TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOSEPH DAVENPORT, of Massillon, in the county of Stark, and State of Ohio, have invented new and useful Improvements in Arch-Bridges; and I do hereby declare that the following is a full, clear, and exact description of my invention, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon, of which drawings—

Figure 1 is an elevation of a bridge-girder with my improvements.

Figure 2 is a plan of the same.

Figure 3 are sectional and side views of the lever-posts and their connections.

Figure 4 is a side view and plan of the tension-straps and bolt.

Figure 5 are side and front views of the lever-post-rod supports.

The nature of my invention consists in the peculiar arrangement of the bridge-girder, chords, and girder-shoes, with lever-posts, rods, and tension-straps, in such a manner as that the arch of the bridge-girder shall be greatly strengthened against any vertical bending of said arch, at or near what may be termed the "points of rupture" of said arch, whereby a much stronger arch may be constructed from the same amount of material than has hitherto been made.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The arch B, shown in drawings, is the same as the arch for which I was granted a patent on the 24th day of December, 1867, and which, as it is fully described in the specification for that patent, need not be further specified here, but I wish it understood that I do not limit the application of my improvements to this particular form of arch.

The ends of the arch B rest in shoes G G, which have the eyes h h formed at their sides.

The chords A are one in number to each girder, and are formed of continuous strips of plate-iron, set up edgewise, and parallel to each other.

The bolts E E are of the form shown, being flattened out at one end, and are secured to the ends of the chords A by rivets or bolts e e, as shown.

The bolts F F pass through the eyes h h in the shoes G G, and by the sides of the lever-posts K K, through the washer-irons F F, where they are secured by nuts f f, as shown.

The posts or suspension-rods C C and diagonal braces D D are arranged and secured to the arch B and chords A, as shown.

The lever-posts K, shown in detail in fig. 3, are composed of the side-pieces K K, of plate-iron, of the form shown, which are connected by the bolts or rivets k k, and have secured, between said side-pieces K K, the blocks M M, having the pins m cast thereon, and the cross-piece L with hole l therein. These lever-posts K set against the rear part of the shoes G G, and have the washer-irons F F arranged so as to bind them in said position.

The tension-straps I I are formed of plate-iron, and are secured at one end to the chords A, by the bolts i i, as shown. They pass up from the chords, one on each side of the arch, and are secured by a bolt or rivet, j, to the tension-bolt J. This bolt J passes through the hole l in the cross-piece L in the lever-post K, and is secured by a nut, g, as shown in fig. 8.

The lever-post rods N N are formed of hollow tubes, having one end flattened down, and secured to the arch B by one or more bolts n, while the other end abuts against the blocks M in the lever-posts K, the pins m on said blocks entering into the hollow of the tubes N, and hold them in position, as shown in fig. 8.

The supports O are bolted to the arch B, and have holes o, through which pass the rods N N, thus giving a support to said rods.

The floor of the bridge is laid on cross-beams, which are arranged on the chords A, in an ordinary manner. A load being placed on the girder or bridge at a point, w, on the end of the same, has a tendency to draw down the arch above it, and to cause the arch to rise at the other end, above the point X near the other end,
which rising is prevented by the rods N N, which press against the block M in lever-post K, which is prevented from turning by the tension-rods I.

A load being placed at W, near the centre of the girder, has a tendency to draw down the centre of the arch, and cause a bending of the same, at or near the points of rupture, above the points W and Y, which bending is prevented by the rods N N, as before shown, while the tension-strap I I forms, with the chords A, a suspension-chain, which helps to carry the load at the centre, the posts K K being sustained against this strain by their lever-action over the shoes G G, and against the washer-irons P P at the ends of the chord-bolts E E, and also by the rods N N bearing on the arch B.

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

1. The rods N N, when used in combination with the arch B and posts K K, substantially as and for the purpose specified.

2. The supports O, when used in combination with the arch B and rods N N, substantially as and for the purpose specified.

3. The lever-posts K, when constructed of the side-plates K K, bolts or rivets & c, blocks M M, and cross-piece L, and used in combination with the chord-bolt washer-iron F, the shoe G, the tension-bolt J, with straps I I attached thereto and to the chords A, the rods N N, and the arch B, substantially as and for the purpose herein specified.

As evidence that I claim the foregoing, I have hereunto set my hand; in the presence of two witnesses, this 4th day of May, A. D. 1868.

J. DAVENPORT.

Witnesses:

Ed. L. BEESOUT,
JOE ABBOTT.