A. BANNISTER.
Truss-Bridges.

No. 141,026. Patented July 22, 1873.

Fig. 1.

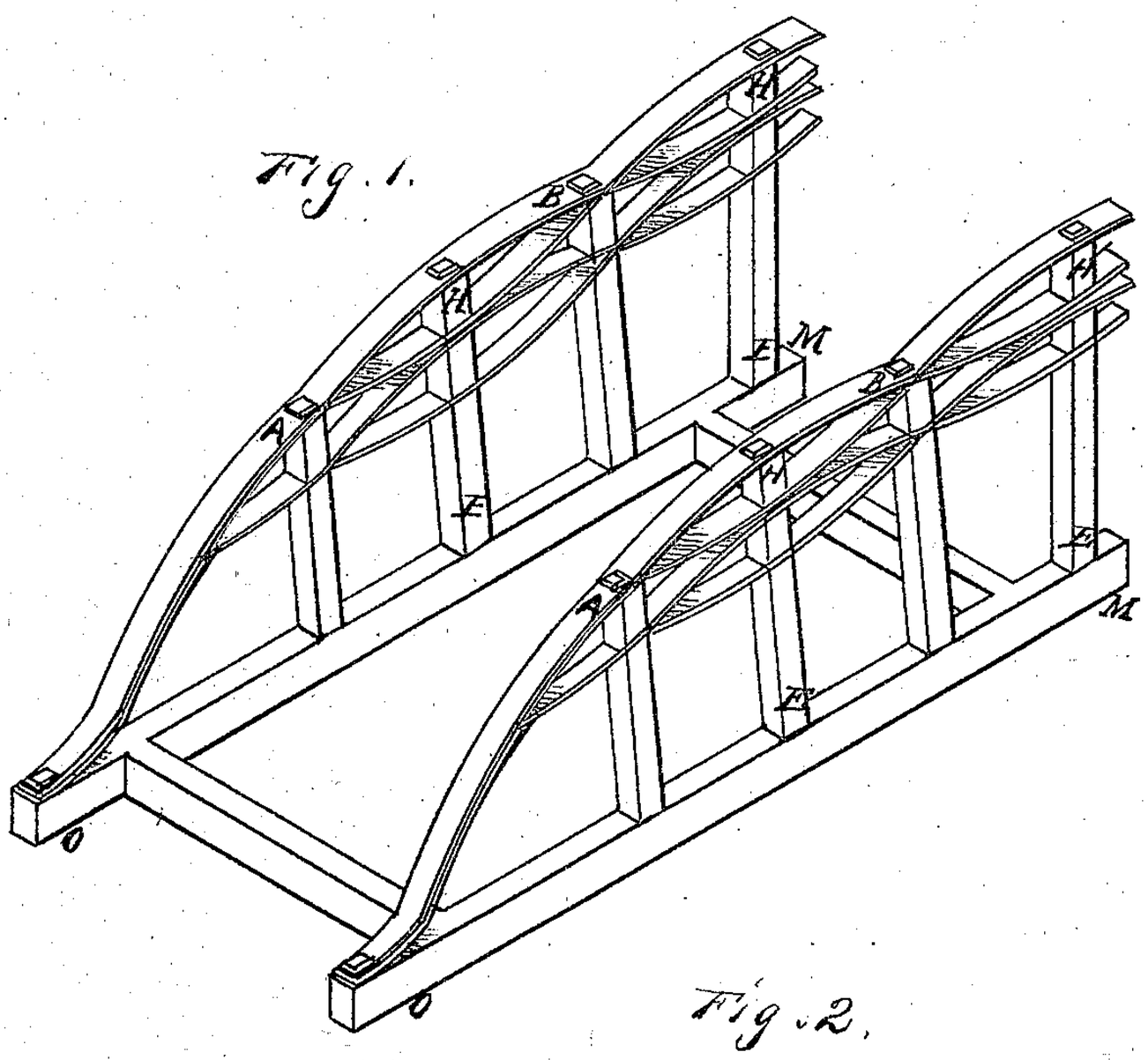


Fig. 2.

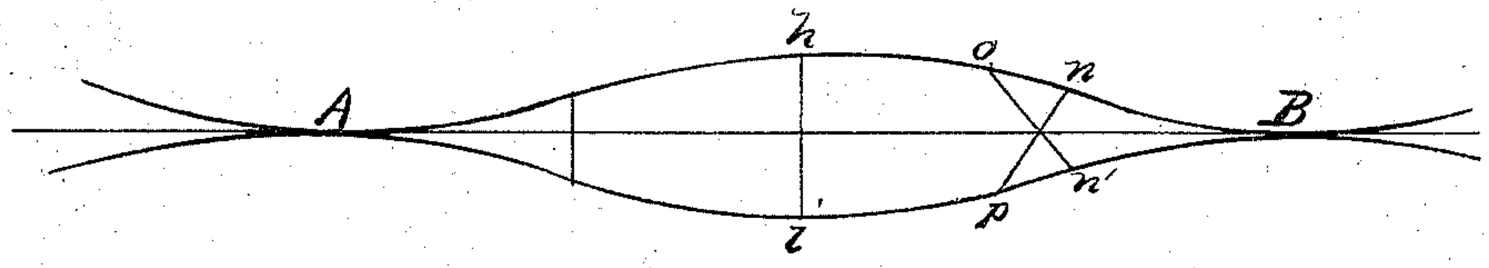


Fig. 3.

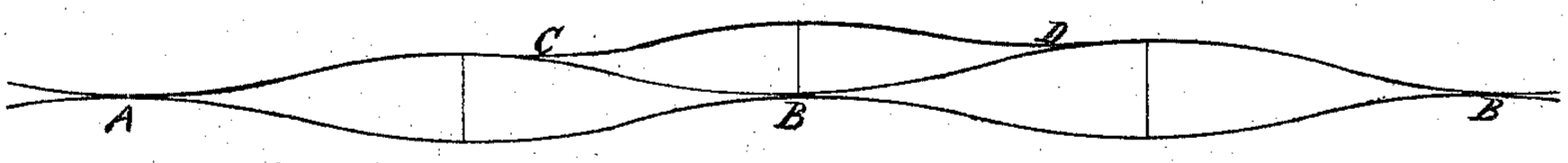


Fig. 4.

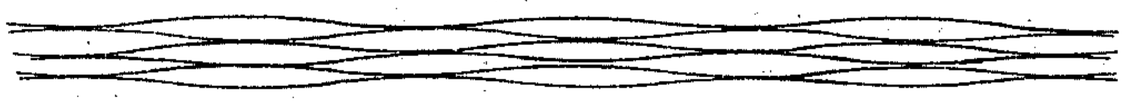
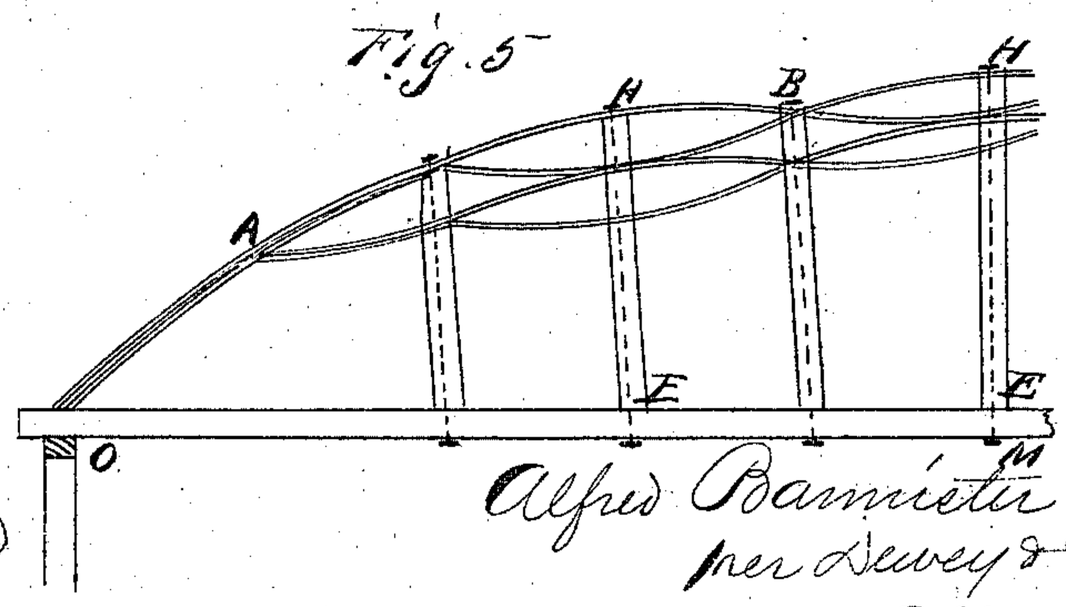


Fig. 5.



Witnesses
John. L. Borne
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UNITED STATES PATENT OFFICE.

ALFRED BANNISTER, OF ALAMEDA, CALIFORNIA.

IMPROVEMENT IN TRUSS-BRIDGES.

Specification forming part of Letters Patent No. **141,026**, dated July 22, 1873; application filed May 28, 1873.

To all whom it may concern:

Be it known that I, ALFRED BANNISTER, of Alameda city and county, State of California, have invented an Improved Bridge-Truss; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

The object of my invention is to provide an improved truss for supporting the span of a bridge or other structure, the extremities of which rest upon abutments which are placed at a distance apart. My improvement consists in constructing the upper chord of a bridge by framing or joining the longitudinal timbers together in curved lines, so that elliptical bays or figures will be described by the alternate separation and bringing together of the timbers which form the chord. These bays are braced by struts and ties, while posts connect the upper and lower chords at intervals.

In order to more fully illustrate and explain my invention, reference is had to the accompanying drawings forming a part of this specification, in which—

Figure 1 is a perspective view of a section of my bridge. Figs. 2, 3, and 4 show the manner of uniting the timbers. Fig. 5 is a side elevation of my bridge section.

Any number of timbers, A *h* B and A *i* B, are firmly fastened together at A and B, and are opened and strained apart, as shown. A strut and tie-bolt, *h i*, is placed midway between the points A B, so as to cause the two timbers thus conditioned to form a figure similar to an ellipse, each one of which I call a bay. In some cases, in order to counteract certain strains, other struts and ties and braces, *n p* and *o n'*, may be placed in any required position between the upper and lower timber of each bay. This should be done when the stretch of the ellipse is very long. Now, suppose that this compound beam or bay is supported at A and B and a weight is placed upon it at *h*, causing a vertical strain in the line *h i*, it is evident that all of the fibers of the material at any given point will resist the active strain. The entire upper chord of the bridge I construct in this manner, as shown at Fig. 2, so that a strain given at any point along this chord will be distributed throughout the material of which the chord is constructed, so as to react in a line with the length of the chord, thus rendering the chord in itself a reservoir of strength. At a suitable point, which is usually at the middle of each bay, I place vertical posts H E, which extend down to the lower chord O M; or the entire space between the lower and upper chord can be filled up with timbers bent and braced into elliptical bays, in the manner above described. The extremities of the upper chord are formed by uniting the various timbers which form the bays into one united bundle of timbers, and carrying them down to the extremities of the lower chord and fastening them either by a system of bolts or stirrups, as most convenient.

The posts H E should be set bracing, or at right angles to the upper chord when it inclines at either end toward the extremities of the lower chord, so as to cause the strain to act vertically, in accordance with mechanical principles.

Fig. 4 shows how the timbers in one bay can be extended so as to form successive bays, each timber being alternately in direct and reversed curves. It also shows how a system of bays can be arranged upon each other to form a truss, either with or without chords. In all cases the timbers are secured to each other at the points of tangency. The same figure may be taken in plan and illustrate a good method of composing the leaves of a chord. Such a combination will tend to prevent lateral distortion, and, to a great extent, obviate the necessity of the usual lateral bracing.

Fig. 3 exhibits another design for applying this method. The truss is supported at B A, and a lower chord (not shown) may or may not be used. The stability of the bays A B is increased by the addition of the bays C D.

By this arrangement of the timbers of a truss, I am enabled to make the upper chord an independent self-sustaining truss, which can be used either with or without a lower chord.

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

A truss for supporting the spans of bridges and other structures, composed of two or more continuous beams or timbers, alternately separated and brought together, so as to form oval or elliptical bays, which alternate and are united together in the manner substantially as above described.

In witness whereof I hereunto set my hand and seal.

ALFRED BANNISTER. [L. S.]

Witnesses:

JOHN L. BOONE,

C. M. RICHARDSON.