CAST IRON BRIDGES.

In 1779, or 38 years after the construction of the Tees suspension bridge, the Colebrookdale arch bridge, of 100 feet span, composed entirely of cast iron, was erected over the river Severn. A number of others were subsequently built of the same material, among which may be mentioned the Wearmouth, over the river Wear, of 200 feet span, built in 1796; the Austerlitz, over the river Seine at Paris, with five spans of 106½ feet each, built in 1805, and the Southwark over the Thames at London, with a centre span of 240 feet, and two side spans of 210 feet each, which was completed in 1819. All of these bridges are on the arch principle, where the metal is subjected to a direct compressive strain, and all of them remain in use and in substantial repair at the present time.

About 1840, Major Delafield of the United States Engineers designed several cast iron arch bridges, making the ribs tubular, one of which had a span of 80 feet. Some ornamental bridges have also been erected in the Central Park, New York. But the only cast iron bridge of any magnitude in the United States is on the line of the Potomac Aqueduct for supplying the city of Washington with water. The span is 200 feet and the rise 20 feet. There are two arched ribs formed of water pipes 1 3/4 inches thick, and 4 feet 3 inches diameter, through which the water flows. These pipes support a carriage-way above. This bridge was erected in 1858.

Many others have been constructed in Great Britain and on the Continent of Europe. Where the site admits of arches, and the structures are not liable to be subjected to severe impulsive forces they make reliable and beautiful structures.

The introduction of railroads opened a new and vast field to the engineer and mechanic for the application of iron. The properties of cast iron were at that period much better understood than those of wrought iron, and as the former could be readily moulded and cast into the desired forms it was at first almost exclusively used. The requirements of railroad construction, however, did not readily admit of the arch form, and girders having the top and bottom parallel were of necessity used; thus subjecting the metal to transverse and tensile strains. But as cast iron offers a very