2 Sheets--Sheet 1.

W. M. BLACK.

Draw-Bridge.

No. 166,959. Patented Aug. 24, 1875.

FIG. I.

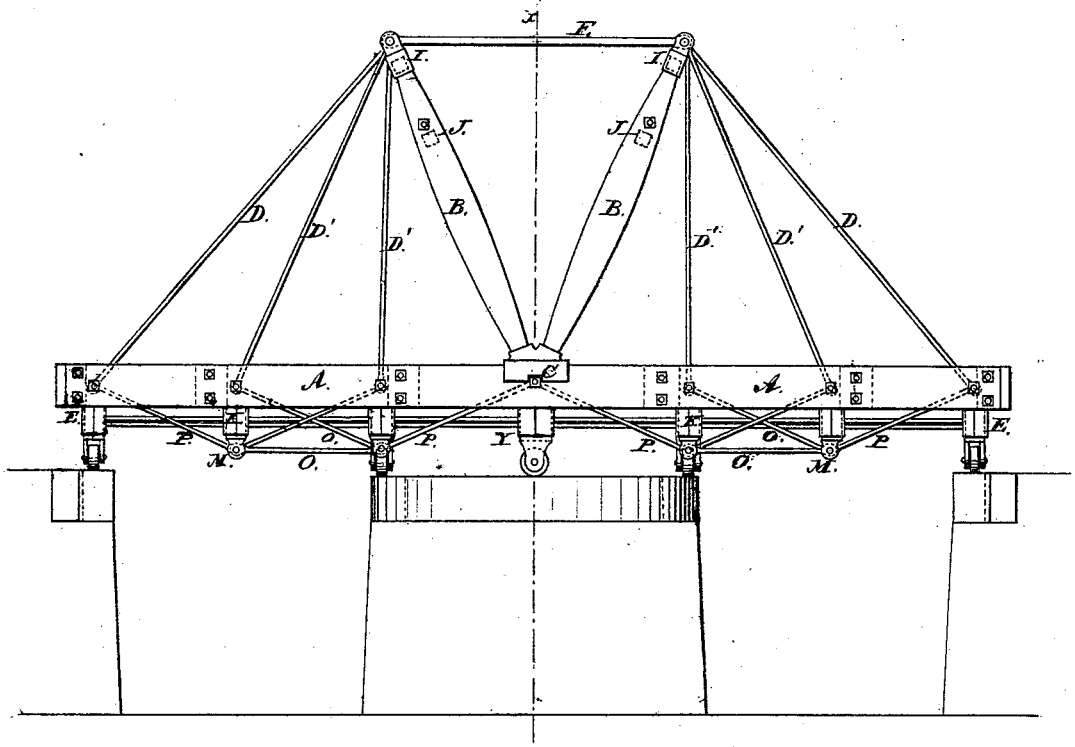
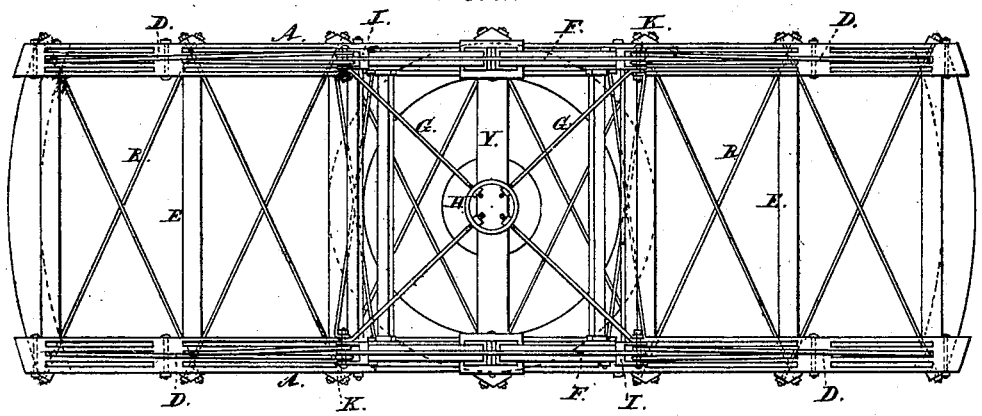


FIG. II.



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per L. C. Black.

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2 Sheets--Sheet 2.

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Draw-Bridge

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FIG. III.

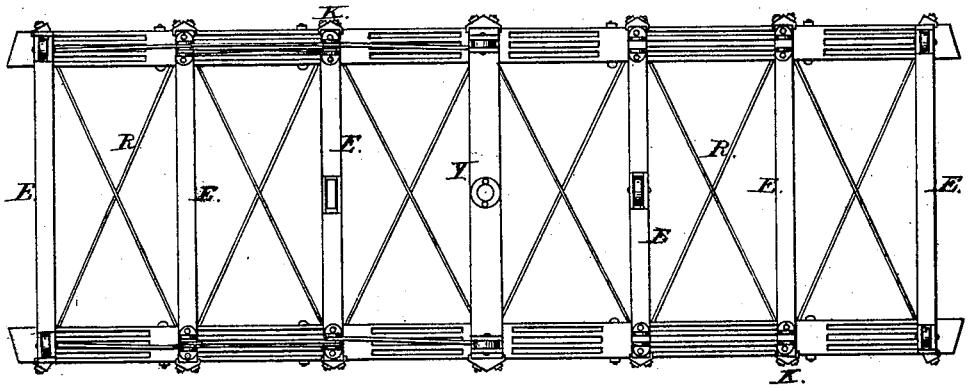
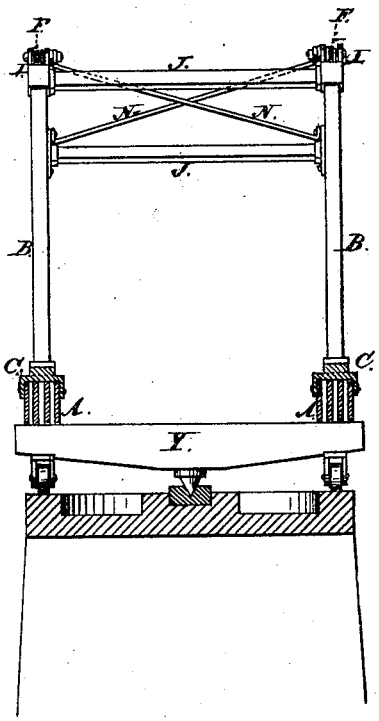


FIG. IV.



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UNITED STATES PATENT OFFICE.

WILLIAM M. BLACK, OF LANCASTER, OHIO.

IMPROVEMENT IN DRAW-BRIDGES.

Specification forming part of Letters Patent No. **166,959**, dated August 24, 1875; application filed August 2, 1875.

To all whom it may concern:

Be it known that I, WILLIAM M. BLACK, of Lancaster, in the county of Fairfield and State of Ohio, have invented certain new and useful Improvements in Draw-Bridges; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

The object of the invention is to so construct a turning draw-bridge that the weight of the structure is concentrated on a central or pivotal cross-beam, which is firmly supported by the pier, thus counteracting the tendency to depression at the ends of the bridge at all times, but especially when it is turned to clear the channel. This object is effected by means of a pair of diverging posts, properly secured and braced on each of the chords, just over the pivot-beam, in connection with supporting-rods running from the tops of the posts to graded points on the chords.

The invention also pertains to the peculiar manner of trussing the bridge on both sides of the pivot-beam, to strengthen it when in position for travel.

In the accompanying drawings, Figure I is a side elevation of the bridge. Fig. II is a plan of the bridge viewed from the top. Fig. III is a plan view of the bottom of the bridge. Fig. IV is a transverse section view of the bridge on line *x x* in Fig. I.

In Fig. I, A are the chords, constructed in the ordinary manner, as the bridge may be built wholly of metal, or a combination of wood and metal. The posts B are set in the shoes C, or secured to the chords in any convenient manner, and are caused to diverge in any suitable degree. As shown in Fig. I, they diverge so that the supporting-rods D, which are joined to the chords just over the first cross-beams E on either side of the pivot-beam Y, may be perpendicular to the chords. The shoes C, as shown in Fig. I, are made of cast-iron, with cavities fitted to receive the posts B, and are grooved, so as to sit firmly on the chords. The posts B are braced laterally by the cross-ties J and the diagonal rods N, as shown in Fig. IV. The tops of the posts B on the same side of the bridge are connected by the bars F, as seen in Fig. I, thus communicating the strain on the supporting-rods of either side of the bridge to the opposite inclined post. The inclination of the posts B gives them greater resisting power than could be secured by vertical posts, and carries whatever strain is on them to the pivot-beam. The supporting-rods D′ extend from the tops of the posts B to points in the center of the chords A, over the center of the cross-beams E, and are secured there by bolts or otherwise, there being a rod on each side of the bridge for every beam, with additional rods, if necessary, in bridges of long span. These rods are supplied with swivel adjustments, for the purpose of raising and lowering the ends of the bridge on the abutment-track. The diagonal tension-rods G, as shown in Fig. II, give lateral bracing to the posts B, and act with the bars F in carrying strain from the supporting-rods D. The ring H is used to equalize the tension of the rods G. When the posts B are made of metal the rods and bars meeting at the top of any post may be secured there by any convenient method. When wooden posts are used the cap I is required. The lower part of the cap I has a cavity to receive the post, and one side of the cap is supplied with a similar cavity to receive the cross-ties J. The top of the cap is made with jaws to receive the rods and bars, a single bolt securing the whole.

The cross-beams E, which sustain the roadway, may be placed under the chords, or on top of them, or they may be joined to the chords in any suitable manner. R, as shown in Fig. III, are ordinary brace-rods, and may be joined to the beams in any suitable manner.

If wooden beams are used, the cap K is required. The bridge is strengthened by the suspended tension-arcs O, as shown in Fig. I, there being two of these arcs on each chord. The tension-arc O is composed of eye-bars or links of suitable length, joined by bolts, and the two arcs on the same chord have a common point of suspension in the center of the chord, just over the center of the pivot-beam Y. The other ends of the arcs are suspended to the

ends of the chord, a single bolt securing both the arc and the end supporting-rod D.

When the cross-beams E are placed below the chords, as shown in Fig. I, they act as compression members between the arc and the chord. If the cross-beams are otherwise placed a short compression-post may be inserted at each joint of the arc. If wooden posts are used, or if the cross-beams are placed as shown in Fig. I, the cap M is required. The tension-arcs O are strengthened by the rods P. These rods are secured by bolts at the joints of the arcs O, and, crossing each other, extend diagonally to the center of the chords A, where a single bolt secures both the rods P and the corresponding supporting-rods D. The rods or links composing the tension-arcs O and the rods P are supplied with swivel adjustments for regulating the tension. On the ends of the pivot-beam Y, and on the middle of the first cross-beam, on either side of the pivot-beam, are placed ordinary travelers to balance the bridge in turning. The pier is provided with a track suitable for the travelers. Similar travelers are placed on the end cross-beams E, with suitable tracks on the abutments. The pivot on the beam Y and its socket or bed on the pier are of the ordinary kind, Fig. IV.

I claim as my invention—

1. In combination with the chords of turning draw-bridges, pairs of diverging posts placed over the pivot-beam, substantially as described, and for the purpose specified.

2. In combination, pairs of diverging posts placed on the chords of a turning draw-bridge over the pivot-beam, supporting-rods extending from the tops of the posts to graded points on the chords, substantially as shown, and for the purpose specified.

3. In combination with pairs of diverging posts placed on the chords of a turning draw-bridge over the pivot-beam, and supporting-rods extending from the tops of the posts to graded points on the chords, the connecting-bars F and diagonal tension-bars G, with the ring H, substantially as shown, and for the purpose specified.

4. In combination with the chords A, the diverging posts B, and the supporting-rods D, the tension-arcs O and the rods P, substantially as described, and for the purpose specified.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

WM. M. BLACK.

Witnesses:

THOS. H. WHITE,

WILLIAM MITCHELL.