In nearly all iron bridges the batter braces are made with ends fixed at the pedestals (i.e., they are rigidly attached to the shoe plates), although hinged pedestals are not unknown: the advantage gained by their use is the certainty of a uniformly distributed pressure on the rollers, and the disadvantage a great increase in the section of the batter braces.

The shoe plate can be attached to the batter-brace channels by bent plates on the inside, the outside, or both, or by pieces of channels, with one flange removed, placed on the inside, and riveted through their webs to the webs of the batter-brace channels, and through their flanges to the shoe plate, as shown on Plate IV. The lower end of the batter-brace plate should be turned up horizontally, and riveted to the shoe plate.

The area of a section of the connecting channel or plate made by a plane perpendicular to the direction of the batter brace should be equal to the area of one batter-brace channel, or greater if the shoe pin require greater bearing than this would afford; and there should be enough rivets to transfer the stress from the batter-brace channel to the connecting channel or plate. Should the batter-brace channels bear against the shoe plates, as they ought to do, there will be more rivets than necessary; but such a bearing should not be counted upon. Details of shoes are shown on Plates II., III., IV., and VI. The rules for proportioning shoe, roller, and bed plates, are given on p. 16.

A very good connection for the hip joint is the one shown on Plates III. and IV. The inner splice plate has five sides, the under one passing entirely below the joint; and the outer splice plate is cut to fit closely to the webs of the chord and batter-brace channels, being made as wide as the flanges of the channels and the rivet heads therein will permit. The objection to this detail is, that it requires a good deal of field riveting.

Another good detail for this joint is that shown in Fig. 14, Plate II. Here there are two connecting-plates on the outside of the chord, and two on the inside of the batter brace, through all of which the pin passes. Those on the chord abut against plates riveted to the outside of the batter-brace channels; and those on the batter brace abut against plates riveted to the