R. HOOVER.
Bridge.

No. 215,522. Patented May 20, 1879.

Fig. 1.

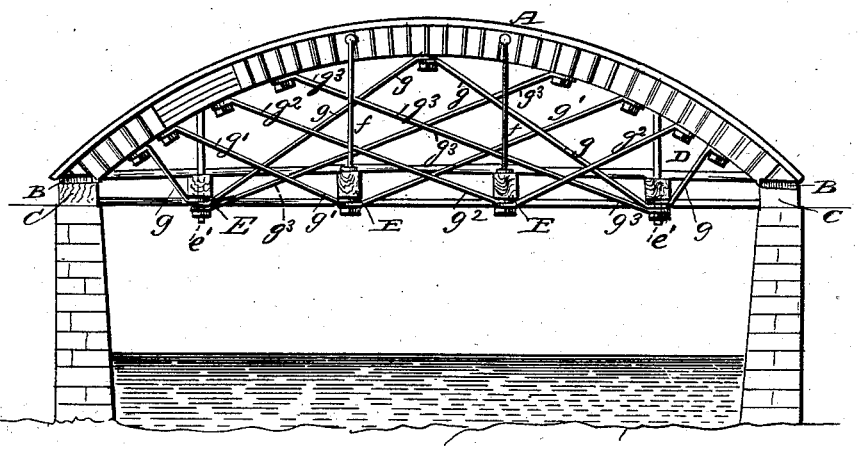


Fig. 2.

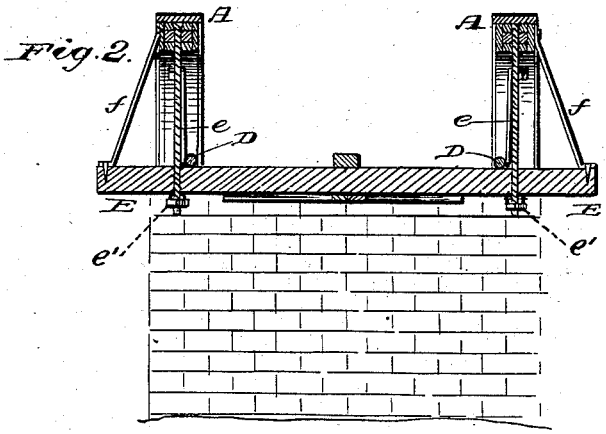


Fig. 3

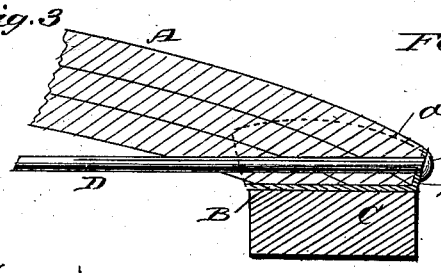
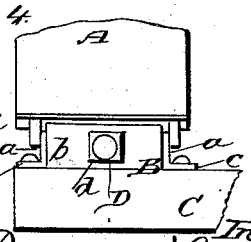


Fig. 4



Witnesses
Fred. G. Dieterich
George Binkenburg

Inventor
Reuben Hoover
by A. Peterson & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

REUBEN HOOVER, OF IOWA CITY, IOWA, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN E. JAYNE, OF SAME PLACE.

IMPROVEMENT IN BRIDGES.

Specification forming part of Letters Patent No. **215,522**, dated May 20, 1879; application filed February 1, 1879.

To all whom it may concern:

Be it known that I, REUBEN HOOVER, of Iowa City, in the county of Johnson and State of Iowa, have invented certain new and useful Improvements in Bridges; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side elevation. Fig. 2 is a vertical cross-section. Fig. 3 is an enlarged view of one end of the arch with its chair; and Fig. 4 is an end view of the same.

Similar letters of reference indicate corresponding parts in both the figures.

My invention relates to that class of bridges known as "arched-beam" bridges; and it consists, essentially, in the combination, with the arched beams, chords, and cross-beams, of supporting-stirrups arranged in such a manner as to distribute the weight or pressure of the roadway and its superimposed load or loads evenly over all parts of the arched beams, substantially as hereinafter more fully set forth.

In the drawings, A A are the arches, which are made from long boards or planks of suitable width, bent over a form and securely nailed and spiked together at each layer, so that the whole will form one compact mass, which is then thoroughly saturated with coal-tar to preserve it from decay. Each arc is then cased up and down on both sides with common casing or ceiling boards, and a neat molding is put along the upper edges, after which the top is covered with galvanized iron, or similar material, and painted.

Each end of the arches A is set into a flanged metallic chair or seat, B, the construction of which will be more readily understood by reference to the detail views represented in Figs. 3 and 4.

Each chair consists of a flat plate having parallel side flanges, *a a*, and end flanges, *b*, the side flanges being provided with extending lateral ears or wings *c c*, by means of which the chairs are spiked to the pier or abutment beams C C.

That end of the arches A which is set into the chairs B between the side flanges, *a a*, is recessed longitudinally to admit of the insertion of the ends of the chord-rods D, which pass through perforations in the end flange, *b*, of each chair, and are there held in place by a nut or enlarged head, *d*.

The cross-beams E are suspended from the arches A by vertical rods *e*, having nuts *e'* at their lower ends, and are braced to the arches A A (with the exception of the cross-beam nearest each end of the arches) by diverging strap-rods *f*, secured upon the outer sides of the arches, as shown in Fig. 2.

To equalize the pressure or strain upon the arches, I employ stirrup-rods g g^1 g^2 g^3, arranged as shown in the drawings—that is to say, starting at one end, the stirrup-rod g passes under the first cross-beam E, forming an eye around the downward-projecting end of the suspension-rod *e*, and then up to a point at or near the center of the arch, wherefrom it is continued in like manner down on the other side and up again to the arch near its other end, as shown.

The next stirrup-rod, g^1, starts from the arch at a point a short distance above the starting-point of g, and between this and its corresponding vertical rod, and passing under the next cross-beam E in like manner, reaches up to a point at the other end of the arch between g^2 and g^3. Rod g^2, passing obliquely downward from the arch, supports the third beam E in like manner as rods g g^1 sustain their respective beams, and then up to the opposite side of the arch, where it is secured between rods g g^1, as shown. Finally, the pair of stirrup-rods denoted by g^3 cross each other under the center of the arch, starting, on one side, between the fastening-points of g^2 and g, and on the other between g and g^1, their diverging ends forming eyes, through which are inserted the suspension-rods of the beams nearest the respective ends of the arches.

It is obvious that the arrangement of the stirrup-rods, as herein described, requires modification where more than four cross-beams

are used in a single span or arch, or where one of the cross-beams comes directly under the middle of the arch; but in all cases these rods are so disposed as to alternate in the peculiar manner shown, so as to distribute the strain evenly over all parts of the arch.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

In an arched-beam bridge, the combination, as described, of the arches A, vertical suspension-rods *e*, chords D, oblique tie-rods $g\,g^1\,g^2\,g^3$, and cross-beams E, in such a manner that the latter are supported below the chords D upon nuts e' of the vertical suspension-rods, and upon shoes or hangers formed by the doubling of the tie-rods under the ends of the cross-beams, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

REUBEN HOOVER.

Witnesses:
WILMOT HEARD,
J. W. SMITH.