Since 1906, the Chicago and Alton Railroad Bridge has taken trains over the south branch of the Chicago River.

Serving the South Side

BY JIM TALBOT

STEEL CENTURIONS
SPANNING 100 YEARS

Our nation's rich past was built on immovable determination and innovation that found a highly visible expression in the construction of steel bridges. The Steel Centurions series offers a testament to notable accomplishments of prior generations and celebrates the durability and strength of steel by showcasing bridges more than 100 years old that are still in service today.

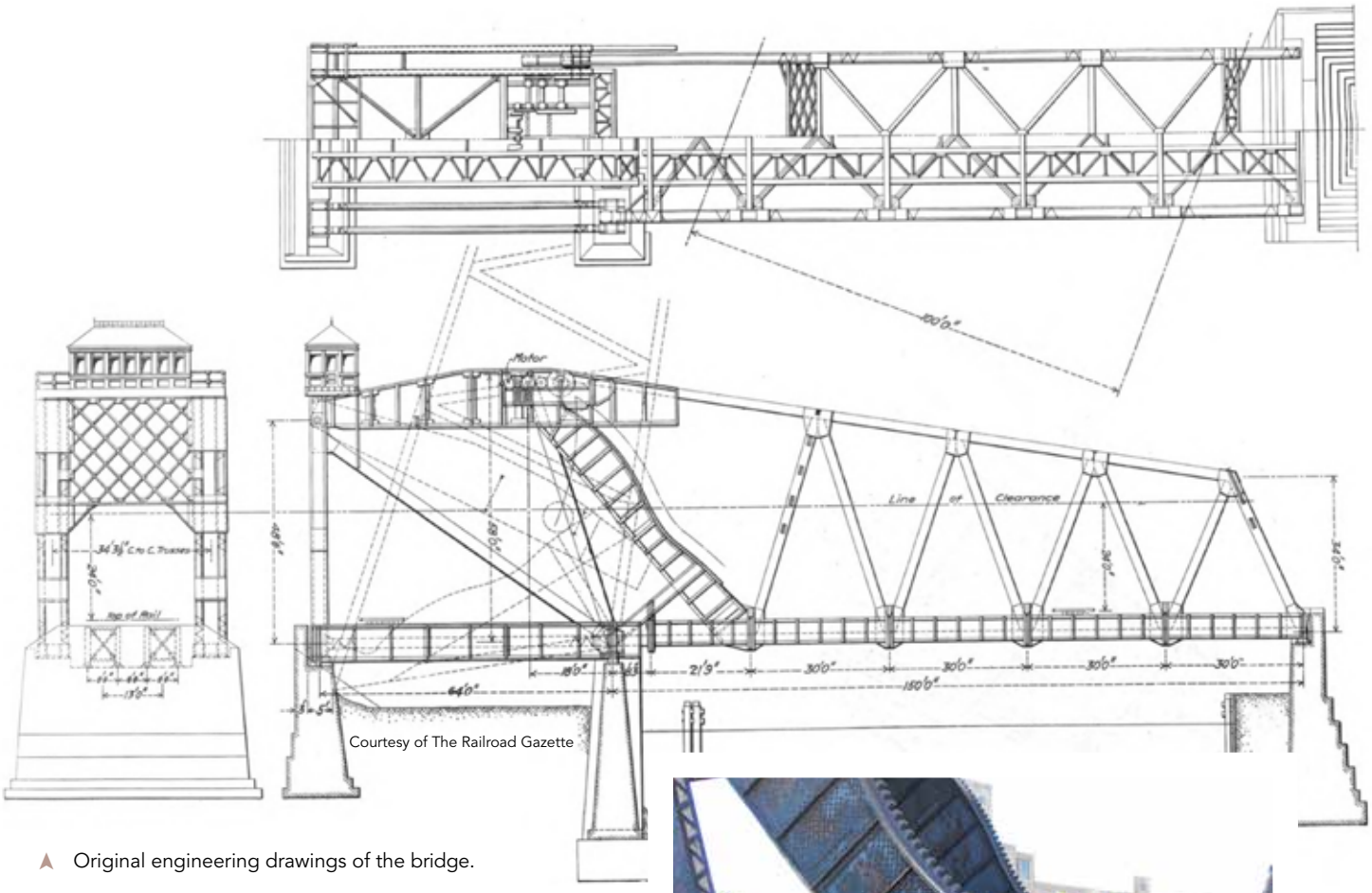
IN TERMS OF ITS MOVABLE BRIDGES, Chicago can be considered world-class.

The city's first movable bridge was built in 1834, and many of its movable bridges set size and weight records when originally constructed. Today, more than 60 movable bridges of various types—trunnion bascule, Scherzer rolling lift, swing and vertical lift bridges—remain in and around Chicago, although about half no longer move.

This month's Centurion is one of those that no longer move: the Chicago and Alton Railroad Bridge, a designated Chicago Landmark built in 1906. This fixed-trunnion, single-leaf bascule (French for "seesaw and balance") rotates around a large axle. The trunnion bascule is sometimes called the Chicago bascule because the city's designers and engineers perfected this bridge type early in the 20th century, and several of them cross many of the city's waterways.

Reaching across the south branch of the Chicago River, the bridge is adjacent to Interstate 55 and a station on the city's "L" train system. Chicago consulting bridge engineer William M. Hughes designed the bridge (the contractor for the superstructure was the American Bridge Company and the erector was Kelly-Atkinson Construction Company). Its rarely implemented design, patented by John W. Page, stands as perhaps the only surviving bascule bridge of its type and the first bascule built for railroad use. Aside from the Chicago and Alton railroad, it also served the Illinois Central, the Atchison, Topeka and Santa Fe and Wisconsin Central railways.

The bridge replaced a bobtail swing bridge dating to the 1880s, which was kept open during construction, and construction took place with the new bridge in the raised position. The design provided clear headroom of 17 ft for rail traffic during construction, and during the switch between bridges difficulty in demolishing the swing bridge caused a rail traffic delay of 24 hours rather than the expected ten hours.



Courtesy of The Railroad Gazette

▲ Original engineering drawings of the bridge.

◄ The fixed-trunnion, single-leaf bascule bridge today.

► The gear rack for the bridge.

Nathan Holth

Vertical Free

Essentially, the Chicago and Alton Railroad Bridge is a steel, riveted, five-panel, Warren through truss with no verticals. The bridge has a span, from the trunnion, of 150 ft and a total length of 214 ft. It offers a clear channel of 100 ft for river navigation. The bridge's width of about 34 ft supports two sets of train tracks, and the 64-ft approach consists of a riveted steel plate-girder span. The superstructure design is such that each track can carry a moving load of two locomotives, each weighing 192.5 tons, and followed by 5,000 lbs./linear ft.

The approach—along with the motors, machinery, supporting girders and tender house—also serves as part of the bridge's counterweight. The remaining counterweight on the inside girders consists of concrete placed on buckle plates riveted to the machinery girders, and the counterweight on the outside girders consists of cut iron blocks bolted to the webs. The design is such that during operation, all moving parts are virtually in balance. The only power required is that which is necessary to begin movement and overcome wind and friction.

Two 70-ton rack guides with an unusual curved shape lie outside the truss. There were originally two 124-horsepower motors mounted on the top frame to drive the pinions that engaged the rack teeth to raise and lower the bridge. The operator in the tender could view electric lamps that indicated four bridge positions during movement. A similar indicating lamp showed the position of the end lock. Complete movement in either direction took about 90 seconds.

Phosphor bronze serves as the bearing material for the trunnions, roller shafts, rollers and the rear pins for the counterweight girders. All shaft bearings are Babbitt metal. Total cost of the superstructure, including the erection and electrical equipment, was about $116,000. MSC

Jim would like to acknowledge ***www.historicbridges.org*** *and its author/photographer/webmaster Nathan Holth (****nathan@historicbridges.org****). Holth is also the author of* Chicago's Bridges, *which includes photography and discussion of Chicago's many movable bridges, including the Chicago and Alton Railroad Bridge.*

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