

BY BRIDGE  
TO ST. LOUIS



By

Thomas R. Bullard

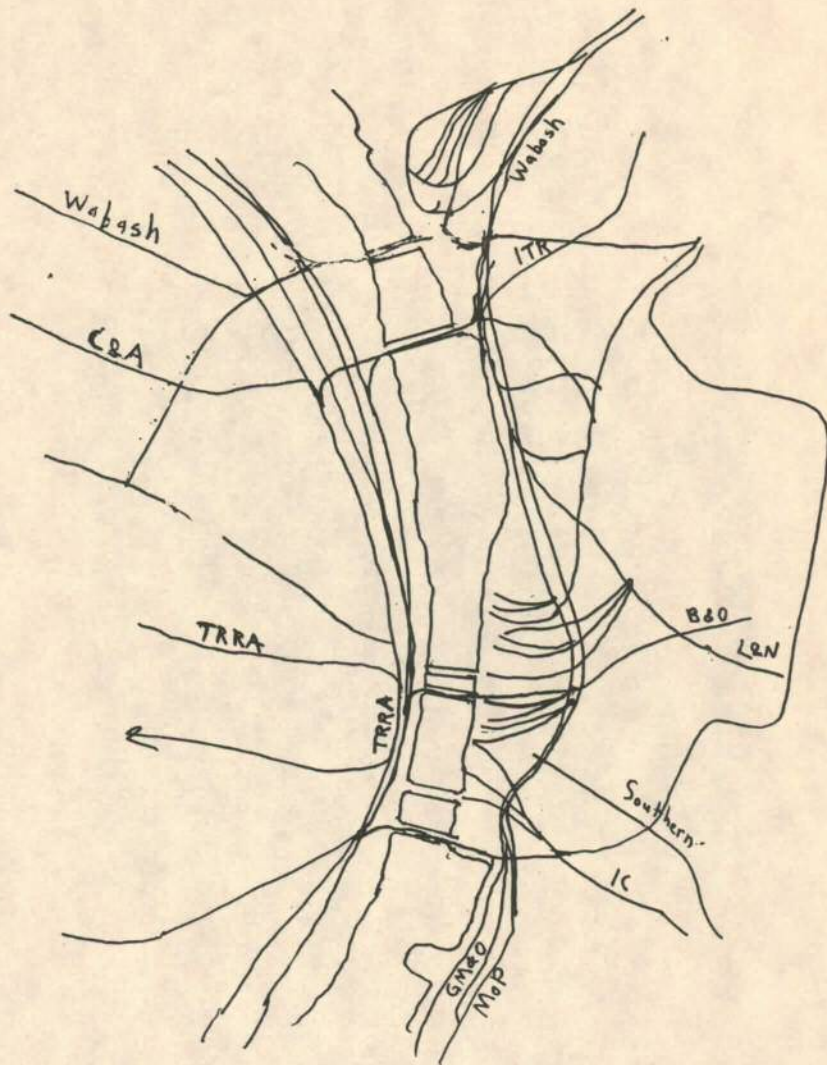


Fig.1. St.Louis area bridges(north to south)  
 Merchants(TRRA); McKinley; Martin Luther King(ex-  
 Veterans); Eads; Poplar Street;MacArthur(ex-Municipal)  
 Railroads shown in simplified style as of ca.1970.

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Privately printed, Oak Park, Illinois 1993

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## Preface

During the early part of this century interurban railways built large numbers of bridges to cross streams or rivers. The Illinois Traction Company had built such a structure over the Illinois River at Peoria during 1906-1907. Before 1900 three electric railways built tracks over bridges across the Mississippi River: the Tri-City Railway (Davenport to Rock Island), the Keokuk & Western (to Warsaw, IL), and the East St. Louis Ry. (over the Eads Bridge). These three lines used existing bridges, and this policy would be followed by later bridges, such as the Oakland-San Francisco Bay Bridge. When the IT approached the Illinois banks of the Mississippi the plan was to cross to St. Louis over an existing bridge.

When the Terminal Railway Association imposed restrictions on St. Louis traffic (including both bridges over the river), and other railways fought the IT tracks by Venice, Illinois, the decision was made to build a bridge into St. Louis. This means the McKinley Bridge is the largest bridge actually built by an interurban in the U.S. Although rail traffic ended in 1978 the bridge has continued to carry auto traffic. After 83 years even that was halted for a while by the terrific floods of 1993. The high water level ran nearly ten feet above the assumed levels of 1910, when the McKinley Bridge was opened.

## Acknowledgments

This book was written with information provided by two men: Tom Fields (Venice City Engineer in charge of the McKinley Bridge over the past decade or so), and Charles S. Stats who provided materials describing the complex background to the sale of the bridge by the Illinois Terminal Railroad to the City of Venice (IL) in 1958. Without their help this book would have been difficult if not impossible.

## 1. Wiggins, Eads and McKinley

Through the last half of the 19<sup>th</sup> century St. Louis became the hub of a railroad network, which was "shared" with the towns on the Illinois side of the Mississippi River, especially Illinoistown, later renamed East St. Louis. In Illinois the Illinois & St. Louis R.R. was built as the 1837 depression began. The Alton & Sangamon R.R. (1847) linked Alton, Springfield, Bloomington and Joliet by 1856. Its passengers could reach St. Louis by steamboat from Alton. These lines eventually merged into the Chicago & Alton R.R. (henceforth C&A). The Ohio & Mississippi R.R. of 1848 connected Illinoistown with the Ohio River, later becoming part of the Baltimore & Ohio Southwestern system. In 1856 the Terre Haute & Alton R.R. was completed, with a branch through Belleville to Illinoistown, later part of the Big Four (CCC&StL). The Toledo, Wabash & Western R.R. (later part of the Wabash) built a line from Decatur to East St. Louis in 1870. By 1907 East St. Louis was a terminus for 19 railroads, handling 90% of freight in the region. St. Louis was base to other lines, fueled by dreams of the great line to China (and its trade) backed by Senator Thomas Hart Benton. He backed the Pacific R.R. of 1849 which reached Jefferson City by 1855. This overbuilt line eventually formed the Missouri Pacific R.R. An unanticipated result of this line's troubles was growing public hostility towards railroads and "monopolies" in general in the region.

All these railroads had to use ferries to move goods/passengers over the river. The earliest local ferries began running in 1757, eventually combining into the Wiggins Ferry Co. by 1821, owning 4 miles of waterfront in Illinoistown and freight terminals, etc. Steamboats arrived by 1817 and the Wiggins line soon had a major fleet of steam ferries. It got its first "icebreaker" in 1839, despite which the line was shut down by ice for 3-5 weeks in 1865 and 1868.

In 1865 Wiggins Ferry carried 15,000 passengers, 600 wagons and over 10,000 bushels of coal. They operated a special omnibus company to carry passengers from the city to the waterfront. In 1870 the company built inclines to allow freight cars to be loaded onto special car ferries. In 1872 this system carried an average of 400 railroad cars each day.

The first serious bridge proposal came from Charles Ellet in 1839: a 3000' suspension bridge for \$737,565. Josiah Dent's \$1.5 million plan of 1855 and Truman Homer's \$3,322,200 plan of 1865 both failed to win support, as politicians balked at the high costs. In 1866 James B. Eads announced plans for a \$6 Million bridge and began a fight against rival bridge men and the ferry lines to win support. He feared delay would allow bridges further north to divert railroads to Chicago, dooming St. Louis to a secondary status. After a battle between Illinois and Missouri bridge companies, Eads won approval for his plan for a two-level, three-span (502'-520'-502') bridge. Rivals fought his dream and Eads had to meet President Grant in Washington to win final approval. The first stone was laid February 25, 1868 and workers began sinking caissons and cofferdams down to a depth of 90 feet. All foundations were done by 1871 and the superstructure came in, built by Andrew Carnegie, who felt Eads' standards were too high. The last stone was set June 24, 1874 and trains were running a week later. The whole project (bridge, approaches and rail tunnel) cost some \$11 million. The costs could not be recovered and the bridge was sold on July 1, 1881.<sup>4</sup>

In October 1889 the main railroads in St. Louis formed the Terminal Railroad Association (TRRA) which operated joint terminals, which included the Wiggins Ferry and Eads Bridge. The TRRA charged 4¢/100 lbs. which became known as the "Bridge Arbitrary" by angry politicians who used the issue to fight the TRRA for decades. In 1889 the Merchants Bridge was built: three through spans (521½'-523½'-521½'), designed by the great George Morison. During the depression of

the 1890's the bridge went broke and was sold to the TRRA, increasing their monopoly and freight rates to St. Louis. In 1895 the Illinois Senate launched an investigation into the rates by the U.S. Grand Jury refused to indict the TRRA, amidst public suspicion of bribery. By now the TRRA was charging 20¢/ton, and public hostility was growing.

As early as 1901 St. Louis politicians demanded a "free" bridge, goading the TRRA and eastern railroads into negotiating with city leaders to reduce the rates. This was too late, as an aroused public voted down a \$5 million bond issue in 1905, forcing a new vote (passed June 2, 1906) including \$3.5 million for a city-owned bridge, open to all railroads. Congress approved the plans June 25, 1906 but property rights clashes delayed work until 1909. The highway portion was opened June 17, 1911, but approaches remained unfinished, so the complete highway deck was not completed until 1917. The Municipal Bridge was a 3-span double-deck bridge (3x668') requiring three more bond issues (1914, 1923 and 1935) to cover the \$17 million cost and the railroad section was not finally opened until January 15, 1940. Some local politicians felt the whole struggle had been a waste of time.

During the time of these bridge questions a big electric railway system was approaching East St. Louis: the Illinois Traction System, specifically its subsidiary St. Louis & Northwestern Railway. Backed by Congressman William B. McKinley, the ITS started at Danville, running to Springfield, thence to Peoria and down towards East St. Louis. McKinley hoped to build extensions to Jacksonville, Terre Haute (IN), and Chicago (through any of several routes), but none of these were built. The St. Louis & N.E. (inc. on December 22, 1904) was supposed to use local streetcar tracks in East St. Louis, Venice, Madison and Granite City to reach either the Eads or Merchants Bridge for its St. Louis connection. Local street railways had served the area around Venice since 1895 and the East St. Louis Street Railway began running its

trolleys over the Eads Bridge since 1889. Local steam roads fought the ITS in court, forcing McKinley to delay plans for linking the ITS with the East St. Louis & Suburban lines. The courts ruled the local city councils were subject to the Illinois Railroad & Warehouse Commission which could kill any railroad crossings or connections. In 1905 McKinley's men in St. Louis began seeking land for a terminal and hoped to gain use of local tracks. The TRRA was firmly opposed and it became clear neither bridge was a realistic choice (the Eads Bridge was way too busy, and weight limits would prohibit freight, which McKinley considered essential) the Merchants Bridge would charge excessive fees). After court cases on March 20 and October 10, 1906 McKinley decided to build his own bridge into St. Louis to solve all his troubles.<sup>7</sup>

The first step was to buy the local trolley line in Venice, Madison & Granite City, giving access to the Illinois riverbank, across from St. Louis. McKinley arranged to use the Wiggins Ferry subsidiaries (Venice Terminal Co. and Madison County Ferry) to move freight cars over the river. Passengers would transfer to ESI&S cars to ride over the Eads Bridge. On October 10, 1906 the StL&NE signed a contract with the East St. Louis & St. Louis Express Company to carry freight from a St. Louis freight terminal over the river, thence to various Illinois terminals. The main freight house was on the north side of Madison, shifting to Venice in a few months. Another was built on Winstanly Ave. in East St. Louis, with a 16x180' platform, able to move 125 tons/day, often using small wagons to carry loads through the mud. ITS freight loads into St. Louis came to 6,359 tons in 1906, up to 3,137 by 1909; tons shipped to the Illinois side came to 11,456 and 12,329 respectively. Considering the difficulties involving ferries plus wagons, these were good numbers for that period.

## 2. Building the Bridge

McKinley's people formed two new subsidiaries to build the bridge: (1) The St. Louis Electric Terminal Company (March 8, 1906) would build the tracks and yards in St. Louis while (2) the St. Louis Electric Bridge Co. (January 1907) would build the bridge itself. The SLET started with \$10,000 in stock, increased to \$1 million (+\$1.4 million in bonds) and announced plans to spend \$5 million for its new buildings. The SLEB began with \$2,500 in stock, soon raised to \$1 million, with \$1.98 million in bonds. The approach tracks to the Illinois side of the bridge would be run by the SL&NE Ry. Since the bridge would cross a major navigation route, the U.S. Army Corps of Engineers had to receive plans. The Corps had already approved plans for the unbuilt East St. Louis & St. Louis Bridge & Construction Co. on Feb. 27, 1906, and the Municipal Bridge on June 25<sup>th</sup> of the same year. On January 29, 1907 H.R. 25123 was introduced in the House of Representatives, while S. 8213 followed in the Senate on February 2<sup>nd</sup>. The latter was bottled in committee, but the House bill passed on February 6<sup>th</sup>, was approved in the Senate on the 12<sup>th</sup> and made law on the 15<sup>th</sup>. The Corps held hearings on June 20<sup>th</sup> and heard several witnesses stress the need for a third St. Louis bridge (the witnesses included some area railroads). The War Department gave its approval on July 5, 1907, since the plans showed river traffic would not be affected by the new bridge.

In April 1906 the SLET first sought a franchise for tracks in St. Louis and an ordinance was introduced on April 30 for the following route: Salisbury-9<sup>th</sup>-Durand-12<sup>th</sup>-Lucas-Morgan-11<sup>th</sup>-Washington Ave.-Walnut St-11<sup>th</sup>-Walnut-8<sup>th</sup>-Clark Ave. and eventually back to Lusas and Broadway. It happened some TRRA and local streetcar tracks might be used, although the city's wide gauge would cause problems. Two branches would also be added (Branch-11<sup>th</sup>-Palmer-12<sup>th</sup> and Lucas-12<sup>th</sup>-Guy-12<sup>th</sup>). McKinley sent agents to the city and bought the first parcel of land on June 26, 1906. The Council delayed action until Congress and the War Department approved plans, so the

ordinance was locked in committee. On February 5, 1907 a special committee was promised, despite claims this was a waste of time. North siders and residents along 9<sup>th</sup> led the opposition, citing fears the ITS was just another railroad, and part of the wicked monopoly. Pro-McKinley leaders stressed the need for a third bridge to increase business and freight shipments. On the 28<sup>th</sup> a businessmen's meeting urged changes to make passage easier: a 5-year construction limit, \$100,000 bond, sliding city fee rate, 5¢ fare and lower bridge tolls for pedestrians and carriages.

Debate began March 1<sup>st</sup> as bitter factions clashed over which committee had jurisdiction (the railroad committee had wasted 8 months to date). The committee then reported the bill by a vote of 7 to 6. A second bill was introduced in the House of Delegates the same night. On the 5<sup>th</sup> the Council heard claims some 1700' along 9<sup>th</sup> St. lacked proper consent forms. The bill was called up in the Council on March 12<sup>th</sup> and some aldermen came close to physical combat amidst jeers and shouts. At one point an angry Councilman demanded that McKinley's personal "agents" had to be expelled from the chamber. On the 13<sup>th</sup> debate ended and the ordinance was passed by a vote of 8 to 5.

The House of Delegates started March 17<sup>th</sup> when the ordinance went to the Committee on Railroads, just 11 days before the session would end. The City's Assessor reported all property owners' forms had their proper signatures but representatives from 9<sup>th</sup> Street continued their opposition. Six of the 7 committee members approved the bill, to break the TRRA monopoly. On March 26<sup>th</sup> the bill was passed by a vote of 26-1-1 (the only nay vote came from a Delegate employed by the TRRA!) On April 4<sup>th</sup> the mayor held a conference with leaders of both council chambers and then signed Ordinance 23041 on the 6<sup>th</sup>. The SLET had permission to build on the following route: 9<sup>th</sup>-Branch-12<sup>th</sup>; also Branch-9<sup>th</sup>-11<sup>th</sup> and on to 12<sup>th</sup>-Branch-Lucas; plus single track line on Lincoln-12<sup>th</sup>-13<sup>th</sup>-Gay-12<sup>th</sup>. The city would supervise all

work, including 18' iron poles, standard paving details. Only single cars were allowed on city streets, so no trailers/freight cars would be run. Fare would be 5¢ (2½¢ for youngsters, babies riding free), the bridge tolls being 3¢ for pedestrians, 10¢ for equestrians, and 15/20/30/40¢ for wagons would 1/2/3/4 axles. Headway would be at least 30 minutes (hourly midnight to 6 p.m.). The city would be paid \$5000 for each of the first ten years, \$7500 for each of the next 15 and \$10,000/year until 50 years passed. The SLEB had five years to build the bridge (the tracks had an 18-month deadline in the city), and a \$100,000 bond was demanded. Most requirements resembled other city plans.<sup>2</sup>

On January 3, 1907 McKinley had already announced plans for the bridge and chose Ralph Modjeski as Chief Engineer. Modjeski (Jan. 27, 1861-June 26, 1940) was born in Cracow, Poland, son of the noted actress Helena Modjeska (the original spelling was Modrzewska and the boy was first named Rudolf). At 14 he chose engineering as a career (his mother hoped for a career as a concert pianist), and he graduated from Paris' Ecole de Ponts et Chaussées in 1885. The family had already come to the U.S. in 1876, first settling on a semi-commune in Anaheim, California. By 1892 he was George Morison's assistant and already a leading bridge designer. For Morison Modjeski helped build the Memphis Bridge, followed by the Thebes Bridge (1902/5) and the ITS' Peoria bridge. This structure had a set of 4 spans @ 142' 10" plus a 141' center bascule span. Built in a year (April 25, 1906-April 13, 1907) this structure's design led to the bigger contract for the McKinley Bridge. Modjeski married Delice Benda on Oct. 25, 1885 (2 sons, 1 daughter) then divorced her to marry Virginia Giblin July 7, 1931. Modjeski was regarded as one of the greatest bridge designers of all time, specializing in great projects.

His chief assistants were: (1) Walter E. Angier (May 18, 1863-Dec. 29, 1928) born in Fitzwilliam, NH, and graduate of New Hampshire College of Agricultural and Mechanical Arts (1885), and Dartmouth (1887). Angier began

his career by working on the Memphis and Thebes Bridges which led to his selection as Modjeski's chief assistant, and partner. (2) Clement E. Case (July 26, 1888-Sept. 18, 1935) born in Omaha, and a graduate of Cornell (C.E., 1910) whose career began as concrete and steel inspector for the McKinley Bridge. He later joined the firm of Modjeski, Masters and Case (earlier just Modjeski, Angier and Case). He died during work on the Ambassador Bridge in Michigan. (3) Frank M. Masters (June 8, 1883-Feb. 7, 1974) born in Pennsylvania, and graduate of the University of Minnesota (1906) and the Carnegie Institute of Technology (1912), thence to Columbia (1915). In 1905 he began working for Modjeski and was given the job of inspection of steel for the McKinley Bridge at the Pittsburgh plant. He was then engineer for the TRRA and became Modjeski's partner in 1924. (4) Howard H. McClintic (April 9, 1867-Aug. 5, 1931) was born in Lewiston, PA and graduated from Lehigh University (C.E., 1888). His firm provided much of the steel for the McKinley Bridge.

The following firms/suppliers combined their efforts to build the McKinley Bridge (contract dates):  
 Central Illinois Construction Co.: general agent.  
 American Concrete Co.: viaduct approach foundation;  
 timber trestle in Venice (approach portion).  
 International Creosoting and Construction Co.: main bridge  
 timber deck.

A. F. Shuman: roadway paving.

Kettle River Quarries Co.: timber for deck plus connecting track and approaches.

Myers Construction Co.: Salisbury extension incline substructure; removal of Venice tracks.

Jeffrey Manufacturing Co.: coal chutes.

Stapp Brothers Bridge & Iron Works: installation;

Missouri Valley Bridge & Iron Company: main bridge substructure/erection (Aug. 24, 1907 for \$2.5 million), piers + piles (Dec. 31, 1907; \$385,796 + \$459,836).

Pennsylvania Steel Co.: main bridge superstructure (Nov. 2, 1907, \$500,000 initial estimate).

Strobel Steel Construction Co.:steel superstructure for supports/approaches(Nov.16,1908).

McClintic-Marshall Construction Co:Salisbury St. steel superstructure.

The Chief Engineer was Modjeski(Angier as Assistant).

Resident Engineer:F.E.Washburn+assistants C.A.G.Weymouth,W.R.Widman,E.R.Tarnowski,C.O.Clark.

Superstructure inspector:F.Masters+ assistants G. Hastings,C.H.Young, W.J.MacDowell.

Cement Inspector: G.N.Knapp.

Masonry Inspector: J.D.Knapp.

Quarry Inspector:C.F.Brown.

Draftsman: C.Jakubowski.

Modjeski submitted his plans on April 3,1907 at a ITS board meeting in New York:he estimated the McKinley Bridge would cost \$2.5million.Bids were opened Aug. 15<sup>th</sup> for the first work and construction would take an estimated 2 years. Once the site was selected engineers used the Burlington Railroad as the sight/base line on the Missouri side of the river and a row of houses on the Illinois side served the same task. A Berger & Sons survey set was used to plat angles for the piers. A strip of land was purchased some 600' from the river in Illinois as a construction base site. A cement warehouse was then built(with 20x42x7'platform).Sand came from the river,and gravel was brought in by rail. A ten-ton car was kept in the yard to shuttle supplies. There were several boats:a pile driver(155x28',with 2 high pressure pumps),3 derrick barges(63x26'),2 concrete barges,4 material barges(62x28'),1 cement barge(69x26'), 2 coal barges and 1 tug.This facility was planned to handle 20,000 feet of timber for the substructure and 16,000 more for pilings,plus 4,000 cubic yds.of cement.

Cofferdams were used to set the pier foundations (at depths of anywhere from 4 to 30 feet), using concrete bases(reinforced with steel rods).12 x 12 timbers were used to build the main cofferdams,plus 2x12"sheet panel walls.Most chambers were 7'high(with tunnels for worker entrance),and had roofs sloped at 45° with timbers atop sheet panels.These chambers were calked, with extra asphalt for corners and joints. Each pier

had clusters of 4 pilings (the largest had 14). The caissons were towed into position, sunk then anchored by a 5<sup>th</sup> piling driven on the spot. The caisson for Pier 3 was launched December 8, 1907. Work was often delayed by floating ice and changing currents. The latter was greater than expected, often washing away sand and shifting cofferdams, forcing extra cement and gravel being forced through tubes into the structures. In the summer of 1908 the current doubled from four to eight feet/second, so more sand had to be dumped inside.

A 40-ton derrick was used to move the steel girders (40T or 9888 feet), unloaded in the yard after arriving over the CB&Q RR. Temporary tracks were run out to link the railroad with the construction yard. The first span went up June 22, 1909, slightly behind schedule. A 10<sup>th</sup> derrick served as the traveller running along viaduct tracks with booms giving a 41' reach (to handle big beams or timbers). This rode some 75½' high with a 29'4" clearance between its legs (being 50/31' wide at the top/bottom). Tracks were then erected to allow a 10T car to carry piles along a stretch of 250 feet. Piles were 40-65' long and jack-hammered into place (six per bent). Piles were also spaced 3½-6' apart, covered with 12x12 timber caps. The falsework was built with spans of 48'8" and timber cross-bracing. A 10-T traveller erected this with timbers stored on barges. The main (517') spans needed a 99½' traveller (width of 64'8" at top, with 37'2" clearance, formed from 3x10" timbers). The traveller used 58,900' (or 118 tons) of timber and 8 T of bolts. Trains brought in the steel beams and framework and the main spans were built from the center outwards. After one-third of the distance was set up the bottom beams were connected then the work resumed at the top. In most cases 20-ton cranes were used for the highest work.<sup>5</sup>

Work moved at a steady pace, interrupted by some spells of bad weather, especially the cold snaps which came each winter. It does not appear the 1907 recession had any effect as work began in the latter stages of the economic troubles and major work followed resumption of

economic recovery. In late 1909 work was at a point where another freeze halted some work. Framework was in place and girders were being sonnected. On December 30<sup>th</sup> a warm spell broke up the river ice and floes came downstream, clustering into bunches 15' high around the bridge pier bases. On the 31st these broke up and a wave of ice came rushing down the river. Workers on the river bakk gave the first alarm, and the hoisting engine operator bellowed a final warning. Some 160 men working on the bridge scrambled for safety as the ice struck, tearing out 300' of falsework and hurling 69 men into the river. When the bents on the St. Louis side collapsed the traveller fell overboard and dragged the hoisting engine into the ice-filled water. The mid-span piles followed, despite use of special wire cable stiffeneres which could not withstand the strain. It was later estimated the ice jam had caused the river to rise by five feet within a few seconds. Damage to the bridge totalled about \$250,000. Losses included one barge, 3 hoisting engines, a traveller and 300' of timbers all resting on the bottom of the river. En-ginners estimated it would take six months to replace lost material and wait for warmer weather. In 1907 McKinley had estimated the work would take three years and his estimate seemed more qccurate than even he would have believed.

Work was finally completed on the 20<sup>th</sup> of Sep-tember in 1910 when a work car was run over the new bridge to gurantee meeting the St. Louis' franchise time limits. A crowd had gathered to greet the new line despite lack of publicity. Since the regular wires were not yet connected a donkey engine provided power until the area of 9<sup>th</sup> and Salisbury when the pole could be raised. on S\_eptember 29<sup>th</sup> the ITS sent its special office sar over the bridge for a final inspec-tion run by company officials. The first regular car was brought down to the yard near the river and once the final wires were strung and the last workers had left it made its initial bridge run October 3, 1910.

Formal opening was on October 9<sup>th</sup> when some 10,000 people gathered amidst fanfare, bunting, brass bands and store decoration on the Illinois side. The North St. Louis Businessmens' Association erected a triumphal arch. The lack of tolls on the first day led to huge crowds surging back and forth across the Mississippi River. A news account noted all stores in Venice, Madison and Granite City were closed for the celebration. Both state's governors and some 20 mayors gave their speeches, praising the bridge and its impact on local trade. On the 11<sup>th</sup> a dinner was held at the Planter's Hotel in St. Louis with additional speeches praising McKinley and his efforts to build the bridge, breaking the TRRA's continued monopoly. By now it was clear the bridge itself, without related buildings, cost \$4.5 million, with the extra \$2 million almost certainly caused by the problems of 1909/1910.

### 3. The Bridge Described

The McKinley Bridge has 3 main spans @517½' each, allowing three 500' openings with a clear headway of 50' at the center or 45' at the end spans. Total length was 2514'4"(center-to-center, etc.). It has three deck truss spans (one of 250' and 2 of 150') on the Missouri side plus a 98' deck plate girder span over the CB&Q RR. On the Illinois side are two deck truss spans (250' and 150'), the center spans level with a grade of 0.875%. The western approaches ran over a 2500' viaduct to a 98' span. At 9<sup>th</sup> Street the tracks were at street grade, then rose (1.75%) to a solid embankment (with concrete retaining walls), continuing over a 330' plate girder bridge, leading to a steel viaduct (with 41' spans), broken by two through girder spans over railroad crossings. The line was level for 1600', rising 1.75% total. The east approach began with a short brick and pile frame trestle (644' with 14' spans) at an angle to the main bridge center line. This leads to ten steel frame viaduct spans (39-50'), a deck truss span and another 2500' viaduct (41-60' spans) to the bridge center line. A timber trestle brings the tracks down to street level in Venice. These have a total length of 3050', plus 1565' bridge, 950' shore spans and 2600' western approaches. At the time the bridge was built (1907-1910) headroom of 50' was considered sufficient. This was derived from an allowed high water mark of 39'. The peak flood level had been set in 1844 at 41'4" and it was predicted this would stand!

The bridge structure showed the following weights (loadings in psf, where given):

three main spans:

Trusses	9,611,000(6,141)
Bracing	529,300( 338)
Floors	2,587,000(1,653)
Railings, wires	234,600( 150)
End Bearings	473,800( 303)
Joint Filings	19,000( 12)
Span total	13,459,300(8,597)

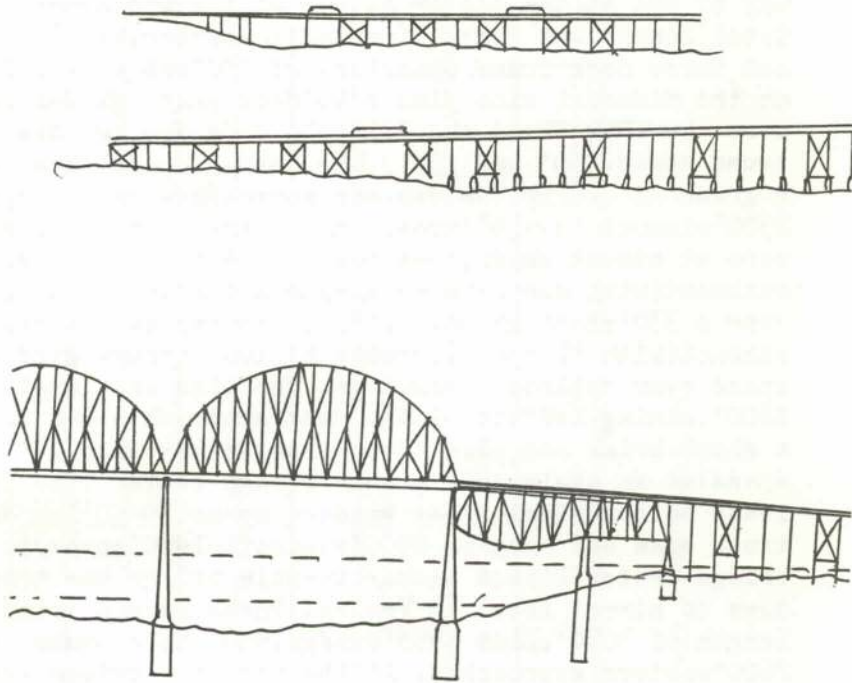
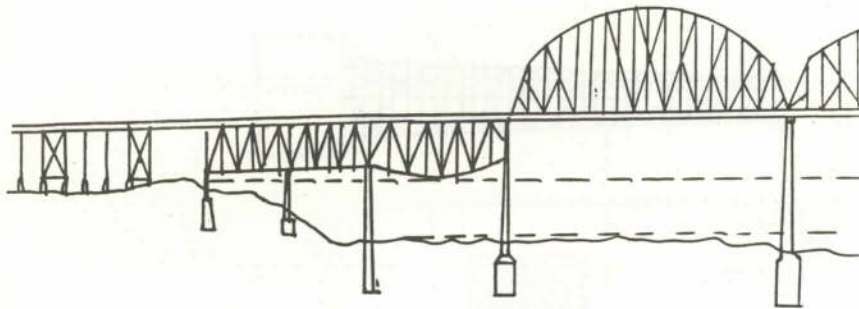


Fig.2. McKinley Bridge(note high&low water lines).



This plan clearly shows how the 1993 flood (where the river came some 8+ feet above the high-water line) could shut down the bridge when the approaches were under water.

Two 245'4" deck spans	2,120,800
Three 146'9" deck spans	1,574,200
Main bridge total	17,149,700 lbs.
West Approach	6,815,200
Salisbury St. Extension	419,500
Venice Approach	1,774,500
Power House Extension	100,600
Approach total	9,109,800 lbs.
Grand total for Bridge	29,259,500 lbs.

The bridge had a total loading derived from an expected use of 40' (75 ton) cars on each track, so there was a loading of 1,000 p.s.f. with stringer flanges allowing a grand total of 5000 p.s.f., which would allow steam locomotives. The bridge was built to withstand wind pressure of 660 p.s.f. All main spans used open-hearth steel with cast-iron pedestals. Steel castings had a tensile strength of 65,000-75,000 p.s.i. and 20' elongation. The main span trusses each had one end resting on a fixed cast-iron bolster and the other on a nest of 8x18" segmented cast steel rollers on a steel bed plate. Trusses are through-pin-connected Pratt style, plus curved top chords and subdivided panels (29'8" apart on centers, 44" cover plates). The 250' deck spans have 36'8" panels (40' depth at span centers), while 150' spans have 28'1 1/2" panels. The approach viaducts rest on 4-post bents: the inner pair (railroad) with 2x15" channels plus 15" "I" beam diaphragm while the inner (roadway) pair have 12" channels. The 41' spans are similar.

The two tracks are 12' apart (on centers) with 8x8" creosote ties, 7" apart on 4 lines of stringers (3'10" deep) framed between floor beams. Outside the tracks are 14' roadways on brackets with plate girder stringers beneath the roadway edges (2'7 1/2" deep), with upper flanges holding the paving edges. A 15" rolled cross beam (framed between stringers) at each panel center forms intermediate support for each wooden floor joint (8x16" yellow pine, creosoted). Every third tie is bolted to stringer flanges and every fourth tie is 11' long. The roadway section had Shuman Sectional Paving (3/4" thick) planks, dipped in a bituminous

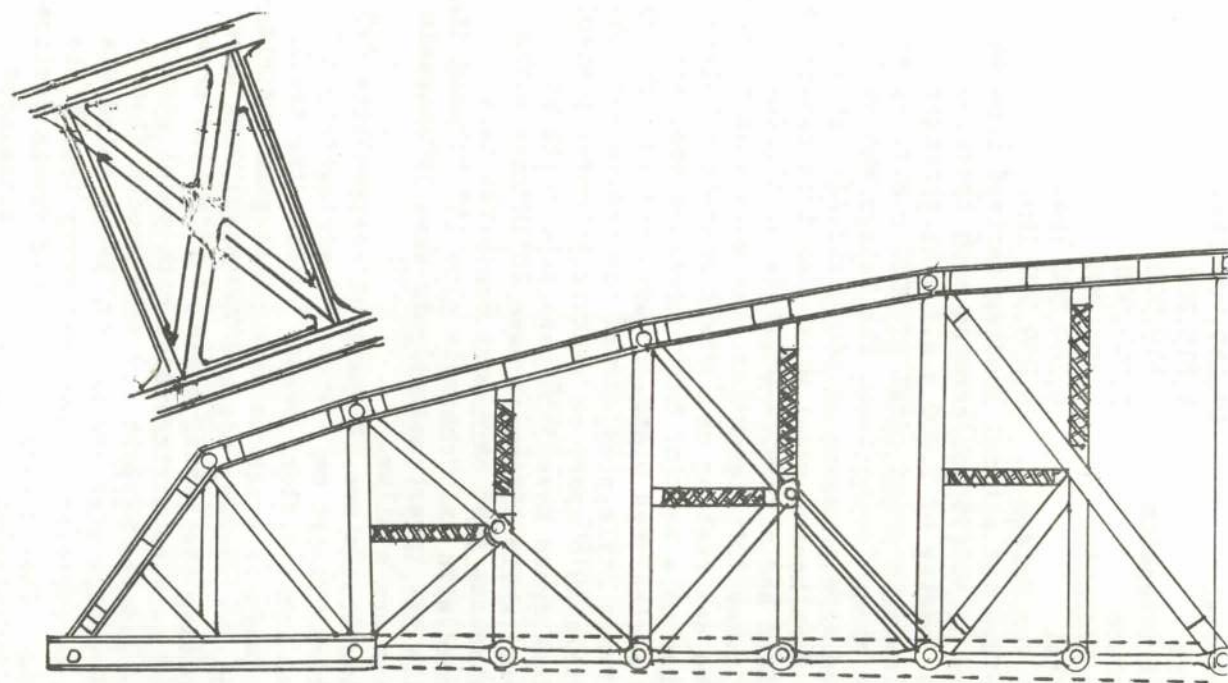


Fig. 4. Channel Span through truss(517')

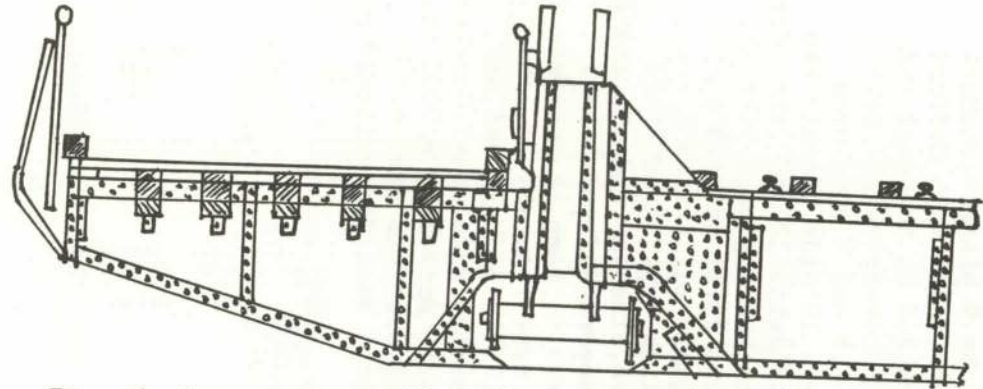
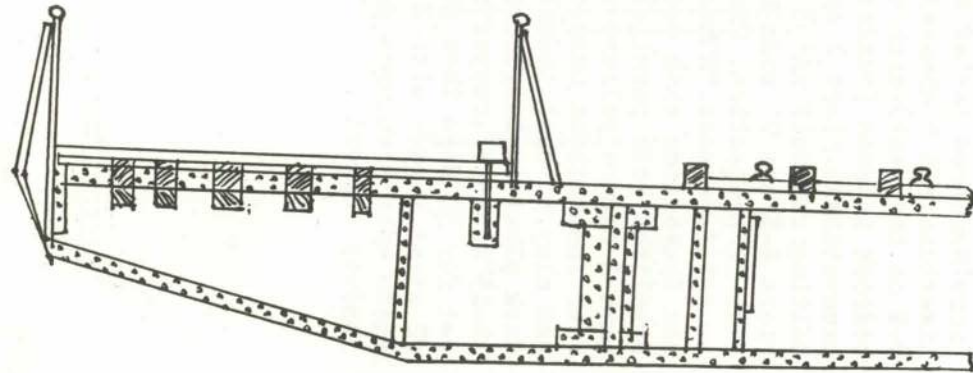


Fig. 5. Span cross sections: Channel span (above) and deck span (below)



solution with roofing pitch filling in joints. Each side of the floor had a 6x8" guard rail. Deck truss spans have 4-angle steel parts with transverse 6" channels for the trolley wire. Atop these posts were carriers for telegraph or telephone wires. The main posts were 82" apart allowing 22' headway.

The bridge is supported by 9 piers: 4 channel piers (Numbered 1-4) of concrete, faced with Bedford limestone, and 5 channel piers (A-C on the west and D-E on the east) which are all concrete. All have bedrock caisson foundations (A, B and E used open excavations). Piers 1 and 4 are 10' wide beneath the belting course (2 and 3 are 12') with 32" (35") shoulders. Piers A-E are 7' wide beneath the coping, 30" high, with 12" projection. Piers have steel bars (10" apart) as reinforcement. "B" has 2 square pillars on a common foundation with arched link top. "C" and "D" are monoliths with parallel sides, circular ends. "A" and "E" have 2 square pillars with separate foundations. Pier foundations used chambers to pump in concrete and clay to seal them. Piles came from the St. Louis work plant in lengths of 20, 25, 16 and 14 feet, and 14-15" diameter, capped and pointed with metal. Concrete set for 30 days then piles were driven by a 7000 lb. #2 steam hammer with 2' drop. Approaches used 41' spans with 4 columns per bent (2 each for railroad and roadway support).

#### 4. Related Structures

The McKinley Bridge was built as part of a more complex set of buildings which formed the ITS St. Louis-area terminal. At one point there were plans for a 10 or 12 story office building at High St. and Cass Avenue but it is likely the 1907 recession cut funds to kill this ambitious structure. The SLET Co. bought a 218x143' lot at the southwest corner of Broadway where they built a two-story building with floor area of 100x58'. The passenger waiting room measured 40x100x19½' on the ground floor, plus two offices. There was also a lunch counter, bathrooms, kitchen, baggage room, and central corridor. The second floor opened out to a balcony with iron railing overlooking the passenger rooms. This floor also held the general agent's office, commercial agent's office, scheduler's office, and 3 private offices.

The SLET/ITS then built another passenger station on Salisbury by the end of the bridge approach. This was incorporated into the actual bridge approach and was designed by Francis Bacon, with steel framework designed by Modjeski himself. The ground floor, beneath a paved deck had 2 tracks plus a loading platform. Fronting on Broadway, floor area was 65x132'. A tile corridor ran through the whole structure. One side had a ticket office, agent's office, restaurant and kitchen, while the other had restrooms and baggage room. The central corridor led to a 5x14' platform elevator. The steel frame was covered by brick walls, trimmed with cut stone. The interior walls were of fireproof brick, holding a reinforced concrete roof with granite finish. Interior finish included plain oak (white paste filler), 3 coats of varnish, white tile (3 coats of plaster) all well lit. There was a small basement for a boiler room, directly beneath the baggage room. Downtown loops serviced these terminals: 12<sup>th</sup>-Gay-13<sup>th</sup>-Center-12<sup>th</sup> and 9<sup>th</sup>-Branch-12<sup>th</sup>-Palm-11<sup>th</sup>-9<sup>th</sup>.

The SLET constructed a freight terminal on a lot some 1½ blocks north of Washington Avenue, between 12<sup>th</sup> and 11<sup>th</sup>. The original lot measured 600x1400', and was

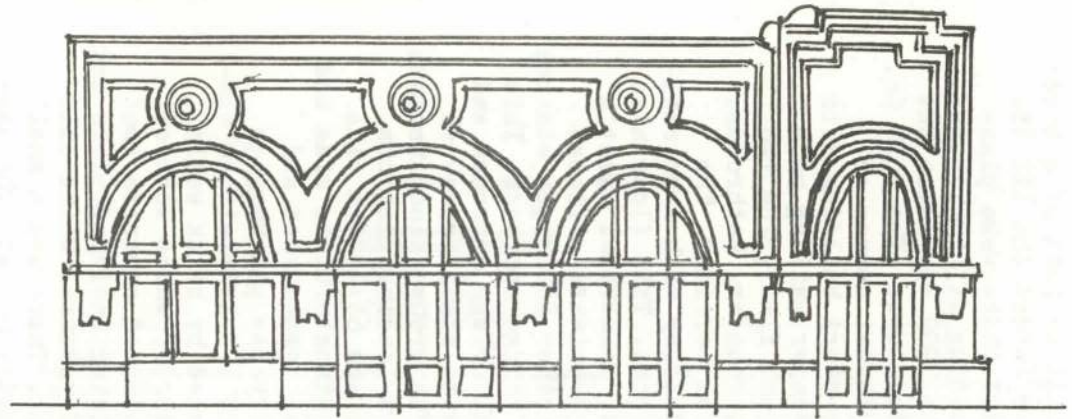


Fig. 6. Illinois Traction St. Louis Terminal of 1910.

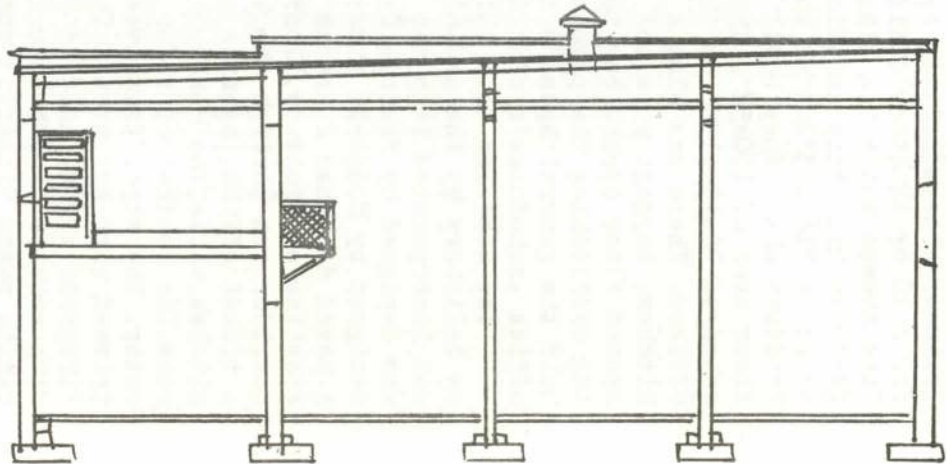
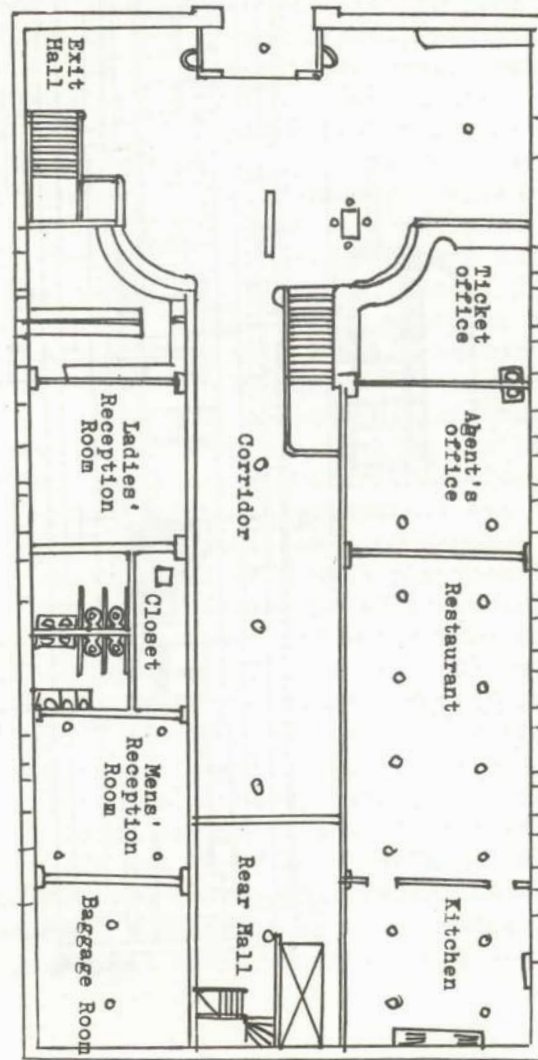


Fig. 7. Illinois Traction Terminal: Floor plan.



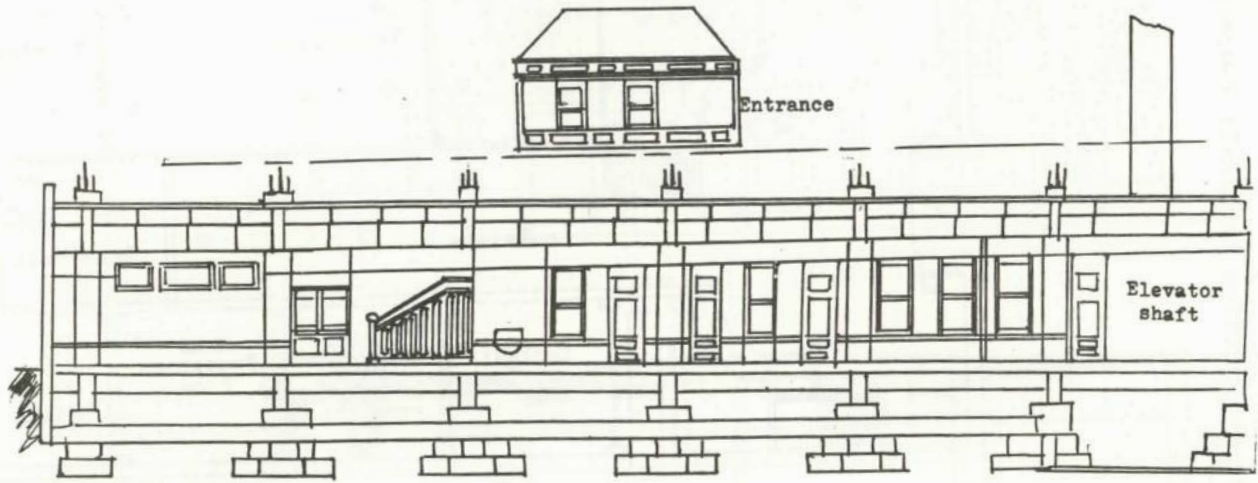
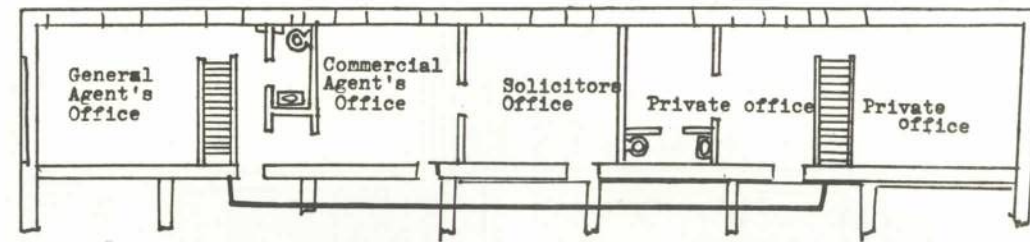
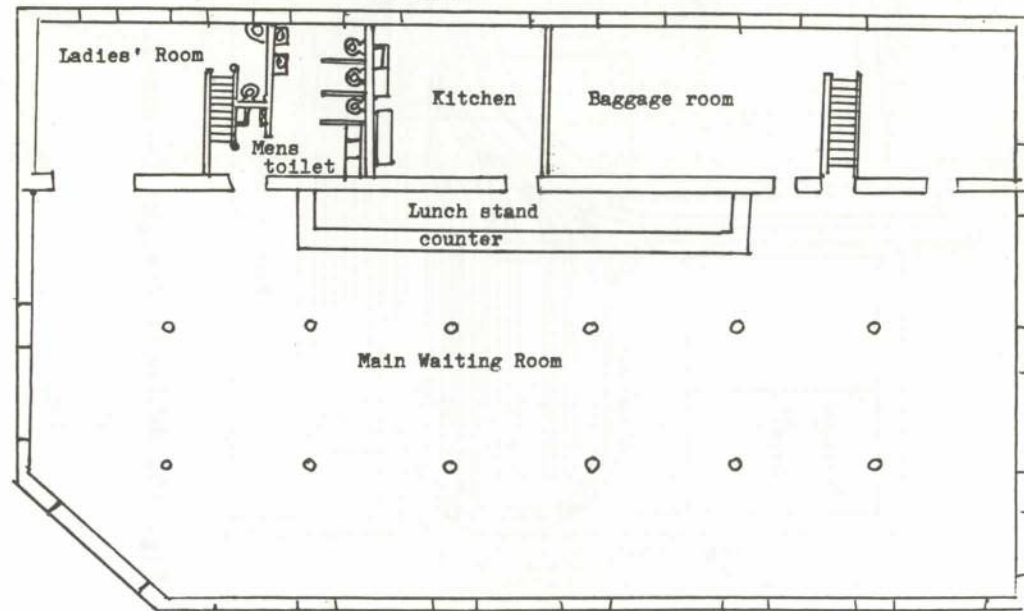


Fig. 8. St.Louis passenger depot.



Part of Second Floor



Ground floor

Fig. 9. St. Louis Passenger depot: Floor plan.

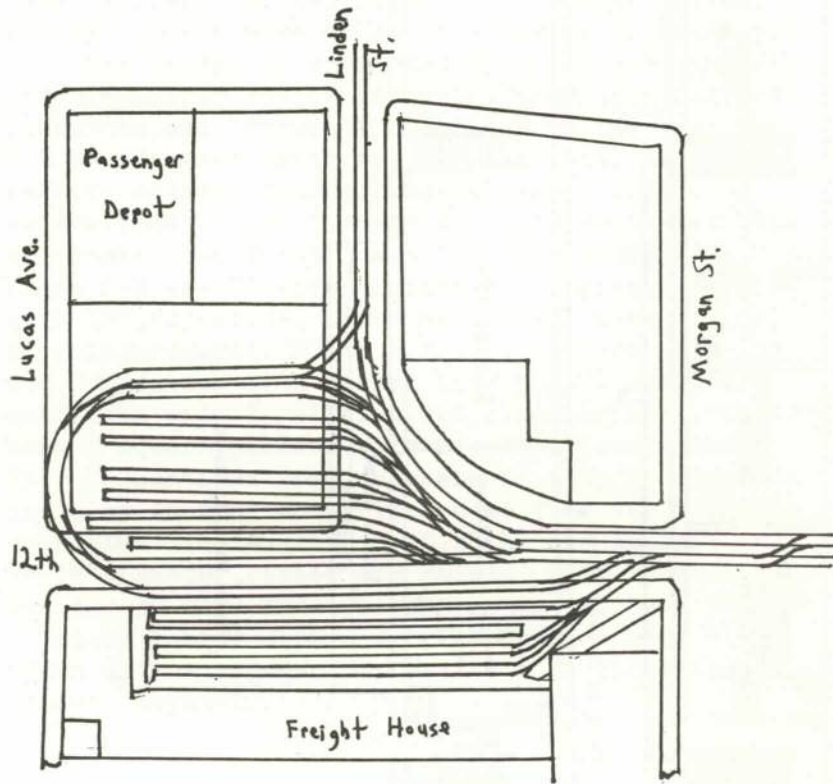


Fig. 10. St. Louis Freight Terminal.

linked to the bridge approach. Cars were handled here, as the franchise banned street movements by trains. Line crew waited in Venice then broke up trains upon arrival there, sending cars across the bridge one at a time. All freight was unloaded and delivered by noon. Freight agents combed newspapers for construction news, then offered to ship material. The freight yard held 12 cars (4 each on three tracks). Two tracks had 11' centers, the third 18' with a platform between tracks. The yard opened in late November 1910 and then a bigger 100-car yard opened March 20, 1911 to complete the line's St. Louis city property.

One problem with these new yards, building and tracks was power as the older power houses would not supply enough. The solution was to build a new power house and this explains why the McKinley interests bought the local power system in the three cities over the river from St. Louis. Work began in 1909 and the building was in service October 1, 1910. The foundation was designed to handle a rise of 40' in the river (once again assuming the old records would not be broken). It was some 800' from the river bank and measured  $138\frac{1}{2} \times 192\frac{1}{4} \times 92'$ . The condenser/pipe floor was built at the high water level with the machinery floor  $12\frac{1}{2}'$  higher and a sub-basement floor was 17' below the high water level (21' above the low-water level). This meant the basement and sub-basement formed a concrete box whenever water rose 21' above the floor. Concrete foundations were on 500 concrete pilings ( $22'2\frac{1}{2}''$  with 8" diameter at bottom and 18" at top) able to handle loads of 60 tons. These pilings were topped by 3' concrete sub-floor slab ( $200 \times 140'$ ) using 9000 cubic yards of concrete. Some \$75,000 was spent to raise floors above the high flood level.

The main building held an 80' boiler room, 73' engine room and 30' electrical galleries for a total of 134'. It had red brick walls, trimmed with white stone, book tile roof with Cary roofing. 750 T of steel was used for the frame (Myers Construction Co.) Interiors were sand-lime brick + white enamel wainscot

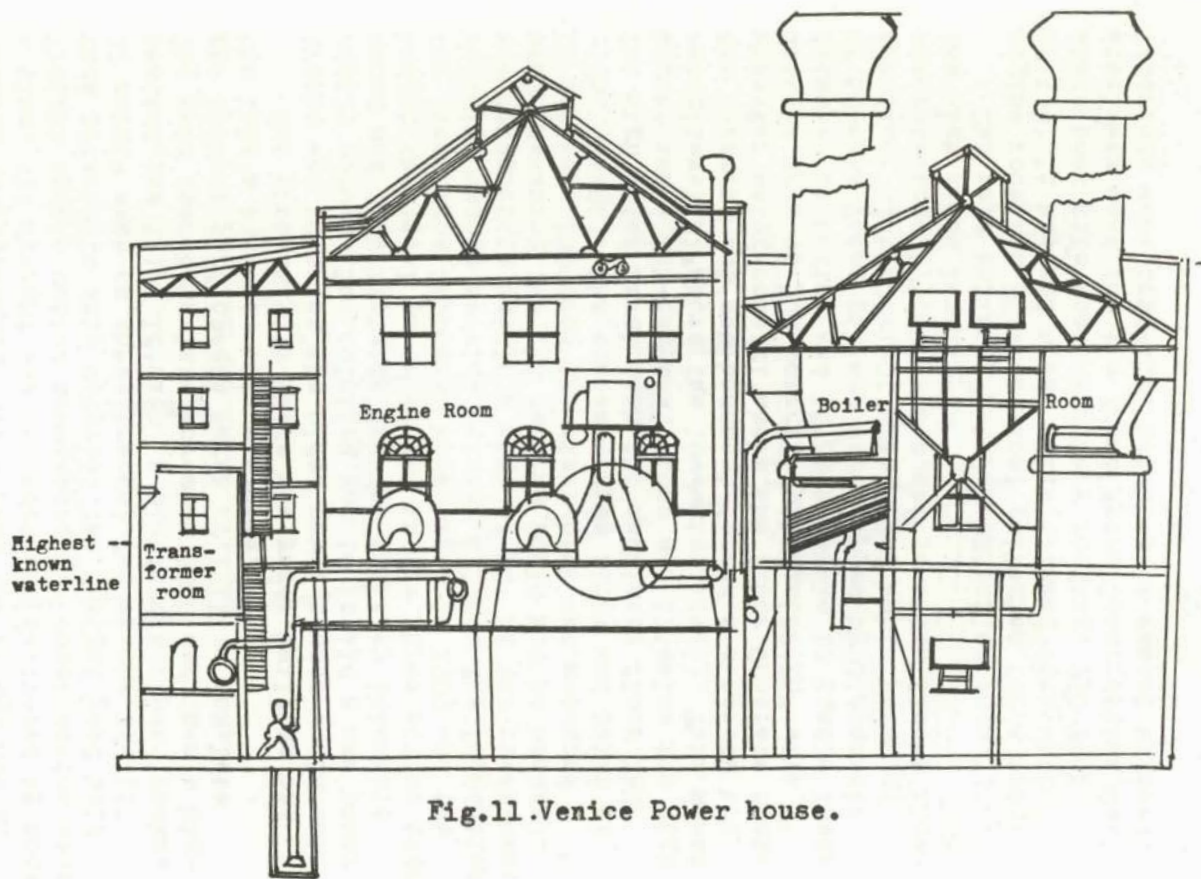
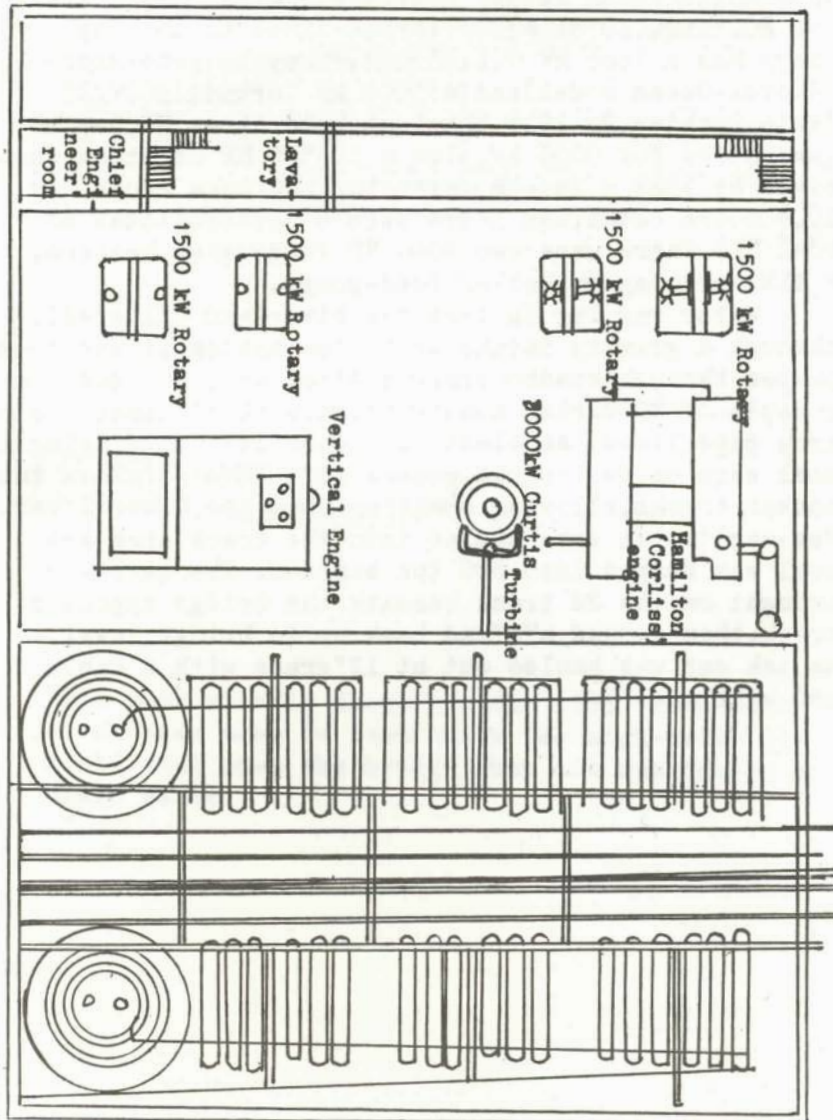


Fig. 12. Venice Power house floor plan.



plus metal stairs with concrete treads. There was a chief engineer's office, toilet rooms, showers, steel lockers. The engine room held a 30T Case crane (on a runway 47½' high). There were six 608 HP O'Brien water-tube boilers with Foster superheaters. The steel stack was 200' high (12' diameter) (brick-lined to the top). There was a 1000 kW G.E., 2300V, 25 cycle generator (Hooven-Owens model) and a 3000 kW Curtis, 2300V, 25 cycle turbine. By 1918 the plant held three GE, 3-phase generators for 9000 kW, plus a 10,500 HP GE steam turbine. By 1924 a fourth generator had been added for 19,480 kva total, and there were 8 boilers (total of 4848 HP). There were two 4000 HP feed-water heaters, 2 HLR. Worthington boiler feed-pumps.

Water was let in from the river (and filtered), through a gravity intake well/pipe system. It was then pumped through condensers. The steel well was sunk to a depth of 40' during construction, with 4' diameter cast iron pipe links. An electric locomotive would bring in coal cars on two tracks placed at a level 5' above the bunker tracks, allowing shunting onto the lower level. Ten-car trains were hauled into the track area and coal was dumped into 800 ton bunkers. The cars were brought on the 2d track beneath the bridge approach track, then around a "Y" and back up to bridge level. An ash car was hauled out at 12° grade with a cable and windlass.

## 5. From Illinois Traction to Illinois Terminal

The McKinley Bridge served the electric railway system created by its namesake leader for nearly half a century: electric operations ending in 1958, and diesel railroading since then. During this era there were numerous changes in corporate ownership: (1) On January 1, 1923 North American Light & Power Company gained control of the IT, then including 55 subsidiaries. McKinley had been elected to the U.S. Senate in 1920 and his duties provided less time for railroading. On May 23d a new company--Illinois Power & Light--to control Illinois Traction, Inc. and the interurban lines. (2) After NAP&L was reorganized it bought the steam-powered Illinois Terminal R.R. and merged the interurbans into this, using the older name (April 25, 1928). In 1930 the ITR bought the Alton branch of the ESL&S lines, and assumed complete ownership on April 30, 1940. (3) On February 27, 1937 the ITR was reorganized, as the IP&L (renamed Illinois-Iowa Power Co.) had to divest itself of railways, following federal rulings. (4) On Feb. 14, 1945 ITR was again reorganized. (5) On March 8, 1954 the Illinois-Missouri Terminal Ry. got control of the ITR, as 9 railroads formed a group to prevent the ITR from falling into "hostile hands." On June 25, 1956 the name ITR was resumed.

The bridge itself had an immediate impact on its surrounding area. During 1900-1910 population in St. Louis/Illinois towns grew 19/108%. Six months after the bridge was opened some 350 lots were sold in the region (75% going to St. Louis buyers). Within the first decade the bridge was open it was estimated 70% of Granite City's earnings went to St. Louis businesses. In 1910 the ITS bought 30 new cars for bridge traffic, and they remained in service through World War II. By the 1930's the bridge was using center-entrance cars from the ESL&S system for local operations. The main ITS system was running trains between St. Louis and Springfield every two hours when the bridge opened, and by 1913 there were 16 daily trains (9:45

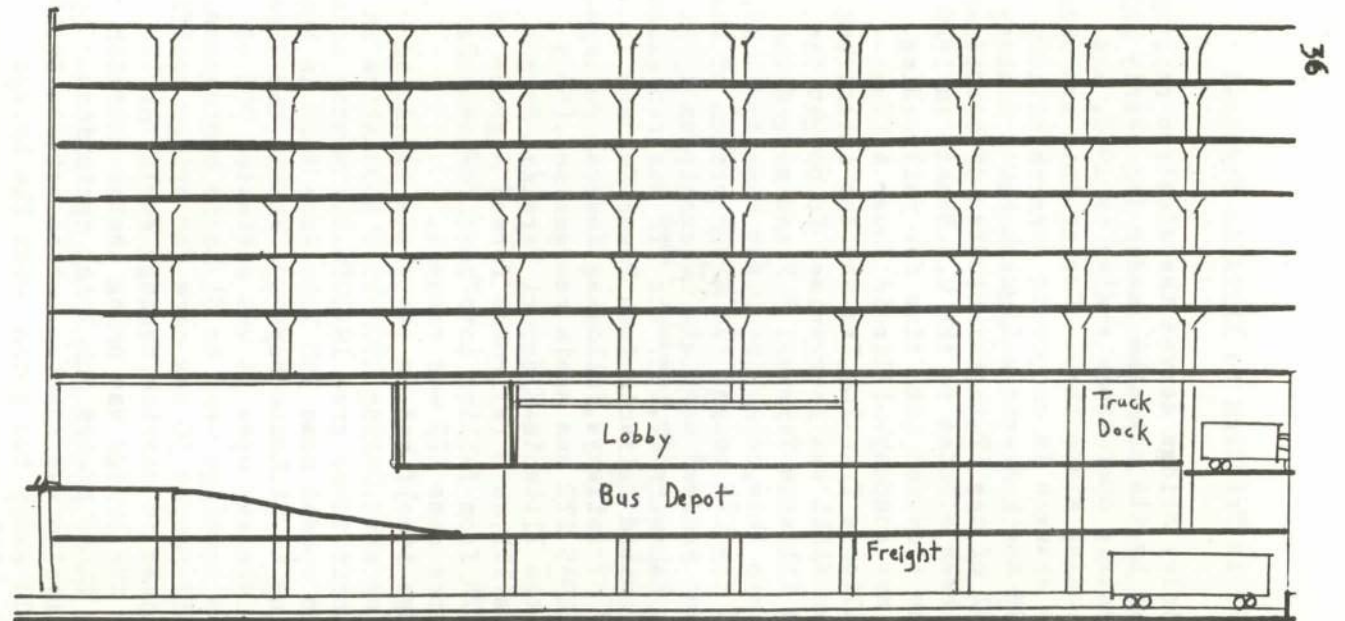


Fig. 13. New St. Louis Terminal cross-section.

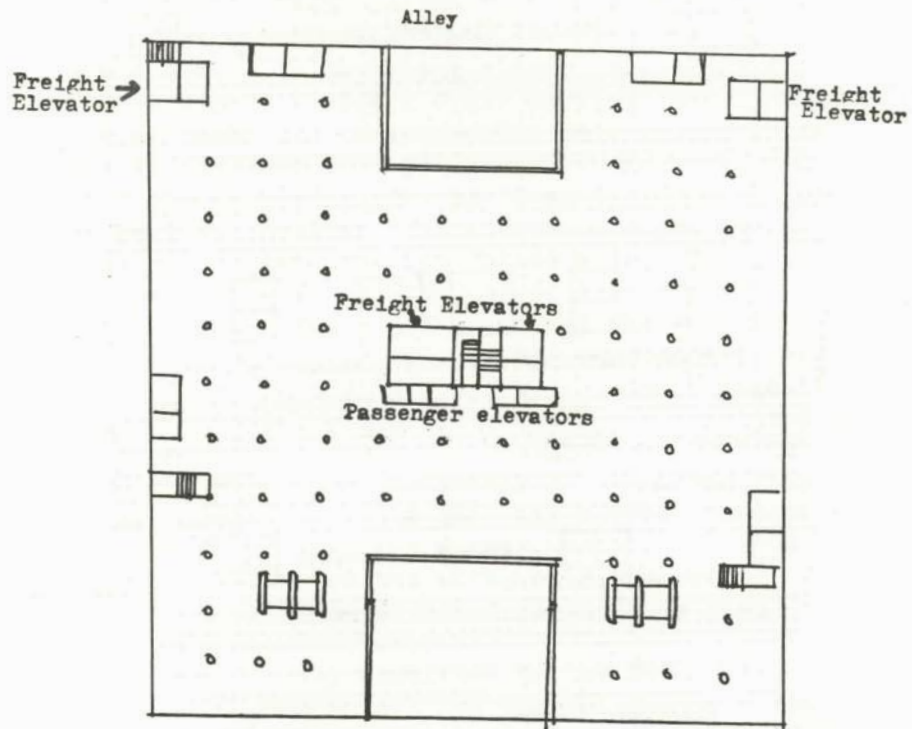


Fig. 14. New St. Louis Terminal: Floor plan.

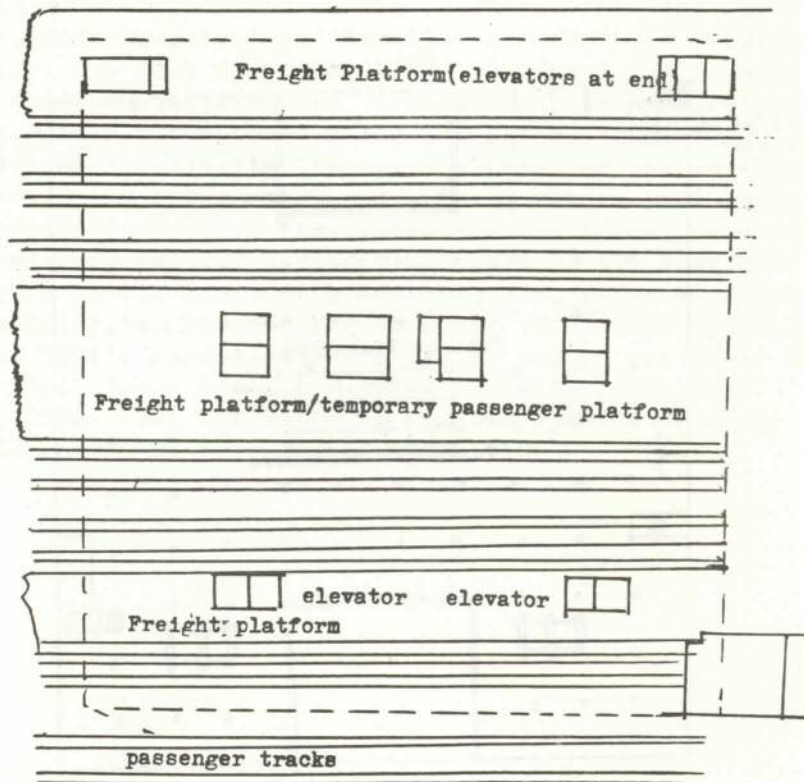


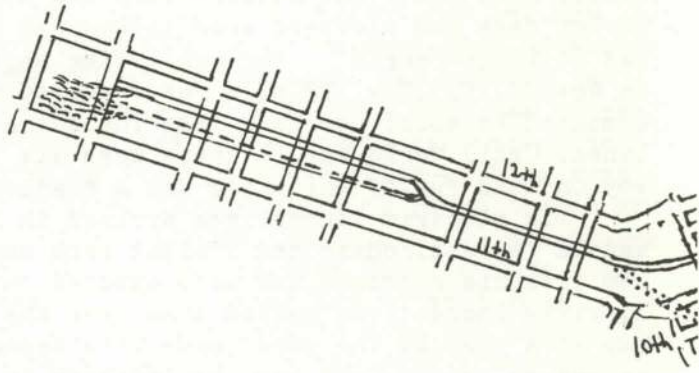
Fig. 15. New St. Louis Terminal: Track floor plan.

a.m. to 6:45 p.m.), and locals every ten minutes. Parlor cars and sleepers were introduced by the ITS, and St. Louis-Peoria through trains began running on Nov. 20, 1913. The 172 mile run required 5 1/4 hours, compared to about one hour less for competing steam lines. Until World War II there were six trains each way on this run, of which one was a sleeper train.

Six electric locomotives arrived in 1910-1913 to handle freight. Southbound freight cars came down to the Illinois approach, and were shunted onto a siding. Electric locomotives hauled them over the bridge, one car at a time. At the yard loads were transferred to wagons or trucks. Cars were hauled back to Venice one or two per trip. In 1925 the city eased freight rules, so six new electric locomotives were bought, able to negotiate city curves. In 1910 the ITS freight in/out at St. Louis came to 4,016/16,336 tons--by 1912 this had increased to 11,551/53,524 tons and by 1923 the figures were 372,153/334,655 tons. In addition the ITS brought in 299,450 tons of coal in the latter year.

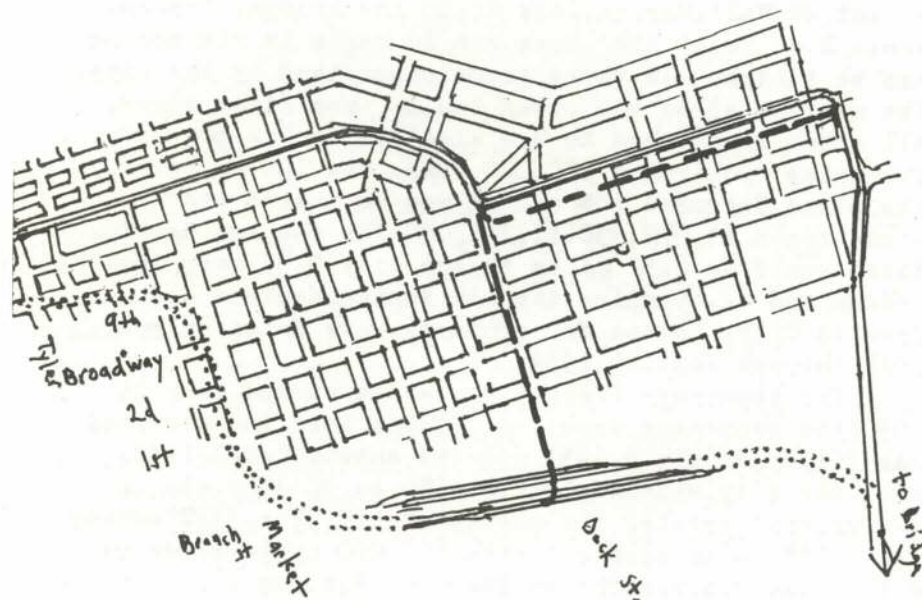
Even as the Illinois Terminal Railroad was about to gain control of the whole system, plans were being made to reorganize the St. Louis operations. During the mid-1920's there were reports that the ITS still hoped to run its main line through Danville into Indiana, but the proposed Indiana partners lacked the money to build its share of bridges/track so the plan was dropped in favor of the St. Louis work. The real problem was the low speed needed to cross 12 streetcar lines and 31 streets on the way to the St. Louis terminal. By 1926 initial plans were prepared for a centralized depot with subway/elevated tracks.

On July 30, 1928 Ordinance 37152 was approved, granting the SLET rights on the region bounded by High St., Washington Ave., Eleventh St. and O'Fallon St. A 36' wide subway would be built from O'Fallon St. under/across various blocks and High St. to Block 589, where it came to the surface (see Fig. 16) to join tracks on 12th St. most of which would be replaced. A 32' wide elevated structure would be built from 12th & Howard St.



- ==== Surface tracks
- - - subway
- ..... elevated tracks
- - - - Unbuilt branch of 1926

**Fig.16.** Map of St.Louis tracks.



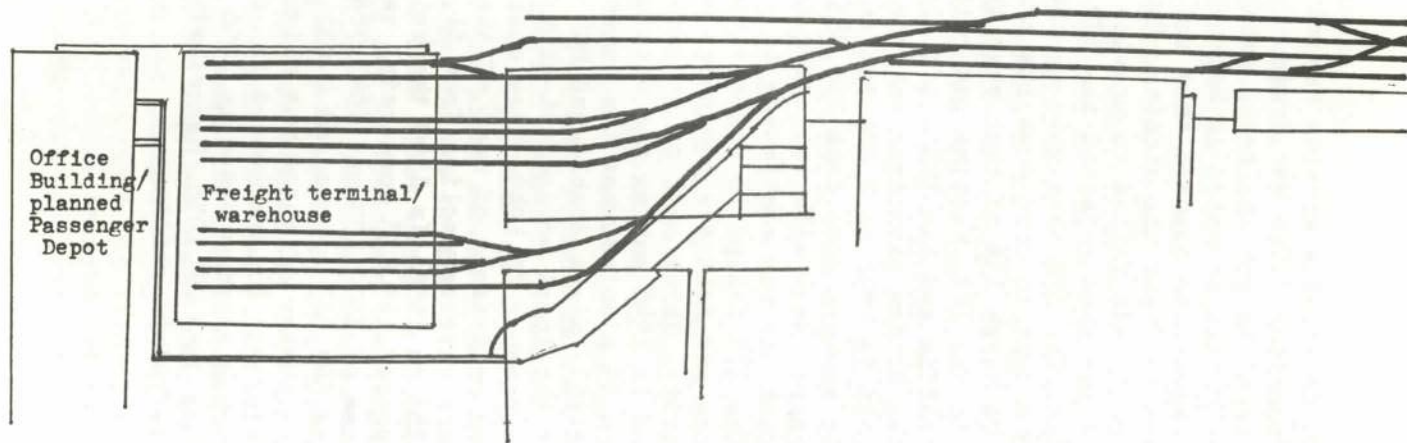
Plans dated back to 1926 when the original elevated tracks were supposed to run nearly a mile east of the actual track site. The original surface tracks were retained for several years, for local traffic only, which did not have speed requirements.

across/along 11<sup>th</sup>, Howard, 11<sup>th</sup>, Tyler, 10<sup>th</sup>, Chambers, North Market, 9<sup>th</sup>, Hall, Warren, Dock St. to the bridge. Clearance would be at least 15½'. Work was to begin in six months and be finished in three years, supervised by the city. The section along the river could use steam power, all other tracks had to use electricity. The 50 year franchise required a \$50,000 bond. The ICC approved the plans December 18<sup>th</sup> and it was estimated costs would reach \$4,972,950 (\$1,385,000 for the new depot). There would be 2.52 miles in the city, 0.85 over the bridge and 2.69 miles through Venice, Madison and Granite City. Leases for property were dated July 17, 1928 through Sept. 26, 1932.

The temporary freight house was opened July 1, 1930 (the passenger depot on October 1st), the elevated was finished July 4, 1931 and the subway Oct. 3, 1932. When the city widened 12<sup>th</sup> (from 50 to 98') for six blocks, that created the subway's "roof." The 3327' subway was built in an open cut, with 600,000 cubic yards of dirt being removed. The surface portion ran 1805' and the elevated another 8,509'. Tracks ran to the bridge on a curve (12°30') over a new 250' span truss. The elevated needed 1000' of concrete bents and a special caisson at the river edge. 100 lb. rail was used for the double track line. On a 300x285' site the ITR built a 7-story depot (12 were planned) of 634,000 ft.<sup>2</sup> or total volume of 11,285,000 ft.<sup>3</sup> Upper floors were for storage or business. The below street mezzanine allowed buses to drive down from the street; trucks came in at street level. Steel-reinforced concrete columns ran up 4 floors with spiral columns above. Each floor was 75,000 ft.<sup>2</sup> and 6 passenger and 1 freight elevator served all. The first floor was 17½' high (others 11½'). The new Venice high line was opened June 9, 1929 allowing yet faster service over the bridge.

These changes came just as the Great Depression struck, forever changing the way railroads did their business. Freight became more important than passengers with parlor cars being dropped in 1938 and sleepers on August 31, 1940. On July 9, 1942 the ITR petitioned

Fig. 17. St.Louis Subway tracks,etc.



the ICC to abandon service beyond the St. Louis-Springfield "corridor." The War Production Board seemed quite eager to get the scrap metal and ordered the "unused" tracks scrapped on September 28<sup>th</sup>. Some 84 local industries opposed this and testified at ICC hearings to fight the closing. The ICC determined steam railroads failed to provide the same level of service and thus rejected the ITR request to close the line. The ITR then gave up and announced it no longer sought to shut down its tracks on January 9, 1943. On March 13<sup>th</sup> of that year the WPB returned the track to the ITR. Wartime gas rationing increased rail traffic and the ITR's officials became optimistic. McKinley Bridge passenger vehicle loads increased from 1,268,520 in 1936 to 2,202,397 in 1943. Commercial vehicle numbers rose from 257,883 to 494,786 in the same years. Even with rationing it was clear auto and truck use was continuing to grow.

The ITR failed to foresee the postwar return to auto use and felt new equipment would produce more prosperity. Three sets of streamlined cars were delivered in 1948 making the Decatur-St. Louis run in 3 hours, 35 minutes (when the competing Wabash took just 2:26). Eight double-end PCC cars were also ordered for the local bridge/tri-city lines, entering service September 15, 1949. They cost \$300,000 apiece, and allowed retirement of most of the older cars. ITR saw passage revenue decline from \$1,326,300 in 1949 to \$366,383 in 1955. In 1949 the bridge carried 2,539,722 passenger+3,149,038 commercial vehicles, producing toll revenues of \$532,137 and \$643,788. In 1950 the bridge carried 643,613 trucks and 2,821,260 automobiles. The growing number of autos was slightly reduced when the new Veterans' Bridge opened in January 1951. ITR interurban service ended in 1956 and the last PCC run came June 22, 1958. Henceforth the ITR would be an all-freight railroad.

## 6. Venice Buys a Bridge

By the time the ITR ended passenger service it had come under the control of nine railroads (B&O, IC, CB&Q, GM&O, C&EI, L&M, Nickel Plate, Wabash and Frisco), and on September 8, 1954 they offered \$20,015,635 for the ITR. This was accepted on the 15<sup>th</sup> and approved on November 19<sup>th</sup>. On May 4, 1954 the City of Venice had made an offer to buy the bridge itself, at a time there was a rival offer from the Toledo, Peoria & Western R.R. The Bi-State Development Agency made a \$13 Million offer for the bridge as well, and asked St. Louis-area banks to approve a loan of \$20,015,635 (@3% interest) guaranteed by the nine railroads. The bridge would be leased back to a new ITR for 40 years, at an annual rent of \$300,000. \$11.74 million would be used to retire all ITR bonds. On June 15, 1956 the ITR was sold to the Illinois-Missouri Terminal Ry. which resold it to the Bi-State Agency which then failed to follow up the purchase and the plan thus came to nothing.

On January 23, 1958 the Sarjem Corp. made an offer (acting as agent) which would let the ITR sell the bridge to the City for \$20 million (\$9 million in cash) to prevent any other railroads from gaining control. A draft agreement was prepared May 27<sup>th</sup> for the line between Branch St. and the east side of Venice. The city would issue \$11 million "A" bonds (30 years) and another \$11 million "B" bonds (for 40 years). At closing the city would pay \$9 million for the "A" bonds and \$11 million for the "B" bonds. Tolls were expected to cover all main debts. A second draft (June 11<sup>th</sup>) insisted on an end to all passenger service, and removal of local tracks. When the ICC approved the end of local bridge car service on November 17<sup>th</sup> it was shown the sale would involve 1.979 miles of first track and 1.299 miles of second track. The rent would be \$250,000 plus \$25,000/20,000/15,000/10,000/5,000 for the 1st/2d/3d/4th/and 5<sup>th</sup> years. This would be reduced if the bonds were sold at a rate below 4.95%. \$1 would be paid for each car, caboose or locomotive in excess of 200,000

units per year. Each of the 11 controlling railroads would pay its share. The bridge was valued now at \$8,950,000 (or replacement cost of \$14,482,630).

The city and 11 railroads signed an agreement of sale July 3, 1958. The railroads agreed to cover shortfalls, so if one line came up short the others would cover the difference. On the 23d the railroads' directors approved the sale. Negotiations continued to September 5<sup>th</sup> for a final sale price of \$22.97 million (\$11.97 "A" bonds + \$11 million in "B" bonds). Bonds were \$1000 value each, payment due October 1, 1973. The first \$11.97 million would be Sarjem's commission; \$9 million for the actual purchase with \$1.61 million deducted for repairs. Tolls were 25¢ (or 20 for \$3.60), 50¢ for buses with trucks paying 40/50/60/75¢ (2/3/4/5 axles). On September 24<sup>th</sup> the ICC indicated its approval would be forthcoming. For the past two years that agency had been watching the negotiations without any complaints. On October 3<sup>rd</sup> the various groups gave final approval for the sale.

On October 19<sup>th</sup> Congressman Morgan M. Moulder sent an angry telegram to the ICC demanding the sale be halted. He was a member of the House Legislative Oversight Investigating Committee and used this to apply pressure to the ICC. Moulder threatened a committee investigation of the ICC (charging bribery and undue influence, etc.) unless the agency withdrew its approval. On the 20<sup>th</sup> the ICC informed the ITR and all backer railroads it would oppose the sale and it was thereby suspended. Railroad and city leaders gathered in New York for the final agreement were stunned. The congressman did not even represent a riverfront district and his opposition was puzzling. Documents in the ICC files later revealed the Brotherhood of Railroad Trainmen feared the sale would eliminate 26 jobs. On June 25<sup>th</sup> the BRT's grievance committee contacted the ICC and got no reply. They then began contacting all Missouri congressmen and senators, seeking an ally. On August 27<sup>th</sup> the ICC informed the Brotherhood it lacked jurisdiction in the matter (and the ICC also said the

loss of jobs was not serious). After congressional pressure the ICC suddenly showed a new interest in the sale and demanded the ITR submit a formal application for its approval of the sale/transfer. This was done on October 27<sup>th</sup> and the ICC indicated its preliminary approval on the 31st, followed by formal approval November 17<sup>th</sup>. The sale agreement was then signed in the New York offices of the bank at 11:00 a.m. on November 21st. An advance payment was made (\$49,832) and a syndicate of underwriters bought the \$11.97 million issue of "A" bonds. The city of Venice then gave \$11 million to the railroad consortium.

On August 21st the firm of Hardesty and Hanover presented Venice with a report on the bridge and its condition. At that time the bridge measured some 11,700' plus 6,025' in Venice (the "high line"). By this date the entire bridge was paved for auto traffic. When the bridge was completed there was paving on the roadway portion, which ran "outside" the main girders. Now the two "interior" lanes were paved as well. The two north lanes head into St. Louis, and the south lanes head to Illinois. The report indicated needs for repaving the south lanes, replacing the guardrails. Approach lanes were congested and the toll booths needed to be moved. The interior lanes (rail track lanes) needed new paving as well, since the timbers had split. Speed limits were 10 m.p.h. for trains and 25 for vehicles. \$1.61 million was estimated as the total cost (tolls would cover this). It was assumed tolls would produce \$867,000 in 1959, climbing to \$1.755 million per year after 1983. Net revenues would be roughly one million per year. The<sub>1</sub> MacArthur (ex-Municipal) Bridge tolls were just 20¢.

Since the bridge's purchase in 1958 there were six bridges crossing the river into St. Louis: Eads, Merchants, McKinley, MacArthur (ex-Municipal), Martin Luther King (ex-Veterans), and the Poplar Street Bridge which opened in late 1967 (see Fig. 1 for map showing their locations). East St. Louis owned the Martin Luther King Bridge, which was considered a

money-loser. The Poplar Street Bridge immediately took away up to 85% of the rivals' business, as it had no tolls. By 1986 all six bridges had so many problems a report was issued, urging major repairs plus a seventh bridge by the year 2000. In that same year hourly traffic averaged 520/1195/1269/6040 vehicles on the Eads/King/McKinley/Poplar bridges and the first three charged tolls of 50/40/30¢. When repairs were finally made, major traffic jams resulted.

The McKinley Bridge was affected by one last change in the ITR's status. On September 29, 1980 its stockholders voted to sell to the Norfolk & Western R.R. The sale was made December 1, 1981 and completed by May 8, 1982 when all ITR employees moved to Virginia. Service had declined on the ITR tracks until the Peoria-St. Louis run took up to 24 hours (instead of 12). The last trains ran over the McKinley Bridge in March 1978. Trestle damage (timbers had rotted) in Venice caused the high line's closing in 1979 (at the end it was limited to 5 m.p.h.). Tolls increased to 30¢ in 1967 and 50¢ on January 1, 1987 (on that latter date the toll for an 18-wheel truck increased to \$1.15). In 1992 tolls brought in \$2,744,361 with 5,126,809 vehicles crossing the McKinley Bridge. The most recent problem came during the flood of 1993. On July 26<sup>th</sup> a 100' section of roadbed collapsed beneath the Burlington Orthern tracks, and there were fears the nearby floodwall would collapse. On July 30<sup>th</sup> the bridge itself was ordered closed--its first complete closing in its 83 years. Once the waters receded the bridge would be reopened.

## Footnotes

The following abbreviations are used here:

EN(-R) Engineering News(#Record)

ER: Engineering Record

ERJ: Electric Railway Journal

ERR: Electric Railway Review

SLGD: St. Louis Globe-Democrat

SLPD: St. Louis Post-Dispatch

SRJ: Street Railway Journal

### Chapter 1:

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Fig.18. Map of Illinois-side Electric Lines

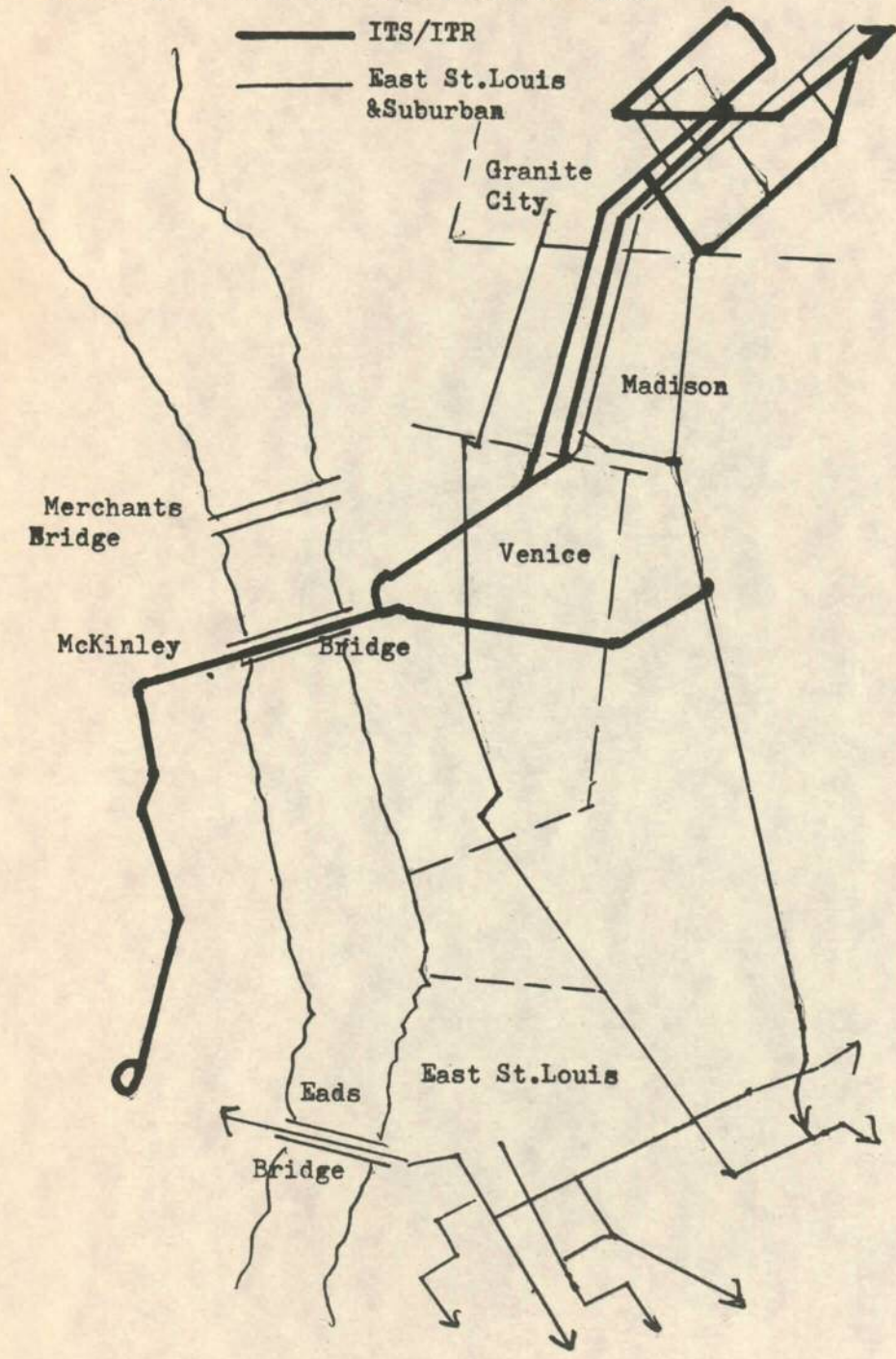


Fig.19. Map of Local Tri-City Service

