J. L. MINER.

Truss-Bridges.

No. 156,936. Patented Nov. 17, 1874.

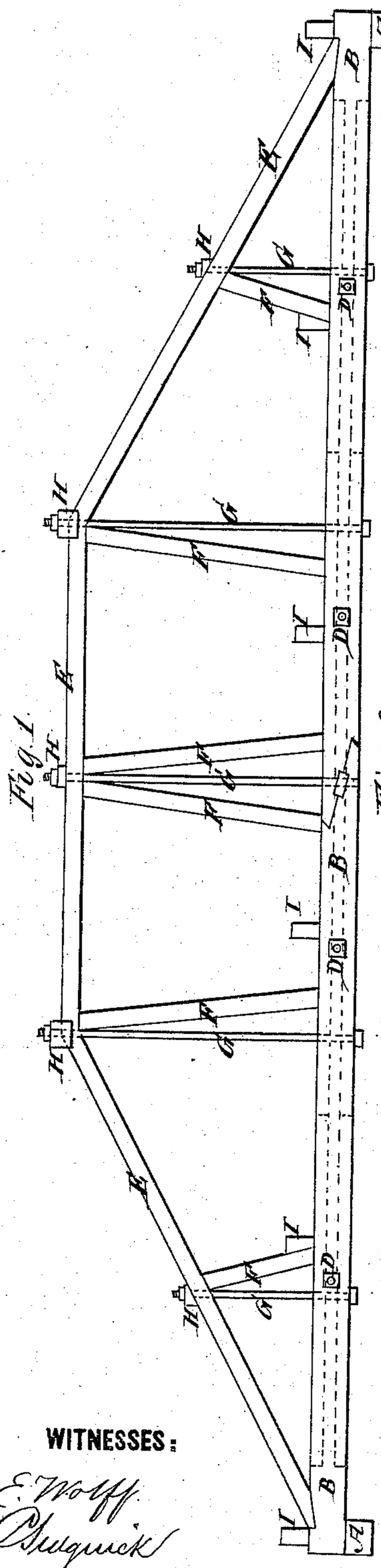

Fig. 1.

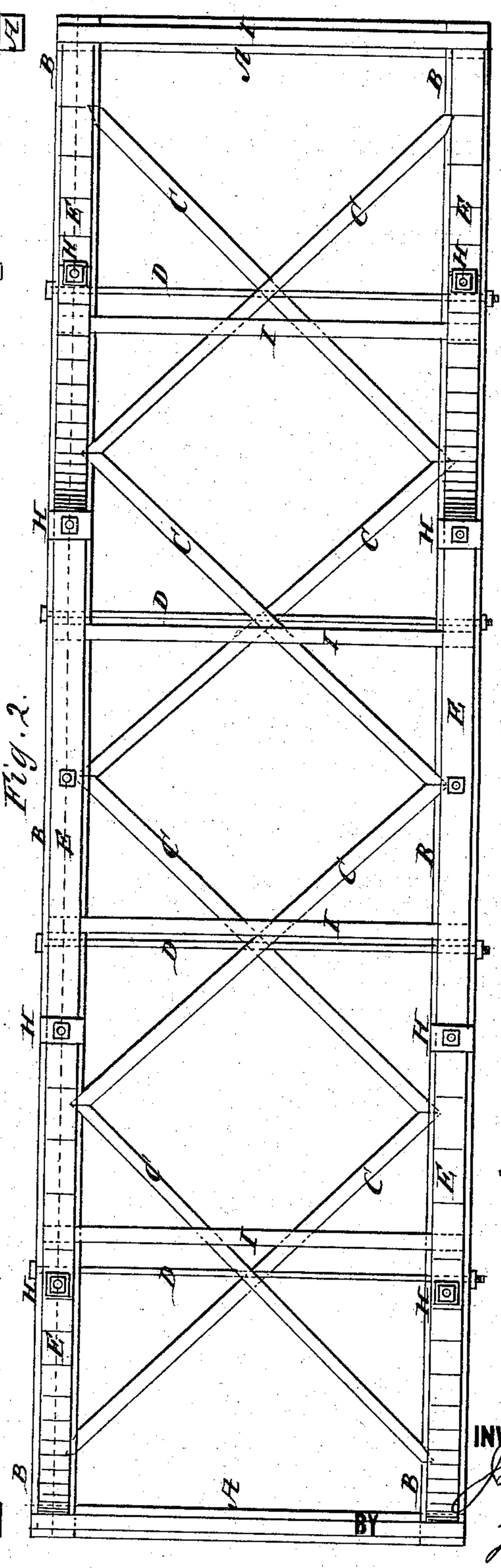

Fig. 2.

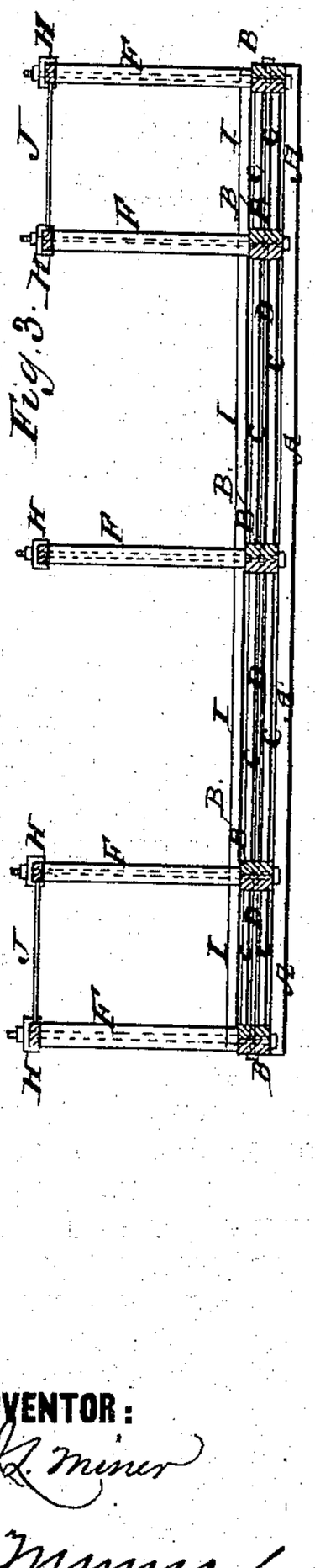

Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN L. MINER, OF BRENHAM, TEXAS.

IMPROVEMENT IN TRUSS-BRIDGES.

Specification forming part of Letters Patent No. **156,936,** dated November 17, 1874; application filed March 14, 1874.

To all whom it may concern:

Be it known that I, JOHN L. MINER, of Brenham, in the county of Washington and State of Texas, have invented a new and useful Improvement in Bridges, of which the following is a specification:

Figure 1 is a side view of one of my improved bridges. Fig. 2 is a top view of a single roadway-bridge, and Fig. 3 is a cross-section of a bridge shown with two roadways and two sidewalks.

Similar letters of reference indicate corresponding parts.

My invention has for its object to improve the construction of bridges, whether made with a single or double roadway and with or without a sidewalk upon one or both sides, so as to enable them to be made with less material and less expense than when made in the ordinary manner, and which shall at the same time have an equal or greater strength.

The invention consists in an improved bridge formed by the combination, with each other, of the double stringers, the zigzag braces, the base tie-rods, the cap-plates, the inclined side-wall braces, the side-wall tie-rods, and the cast washers, as hereinafter fully described.

A represents the caps of the piers, to which the ends of the stringers B of the bridge are bolted. The stringers are formed by bolting two parallel beams to each other, a space of about an inch being left between them to allow water to run off. The two stringers of the roadway are connected by two sets of inclined or zigzag braces, C, placed the one set at the upper part, and the other set at the lower part, of said stringers, the braces of the two sets crossing each other at their centers. The two stringers are secured to each other by tie-rods D, having a washer and head at one end and a washer and nut at the other end, the said tie-rods passing through the space between the two sets of braces C. The side walls of the bridge are formed of the cap or wall-plates E, the braces F, and the tie-rods G. The cap-plate E is made in three parts, the central part being parallel with the stringers B, and at a distance above them of fifteen feet or more. The end parts of the cap-plates E are inclined, extend from the ends of the central part to the ends of the stringers, are spliced to the said middle part, and are bolted to the said stringers. The braces F, at the inclined parts of the cap-plates, are placed with their lower ends inclined toward the middle part of the bridge. At the horizontal part of the cap-plates E the braces F are used in pairs, which are placed with their upper ends near each other, and their lower ends inclined from each other. The tie-rods G are vertical, pass through the stringers B, and through the cap-plates E near the upper ends of the braces F, and have washers and heads upon their lower ends, and washers and nuts upon their upper ends. The washers H upon the upper ends of the tie-rods G are cast-iron, are so formed as to fit upon the cap-plates E, and those at the splices or angles of the cap-plates have flanges upon their ends to overlap the side edges of said cap-plates E, as shown in Figs. 1, 2, and 3. I are the girders, which are attached to the stringers B, and which, in connection with the joists, support the planks that form the road-bed. The joists and planks are not shown in the drawings.

When the bridge is built with two roadways the construction is the same, except that three side walls are used, the one in the center being made the heaviest.

When the bridge is built with sidewalks upon one or both sides the construction is the same, the stringers and horizontal braces being tied to the outer side walls of the bridge in the same manner as the side walls of said bridge are tied to each other, except that the horizontal parts of the cap-plates of the side walls of the sidewalk may be tied to the cap-plates of the side walls of the bridge by tie-rods J, which have a washer and head upon one end, and a washer and nut upon the other end.

In case the length of the bridge be not more than seventy-five feet, the cap-plates E may be made in three equal parts, and their horizontal middle parts about fifteen feet above the stringers B. For a longer bridge the middle or horizontal part of the cap-plate should be lengthened, and should be strengthened by having another plate bolted to it, which should be of such a length that its ends may be midway between the splice or angle of the cap-plates and the first tie-rods G. In this

case also the horizontal parts of the cap-plates should be sixteen feet above the stringers, and should be connected by zigzag braces and tie-rods in the same manner as the stringers, this height of the side walls allowing all kinds of loaded wagons to pass through beneath the top braces and tie-rods.

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

The combination of the stringers B, zigzag horizontal braces C, horizontal tie-rods D, cap-plates E, vertical braces F, and tie-rods G, the various parts being constructed and relatively arranged as herein shown and described.

JOHN L. MINER.

Witnesses:
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