

S. P. HASTINGS.

Improvement in Bridges.

No. 132,284.

Patented Oct. 15, 1872.

Fig. 1.

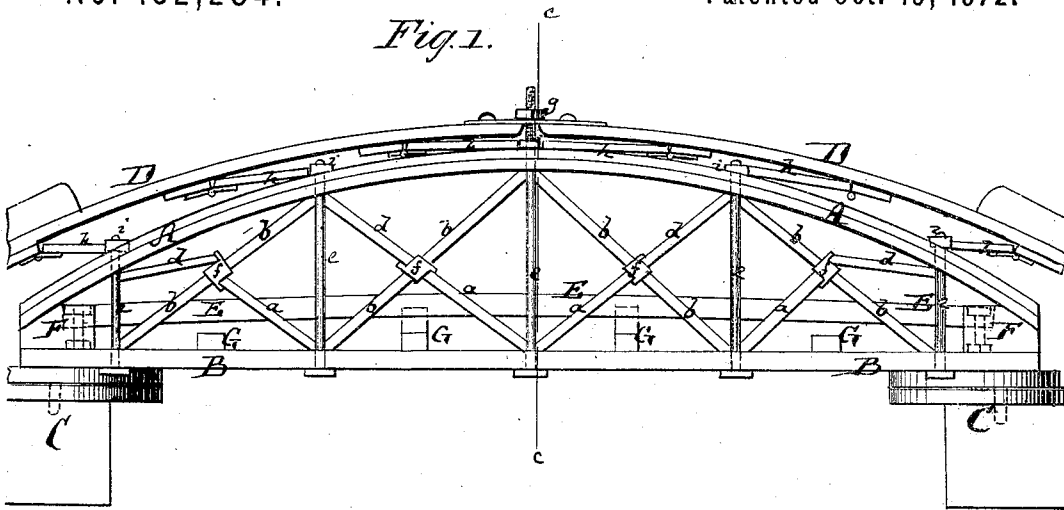


Fig. 2.

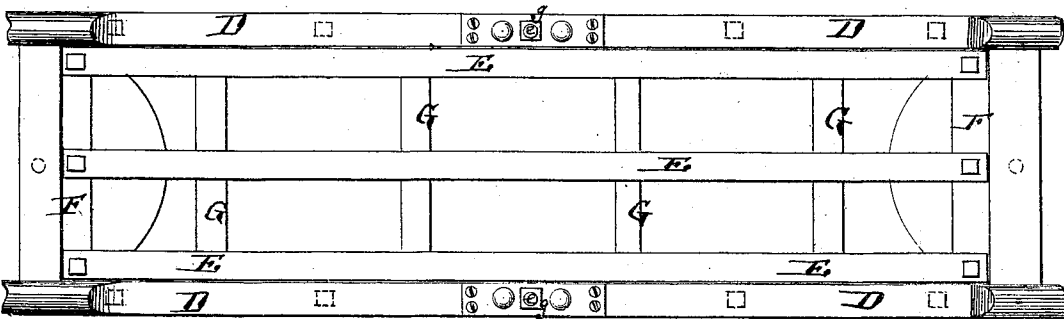


Fig. 3.

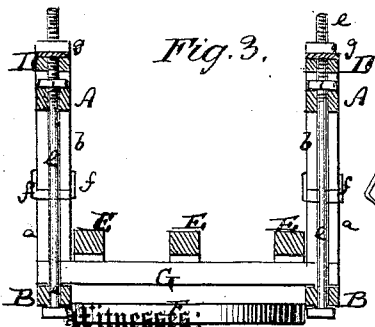


Fig. 4.

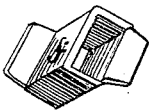
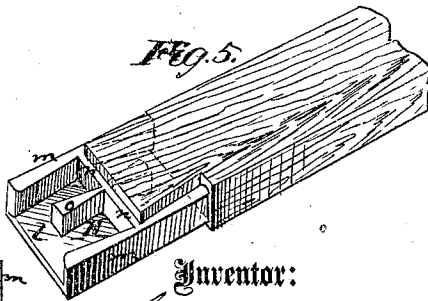


Fig. 6.



Fig. 5.



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UNITED STATES PATENT OFFICE.

SAMUEL P. HASTINGS, OF TONAWANDA, NEW YORK.

IMPROVEMENT IN BRIDGES.

Specification forming part of Letters Patent No. 132,284, dated October 15, 1872.

To all whom it may concern:

Be it known that I, SAMUEL P. HASTINGS, of Tonawanda, in the county of Erie and State of New York, have invented a new and Improved Construction of Bridge, of which the following is a specification:

Figure 1 is a side view of my improved bridge; Fig. 2 is a top view of the same; Fig. 3 is a vertical transverse section of the same on the line *c c*, Fig. 1; Fig. 4 is a perspective view of the brace-connecting link; Fig. 5 is a perspective view of the splice; and Fig. 6, a transverse section of the same.

Similar letters of reference indicate corresponding parts.

This invention relates to improvements in the construction of bridge-arches, beams, connecting-links, and splices, with the object of increasing the strength and durability of parts and simplifying their connection. The invention consists in the arrangement of a counter-arch and inwardly-projecting stays over the main arch; in the construction of simple links, which connect the arch-braces, to allow their playing one upon another; in the use of arched sleepers, which do not touch the cross-beams except under great weight; and in the introduction of a novel simple splice for any of the parts to be connected.

A in the drawing represents the main arch on one side of the bridge. It is, by diagonal braces *a*, *b*, and *d*, and by posts *e*, supported on the girders B that rest on suitable stationary abutments or on floats C C. The braces *b b* extend from the arch to the girder B; but the braces *a a* extend only from the girder B to the braces *b*, while the braces *d* reach from the arch to the braces *b*, as shown in Fig. 1. Sleeves *f f* embrace the braces *b*, and can slide loosely thereon, and have projecting ears on the sides that serve as steps for the braces *a* and *d*. When, during excessive strain, the arch is flattened, the braces *a* and *d* are allowed to become displaced on the braces *b*, as the sleeves or links *f* can slide on the latter and resume their former position as soon as the strain ceases and the arch is restored to its original form. D is a counter-arch or second arch, placed above A, and fastened thereto in the middle by an extension post, *e*, and nut *g*. The arch D is more flat than A, but is, toward the ends, supported by inwardly-projecting stays *h h*, which bear against projecting ears or stops *i i* on the upper sur-

face of the arch A, as is clearly shown in Fig. 1. If the bridge is severely strained in the middle, the arch D is designed to stiffly brace the arch A, and help to strengthen the entire bridge. E E are the beams or sleepers upon which the bridge-flooring is secured. They are, at the ends, rigidly bolted to the end cross-beams F of the bridge, but are not otherwise supported, but are arched so as not to come in contact with the other cross-beams G of the bridge. Any ordinary load will be fully supported on the beams F and their end-supports without in the least straining the arches. But when, by a very heavy load, the beams E are flattened, they will bear upon the cross-beams G, and draw the arches into service. By this feature the bridge is prevented from wear by its own weight, or that of average loads. H is a metal splice for the beams and girders used on the bridge, or on any other structure. This splice consists of a metal plate, *l*, as wide as the beams to be connected, and flanged at the sides, the flanges *m* being thicker toward the ends to form dovetail recesses between them. A cross-rib, *n*, in the middle of the plate *l*, serves as an abutment for the sections of beams to be united. Dovetail ribs *o* may further be caused to extend from the rib *n* toward the ends of the plate. The beams to be united are, at the ends, recessed to fit the several projections of the splice-plate, and are then secured thereto by screws.

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

1. The counter-arch D, fastened to the middle of the main arch A, and provided with the stays *h* that bear against the stops *i* of the main arch, as set forth.
2. The links *f f* sliding on the braces *b*, and constituting supports for the braces *a* and *d*, substantially as herein shown and described.
3. The beams E of a bridge, when arched so as not to touch the cross-beams G, as set forth.
4. The splice-plate H, made with flanges *m* and ribs *n* and *o*, substantially as herein shown and described.

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