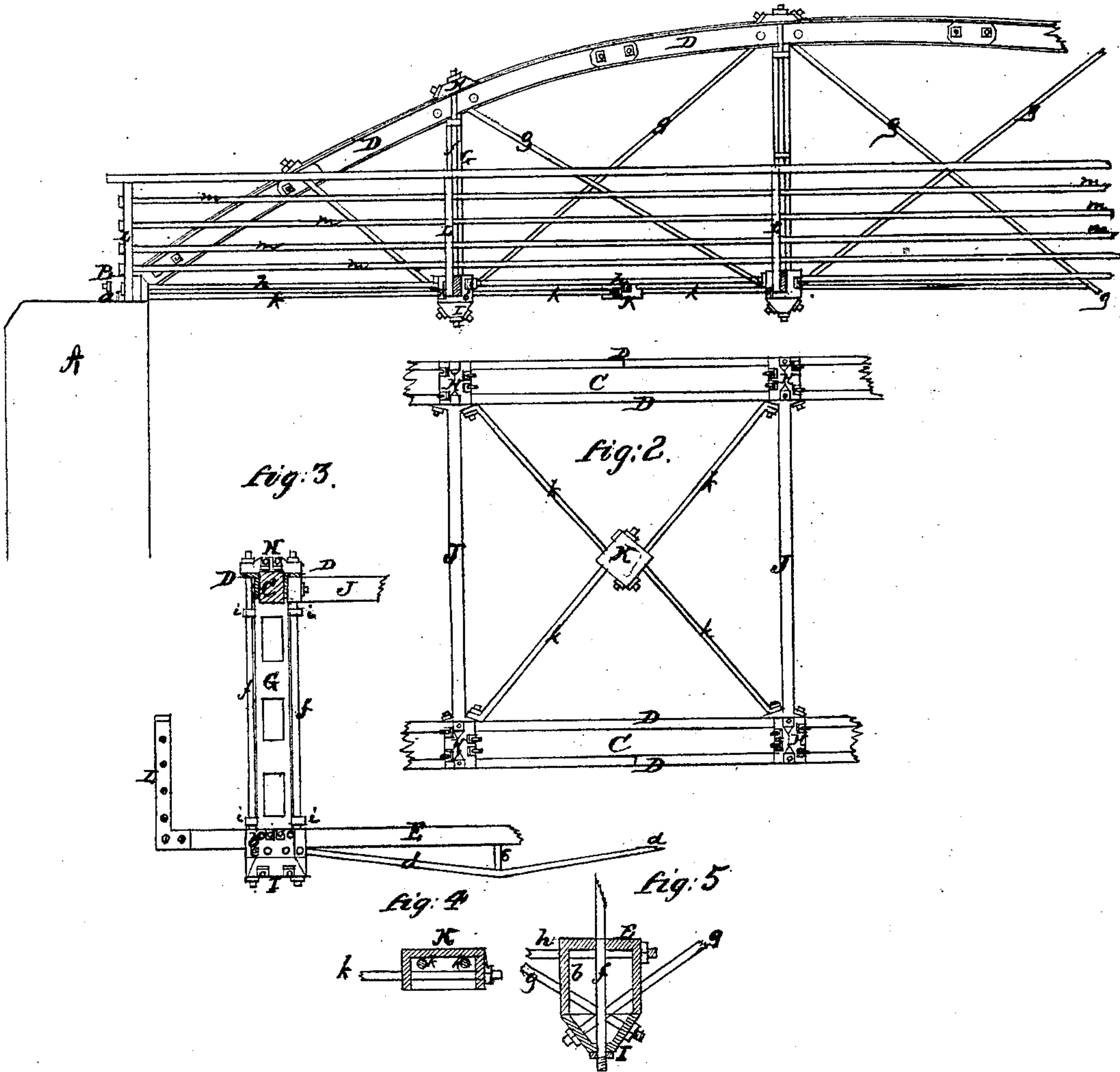


JACOB SEEBOLD.  
Improvement in Bridges.

No. 114,479.

Patented May 2, 1871.

*fig:1.*



Witnesses.

*H. L. Byert,*  
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*Jacob Seebold*  
*per*  
*Alexander Tharou*  
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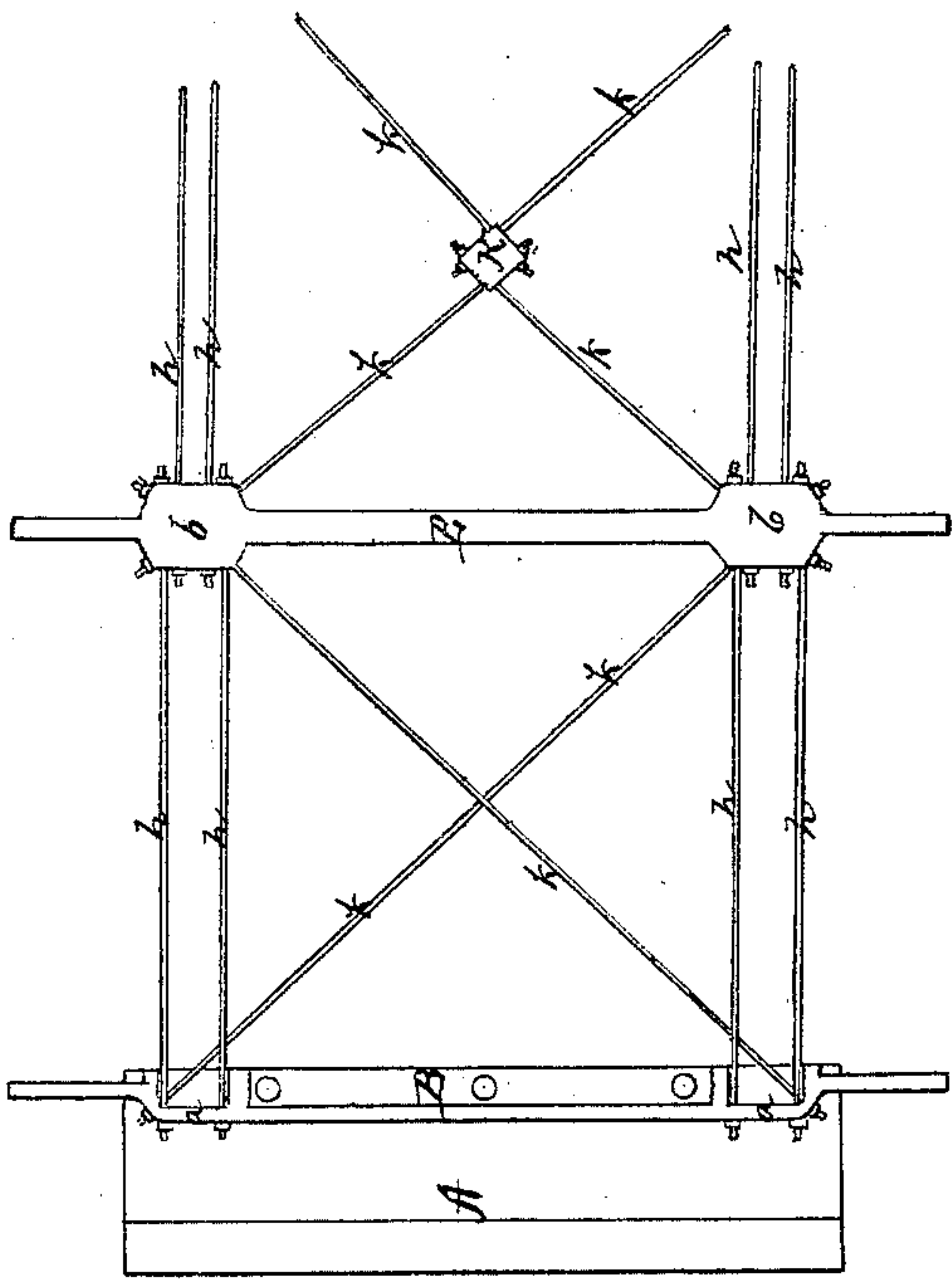
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Fig. 6.



Witnesses.

*Jas. O. Hutchinson  
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Inventor.

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 per  
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 Atty.*



# UNITED STATES PATENT OFFICE.

JACOB SEEBOLD, OF KANTZ, PENNSYLVANIA.

## IMPROVEMENT IN BRIDGES.

Specification forming part of Letters Patent No. 114,479, dated May 2, 1871.

*To all whom it may concern:*

Be it known that I, JACOB SEEBOLD, of Kantz, in the county of Snyder, and in the State of Pennsylvania, have invented certain new and useful Improvements in Bridges; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a bridge, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a side elevation of a portion of my bridge. Fig. 2 is a plan view of a portion of the arch. Fig. 3 is a side view of a portion of one of the floor-beams, showing the post connecting it with the arch. Fig. 4 is a vertical section through a block used in bracing my bridge. Fig. 5 is an enlarged vertical section through the enlargement of the floor-beam, and Fig. 6 is a plan view of one end of the floor of the bridge.

A represents the abutment for the bridge, made in any of the known and usual ways, and upon or in which is firmly secured the shoe B. This shoe is made of cast-iron, in L shape, extending the entire length and beyond each side of the abutment. At a suitable distance from each end of the shoe B, and in the same, is formed a box, *a*, in which the end of the arch is inserted and firmly bolted.

The arch is composed of timber C, with cast or wrought iron bars D firmly bolted on each side. These bars D D are also L-shaped, the horizontal portions extending outward on a line with the upper surface of the timber C. The L-shaped bars D D are attached to the timber C in such a manner as to break the joints.

The entire arch may be made of cast-iron instead of timber and iron, in which case it is made of two pieces crosswise, so as to break joints where they are attached together.

E E represent the floor-beams, made of cast-iron, and provided, a suitable distance from

their ends, with enlargements or boxes *b b*, which are hollow from underneath. Each floor-beam is braced or strengthened on the under side by a wrought-iron rod, *d*, extending between the boxes *b b* and bearing against a short post, *e*, in the center of the beam. The rod *d* and post *e* are inserted in their proper places in the mold before the beam is cast, and then the metal poured on. The rod and post being provided with notches, they, of course, cannot slip out, and this wrought-iron rod strengthens the cast-iron floor-beam, preventing its breaking, or, rather, rendering its liability to break considerably less. Upon each of the boxes or enlargements *b* of the floor-beams is placed a post, G, reaching up to and supporting the arch. These posts G G are provided with eyes *i i* on their sides, through which rods *f f* are passed. The upper ends of these rods pass through the horizontal portions or flanges of the L-shaped bars D, and through a block, H, on the upper side of the arch, and are fastened by nuts on top of said block. The lower ends of these rods pass through the floor-beam enlargements or boxes *b*, and through a cap-piece, I, closing the under side of said box, and then nuts placed on the under side of the rods to fasten them.

It might here be remarked that the enlargements or boxes *b b* in a full-sized bridge should be cast with cross-bars on the inside, and also the caps I should have a shoulder to extend up on the inside of the box, to make it stronger and prevent the sides from bending inward.

The bottom or lower end of each post G is braced to the top of the next one on each side by cross-rods *g g*, the lower ends of which pass through the side of the box and through the cap I on the other side, while the upper ends pass through the timber C and the block H, nuts being placed on both ends of said rods.

*h h* are rods forming the bottom chord of the bridge, one set of said rods passing through the box *a* of the shoe B, and also through the box *b* of the first floor-beam E, with nuts on the ends, as shown. The next set of rods pass through the boxes of the first and second floor-beams, and so on to the other end of the bridge.

The central portion of the bridge is further braced by means of cast-iron bars J J, connect-



ing the arches, as shown in Fig. 2. These bars have projections at the ends, through which bolts pass to secure them to the arches. On these bolts are also placed rods *k k* by means of eyes formed on the ends of the rods. The rods *k k* run in a diagonal direction and through a central block, K, and have nuts on their ends which go through said block, so that they can be readily tightened when necessary. The block K is hollow, as shown in Fig. 4, and may be entirely open on the under side; or it may be closed, with one or more small holes through its under side, so that any water which might leak in through the holes for the rods will pass out and not remain within the block. The caps I are provided with holes for the same purpose.

The floor-beams E E are braced in the same manner with rods and central block, as shown in Fig. 6; but in this case the outer ends of the rods pass through the boxes *b b* of the floor-beams and have nuts on their ends also. In some cases I may dispense with the central block, K, and allow the rods *k k* to cross each other in the center, as also shown in Fig. 6. From the extreme ends of the floor-beams E E, as well as on the extreme ends of the shoes B B, are secured standards L L, through which pass rods *m m* to form a railing for foot-passengers outside of the main bridge, the flooring for the same being laid on the ends of the floor-beams and shoes, outside of the boxes *b* and *a* respectively.

In cases where it is necessary to make the bridge very strong—for instance, for railroad-bridges—I place an additional floor-beam in between the floor-beams above described, and in the center of such additional floor-beams

the box K is formed for the brace-rods *k k* to pass through.

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

1. The floor-beam E, cast, as described, with hollow enlargements or boxes *b b*, in combination with the wrought-iron rod *d* and post *e*, all substantially as and for the purposes herein set forth.

2. The combination of the arch C D, floor-beam E, post G, with its eyes *i*, rods *f*, block H, and cap I, all constructed and arranged substantially as and for the purposes herein set forth.

3. In combination with the floor-beam E, as constructed, the hollow cap I, through which passes the rods *g g* and *f*, substantially as and for the purposes set forth.

4. The combination of the centrally-placed inverted hollow box K with the four rods *k k k k*, which pass entirely through said block and are secured substantially as set forth.

5. The combination of the bars J J, rods *k k*, and central block, K, for bracing the arches C D, substantially as herein set forth.

6. The combination of the shoes B, arches C D, floor-beams E E, posts G, blocks H K, caps I, rods *f g h k*, and bars J, all constructed and arranged substantially as shown and described, and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of February, 1871.

JACOB SEEBOLD.

Witnesses:

A. N. MARR,  
C. L. EVERT.