of the four main girders and cantilever out to the sides supporting facia girders 27 ft. 2 in. apart. The facia girders consist each of a 30 x 5/16 in. web with two 3 x 3 x 5/16 in. angles forming the top flange, and one 3 x 3 x 5/16 in. angle at the bottom. The top flange of the facia girders is set 4 inches above the base of the rail. The 9-in. cross beams support a concrete slab 10 in. thick, the top of which is 2¼ in. above the top of the beams. This concrete slab supports 14 inches of ballast, the top of the ballast being level with the base of rail, so that the top of the 9-in. beams is 16¼ in. below the base rail, or 20¼ in. below the top of the facia girders. The beams are connected to the facia girders with web connections and the girders are stiffened with vertical gussets from the top of every fourth cross beam. At the abutment there is an apron plate spanning from the last cross beam to the top of the ballast wall. The four main girders span the whole width of the street without posts, making a length centre to centre of end bearings of 71 ft. 0 in. They each have a 72 x 7/16 in. web plate and top and bottom flanges of two 8 x 8 x ¾ in angles, two 18 x 11/16 in. cover plates, and one 18 x ⅝ in. cover plate. These four girders are spaced traversely, making three equal spans of 6 ft. 6 in. centre to centre. There are no top laterals, as the concrete floor forms a most effectual bracing. The two girders under each track have a bottom lateral system, and all four girders are connected together with brace frames, spaced about twelve feet apart longitudinally. The pier members are of the Standard Transcontinental type, consisting of a heavy cast iron bed plate with a turned spherical disc surface on top, and a thick shoe on the girder dished on the under side to suit the disc, the shoe plate and casting together making a height of about 1 ft. 4 in.

In the 58-ft. through span over the spur tracks of the Canadian Northern Railway, the standard open floor of the Transcontinental was used with 8 x 10 in. ties notched ½ in. over the stringers, and laid in two lengths of 13 ft. 6 in. butting in the centre of the bridge, making the outer ends 7 feet from the centre line of the track. It was necessary to have 22 ft. 6 in. clearance from the base of rail of the spur tracks to the under side of the bridge, but only for a width of 7 feet over each track. It was, therefore, possible, by arranging the floor-beams to come between the tracks of the Canadian Northern, to allow their bottom flanges to be about 2 feet lower than the bottom of the stringers and main girders. The side girders are 31 feet apart and the bending moment on the floor beams consequently large, so that the extra depth thus obtained for them was most desirable. The cross section of this span is typically the same as that shown for Thistle Lane on Plate No. 1, but the outer rail has no superelevation as at Thistle Lane, and there are but two lines of stringers under each track instead of four. This span is divided by the two floor beams into three panels. The stringers—two under each rail—are built girders, 30¼ in. deep. The floor beams have 60 x ⅜ in. webs and a flange composed of two 8 x 8 x ¾ in. angles, one 17 x 11/16 in. plate and one 17 x ⅝ in. plate. The bottom flange is curved up at the ends to meet the bottom of the main girders. The girders are 8 ft. deep, 3 ft. 3 in. below the rail and 4 ft. 9 in. above, and consist each of a 96 x ⅜ in. web and flanges of two 8 x 8 x ¾ in. angles, one 17 x ⅝ in. cover plate and two 17 x ½ in. cover plates.

Fig. 3.—Curved Western Approach, Looking From the East.

The material and general dimensions of the four 150-ft. through truss spans over the river are indicated on Plate No. 2, and Photo No. 1 gives an idea of the appearance of the completed bridge. The spans have 6 panels of 25 ft. each and are 32 ft. 0 in. deep, centre to centre of chords and 31 ft. 3 in. wide centre to centre of trusses. The main diagonals in the two centre panels were reversed from the customary direction, making them compression members when there is a symmetrical arrangement of the live load. This adds to the appearance of the truss, and it was also found to be economical on account of the reversal of stress in these members. The trusses are cambered 1⅜ in. at the centre. Longitudinal tractive force is provided for in the second and fifth panels of the bottom laterals, as shown on Plate No. 2, by the addition of some sub-laterals forming a triangular truss, the chords of which are the main laterals and the bottom flange of the floor beams, while the additional laterals and the bottom flanges of the stringers form the web members. There is no separate lateral system for the stringers, but at the centre of each panel there is a continuous line of brace frames, between the four stringers, and the centre brace frame is connected at the bottom to the intersection of the main bottom laterals. The bottom flanges of the stringers are also connected to the main laterals wherever they cross them. The portal strut and the intermediate sway struts at each truss vertical are tied to each other at their centre points and to the intersections of the main top laterals, by a continuous strut on the centre line of the bridge, of the same depth as the top chord and the intermediate struts. The intermediate struts are knee-braced to the truss verticals at each panel point. The details of the portal were arranged so that it could be set in place all riveted up without spreading the trusses. All abutting joints in the top chord were faced to bear. These top chord joints and all other joints and splices were riveted sufficiently to develop the full strength of the material. The bottom chord joints were also faced as a matter of good workmanship. The end gusset plates on the bottom chord were protected on their tops and at the ends from the weather, by a cover plate bent to conform to the profile of the gussets and bolted to connection angles on the gussets with ⅞ in. machine bolts, so that the bent covers could be removed whenever it was decided to inspect or paint the shoe diaphragms. The end reaction of 1,134,000 lbs. is taken care of by a shoe of cast steel 3½ in. thick riveted to the underside of the bottom chord, dished on the underside to a concave sperical surface of 3 feet radius to engage a lower convex casting 5 in. thick which in turn rests on three 2¼ in. plates riveted together, resting on a nest of eight 6 in. rollers, 4 ft. 3 in. long. This roller nest rests on a 2 in. plate, 4 ft. 11 in. by 5 ft. 0 in. The plate sits on the masonry with ⅛ in. sheet lead between to take up inequalities in the bridge seat. On the