SWING BRIDGE OVER THE PARNITZ AT STETTIN.

ON Plate LXXIV. is shown an example illustrating a type of swing railway bridges, of which many have been constructed on the Continent, as, for example, over the River Poone, near Anclam, on the Pomeranian Railway; on the railway at the port of Stralsund; over the channel at Duisberg, on the Bergsch-Märkish Railway; over the River Mottaw, near Danzig; over the Fregel, near Königsberg; for the Stettin Railway, over the Rivers Oder and Parnitz, near Stettin; and over the Elbe, near Haemmen, and near Harburg. Mr. J. W. Schweller has published illustrations and descriptions of most of these works in the Zeitschrift für Bauwesen, to which we are indebted for the following particulars of the Parnitz Bridge, which we have selected as an example.

In this class of bridges the superstructure is supported by two parallel main girders, carried continuously over two openings, being supported on three piers, the intermediate one being, of course, the turning pier. Each main girder has three supports, one on each of the two outer piers, and a central support on the intermediate pier. The spans of the bridge are not made equal, so that if the openings between the piers are equal, the intermediate support of the structure is placed out of the centre of the middle pier. The middle and one of the end bearings of the bridge consist of fixed plates, but the remaining bearing forms a movable support, which can be removed before the bridge is opened. The pivot pin is attached to the main girders by almost rigid transverse connexions. At that end of the bridge which rests on the movable supports is placed a counterweight, so that if this end of the bridge or its movable supports be lowered, the bridge cant upon the pivot pin until the bearing at the opposite end is cleared, as well as the bearing on the central pier, and a roller, placed underneath the bridge, in the axis of its length, takes a bearing on a rail running around the turning pier, thus limiting the cant of the bridge, which is then entirely supported by its axis and the roller. In this position it is easily turned by a pinion gearing into a rack, secured to the central pier, close to the guiding roller rail. For further security, however, two other rollers are placed, one on each side of the pivot pin. These rollers run upon the same circular rail as the one previously mentioned, and are always in contact with it, whatever may be the position of the bridge. For this reason they have to be constructed so as to allow for the deflection of the main girder under a passing load. To this end they are attached to the girders by means of springs, which only come into action when the girder deflects. The bridge, when turned, is then supported on four points, three of which are in a line with the pin. In some instances the side rollers are omitted, and two rollers placed in the centre line of the bridge are adopted, these rollers being, of course, both out of contact with the circular rail where the bridge is shut. This arrangement, indeed, is preferable in cases where the weights of the superstructure are not systematically arranged, as in skew bridges, in which the supports are not at the corners of a rectangle, but of a rhomboid. In railway bridges of this class, the danger signal is shown as soon as the operation of opening is commenced; in such cases the signal is often connected with the mechanism for lowering the support. This arrangement, however, is not safe, for the gradual lowering and raising of the supports only produces a gradual appearance and disappearance of the signals. In order to indicate, therefore, the position of the bridge, it is better to apply to the moving parts a sliding bar, connected with the signals in such a manner that the latter is freely raised with the first movement of the bridge.

The bridge illustrated has two equal spans, as regards the position of the piers, of 40 ft. each, and a central or turning pier of 25 ft. in diameter; the bridge is situated between two river piers 12 ft. wide, and carries a double line of rails. The whole length of the superstructure is 117 ft., and the transverse distance between the main girders is 18 ft. When the bridge is shut, each main girder is supported at three points, so that it forms two spans of 58 ft. 6 in. and 54 ft. respectively as the turning point is placed 3 ft. from the centre of the middle pier. When the bridge is opened the outer support of the longer span is lowered, the bridge being then carried by the pivot and three rollers; the counterweight is 20 cwt., so that the pressure upon the central roller is about 100 cwt., but some means should be adopted for regulating the exact height of this roller. The two other rollers are provided with springs, which limit the pressure on these rollers to five tons per roller, and which give full elasticity during the traffic. Any irre-