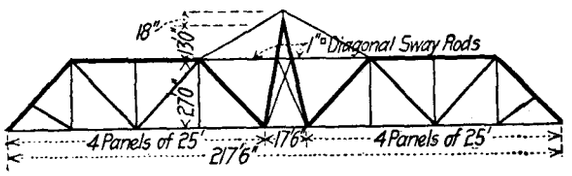
tives with a uniform train load of 3,000 lbs. per lineal foot. For the longer span this gives a loading on the turntable, when the bridge is swinging, of about 800,000 lbs. The general style

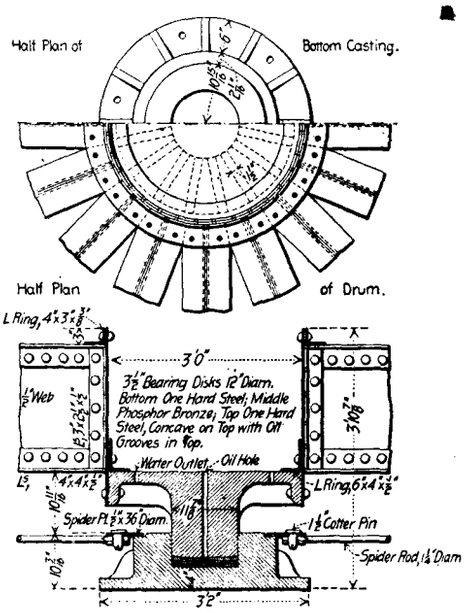


of construction is shown in the diagram, Fig. 1, and need not detain us except to say that all connections were riveted with the exception of the top laterals and the pin connections for the eye-bars and sway-rods connecting the trusses to the central tower. The peculiarities of the construction were three: The turntable centre, the central tower, and the end lifts. The design of the latter is the especial property of W. H. Law, of Toronto, at that time the engineer and manager of the company. The device is based on the use of the toggle-joint, is very simple to construct, and most effective in operation.

Central Tower.—In most swing bridges of ordinary types, whether rim or center bearing, we have to do in the ultimate analysis with beams of complete or partial continuity, and have to take care of shearing stresses transmitted across pivot or drum, and provide special devices to prevent hammering of the truss ends. In the bridge under consideration the rolling load can produce stresses only in the span on which it may be; and the trusses when closed may be figured as simple spans resting on their own supports and completely discontinuous. The turntable is surmounted by a braced tower, Fig. 2, on which rests forged steel links turning on 4 15-16 inch pins, and themselves carrying similar pins to receive the ends of the eye-bars. When the bridge is closed these eye-bars can receive no stress; when the bridge swings, the trusses are simply hung by them to the central tower—a form of construction most simple, effective and economical, easily computed and most practicable in the shop.

It is quite possible, of course, that by some accident or other —a knock from a boat, say—the links at the top of the tower might be drawn over so far to one side as to fail to return to their normal position when the bridge is swung back to its position when closed. To obviate any mishap of this kind, diagonal sway rods 1 inch square are introduced extending from the pins at the hip to the central tower. Here they connect to 2 inch pins which travel in slotted holes 4 inches in length, giving each pin a movement of 1 inch each way from the center. These rods only come into play in the case of accident to the links, and are emergency safeguards and wind braces.

The central portal is double, as shown; one set of bracing acting with the links, the other set giving rigidity to the tower; the whole forming very efficient protection against accidents common to canals as well as against high winds.



Turntable Center.—This was designed for the express purpose of reducing shop cost by keeping the radial girders of full depth throughout their length. The load from the bridge is delivered to the drum by 16 radial girders which receive it from 8 bearing beams—that is, from 8 points of support. The turntable is combined rim and center bearing—and 250,000 lbs. reach the center, while 550,000 lbs. go to the 36 rollers. The center, Fig. 3, of cast-iron or steel, terminates in its own pin, and the form of construction reduces somewhat the amount of power required to turn the bridge; with this additional feature that the necessity of using bolts is entirely done away with. The steel center plate was riveted to the cast-iron center in the shop and the field riveting was then easily done without any special danger to the center.

The whole structure as thus designed merits attention from the manufacturer's standpoint, and its description may be of use in the further perfecting of shop detail, most centers being