the looped or U-shaped clamp bolts V, embracing such pillars and bolted to the said plates. The corrugated abutment plates are made of galvanized iron or similar non-rusting and non-corroding metal material to be rendered sufficiently durable for the purpose, and designed to receive the "fill" which is located at each end of the bridge to form the abutments therefor, the corrugations of said plates assisting to prevent the "settling" down of the earth "fill."

Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a bridge, the combination with the opposite mud-sills; of a series of supporting pillars arising from said sills, angle connecting plates bolted to the upper inner ends of each series of pillars, the longitudinal I-beams bolted to the horizontal flanges of said angle connecting beams and having their opposite extremities rest on the upper ends of said supporting pillars, and the bridge flooring laid on said I-beams, substantially as set forth.

2. In a bridge, the combination with the opposite mud-sills; of a series of vertical tubular supporting pillars arising from said mud sills, angle or L-shaped connecting beams arranged at the upper inner ends of said pillars, U-shaped clamping bolts or stirrups embracing said pillars and secured to the vertical flanges of said connecting beams, a series of longitudinal I-beams having their extremities resting on the upper ends of said pillars and their lower flanges bolted to the horizontal flanges of said connecting beams, diagonal bracing rods connected to said connecting beams and to the mud sills, and the bridge flooring on said I-beams, substantially as set forth.

3. In a bridge, the combination of the opposite transverse series of supporting pillars suitably connected at their upper ends, a series of longitudinal floor beams having their opposite ends secured on the upper ends of said supporting pillars, a needle beam centrally arranged under the longitudinal beams and secured thereto, depending notched truss brackets bolted to said needle beam, opposite truss saddles having inner grooved faces registering with the ends of the floor beams, and the endless adjustable truss rods having their central portions passed under said truss brackets and their opposite looped stirrup ends passed around the opposite truss saddles and holding the latter in position on the ends of the floor beams, substantially as set forth.

4. In a bridge, the combination with the opposite supports and a longitudinal series of I-beams having their ends placed on such supports, of the central needle beam secured under said longitudinal beams, the truss saddles provided at their upper outer ends with the stirrup grooves and in their inner faces with I-grooves registering with the ends of the longitudinal I-beams, and the endless adjustable truss rods passed centrally under the needle beam and having stirrup ends seated in the stirrup grooves of said saddles, substantially as set forth.

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

GEORGE N. CLYMER.

Witnesses:
ISAIAH CONNER,
ROSE E. WILE.