THE SINGAPORE SUSPENSION BRIDGE.

PLATE XXI.

The town of Singapore, situated on the island of the same name, is the capital of the English possessions, known as the Straits Settlements. Previous to 1866, the three islands of Singapore, Malacca, and Penang were under the control of the Indian Administration; but in that year, at the united request of the resident merchants, the government was transferred to the Home Office, and incorporated into one Crown colony, subject to a governor appointed by the Colonial Office. As Singapore possesses a commodious harbour, and is conveniently situated, it has become an extensive depot and centre of exchange for Eastern markets, selling English goods, and receiving every kind of Asiatic produce. In 1865 the imports amounted to 6,610,000l., and the exports to 6,630,000l.

Under the direction of Colonel Collyer, R.E., who was for many years chief engineer to the Straits Settlements, but who resigned his appointment in the year 1867, numerous public works in Singapore were designed and carried out. One of the most important, and the last upon which Colonel Collyer was engaged, was the bridge which we have illustrated in Plate XXI, and which is erected across the river near its mouth where it flows into the harbour. It connects the new wharf known as Collyer's Quay, which is built on both sides of the river, and surrounds the sea face of the town. The bridge also gives access to the Esplanade, which runs parallel with the quays, and is adjacent to the Town Hall, Court House, and other public buildings, most of which have a sea frontage, for Singapore is built on a strip of land between the beach and a range of hills, and has consequently no depth, but a considerable linear extent.

The bridge, which was constructed by Messrs. P. and W. McClellan, of the Clutha Ironworks, Glasgow, is upon the rigid suspension principle of Mr. Rowland M. Ordish, and was designed by him, in concert with Colonel Collyer. The clear span is 200 ft., and the width of roadway is 21 ft., with two side footways of 5 ft. each, making the platform altogether 31 ft. wide. Figs. 1 and 2 on Plate XXI give the elevation of the bridge and towers, from which the general arrangement is apparent, the details being fully shown in the other figures. The towers are partly of stone, and stand upon stone abutments. Twenty-two feet from the platform they are united by an open ornamental cast-iron girder, and above this level the saddles, over which the chains pass, are concealed behind a light iron casing, which is carried up to a height of 8 ft., and makes a finish to the towers. The main longitudinal girders are placed 23 ft. apart, and separate the carriage from the foot roads; these latter being carried on the extended cross beams, which are suspended from the bottom flanges of the longitudinal girders, and project 6 ft. 3 in. beyond the centre line on each side, as drawn in Fig. 3. The hand-rails are of cast iron (Fig. 4), starting from a heavy plinth, and divided into bays, the length of which corresponds to the distance apart of the cross girders; the platform has a camber of 4 ft., and is supported by the chains at three points in the span of 260 ft., so that the distance between the connection with the chains is in each case 30 ft. From the towers, landward on each side, the chains are taken below the ground, and secured to anchor blocks which take their bearing upon stone abutments. As the two towers over each pier are placed only 20 ft. apart transversely, the space between is entirely occupied by the roadway, and the abutments are made sufficiently wide to allow the footpath to be continued outside the piers without reducing their width. Fig. 3 is a cross section of the bridge, and shows the disposition of the main and cross girders, the hand-railing, and the auxiliary longitudinal stringers, which rest upon the transverse beams, and act as cover plates for the edges of the buckle plates, which form the foundation of the carriage road of the bridge. It will be seen that the space above the buckle plates is filled with cork and asphalt, flush with their crown, and that a longitudinal timber (and in the centre two) runs alongside each T-iron for the purpose of securing the timber platform to the ironwork of the bridge. The platform is covered with timber blocks 9 in. long and 6 in. wide, by 3 in. in thickness, laid endwise of the grain. These blocks are channelled down the centre lengthways, and chamfered at the edges all round, so as to afford a good foothold for horses. The blocks are spiked down through the centre channel to a close planking 2 in. thick, laid transversely all over the area covered in with the buckle plates. A longitudinal kerb timber, 10½ in. by 9 in., is laid along the bridge on each side against the webs of the main girders, and a cast-iron angle plate preserves the timber, and acts as a gutter (see Fig. 5). The footways are carried upon