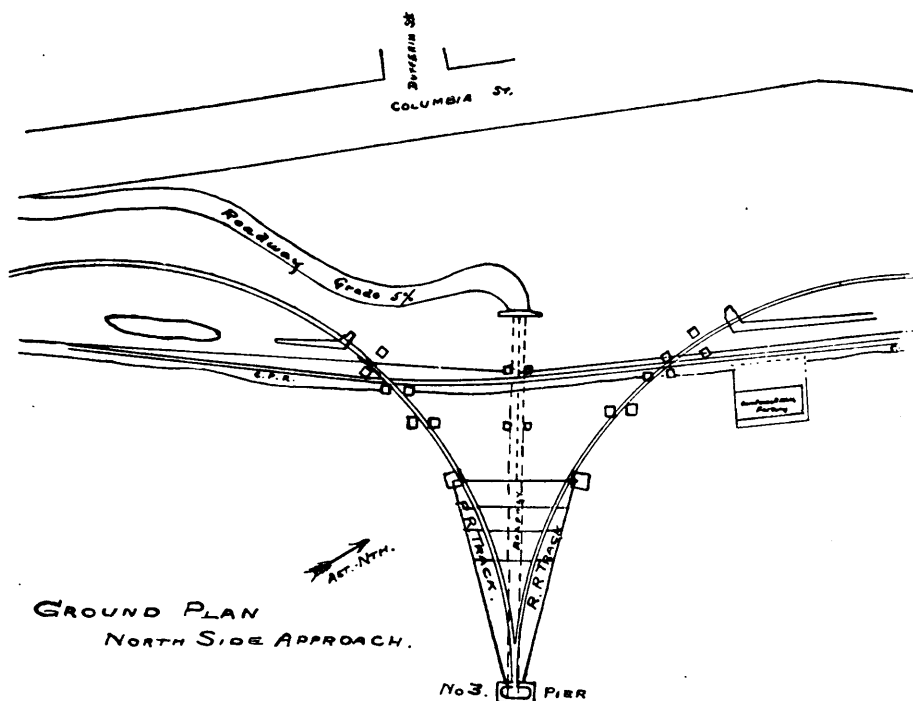


guarding the interests of passengers, recent legislation has been directed to the protection of the servants of railway companies, and investigations are held into numerous cases of injury, fatal or otherwise, which befall railway men. A code of rules has been drawn up by direction of Parliament for the safety of the men, and further rules are at present under consideration.

There are four inspecting officers, including Lt.-Col. Yorke, whose duties are chiefly, though not entirely, confined to the inspection of new railways and tramways, or new works on railways, e.g., signal boxes, stations, sidings, junctions, etc., and to the investigation of accidents to trains. There are also two assistant inspecting officers and two sub-inspectors, whose duties are chiefly directed to the investigation of accidents to railway servants. The above staff deals with all the railways and tramways in the United Kingdom, including Scotland and Ireland. The duties are sufficiently onerous and responsible. The relations between the officers of the Board of Trade and the officers of the railway companies are of a friendly nature, and the latter do all they can to assist the former in the performance of their duties.

The Manual of Statistics.

The Manual of Statistics Co., 220 Broadway, New York, has published its 25th annual volume, which comprises within its 1044 pages, a substantial increase on its size for 1902, information, statistical and otherwise, as to railway and other transportation, and allied companies as well as to general industrial and other corporations. The arrangement under the different departments is a good one, and the thumb index aids in locating the section which it may be desired to consult. In regard to the information respecting the Canadian railways and other companies included in the volume, it would be advisable that the proof sheets should be submitted to some one in Canada for correction before going to press, with a view of preventing errors, which detract from the value of the work. For instance, we note the following: On pg. 48 it is stated that the Canadian Northern Ry. Co. has issued \$7,000,000 of the \$24,750,000 of ordinary stock authorized, and has a funded debt of \$1,418,300, in respect of 1,221 miles of railway owned and leased, while the reports to the Dominion Government for the year ended June 30, 1902, show that the company had issued the \$24,750,000 of common stock authorized, and there was paid up on its debenture stock \$10,881,726, which includes the \$2,000,000 of land grant bonds, and the \$7,361,152 of bonds, the interest of which is guaranteed by the Manitoba Government, in respect of 892.62 miles of line. On pg. 150, under the heading of the Kingston and Pembroke Ry. Co., there appears a sentence, "It was stated in 1901 that the Canadian Pacific had acquired the property," while the list of officers shows that out of the nine directors, there are one C.P.R. director and five C.P.R. officials, one of whom is Vice-President and General Manager. On pg. 151, under the Lake Erie and Detroit River Ry., it is reported that in Nov., 1902, the Pere Marquette Rd. had acquired the control of the line, and the new officers are given; while under the Pere Marquette Rd., on pg. 226, mention is made of its being "stated in Dec., 1902," that the L.E. and D.R. Ry. had been acquired in the interests of the P.M. Rd. Errors of this kind are calculated to impair the value of the work, and show the necessity of fixing a date each year up to which the information published is obtained from the latest issued reports, with a supplement showing changes and alterations up to the date of going to press.



THE NEW WESTMINSTER END OF THE FRASER RIVER BRIDGE.

On the New Westminster side the bridge ends in a Y, the left or westerly fork of which leads to the location for a station for any new lines entering the city, while the right or easterly fork heads for Sapperton, on the way to Vancouver.

The Fraser River Bridge.

The substructure for the bridge being constructed by the B.C. Government over the Fraser river at New Westminster is almost completed, and preparations are well under way for starting the erection of the superstructure. The completed structure, of which a view of the engineer's perspective sketch is given on pgs. 274 and 275, will span the Fraser river from near the foot of Dufferin st. to a point not far from the little Indian church on the south side of the river, above Brownsville. It will have thirteen spans, five each 160 ft. in length; one of 225 ft.; one of 380 ft.; and a swing span 361 ft., giving a passage for steamers on either side of 180 ft. Also there will be two plate girder spans, each 40 ft. wide, and one of 90 ft., at the railway track on the city side. At the south, or Surrey end, there will be a trestle approach 1,310 ft. long. The clearance under the bridge, with an average tide, will be 25 ft. This will allow steamers only that height to pass without opening the draw or swing span, but most of the small river tugs may thus pass, while even larger tugs may do so by simply having their funnels constructed so that they may be lowered, as is done in other places. The structure will be of the double-deck type, the railway track occupying the lower chord of the bridge. Where this track leaves the bridge it will pass 23 ft. above the C.P.R. track on the city shore, and the same height above the Great Northern Ry. track on the Surrey shore; and on the city shore, moreover, space is left beneath for building two tracks outside that of the C.P.R. The railway approach on the city side presents a novelty in bridge architecture, viz., a fan tail approach. From the end of the bridge proper, at the deep water pier, the railway track will branch into two, one curving westerly, the other easterly. A sketch showing this approach appears on this page. At pier no. 3 is the deepest water and a 225 ft. span. Over this pier the girders are 20 ft. centres, while on no. 2 pier, nearer shore, the fan spread has extended to 135 ft., no. 2 pier being a double pier, in shallow water near shore. On

the south, or Surrey side of the river, the railway approach will be on a high embankment or trestle curving east from the bridge. The grades of the approaches will be 1% compensated. Where the track crosses the C.P.R. it will be 25 ft. above it, but at a distance of 700 or 800 yards it reaches the level of the C.P.R. track on Front st., about the Brackman-Ker wharf, the level to the east being reached beyond the penitentiary. On the south side the level is reached on neutral ground, where connection is made with the tracks of the G.N.R. or any other railway seeking to cross the river at this point. The highway for wagons and other vehicular traffic will be on the upper deck of the bridge, with the usual clearance of 23 ft. above the railway track. On the shorter spans this deck will be on the upper chord, and on the longer spans it will be about mid-height. On the city side this highway does not follow the curves of the railway tracks beneath, but, on leaving the bridge proper at no. 3 pier, goes straight ahead and strikes the bank of the Pleasure Grounds, about 50 ft. above the level of Front st., and nearly as much below the level of Columbia st. at that point.

The substructure possesses a number of features of interest. Piers 1 and 2 are double, making seventeen piers, exclusive of the abutments and pedestals on the shore. The borings failed to discover solid rock bottom within reasonable depth. The water at no. 3 pier was found to be 80 ft. deep, at low tide, and as the foundations of this pier are sunk in the river silt 55 ft. this makes the distance from the surface of the river at low tide to the bottom, 135 ft., one of the deepest foundations sunk in America. On this is built a stone pier 35 ft. high, and on this in turn is a truss 50 ft. high, so that from the extreme top of the bridge to the bottom of this pier the distance is 215 ft. The pressure of the water at the bottom of the caisson used in sinking the foundation is too great for man to work at that depth, either in diving suits or by pneumatic process, being about 52 lbs. a square inch. The necessary excavating, therefore, is being done by open dredging system. The caissons are built on shore, of