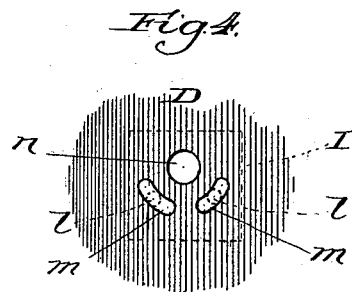
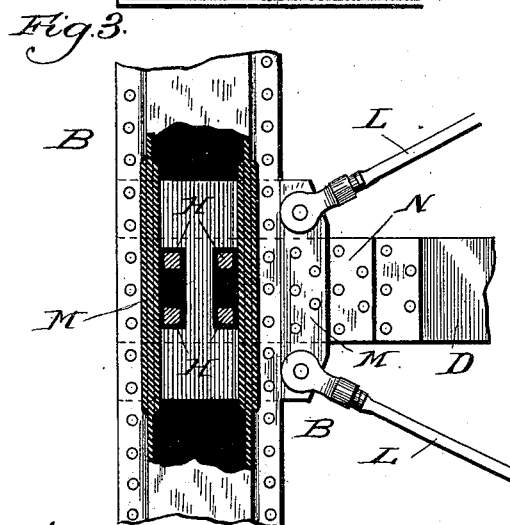
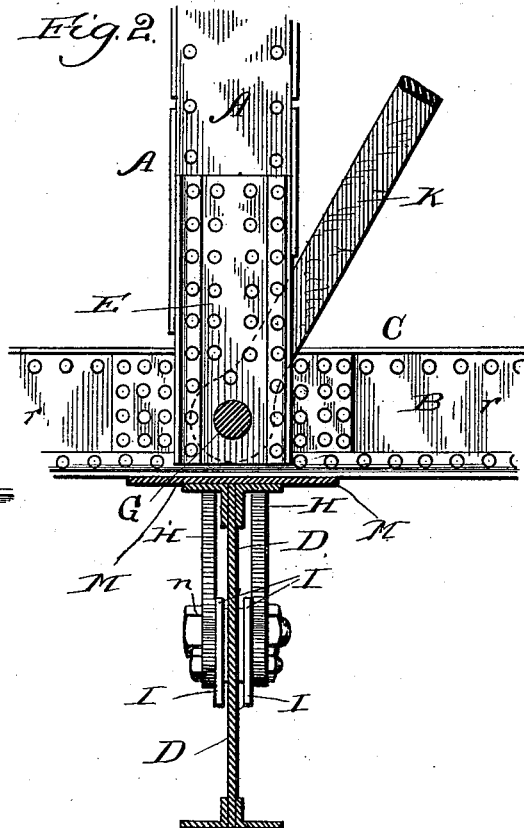
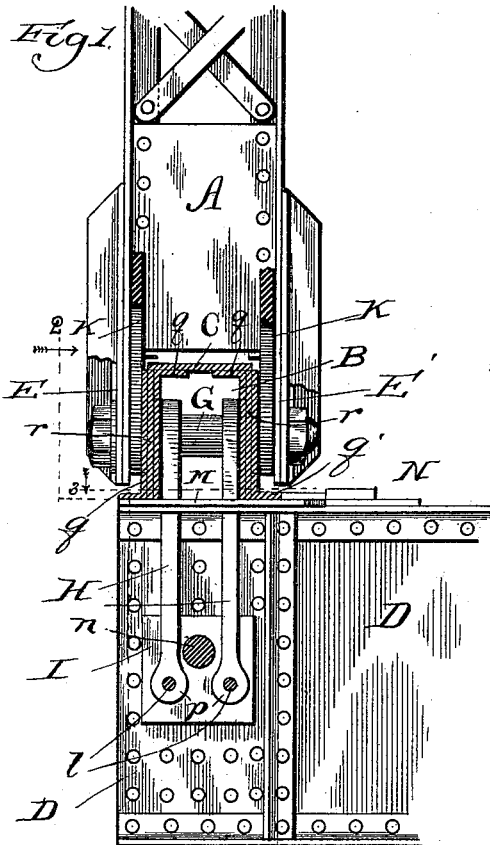


(No Model.)

C. F. T. KANDELER.
CONSTRUCTION OF BRIDGES.

No. 346,591.

Patented Aug. 3, 1886.



Witnesses:
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Atty's

UNITED STATES PATENT OFFICE.

C. F. THEODOR KANDELER, OF CHICAGO, ILLINOIS.

CONSTRUCTION OF BRIDGES.

SPECIFICATION forming part of Letters Patent No. 346,591, dated August 3, 1886.

Application filed May 17, 1886. Serial No. 202,428. (No model.)

To all whom it may concern:

Be it known that I, C. F. THEODOR KANDELER, a subject of the Emperor of Germany, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in the Construction of Bridges; and I hereby declare the following to be a full, clear, and exact description of the same.

It is common in the construction of bridges, particularly draw-bridges, to connect the vertical posts upon the bottom chords in a manner that prevents the use of a continuous top plate for each chord, the absence of which detracts greatly from the strength of the structure. If the top plate is in sections extending between the posts, (one form of construction,) the intervals between each two sections afford weak places, which, in their aggregate, constitute an important consideration, and the entire omission of top plates for the bottom chords (another form of construction) deprives the structure of strength in a measure even greater than the construction first referred to. Still another form of construction, including the use of a bottom plate for the chord, but not a top plate, is objectionable, as affording a receptacle in each chord for matter, particularly snow and ice, the effects of which are, for obvious reasons, highly injurious to the structure.

It is my object to afford a construction whereby a continuous top plate may be provided on each bottom chord, thereby greatly adding to the strength of the structure and avoiding the objections stated.

To these ends my improvement consists in the general construction I employ to accomplish the above-stated purposes; and it further consists in certain details of such construction and combinations of parts forming the same, all as hereinafter more fully set forth.

In the drawings, Figure 1 is a view in elevation, partly sectional cross-wise of the structure, of a broken portion of a bridge, illustrating my improved means of connecting the vertical posts and diagonal braces with the bottom chords to permit the use of continuous top plates for the bottom chords; Fig. 2, a similar view lengthwise of the structure, taken on the line 2 2 of Fig. 1; Fig. 3, a sectional plan view taken on the line 3 3 of Fig. 1; and Fig.

4, a broken face view of the web of a floor-beam, showing the construction I employ to relieve the connection with a post of stiffness.

A is a vertical post of a common form used in bridges, and B is a bottom chord comprising a hollow rectangular metallic beam formed of side plates, *r*, and a continuous top plate, C, secured together and braced internally by means of riveted angle-irons *q*, and a base-plate, M, connected with the side plates by means of external riveted angle-irons *q'*, the common forms of tie-plates and lattice-work being employed to connect the angle-irons *q'*. The sides of each post A that extend lengthwise of the structure are continued below the adjacent sides to render the post bifurcated toward its lower end, and afford thereby the bearings E and E', to embrace the corresponding sides, *r*, of the bottom chord, B, to which the post is secured by means of a pin, G, passed through the bearings E E' and side plates, *r*, of the chord, a space being left between the top plate, C, and lower end of the post, as shown.

The bottom chords, B, are connected with the floor-beams D by means of suspenders or straps H, passed over the pins G, and extending through the top flanges of the beams D, near the ends of the latter, toward the center of the web of the same on opposite sides, where they are provided with perforated heads *p*. A plate, I, is provided on the inner sides of adjacent straps H, on opposite sides of the web of each floor-beam, where it is suspended, and is held between the straps and web of the floor-beam by means of a pin, *n*. Coincident with the openings in the heads *p* of the suspenders H are openings, preferably in the form of curved slots *m*, in the web of the floor-beam to admit pins *l*, which pass through the openings *m* and openings in the strap-heads *p* and plates I. By these means the connection between the posts A and floor-beams is rendered yielding.

K represents the diagonal braces, which extend from the chords B, at the junction therewith of the posts A, to the top chords at the junction with the latter of adjacent vertical posts A, and these braces are sustained at their lower ends by the pins G, which are caused to pass through them, and extend from between the side plates, *r*, of the bottom chords and respectively adjacent bearings E and E'.

The truss-work or lateral rods L, (shown in Fig. 3,) which afford the lateral bracing of the bridge, extend from the plates M, riveted to the chords B, and bearing against stops or plates N, riveted to the floor-beams.

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

1. In a bridge, the combination of the posts A, bottom chord, B, having a continuous top plate, pins G, and diagonal braces K, substantially as and for the purpose set forth.

2. In a bridge, the combination of posts A, bifurcated toward their lower ends to produce bearings E and E', a bottom chord, B, provided with a continuous top plate, C, and embraced by the bearings E E', and pins G, extending through the bearings and bottom chord, substantially as and for the purpose set forth.

3. In a bridge, the combination of posts A, bifurcated toward their lower ends to produce bearings E and E', a bottom chord, B, provided with a continuous top plate, C, and embraced by the bearings E E', pins G, extending through the bearings and bottom chord, and diagonal braces K, sustained at their lower ends by the bolts G, between the sides of the bottom chord and adjacent bearings E E', substantially as and for the purpose set forth.

4. In a bridge, the combination of posts bifurcated toward their lower ends to produce bearings E and E', a bottom chord, B, provided with a continuous top plate, C, and embraced by the bearings E E', pins G, extending through the bearings and bottom chord, diagonal braces K, sustained at their lower ends by the bolts G, between the sides of the bottom chord and adjacent bearings E E', suspended floor-beams

D, provided with stops N for the bottom chord to bear against, and lateral rods L, connected to the bottom chord, substantially as and for the purpose set forth.

5. In a bridge, the combination of posts A, bifurcated toward their lower ends to produce bearings E and E', a bottom chord, B, provided with a continuous top plate, C, and embraced by the bearings E E', pins G, extending through the bearings and bottom chord, floor-beams D, provided with openings m, plates I, secured on opposite sides of the floor-beams, and suspenders H, supported on the bolts G, and secured at their opposite ends to opposite sides of the floor-beams, through the plates I and openings m, by pins l, substantially as and for the purpose set forth.

6. In a bridge, the combination of posts A, bifurcated toward their lower ends to produce bearings E and E', a bottom chord, B, provided with a continuous top plate, C, and embraced by the bearings E E', pins G, extending through the bearings and bottom chord, diagonal braces K, sustained at their lower ends by the bolts G, between the sides of the bottom chord and adjacent bearings E E', floor-beams D, provided with openings m, plates I, secured on opposite sides of the floor-beams, and suspenders H, supported on the bolts G, and secured at their opposite ends to opposite sides of the floor-beams, through the plates I and openings m, by pins l, substantially as and for the purpose set forth.

C. F. THEODOR KANDELER.

In presence of—

J. W. DYRENFORTH,
HENRY HUDSON.