

the horizontal reinforced concrete struts running at right angles to the girders. On this concrete wall were placed the plate girders already referred to. Twisted steel anchor rods were then hooked into the projecting plates provided on girders, and laid in a trench 2 ft. 6 in. wide

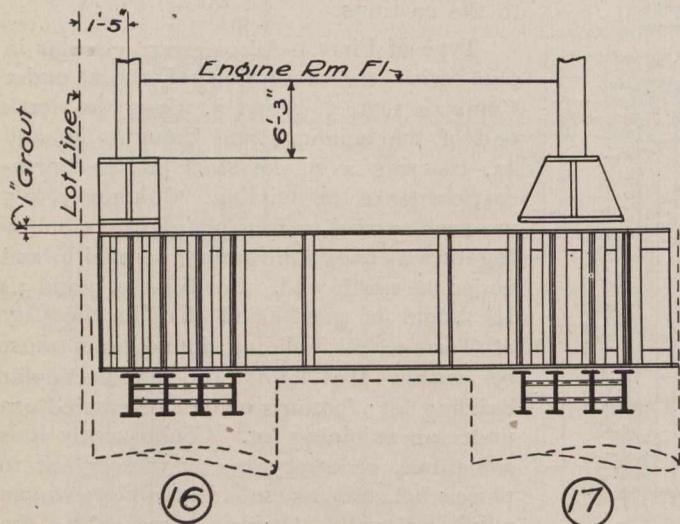


Fig. 6.

by 5 ft. 0 in. deep, extending out at right angles to the girders and butting onto the caissons of the next row of columns. The girders, and trench with rods, were then filled in with concrete, the outer girder being grouted with neat cement flushed in to lot limit, as shown in Fig. 5. The girders are surmounted by cast iron column bases levelled and grouted as previously described.

**Columns Nos. 45 and 45a.**—The foundations for columns Nos. 45 and 45a present several features which are worthy of special description. These columns are respectively the main and auxiliary columns at the southwest corner of the building.

The main column runs up to the full height of the building, but the auxiliary stops at the third floor level, and carries the wind bracing up to that point. Above the third floor the wind bracing is carried by the main column.

The pier for these columns is circular in plan, as shown in Fig. 9, and is surmounted by a special grillage composed of a bottom course of five and an upper course of six 12-in. @ 40 lb. I-beams, the latter course laid at right angles to the lower, as shown in Fig. 9. It will be noticed that the beams in the upper course are carried diagonally towards the

centre of the building, to form a base for the auxiliary column. The weight thus applied would cause an eccentric loading upon the pier, the load centre approaching towards the inner wall of pier. To overcome this

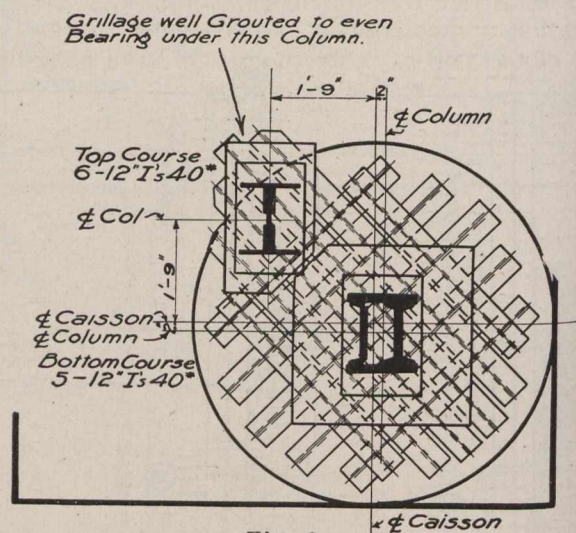


Fig. 9.

eccentricity of loading, the position of the pier has been moved diagonally inwards by  $2\frac{3}{4}$  in., thus concentrating the combined load about the centre of the pier.

**Cantilever Girders.**—Columns 17, 27, 28, 39 and 40 on the east side of the building abut on an existing structure, and commence from a level considerably above the rock (as very little basement excavation was required under this portion of the building). They are carried upon cantilever girders. These girders are each carried in turn by two circular caissons which are surmounted by single grillages composed of four 15-in. I-beams. This is diagrammatically shown in Figs. 4, 6 and 7.

The girders are each built in three longitudinal sections, as shown in Fig. 7, and are bolted together through diaphragms after being set in place. The spaces between the girders are filled with concrete, and they are also encased in the

same material. A cast iron column base is set at both ends of each girder and grouted in, as shown in Fig. 6. This cut also shows the method of cantilevering.

The building is being erected for the Guardian Realty Company of Canada, Limited, at a cost of about

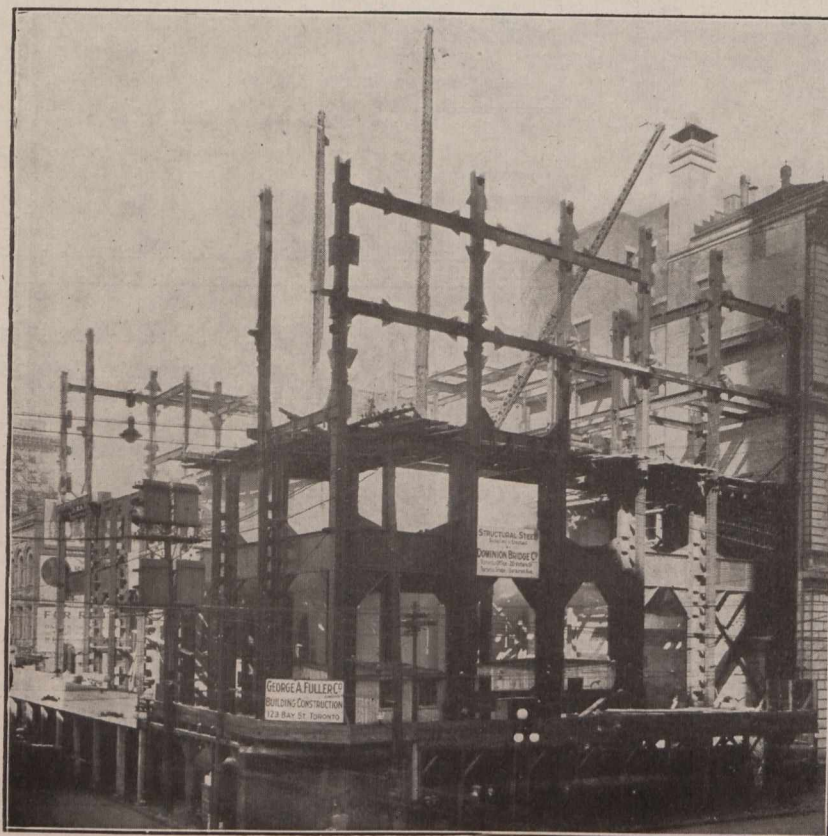


Fig. 8.—State of Erection of Royal Bank Building on March 20th, 1914.