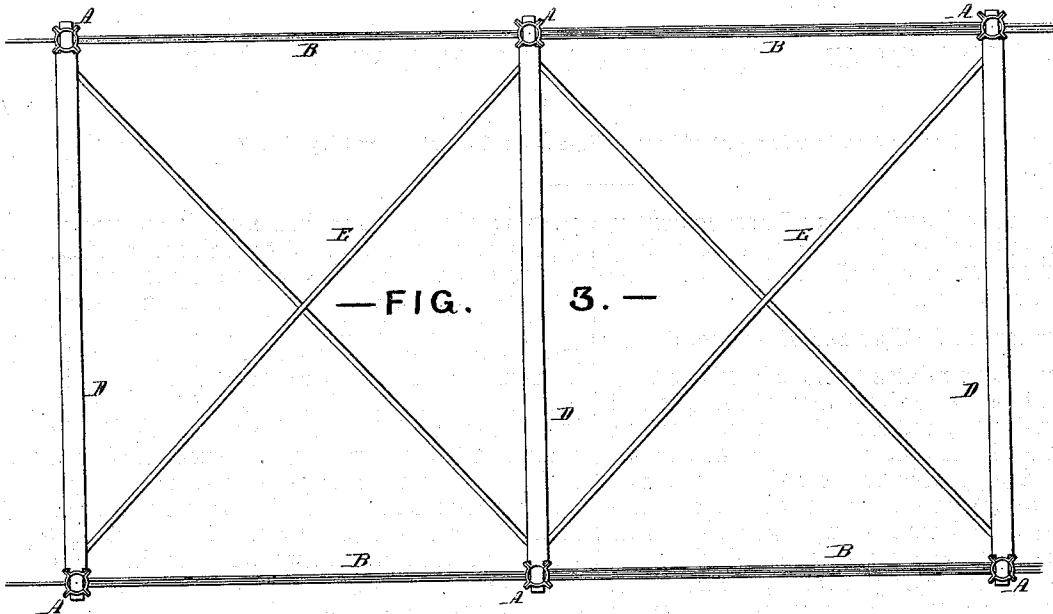


A. BONZANO.

Improvement in Bridge and other Structures.

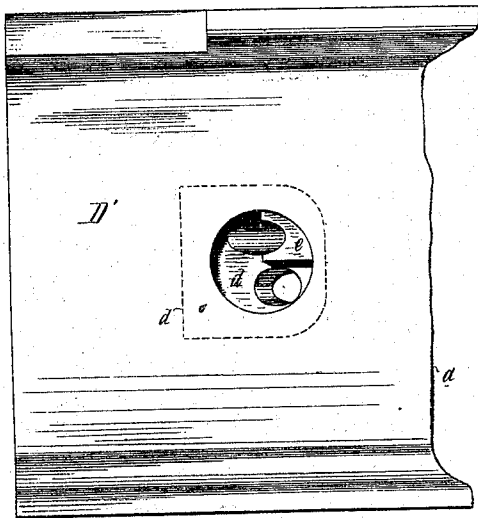
No. 127,017.

Patented May 21, 1872.



— FIG. 3. —

— FIG. 2. —



*Adolphus Bonzano
by his Attys
Hewson and Son.*

— FIG. 1 —

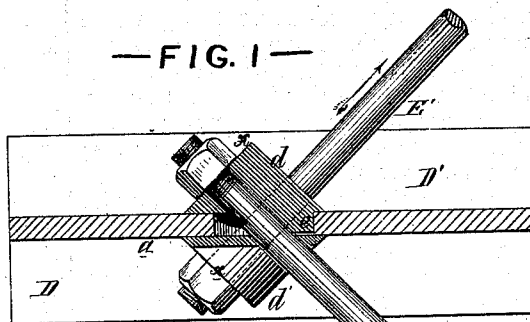
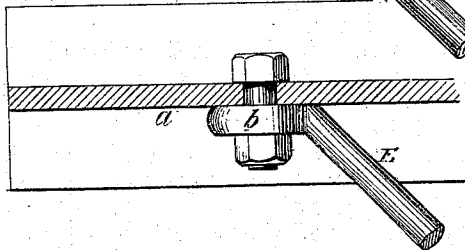


FIG. 4.



WITNESSES { *Harry Smith*
Thomas M. Main

UNITED STATES PATENT OFFICE.

ADOLPHUS BONZANO, OF PHOENIXVILLE, PENNSYLVANIA, ASSIGNOR TO
CLARKE REEVES & CO., OF SAME PLACE.

IMPROVEMENT IN BRIDGES AND OTHER STRUCTURES.

Specification forming part of Letters Patent No. 127,017, dated May 21, 1872.

Specification describing an Improvement in Bridges and other Structures, invented by ADOLPHUS BONZANO, of Phoenixville, Chester county, Pennsylvania.

Improvement in Bridges and other Structures.

My invention relates to a mode of securing diagonal tie-rods to the beams of bridges and other structures; and consists of certain blocks adapted to the rods and their nuts and to the beams in the peculiar manner fully described hereafter, so as to dispense with the costly forged eyes and screw-couplings with which such rods have been usually furnished.

In the accompanying drawing, Figure 1 is a sectional plan of part of a beam illustrating my mode of connecting tie-rods to the same; Fig. 2, a side view of Fig. 1. Fig. 3 illustrates the application of my invention to a truss-frame bridge; and Fig. 4 shows the usual mode of connecting diagonal tie-rods to beams.

In building iron truss-frame bridges and other structures of which wrought-iron beams form a part, it is generally necessary to connect such beams together by diagonal tie-rods. In Fig. 3, for instance, I have shown a sectional plan of a truss-frame bridge having such rods; A A being the vertical posts of the bridge; B B, lower chords; D D, the floor-beams, made of H-iron and commonly known as Phoenix beams; and E E, the tie-rods.

It has been the common practice to secure these rods to the beams in the manner illustrated in Fig. 4, where *a* represents the web of the beam; *b*, an eye forged on the end of the tie-rod E, for receiving a bolt which secures the rod to the beam.

There are two main objections to this plan of securing the tie-rods: first, the expense of forging the eye on the opposite ends of the rods; and second, the necessity of furnishing each rod with an expensive screw-coupling for longitudinal adjustment. These objections I obviate by the invention which forms the subject of this application, and which I will now proceed to describe.

D', in Figs. 1 and 2, represents a portion of an H-beam, such, for instance, as may be applied as a floor-bearer to the bridge-structure, Fig. 3. E' and E'' are two diagonal tie-rods,

passing through the beam in directions at right angles or thereabout to each other. Each rod is simply threaded, and furnished with a nut at each end, and is without any adjusting coupling. In the web of the beam D', at the point where the rods pass through it, I make a circular hole into which a projection, *e*, on each of the cast-iron blocks *d* and *d'* fits snugly. The ends of the rods E and E' pass freely through these blocks, one above the other, and each block has a properly-inclined face, *x*, serving as a bearing for one of the nuts of one of the rods, as clearly shown in Fig. 1. As the tension of the rods is always in the direction of the arrows, it will be evident that the tendency of both the rods with their nuts will be to confine the blocks firmly to the web of the beam, and that the displacement of the blocks by this tension is prevented by their projections *e*, which bear against the edge of the hole in the web.

As the longitudinal adjustment of the rods can be readily accomplished by their nuts, I am enabled to dispense with the usual costly screw-couplings; at the same time the above-described simple blocks and nuts render the expensive forging of eyes on the end of the rods unnecessary. It may be remarked, moreover, that the tension of the rods is more effectually and safely resisted by the blocks and nuts than by the eye and bolt shown in Fig. 4.

It will be observed, on referring to Fig. 2, that the projection *e* on each block occupies about one-fourth of the interior of the hole in the web, the projection of the block *d* leaving a space in the hole for receiving the projection of the opposite block. It will also be seen that, in order to carry out my invention, one rod should be situated above the other. It is not essential, however, that H-beams should be invariably used in connection with my invention, for the latter is applicable to all beams having a web in which can be made a hole for receiving the projections of the blocks. In the present instance the projections of both blocks are sufficiently prominent to pass through, or nearly through, the web of the beam, the projection of one block being, as before remarked, so formed as to leave room in the hole for that of the other block. This plan is advisable when

the webs of the beams are thin, so that the projections can have a safe hold on the edge of the hole; but in beams with thicker webs the projection of the blocks may pass only half through the web, in which case no such provision as that shown in the present instance may be made for one projection to accommodate the other.

I claim as my invention—

The within-described blocks, adapted to the

tie-rods and nuts and to a recess in the web of a beam, substantially in the manner described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

A. BONZANO.

Witnesses:

WM. A. STEEL,
HARRY SMITH.