

S. P. HASTINGS.

Improvement in Bridges.

No. 132,284.

Patented Oct. 15, 1872.

Fig. 1.

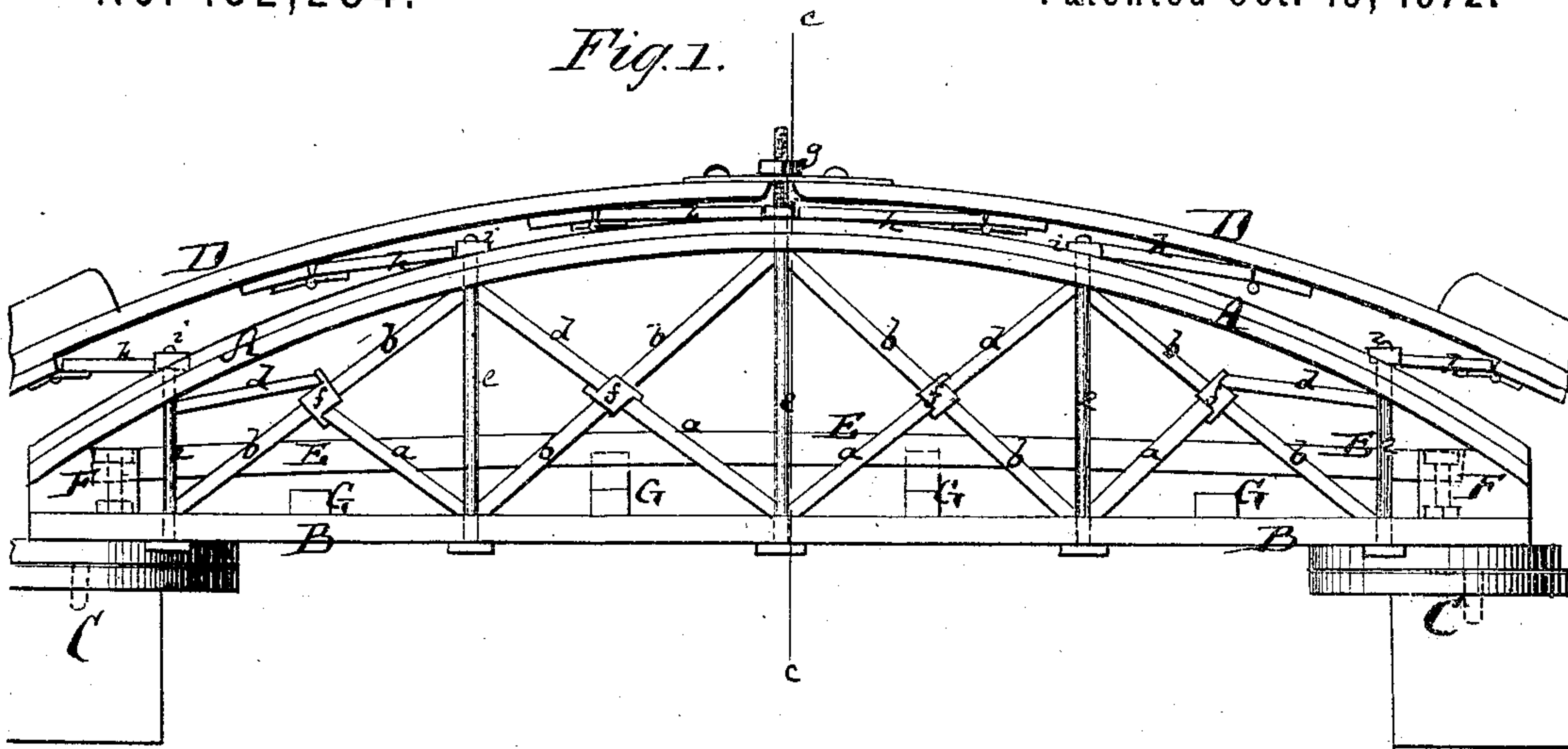


Fig. 2.

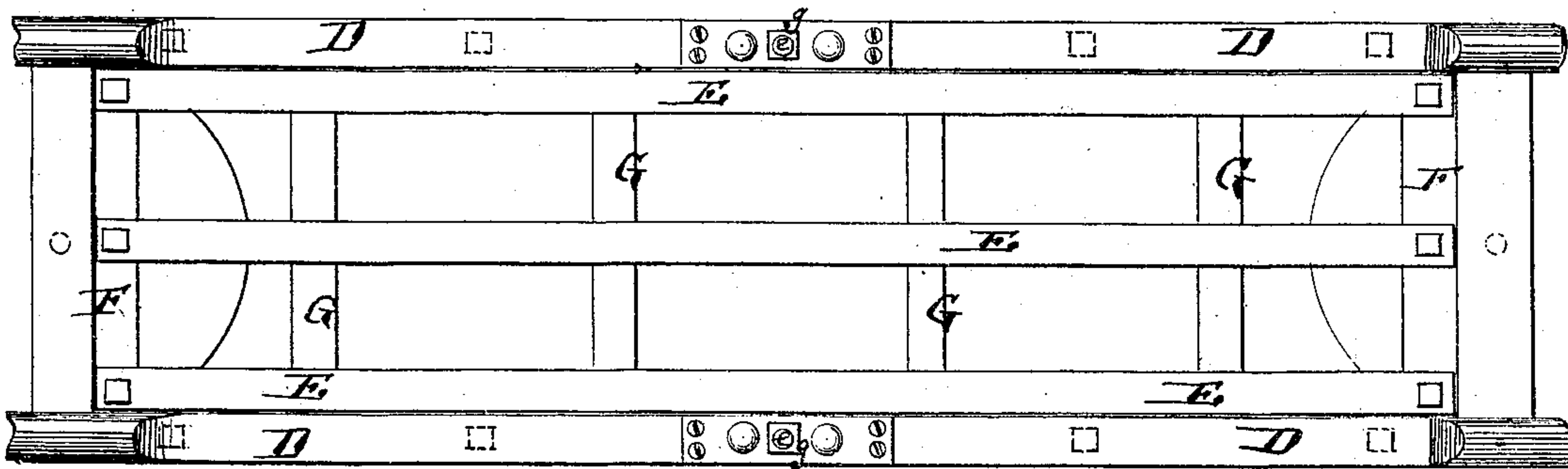


Fig. 3.

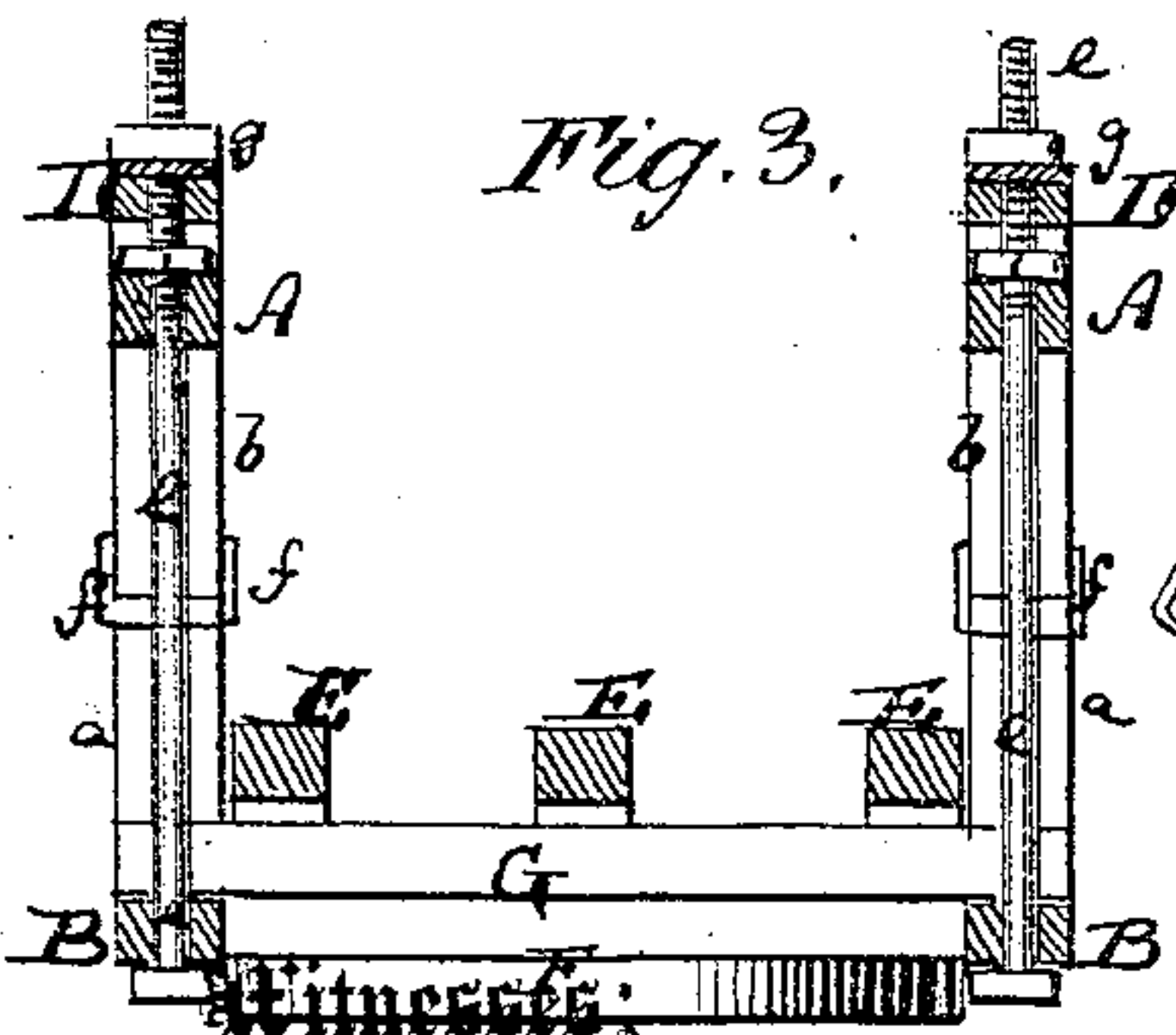


Fig. 4.

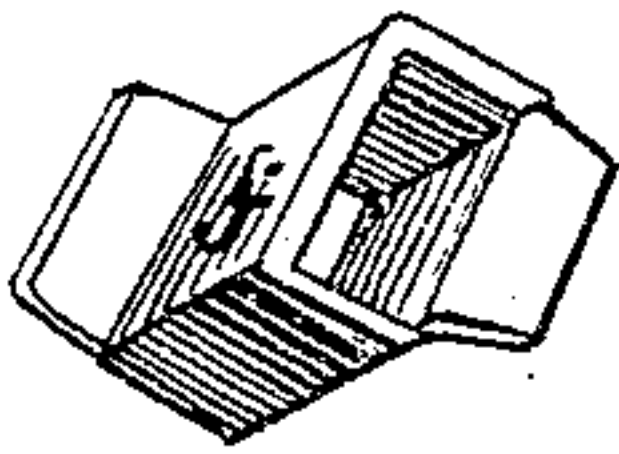
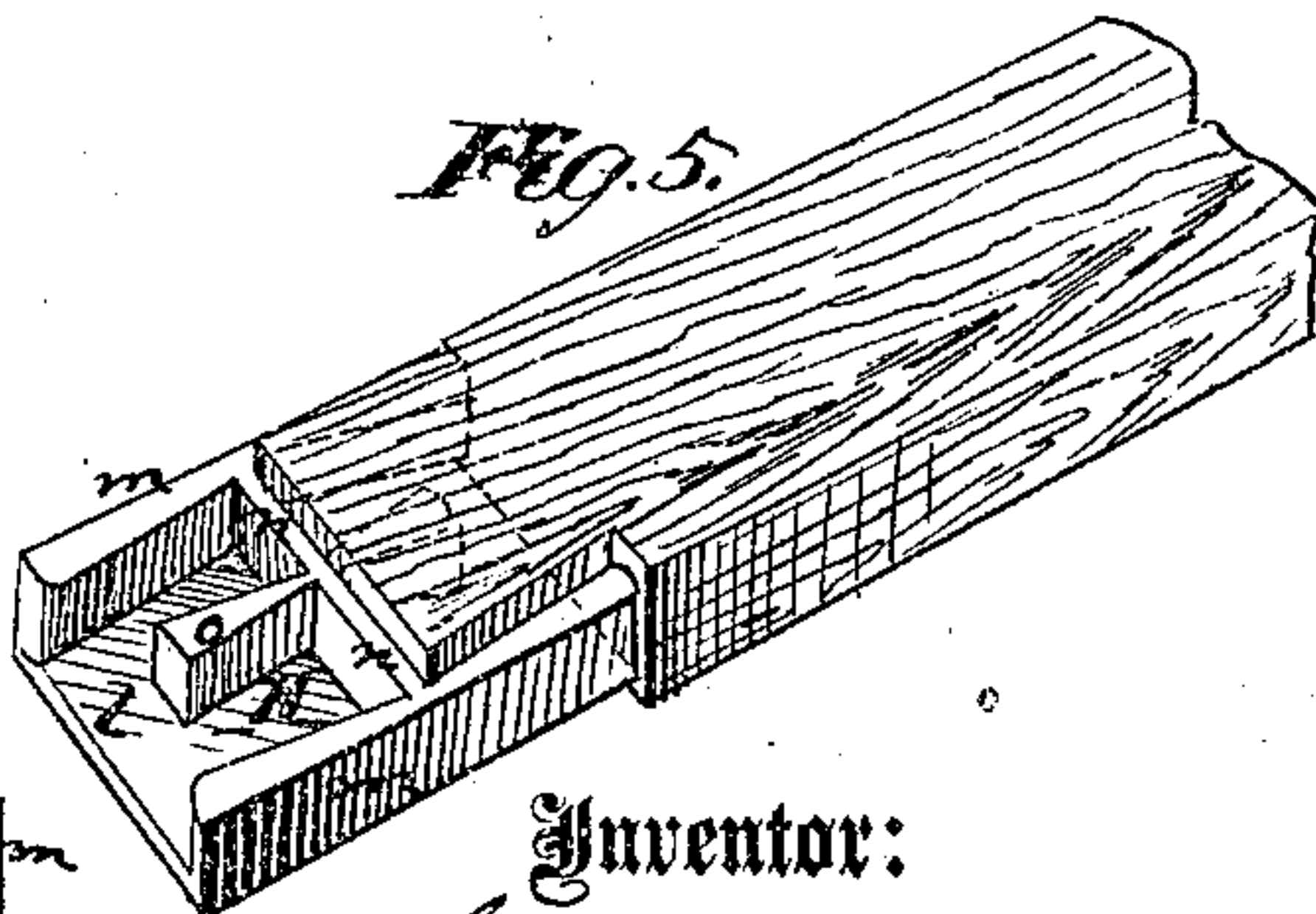


Fig. 6.



Fig. 5.



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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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