W. IRELAN.

BRIDGE.

No. 190,437. Patented May 8, 1877.

*Fig. 1*

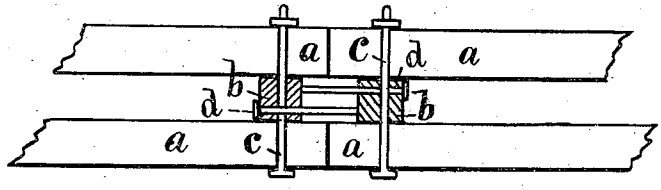
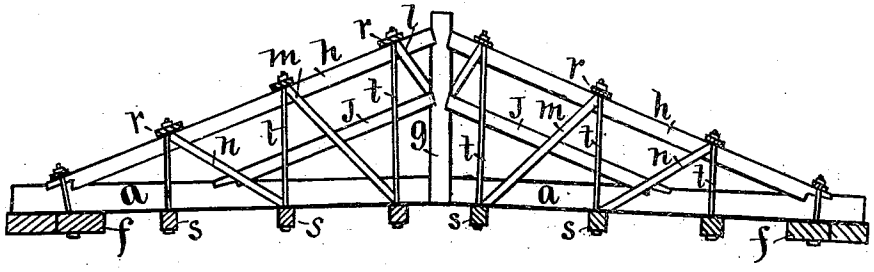



*Fig. 2*

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# UNITED STATES PATENT OFFICE.

WILLIAM IRELAN, OF OAK SPRINGS, IOWA.

## IMPROVEMENT IN BRIDGES.

Specification forming part of Letters Patent No. **190,437**, dated May 8, 1877; application filed October 27, 1876.

*To all whom it may concern:*

Be it known that I, WILLIAM IRELAN, of Oak Springs, in the county of Davis and State of Iowa, have invented certain Improvements in Bridges, of which the following is a specification:

The object of my invention is to improve the construction and increase the strength and durability of a bridge.

It consists, first, in the manner of joining the ends of a beam or chord formed of two parallel pieces; second, in the manner of arranging double or parallel braces relative to each other, a central vertical post, and the parallel beams of the chord, to form a skeleton girder; third, in the manner of combining the binding-joists, the double series of braces, and the parallel beams, all as hereinafter fully set forth.

Figure 1 of my drawing is a top-plan view, illustrating the construction of my improved beam-joints. *a a a a* are the four ends of four independent beam-pieces joined together. *b b* are vertical stay-blocks, secured between the parallel pieces *a*, near their ends, by means of transverse bolts *c c*. *d d* are bolts passed through the stay-blocks *b* in crossed positions or X form, to bind and hold the two complete ends of the compound beam rigidly together. The ends of the pieces *a* which are thus joined together are, preferably, not cut off square, but at a slight angle, so as to make the top sides longest, and thereby produce an upward bow in the complete beam, to give increased strength to the joint, and to prevent the center of a bridge-span from settling below a level line.

I am aware that the ends of parallel beams have been joined together by means of iron clamps and bolts; but I claim that my manner of forming a joint by means of the vertical stay-blocks *b* and bolts *c* and *d* is novel and greatly advantageous.

Fig. 2 is a side elevation of one of my skeleton girders in position as required to form a bridge. *f f* represent bolsters resting upon abutments or piers. *a a* is one of my compound jointed beams or chords. *g* is a vertical center or queen post, framed at its base to the parallel pieces *a* of the chord. *h h* represent braces, formed of two parallel pieces, framed at their top ends to the central post *g*, and at their bottom ends to the parallel pieces *a* of the chord. J J are parallel braces, corresponding in form and position with the braces *h*, but are shorter and lower in the angles formed by the chord *a a* and the post *g*. *l l* are single minor braces, angling in reverse directions from the parallel braces *h* and J. Their top ends are bolted between the parallel braces *h*, and their bottom ends are framed to the post *g* and the top ends of the parallel braces J J. *m* and *n* are single braces, corresponding with the braces *l*. They are bolted between the parallel braces J at their central portions, and framed, bolted, or otherwise rigidly fixed at their lower ends to the chord *a a*. *r r* represent short binding-plates, spanned across the top sides of the parallel braces *h*, immediately over the top ends of the minor single braces *l m n*. *s s* represent binding-joists crossing on the under side of the complete bridge. They are suspended and clamped to the chords *a a* by means of the iron rods *t*, which pass upward through the ends of the joists *s*, and between the parallel pieces of the braces *h* and J, and through the binding-plates *r*, to which plates they are secured and drawn by screws and nuts on their top ends. All the parts are thus arranged and combined to form a skeleton girder. The dimensions of the various pieces used can vary in proportion to each other as required to form complete bridges of various sizes.

By connecting two or more of my complete skeleton girders with binding-joists and floors a simple, strong, and durable complete truss-bridge is easily constructed.

I claim as my invention—

1. In the construction of a bridge, the vertical stay-blocks *b b*, the transverse bolts *c c*, and the crossing bolts *d d*, arranged and combined with the ends of the four pieces *a*, substantially as and for the purposes shown and described.

2. The beam or chord *a a*, the vertical post *g*, the series of parallel braces *h* and J, and the series of single minor braces *l m n*, arranged and combined substantially as and for the purposes shown and described.

3. The chord *a a*, the braces *h* J *l m n*, the binding-plates *r*, the binding-joists *s*, and the rods *t*, all arranged and combined substantially as and for the purposes shown and described.

WILLIAM IRELAN.

Witnesses:

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ANDREW J. GUILE.