connected by means of 3/4-in. through-bolts with pipe separators between the beams. One set was placed at right angles to, and above the other upon the concrete piers. They were carefully levelled up and the whole then

(83)

grouted in level with the top of the uppermost grillage. Section "A" of Fig. 5 illustrates the arrangement.

Column Bases.—Each of the piers constructed as

above are capped with a heavy cast iron column base

similar to those shown in Fig. 5. These bases were cast from tough grey iron. The actual test made on coupon bars one inch square in section and 12 in. long, loaded at the centre, gave on an average a breaking load of 30,000 lb. The upper surface of the cast iron bases is planed true and parallel to the lower surface, and holes are drilled for bolts to connect the columns to bases. In Fig. 1 several of these bases may be seen on the ground ready placing. In designing for these bases provision was made for 1 inch of grout between the base and the steel grillages. In setting, small wooden wedges were used under the corners of the castings, by which means the bases were set dead level, and raised or lowered to the

exact elevation required. Grouting was then introduced through vertically cored holes at the centre of the casting, and by this means the space between grillage and base was thoroughly filled in. The wedges used in levelling were not removed, and, being of wood, will give under any compression to which they and the grouting may be subjected, thus insuring even distribution of the

load over the whole surface without damage to the castings.

Type of Piers.—All piers are circular in plan with the exception of those under Columns 1, 2, 3, 4 and 5, along the north end of the building, and Columns 46 and 47, carrying a smoke stack at the northeast corner of the building. Columns 1 to 5 are each carried by four plate girders bolted together as one, and running parallel to and under the north wall. (See Figs. 2, 3 and 5.) It should be mentioned that in the City of Toronto all building foundations must be within the limits of the particular building lot; footings cannot be carried out under an adjoining lot. Consequently it is sometimes necessary to cantilever out to place the columns sufficiently close to an adjoining wall. Owing, however, to the depth of the basement at this end of the building, bed rock is not more than 10 and

11 ft. below the column bases, and it was not necessary to use cantilever girders to carry these five columns. Instead, a trench was cut along the extreme northern limit of the lot, extending inwards about three feet, and down-

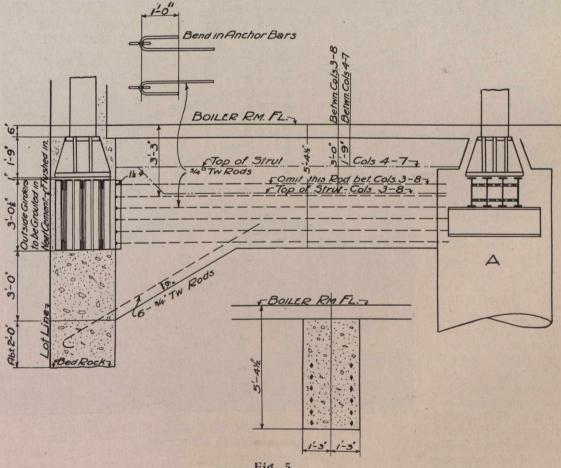


Fig. 5.

wards to bed rock. This trench was filled in with concrete to the requisite height, diagonal tie rods being inserted (as shown in Fig. 5) which later formed part of