

C. Henderson,

Girder.

No. 113881.

Patented Apr. 18. 1871.

Fig. 1.

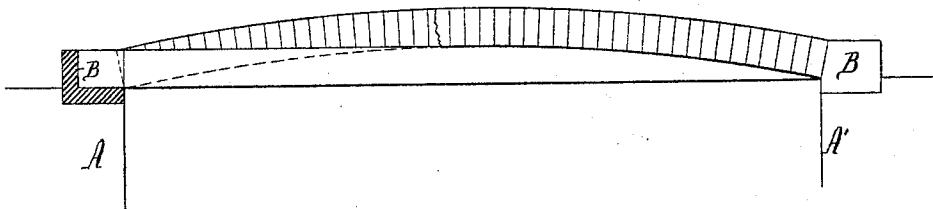


Fig. 2.

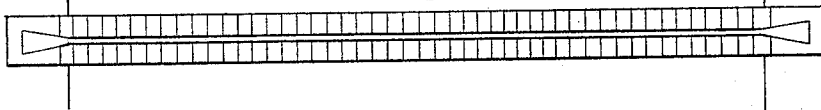


Fig. 3.

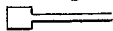


Fig. 4.

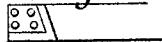


Fig. 5.

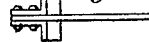


Fig. 6.

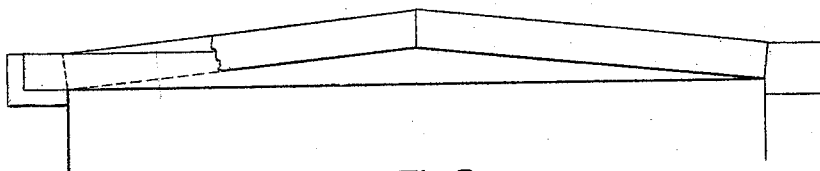


Fig. 7.

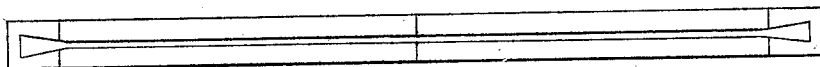
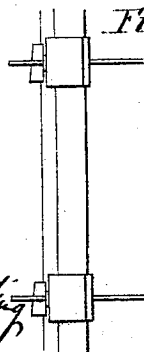


Fig. 8.



Witnesses { *Jns. B. Hend*
W. C. McLean

C. Henderson
by his Atty
Henson and Son

United States Patent Office.

CONSTANTINE HENDERSON, OF LONDON, ENGLAND, ASSIGNOR TO EDWIN R. HALL, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 113,881, dated April 18, 1871.

IMPROVEMENT IN ARCHED STRUCTURES.

The Schedule referred to in these Letters Patent and making part of the same.

I, CONSTANTINE HENDERSON, of London, England, have invented an Improvement in Arched Structures, of which the following is a specification.

Nature and Object of the Invention.

My invention consists in the combination, substantially as described hereafter, of a thin web or plate of iron or steel, and certain abutment blocks with arches of stone or brick or other building-material, or with wooden trusses, so that the said web or plate shall resist the tendency of the arch or truss and its superincumbent wall to force the abutment apart, the comparatively light and inexpensive web thus adding to the stability and permanency of the structure.

Description of the Accompanying Drawing.

Figure 1 represents a side view, partly in section, of an arch with my improvement.

Figure 2, a plan view of fig. 1.

Figures 3, 4, and 5 views representing modifications of parts of my improvement.

Figures 6 and 7, my improvement illustrated as applied to a wooden truss.

Figure 8, a plan view of a modification.

General Description.

In figs. 1 and 2—

A and A' represent piers or abutments across which it is desired to spring an arch. They may, for instance, represent the piers of a wide doorway of any building.

In each of these piers, at the points whence the arch has to be sprung, I build a cast-iron block, B, each block having a dovetailed recess for the reception of the enlarged dovetailed end of a thin web or bar, D, of iron or steel.

On each side of this recess each block is beveled, as shown at *x*, fig. 1, so as to correspond with the angle assumed by the radius of the arch, and two arches, E and E', of brick or stone, one on each side of and

in contact with the web, are built from these beveled portions of the blocks as abutments.

On this double arch is built the wall, the tendency of which to force the piers apart is resisted and counteracted by the web or plate D.

It will be evident that the opposite ends of the bars may be T-shaped, as shown in fig. 3, and adapted to T-shaped recesses in the blocks; or that the ends of the bars may extend through the blocks and be keyed at the back of the same, as shown in fig. 8, and the blocks may form parts of continuous plates resting on the walls of a tunnel or subway.

The inclined abutments for the two arches may form a part of the web or bar, or may be secured to the same, for instance, in the manner shown in figs. 4 and 5, which will be readily understood without explanation.

In many cases wooden struts in place of brick or stone arches are used in structures, as tops for doorways for receiving the superincumbent wall. It will be at once seen, by referring to fig. 6, how the tension-web may be applied to this strut with advantage, or rather to two struts, for there should be one on each side of the web.

Blocks or plates B may be made to receive any desired number of webs D, and arranged as abutments for intervening arches of brick or stone. This plan, for instance, may be adopted in tunnels or subways.

Claim.

The within-described structure, consisting of blocks or plates B, and a flat vertical web or tension-bar, D, connecting said blocks, as specified.

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

CONSTANTINE HENDERSON.

Witnesses:

F. W. ATKINSON,
F. TRELEAVEN.