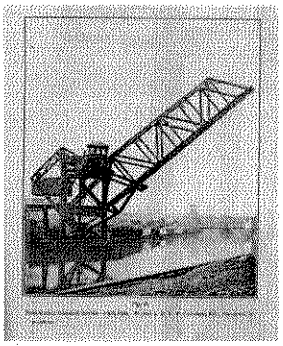
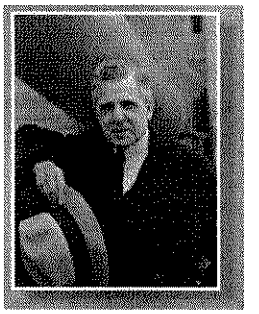


MOVABLE BRIDGE HALL OF FAME PAGE

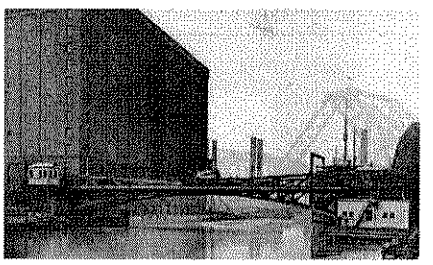
Joseph Baerman Strauss, Visionary and Innovator



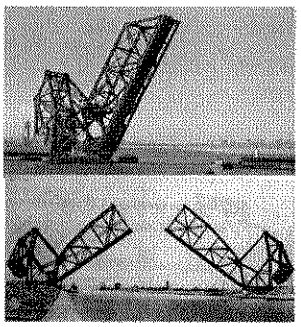
J. B. Strauss was born in Cincinnati, OH in 1870. After graduating from the University of Cincinnati 1892, Strauss worked briefly as a draftsman and later taught. He then became principal assistant to bridge engineer Ralph Modjeski, whose firm served during a study for the City of Chicago, helping the City to establish their preferred "Chicago-type" bascule design in 1901.

Strauss later stated that he worked on nearly all the types of bascule bridges then in use over these 10 years. In 1901 (probably while under Modjeski) he "undertook the task of removing the limitations . . . by selecting of the available types that promised greatest efficiency, and by modifying the counterweighting mechanism in such manner as to reduce the cost, without sacrificing efficiency." He became convinced that the fixed trunnion type was the most dependable. He proposed substituting concrete for the cast iron counterweights typically used at that time. He then sought for the best means to maximize the effective counterweight arm and minimize the amount of counterweight required — or "to so dispose the counterweight as to obtain room for the greatly increased volume required by the concrete."

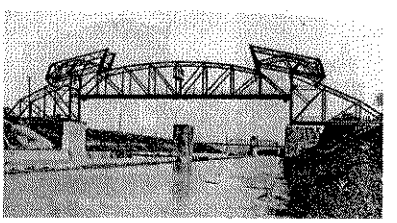
Apparently convinced he was on the right track, he founded his own company in 1902, renaming it the Strauss Bascule Bridge Company in 1904. His first bascule bridge for the W&LE Railroad, shown at upper left, reflected his research at that time. Completed in 1905, innovations included a concrete counterweight connected by its own trunnions to the tail end of the bascule trusses. Further support for the counterweight was provided by a "counterweight link" located between the counterweight and the fixed tower. This link, being of the same length and parallel to the line joining the main and counterweight trunnions, formed a "parallel link" counterweight system, typical of Strauss bascules to follow. While a pin connected concrete counterweight was actually first applied on a Scherzer bridge in 1904, Strauss stated that he first conceived of this concept as shown on plans drawn in 1901, and a patent was issued to him for it in 1903. Another innovation was a cross girder system to support the inside bearings of the trunnions (for which he was issued another patent and later disputed with the City of Chicago regarding its use). AC power was also first used on this movable bridge, and operating struts supporting straight racks were used to engage the operating pinions.



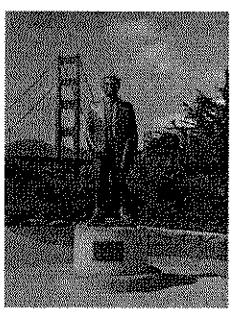
For a more aesthetically pleasing appearance, Strauss developed the "underneath counterweight type" of linked counterweight bascule for the Polk Street Bridge in Chicago in 1908, shown at right. The depth of pit was limited to 10 feet through the use of the parallel link counterweight design. This was half the depth used for similarly sized Chicago bridges. A similar bascule bridge was constructed at Jackson Boulevard in the same city in 1912, which is still in service.



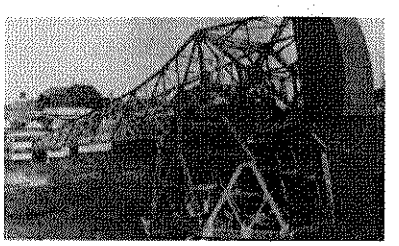
Shortly thereafter, the Strauss heel trunnion bascule design was developed to meet the demand for increased bridge size and capacity, particularly for railroad service. For early heel trunnion bridges, the machinery was located at the rear hip of the trusses on the moving leaf, with operating struts pinned to the inclined leg of the counterweight tower (as in NJ Transit's HX bridge shown at left, top). In later designs, the operating machinery was placed on the counterweight tower and the operating struts were pinned to the truss. This allowed the machinery to be more accessible, as well as more suited for simple direct connection to emergency drive machinery located on the pier. Most heel trunnion bridges are of single leaf construction, but two double leaf railroad bridges were built. One was formerly in Long Beach, California. The other (at left, lower) remains in Sault Ste. Marie, MI, and measures 336 ft. center to center of piers. A dual system of compression and tension locks at the center stabilize the span when under traffic. Typical features originally included air brakes working directly against the flanges of the operating struts, saving the machinery from the impact of sudden brake application.



Strauss also experimented with other designs, including a "direct lift" vertical lift bridge built in Louisville, KY in 1915, shown at right. Another successful design for the World's Fair in San Francisco in 1915 was his "Aeroscope". With a two-story passenger compartment at the end of the trusses, as shown at lower right, it was hailed as "much more exciting" than the huge ferris wheels built for previous fairs.



Although hailed as a movable bridge innovator here, Strauss is most famous concerning his vision for, and work to build, the Golden Gate Bridge over San Francisco Bay. He died one year after the project was completed, in 1938.



The above is based on information found in various sources, including *Bascule Bridges* by J.B. Strauss, a paper presented at the Second Pan American Scientific Conference, December, 1915 — January, 1916; and Encyclopedia Britanica Online.