THE WIDENING OF THE METROPOLITAN RAILWAY.

MR. JOHN FOWLER, ENGINEER.

FIG. 10

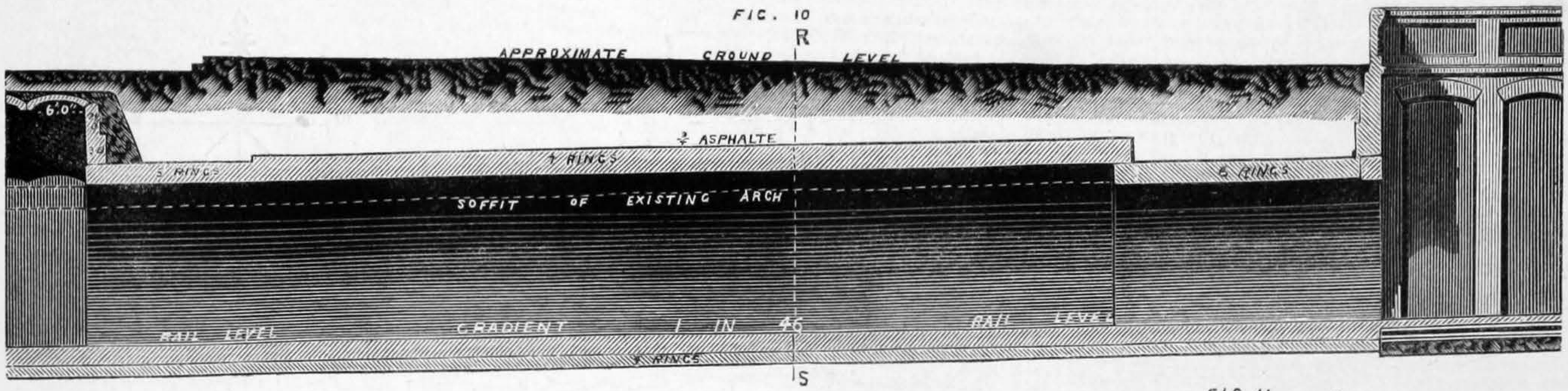


FIG. 14.

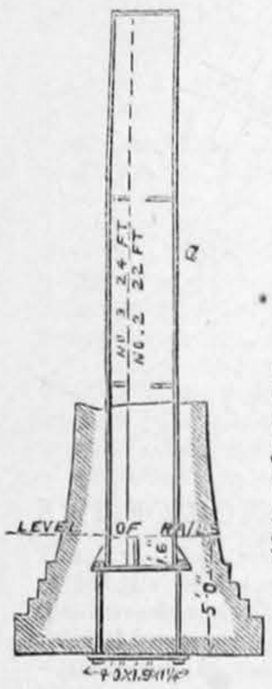


FIG. 12.

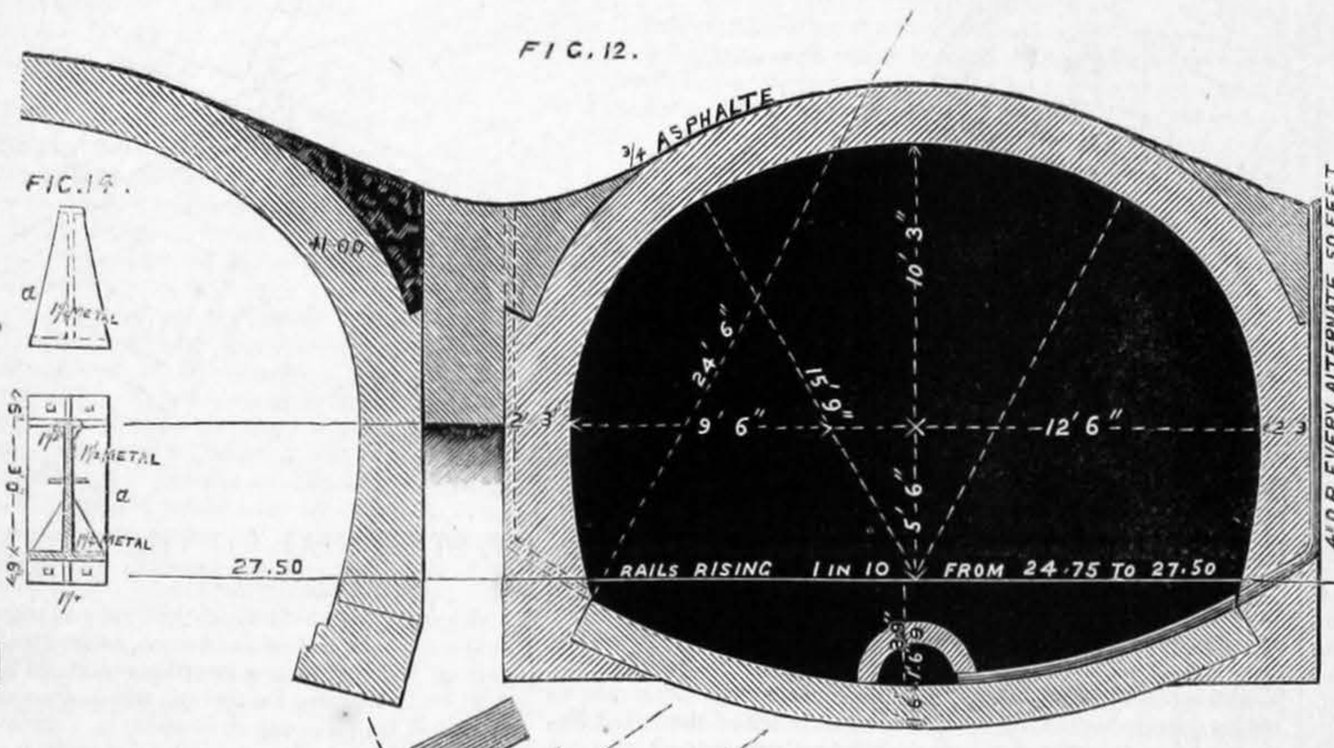


FIG. 11.

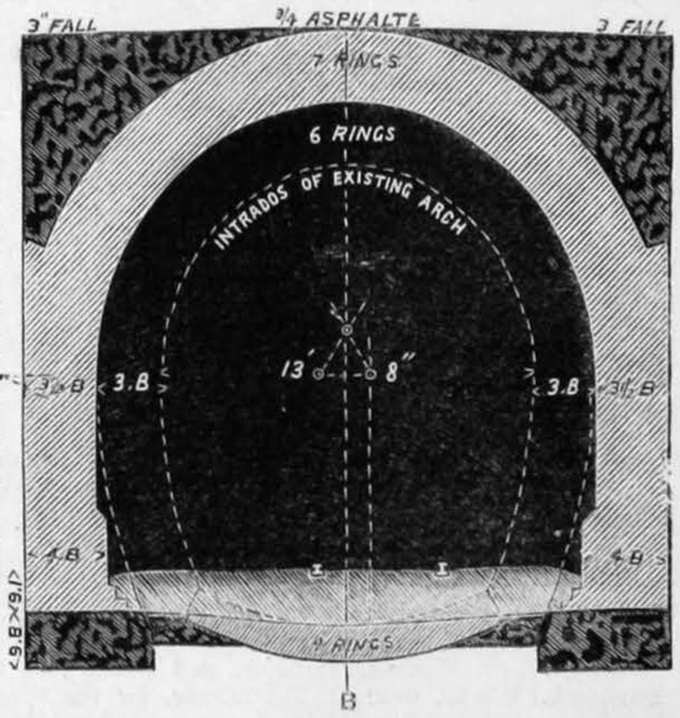
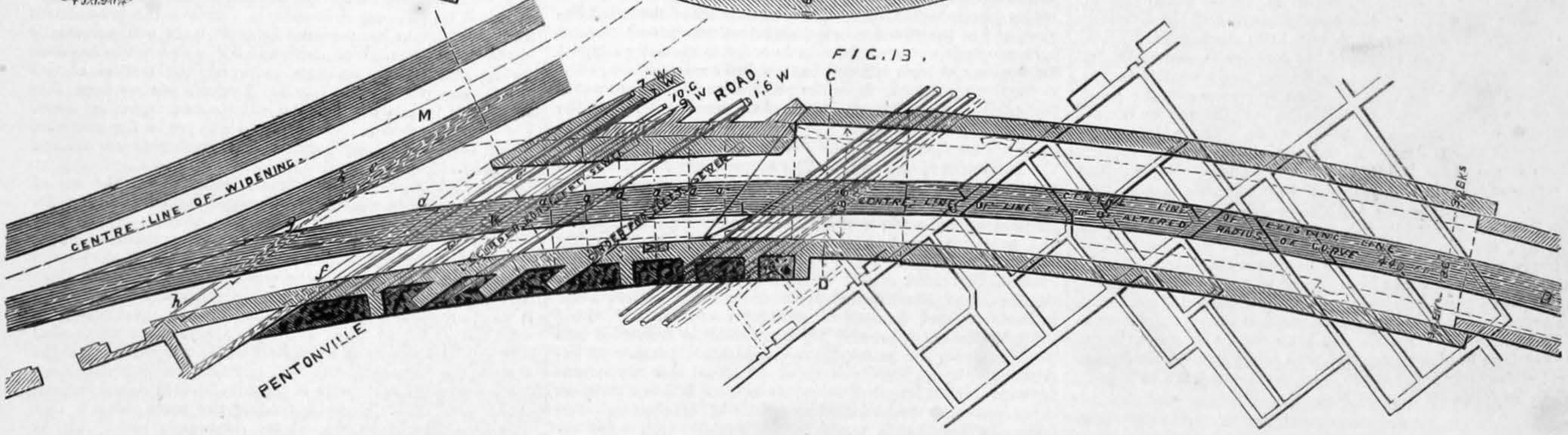


FIG. 13.



THE widening of the Metropolitan Railway between King's-cross and Farringdon-street stations, with the deviations of the branches to the Great Northern Railway, has been practically completed, and on the 15th of January was formally inspected by Captain Tyler on behalf of the Board of Trade.

A constantly increasing traffic has rendered this extension necessary, and the new lines are intended for the service of the Great Western, Great Northern, and the Midland trains (the former line being turned into the widening by a cross-over road, the points of which are at the east end of the King's-cross station platform), so that the Metropolitan Railway proper will be relieved of the extra traffic which has hitherto imposed upon a limited rail accommodation. The widening commences in King's-cross station, and for some distance it runs parallel with the old line towards Farringdon-street; then dipping, it crosses beneath the Metropolitan, and rising on the other side, again runs parallel with it, the rails being laid with such a gradient as to overtake those of the Metropolitan at a point a little westward of the new station at Farringdon-street. Under the same contract is included the erection of the substructure, and the extensive system of sidings, platforms, and hoists for the new Smithfield Dead-meat Market. The works on the widening have presented unusual difficulties, in consequence of the necessary deviation of two existing branches, through one of which the traffic has been unceasingly maintained, the extent of driven tunnel work, and the tedious process of underpinning a portion of the Metropolitan Railway retaining walls and the foundations of Vine-street and Ray-street bridges; indeed, but for the excellent quality of the old brickwork, a different and more costly plan of construction, involving a stoppage in the traffic, would have been necessary, especially in those places where the sides of the tunnel were cut away at the bell-mouthed junctions. In all these cases the new work was carried out in short lengths, with the greatest care, and with the best materials, cement-set brickwork being used throughout.

The plan on the next page shows the general arrangement of the new works at King's-cross, the lines representing the Metropolitan Railway and the Great Northern branches as they were originally constructed, and the centre lines of the deviations and new works. From A to B, a length of 1 furlong 5 chains, is that branch of the widening to the St. Pancras station of the Midland Railway; the length, C D, is the diversion of the Great Northern and Metropolitan Junction Railway (single line), known as the Hotel curve; from E to F is the diversion of the eastern curve, or up line, from the Great Northern to King's-cross (also a single line).

Fig. 1, page 90, is a sectional plan from the bell-mouth, formed by the junction of the former curve with the widening to the bell-mouthed tunnel, where the Midland branch turns to St. Pancras station, diverging from that part of the widening, which it is intended ultimately to extend to Paddington. Fig. 2 is a transverse section of the Hotel curve taken on the line A B; and Fig. 3, a section on C D. At this place the tunnel of the original line of this curve intersected the side walls of the Metropolitan main line, thus making a bell-mouth, which has been cut away by the widening, and another has been formed by the junction of the diverted Hotel curve and the new line. The width of the Metropolitan railway arch has therefore been reduced to 28 ft. 6 in., and the arch of the old bell-mouth has been cut away on one side, and is supported on a brick abutment, which, on section C D, is strengthened with cast-iron standards, shown at *a a*, Fig. 1, and in detail, Fig. 14. Figs. 5, 6, 7, and 8 are different cross sections taken on the respective lines lettered on the plan, and they show the various constructions employed, as the new work gradually leaves the old, until at Fig. 8—a section on line, N O—the bell-mouth of the widening is completed; and the Metropolitan Railway arch is left untouched, except that one abutment is partially cut away, and the space between the two tunnels is filled in with concrete. This part of the work is strengthened by brick spandrils, which are shown in dotted lines in plan, Fig. 1, and in Figs. 3, 6, and 7. Fig. 9 is a section on the widest bell-mouth on the work, spanning, as it does, the two 25 ft. tunnels and a 4 ft. 6 in. intermediate pier. It is constructed with an arch of 6 rings in thickness, springing from abutments 4 bricks thick, strengthened with counterforts placed at short intervals apart, and filled with concrete, as shown in the plan. Fig. 13, above, is a sectional plan of the eastern curve.

The Hotel curve, during its diversion, was stopped up, and another line to the Great Northern, known as the Maiden-lane curve, which was constructed at the same time as the Metropolitan, has been closed permanently, as shown in plan, Fig. 1, at the point where the Hotel curve joins the widening, as now constructed; the deviation in this case is extended only so far as is shown, terminating at the point where the new walls overlap the old. The arch in this length was constructed over the old tunnel (Fig. 11), which was entirely uncovered, and employed as a centering for the diversion, it being pulled down afterwards, and the invert extended to the side walls. The arch here is consequently so much wider than is necessary by the thickness of the tunnel over which it was erected. The arch finishes just beyond the crossing of the Fleet sewer (drawings of which are in preparation), and is exchanged for girder covered way, as seen in Fig. 10, which is a longitudinal section of the diversion, and which shows the point where the covered way commences. This figure also shows the junction of the original and the new tunnel.

(*To be continued.*)

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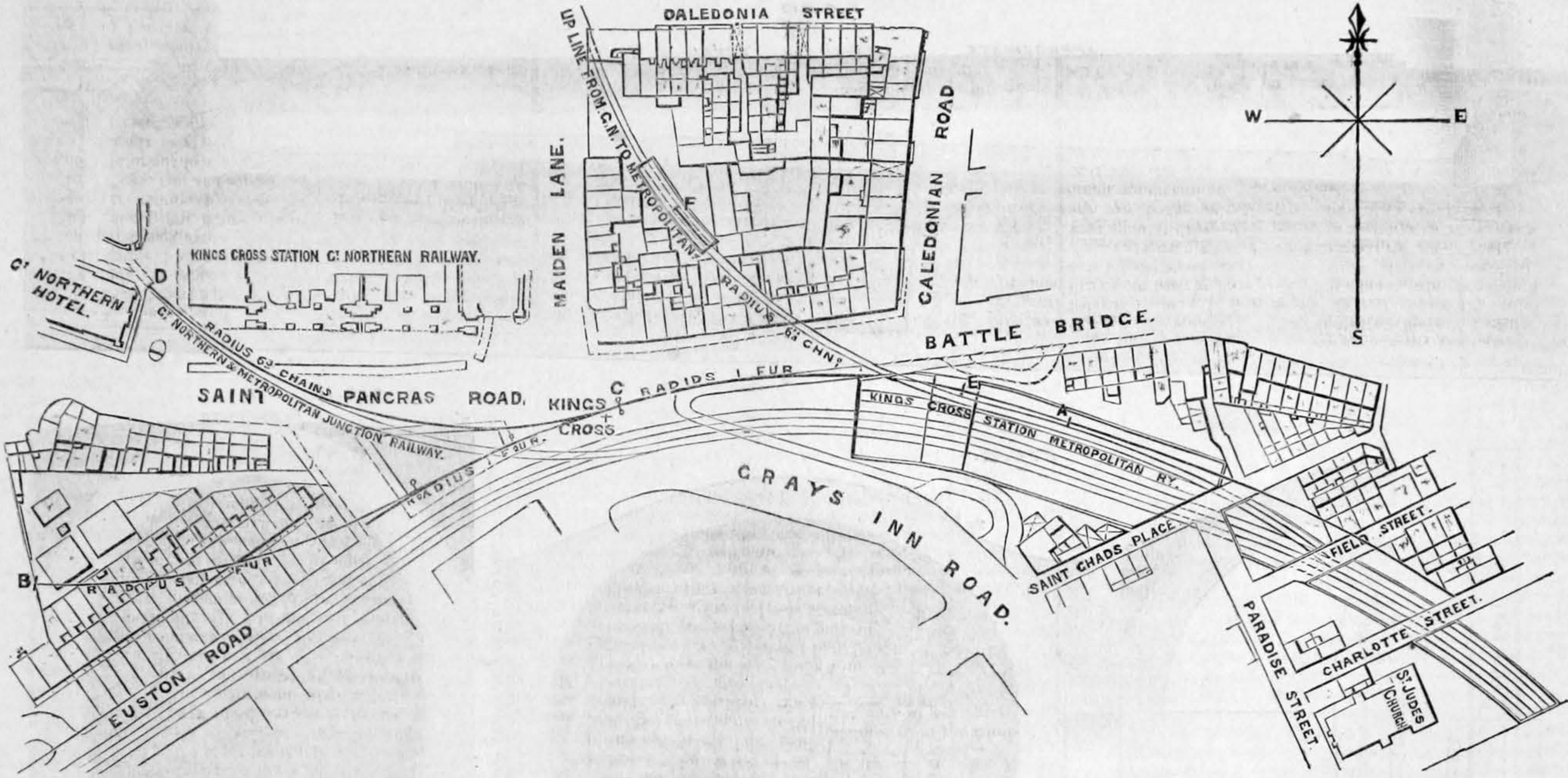
(*For Description, see preceding Page.*)



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(*For Description, see Page 87.*)