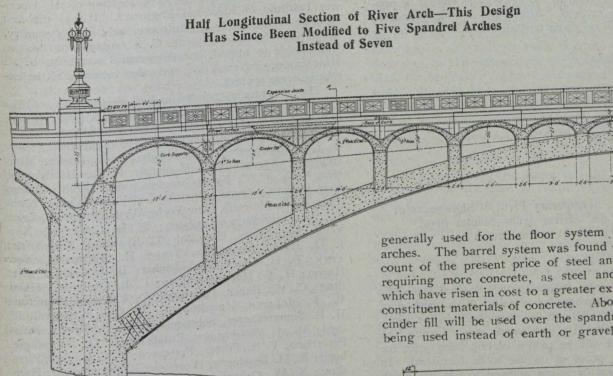
ring from slipping off the pivot. A thermometer will be embedded in the arch ring and when the temperature of the ring is at 45° Fah. which is considered the average yearly temperature, the joints at the skewbacks and crown ancing of the horizontal thrust of adjacent arches was found to be a somewhat tedious problem.

The barrel type of arch was chosen in preference to the beam and slab construction, which has previously been



will be "gunited," that is, filled in with the dense sandcement mortar shot by the cement-gun. The arch will be completed and the whole dead load will be in place before these joints are thus closed.

This results in minimum temperature stresses and in the practical elimination of rib-shortening stresses. The principal stresses in this arch are the compressive stresses due to dead load, and they are never neutralized or reversed by live load or temperature stresses, consequently the entire rib is always in compression. Therefore there is no reinforcing whatever in the ring of the river arch.

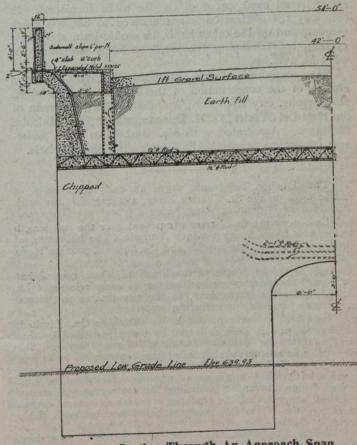
The spans of the five spandrel arches on each side of the centre of the river arch are all different, the length being greatest over the skewbacks and decreasing gradually toward the crown. This is said to be a novel feature but a logical one on account of the decreasing height of

the spandrel piers.

It will be noticed from the plan, Fig. No. 3, that the approach arches on the west are not right arches. However, the skew is slight. The additional stresses caused by the skew have been allowed for, as nearly as could be approximated by bunching of the reinforcing along the shorter centre diagonal of the parallelogram formed by the sides of the span and by the piers.

The soffits of the approach arches are semi-ellipses. Flat arches were necessitated by the clearance requirements of the railway yard. The neutral axes of these arches were designed so as to be identical with the line of resultant pressure due to the dead loads plus half the live loads. The arches being necessarily flat, the semi-ellipse fitted the soffit of the arch by the addition merely of a small amount of concrete near the skewbacks to complete the curve. For consistency of design the spandrel arches

Since the approach spans are alternated, small and are also semi-ellipses. large on account of the track layout in the yard, the balgenerally used for the floor system of open spandrel arches. The barrel system was found economical on account of the present price of steel and labor, although requiring more concrete, as steel and labor are items which have risen in cost to a greater extent than have the constituent materials of concrete. About 350 cu. yds. of cinder fill will be used over the spandrel arches, cinders being used instead of earth or gravel in order to save 54-0"



Half Cross Section Through An Approach Span

weight. The only beam and slab construction in the bridge will be in connection with stairs leading to a baseball field on the west side of the river and for the sidewalk and curbs, underneath which space for public services is provided.