2 Sheets--Sheet 1.

J. B. EADS.

Iron-Bridge.

No. 162,045. Patented April 13, 1875.

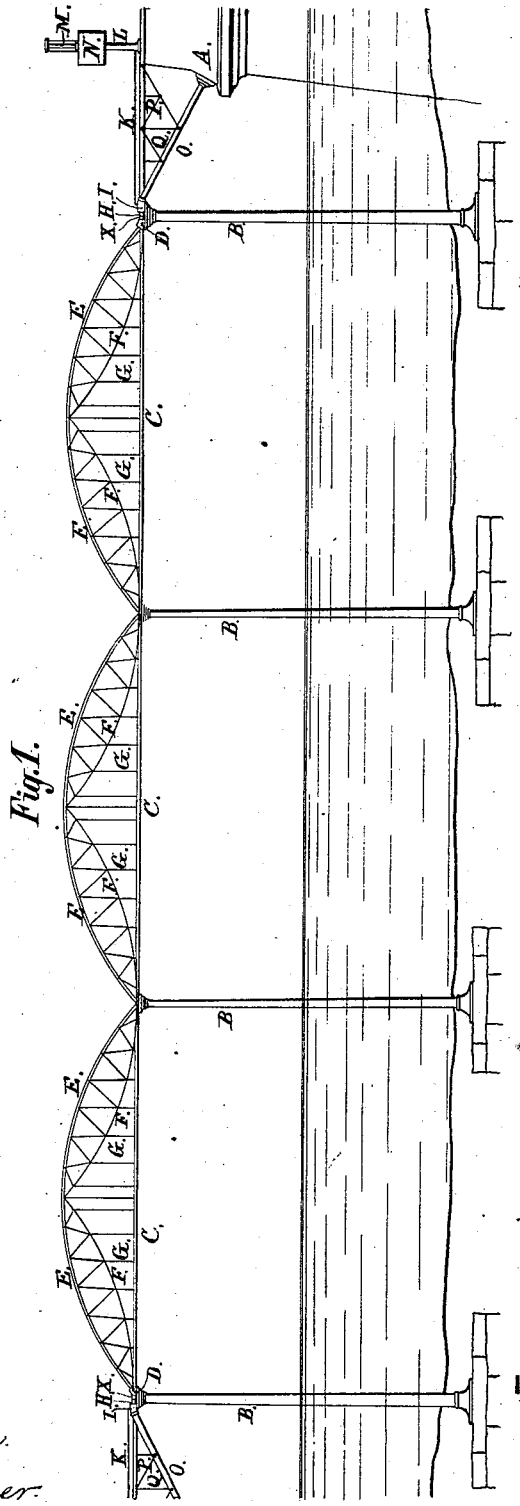


Fig. 1.

ATTEST:
Walter Allen.
H. T. Tanner.

INVENTOR:
James B. Eads
By Knight Bros.
Attys.

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

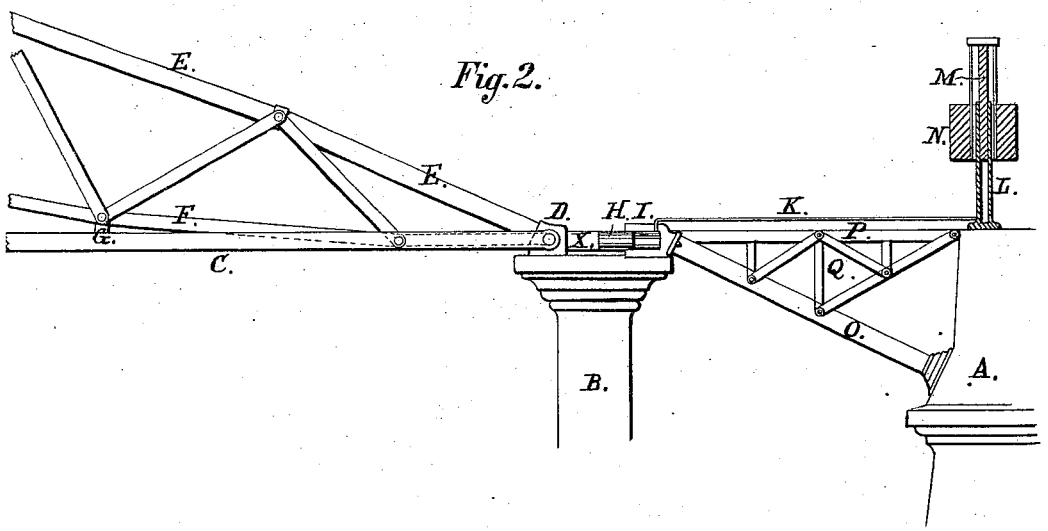
2 Sheets--Sheet 2.

J. B. EADS.

Iron-Bridge.

No. 162,045: Patented April 13, 1875.

Fig. 2.



ATTEST:

Walter Allen

H. T. Tanner

INVENTOR:

James B. Eads

By Knight Bros.

Attys.

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

JAMES B. EADS, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN IRON BRIDGES.

Specification forming part of Letters Patent No. **162,045**, dated April 13, 1875; application filed August 27, 1873.

To all whom it may concern:

Be it known that I, JAMES B. EADS, of St. Louis, St. Louis county, Missouri, have invented a certain Improvement in Bridges, of which the following is a specification:

My improvement relates to means for keeping a constant end pressure from the abutments at each end of the bridge upon the metallic chords or series of abutting chords of the arches, from abutment to abutment.

My improvement consists in receiving the horizontal thrust of the said chord or series of chords upon an abutment-block, skew-back, or other piece which is capable of horizontal movement, but upon which is exerted a constant pressure in opposition to the horizontal thrust of the chords resulting from the horizontal pressure of the arches. The said thrust is received by a hydrostatic ram or cylinder, the liquid in which is held at a uniform pressure or density by a weighted vertical piston or plunger, preferably of much smaller section than the piston on which said thrust is directly received.

In the drawings, Figure 1 is a side view of an abutment with three arches of a bridge. Fig. 2 is an enlarged side view of an abutment and one end of an arch and chord, with the hydrostatic method of resisting the thrust, showing the hydrostatic device in section.

A is the abutment, made of sufficient strength to resist the horizontal thrust at one end of the bridge. B B are the piers, which may be made of only sufficient strength to support the weight of the bridge. These piers may be made of any desired form and material. I have shown them as consisting of metallic columns, which may stand in pairs or sets transverse to the length of the bridge, and be connected together in any suitable manner. C C are the chords or distance-pieces, which extend from pier to pier. These distance-pieces are not necessarily attached to the columns or to the skew-backs D D, but may merely abut against them, and act as horizontal struts to transmit the thrust of the arches to the abutments at each end of the bridge.

Where the columns or piers B B are of considerable height, or the arches of small span, the skew-backs may be firmly attached to the pier-tops, except at the ends near the abutments, where the movement caused by changes of temperature in the chords is most excessive, and on these piers the skew-backs should be allowed horizontal movement to prevent the straining of the piers.

The arches may be of any form. They are shown as consisting of an upright arch, E, trussed by counter-arches F F, and jointed at the center, and the distance-pieces C C having vertical support therefrom by suspension-rods G G.

Attached to the skew-backs on the piers next the abutments, or upon the abutments, are the devices to resist the horizontal thrust of the distance-pieces, the thrust in any case being ultimately brought against the abutments.

H is a hydrostatic plunger or piston, working in a cylinder, I, connected, by a pipe, K, with a cylinder, L, whose vertical plunger or piston M is loaded with a constant weight, N. The piston H may have a section several times as great as that M for the purpose of decreasing the size of the weight N, the weight and plunger having, of course, proportionally greater movement. The cylinder I is connected to the abutment A by inclined struts O and beams P, connected together by bracework Q.

The plunger H should not rest directly against the skew-back D; but a block, X, should be interposed between them, which block may be removed to allow the removal of the plunger H, if at any time it may be desirable to do so.

The hydrostatic cylinders may contain any suitable liquid, such as oil, glycerine, or other liquid remaining fluid at all temperatures that would occur.

I claim as new and of my invention—

1. The combination of the metallic chord C, skew-back D, plunger H, cylinders I and L, weighted piston M N, and abutment A, all substantially as herein set forth.

2. In combination with the chord C, skew-back D, plunger H, cylinders I and L, pipe K, weighted piston M N, and abutment A, the struts O, substantially as and for the purpose set forth.

JAS. B. EADS.

Witnesses:
SAML. KNIGHT,
GEO. C. FABIAN.