

(Model.)

H. C. GROVES.
BRIDGE.

No. 249,038.

Patented Nov. 1, 1881.

Fig. 1.

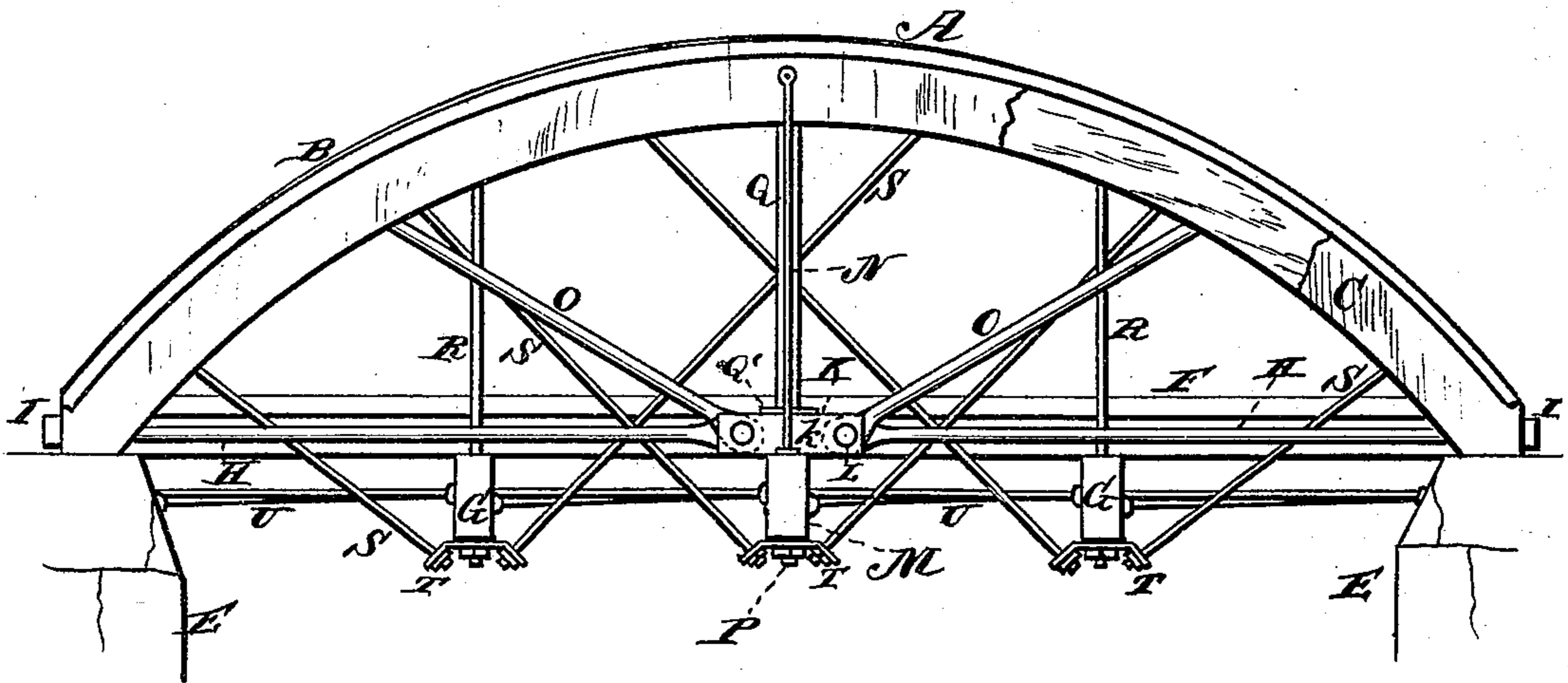
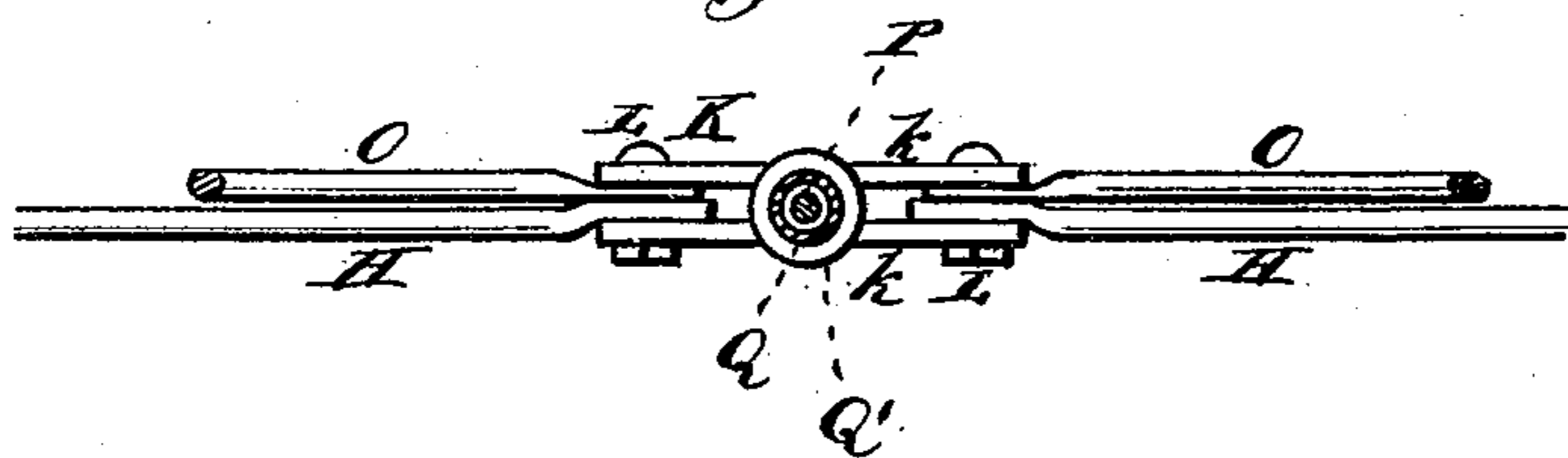


Fig. 2.



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HUGH C. GROVES, OF EMERSON, ASSIGNOR OF ONE-FOURTH TO HARVEY S. GROVES, OF YORK CENTRE, IOWA.

BRIDGE.

SPECIFICATION forming part of Letters Patent No. 249,038, dated November 1, 1881.

Application filed July 21, 1881. (Model.)

To all whom it may concern:

Be it known that I, HUGH C. GROVES, of Emerson, in the county of Mills and State of Iowa, have invented certain new and useful Improvements in Bridges; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side elevation of my bridge, and Fig. 2 is a detail view of the same.

The nature of this invention relates to arched bridges; and it consists in the construction and arrangement of brace-rods, chords, and couplings, as herein fully described, and particularly pointed out in the claim.

In the drawings, A designates the arches, which I propose forming of bent boards nailed or bolted together and covered with top sheet-metal strips, B, and wooden side strips, C. The ends of these arches will in practice be set in heavy iron shoes bolted to the abutments, and the hereinafter-described brace-rods will be secured to the arches during the process of construction and before the last boards are nailed in place. The usual screw-taps will be employed for preventing the rods from being drawn out of their bearings in the arches.

E designates the abutments, F the floor of the bridge, and G the cross-beams to which the floor is secured.

H H designate chords, which are passed through the ends of the arches and secured in place by means of taps I at their outer ends and couplings K at their inner ends, which are made broad and flat to receive the bolts L, which pass through the plates *k k*, of which the couplings are essentially composed. These couplings rest upon the central cross-beam, M, which is located below the floor intermediate of the ends of the bridge, and to which are secured the brace-rods N, which are fastened at their upper ends to the arches. O O designate supplemental brace-chords, which are secured at their lower ends between the plates of the couplings K in the same way as the

chords H, and at their upper ends in the arches by means of taps at points intermediate, or nearly so, of the centers and ends of the arches. These brace-chords prevent the arches from breaking upward when heavy loads are upon the bridge at points corresponding to and at the opposite end of the bridge from where such strain will occur.

P designates a vertical brace-rod, which passes through the cross-beam M, coupling K, a gas-pipe, Q, and a plate upon the under side of the beam M. The upper end of this brace-rod P is secured in the arch by means of an ordinary tap, and upon its lower end a like tap is screwed up against the plate which lies against the under side of the said beam. The gas-pipe Q has a washer or flanged base, Q', which rests upon the coupling, and, if desired, the vertical brace-rods R, which are secured to the arches and to the timbers G, in like manner to the brace-rod P, may also pass through gas-pipes in the same way.

S designates inclined brace-rods, which are secured at their upper ends in the arches and at their lower ends in angular-shaped plates T. These plates have each a central flat portion, which lies against the under side of the beams, and through which the vertical rods pass, and with angular ends through which the inclined brace-rods pass, and against which the taps upon their ends are screwed up flat.

The beams are all braced against each other by means of crossed brace-rods U, the whole constituting a strong and durable structure.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

In an arch-bridge constructed substantially as described, the combination of the chords H, supplemental chords O, and the couplings K *k*, constructed and operating as and for the purposes set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

HUGH C. GROVES.

Witnesses:

MUNSON W. HARRINGTON,
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