DESCRIPTION OF PLATES.

PLATE No. 1.
Design A.—Figs. 1, 2, 3, show a simple form of girder bridge intended for spans of 25 feet and under.
It consists of two pair of rolled Phoenix beams, of 12 or 15 inches deep, according to span, braced together and resting on cast-iron plates.
Where the headway is extremely limited the arrangement shown in cross-section, Fig. 4, may be used, which requires a depth below bottom of rail of but 11 inches.

PLATE No. 2.
Design B is a trussed girder with two panels, intended for spans of 25 to 30 feet, where there is sufficient depth below the rail to truss the beams in the manner shown.

PLATE No. 3.
Design C shows a trussed girder with more than two panels, suited for spans of 30 to 75 feet.

PLATE No. 4.
Design D.—For longer spans than 75 feet we use our regular pattern of deck bridge, with top chords and posts made of Phoenix columns, and having side cross-floor-beams. The track stringers can be either of wood, as shown in the plate, or of iron, if specially ordered.
Where preferred, the tops of masonry piers need not be carried above the bottom chords of the iron truss, and the level of bridge seat at abutments will be the same. In this case the ends of the iron trusses will be supported on vertical Phoenix columns.

PLATE No. 5.
This plate shows the details of construction of the deck bridge illustrated in Design D, Plate No. 4.

PLATE No. 6.
Design E.—This plan of what is sometimes called a "pony" truss bridge is used for through bridges, where the depth below rail is somewhat limited, in spans of from 30 to 60 feet, and may be carried up to 80 feet at points where it is desirable to give the engineer an unobstructed view over the tops of the trusses. We prefer, however, at 60 feet span to carry up the trusses and brace them overhead.

PLATE No. 7.
Design F.—This is our regular pattern of through bridge. 18 feet and upwards in clear height, and 14 feet in clear width for single track. For double track we recommend two trusses, with a clear width of 26 feet.

PLATE No. 8.
This shows the details of construction of the through bridges shown in designs E, F, and the highway bridge design G, Plate No. 11.

PLATE No. 9.
Design H.—This is our regular pattern of through pivot bridges, with our patent turn-table, of a simple and effective construction. Where a pivot-pier has to be specially constructed, considerable economy will be obtained by carrying up a circular wall of masonry, and reducing the depth of iron ring, as shown in Fig. 35.
Our pivot-bridges have always given satisfaction; and we refer particularly to that over the Hudson River at Albany, belonging to the New York Central and Hudson, and the Boston and Albany Railroads, as a model of a quick-working and substantial pivot-bridge.

PLATE No. 10.
This plate shows the details of our patent locking and self-centring arrangement for pivot-bridges, the operation of which will be best understood by the description of the patent itself, dated June 18, 1872.

IMPROVEMENTS IN PIVOT-BRIDGES.

Our invention relates to certain improvements in pivot-bridges, too fully explained hereafter to need preliminary description; the said improvements having for their object, first, the ready withdrawal of the corner-supports of the bridge, when the latter has to be turned on its pivot, and the ready restoration of these supports when the position of the bridge demands them; and second, the self-centring of the bridge, so that the nice and tedious manipulative adjustment demanded, in order that the rails of the bridge may coincide with those of the permanent track, is rendered unnecessary.

In the accompanying drawing, Fig. 37 is a view of a portion of the end of a pivot-bridge; Fig. 36, a side view of a portion of one end of the bridge; Fig. 38, a plan view of Fig. 1; and Fig. 39, a perspective view illustrating a part of our invention.

A and A' are two transverse beams at one end of the bridge; these, together with other transverse beams of like character, supporting the longitudinal beams B, across which extend the ties D for receiving the rails a a. The transverse beams A are secured to the lower chord-beams by suspension-bolts c, this lower chord forming part of a truss-frame of which the pivot-bridge is composed, and of which F represents a portion of one of the diagonal end posts. To the transverse beam A are hung, by means of a pin f, a series of links i i i i, and to the latter are hung, by means of a pin f, a series of similar links m, and to a pin passing through the lower ends of the latter series of links are hung two rollers, p p, which are guided vertically by brackets q q, secured to the under side of the beams A. The two sets of links, as will be seen hereafter, form a knee-joint to the central pin f of which two rods, G G, are jointed, the opposite ends of these rods being connected to the lower ends of arms H, which are hung to the transverse beams A A, and these arms are connected, by a rod, I, to lugs on a nut J, which is adapted to vertical guides arranged between the two beams A A, the said nut being also connected by similar appliances to knee-joint links arranged at the opposite corner of the bridge, which is not shown in the drawing. The nut J is controlled by a vertical screw, so