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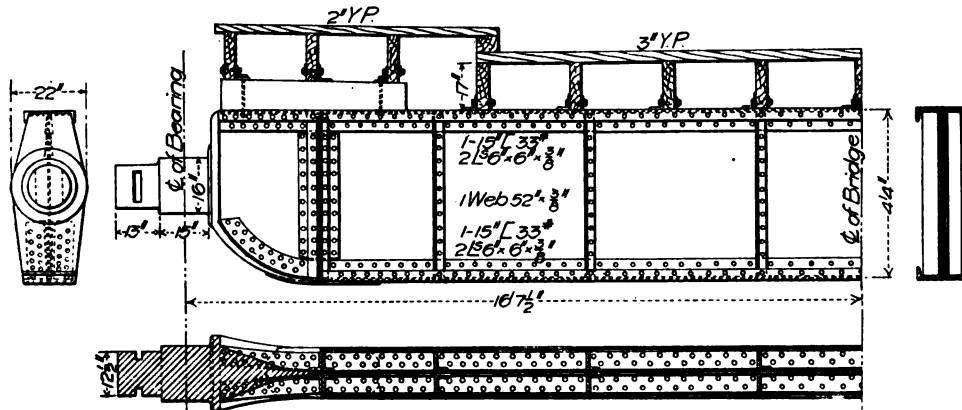
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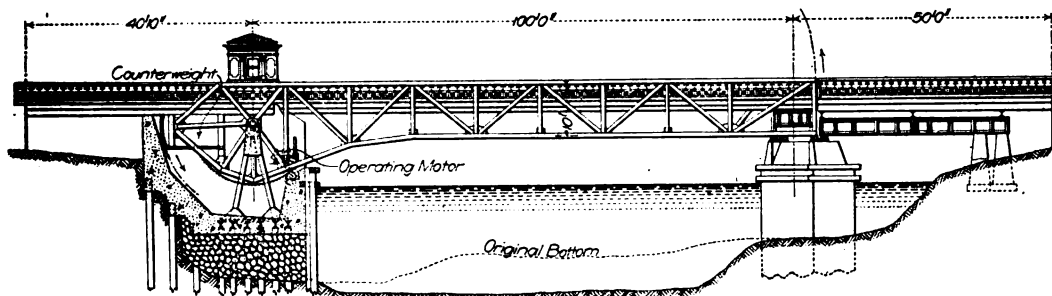
The Franklin Street Bascule Bridge, Michigan City, Indiana.

A single-leaf bascule bridge has just been built to replace the 140 ft. swing span of a deck highway bridge at Franklin St., Michigan City, Ind. The old deck span, 159½ ft. long, had two equal arms supported on a turn-table on a pivot pier about 25 ft. in diameter which reduced the waterway to two channels about 60 ft. wide between dock lines skewed at an angle of 66 deg. with

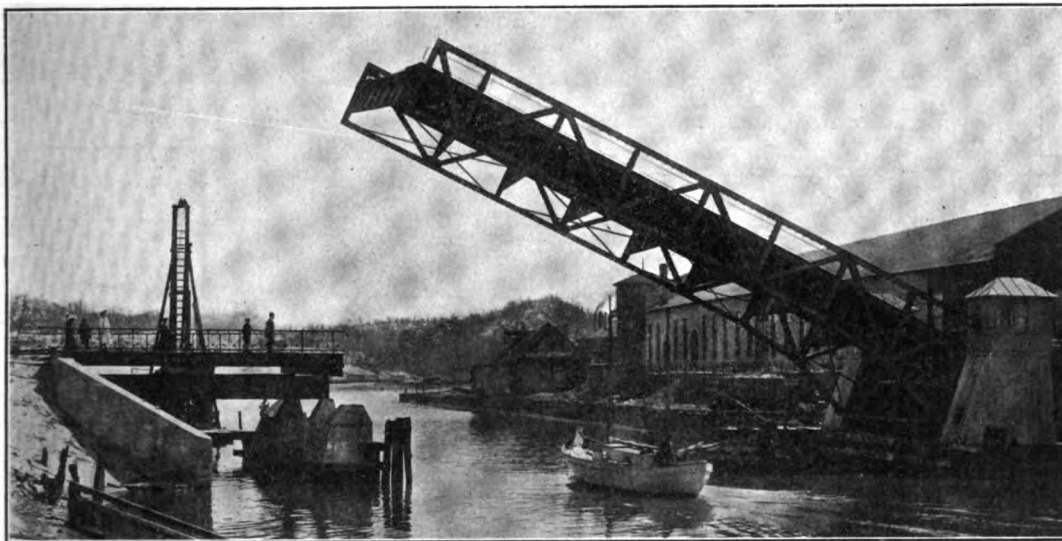
on piles and are of simple construction, the main or pivot pier containing a water-tight inner chamber extending 5½ ft. below water level to receive the counterweight, tail girders and operating machinery. This pier is square with the bridge and is provided with two small operating houses outside the planes of the bridge trusses. The other pier is a narrow rectangular structure nearly at right angles to the bridge axis and supports the movable end of the bascule span and the fixed end of the approach girder span.



Trunnion Girder.



Sectional Elevation through Main Pier.



Completed Span in Operation.

the bridge axis. A considerable improvement has been effected by the removal of the entire former structure, including the pivot pier, the dredging of the channel to a depth of about 20 ft., and the erection of a new structure without any center pier and with the side piers 80 ft. apart in the clear at the narrowest part of the channel. The superstructure consists of a single-leaf deck bascule span, 94 ft. long over all on the center line, and 100 ft. long from center to center of bearings on piers, and two approaches of about 40 and 50 ft., made with beams and girders and providing additional waterway on one side of the main span.

Both of the main piers are between the dock lines and are protected by clusters of daulphin piles at both ends. Both piers are of concrete

The superstructure has a clear width of 32 ft. and carries one 18-ft. roadway and two 7-ft. sidewalks 4 ft. below the center of the top chord and 15½ ft. above water level.

The main trusses are lattice girders 10 ft. deep and 33 ft. 1 in. apart on centers with six regular 11-ft. 9-in. panels and four special panels at one end, where the lower chord is inclined downward to give the truss a greater depth, and special bracing is inserted to provide for the segmental racks attached to the lower chords and for the counterweight platform supported by tail-girders. All of the truss members are made with pairs of 8 and 9-in. channels latticed on both flanges, except that the upper chord has a top flange cover plate; all main connections are made with pairs of gusset plates riveted to the backs of the

channels, while the trusses were shop-riveted complete and shipped as units. The regular plate-girder floor beams have field-riveted connections and bottom flange solid-web knee braces to the vertical posts; the special floor beam over the trunnion pier is made with a trussed 12-in. I-beam. There are bottom lateral X-brace angles in the planes of the lower chords and the 3-in. transverse roadway planks and 2-in. sidewalk boards are nailed to 4 x 12 and 3 x 12-in. longitudinal joists about 2 ft. 3 in. apart bolted to angle clips on the top flanges of the floor beams.

The special feature of this bridge is the pivoting and operation of the bascule leaf, which is effected with great economy and simplicity and secures direct operating mechanism with very few parts, conveniently arranged and protected in a small space under the roadway in a dry pit in the body of the main pier. The trusses are pivoted on a horizontal transverse axis extending through them below roadway level and provided with trunnions which have fixed bearings supported by steel pedestals on each side of the trusses. The web members of the trusses are connected just above the centers of the end panels to the double vertical webs of steel castings integral with a hollow horizontal cylinder. The latter is bushed with phosphor bronze to provide a bearing 15 in. long, revolving on the middle of the 16-in. cast-steel trunnion that has at the outer end a 12½-in. bearing, 13 in. long, in the top of the supporting pedestal.

The trunnion casting is made with a vertical flange, 22 in. in diameter and 2 in. thick, which is integral with a cylindrical portion on one side and on the other side is integral with a vertical web transverse to the bridge axis and riveted between the flange angles and the web plates of a plate-girder, 52 in. deep, which acts as a special fixed floor beam of the approach span. This girder is symmetrical about the center line and provides rigid connection between the two trunnions, thus essentially acting like a continuous shaft between the pedestals to support at its bearings the full weight of the bascule span. The webs of the trunnion castings have reinforced conical horizontal extensions, 16 in. in diameter on each side, which extensions are proportioned to resist the heavy shearing and bending moment developed by the eccentric loads.

The lower chords in the special end panels of the main trusses form chords of an arc about 22 ft. in diameter and have fitted on their outer faces cast-steel rack segments centered on the trunnions. Each rack has horizontal driving pinions driven through worm and reducing gears from electric motors seated back of the abutment pier under the bridge floor. The outer ends of the trunnions are seated in cast-steel saddles riveted between the web plates at the upper ends of the main pedestals. Two-inch vertical notches in each side of each trunnion register with corresponding slots in the saddle casting and receive wedge bolts that are screwed up to engage tapered keys and lock the trunnion securely to the pedestals, thus providing a fixed axis for the bascule. Each pedestal is made with two inclined posts, having I-shaped cross sections built up with four 5 x 3½-in. angles. The foot of each inclined post is extended by wide flange plates with stiffened edges, virtually making large shoes connected on the lower edge by a pair of 5 x 5-in. horizontal flange angles that provide continuous bearing and distribute the load over six 8-in. transverse grillage beams in the footing of the abutment pier. Short plate girders, 6 ft. deep, with the webs coincident with the center planes of the main trusses are riveted into the special end panels and form two longitudinal sides of a counterweight box having the transverse sides made with similar girders and filled with slag concrete weighing about 200 lb. per cubic foot. The lower flanges of the transverse girders sup-

