

THE GATEWAY ARCH





Official Medallion of the
Jefferson National
Expansion Memorial.

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Memorial Association

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Official Brochure

of the

Jefferson National Expansion Memorial



Signing the Louisiana Purchase Treaty, May 4, 1803.

Introduction

Jefferson National Expansion Memorial commemorates the westward growth of the United States from the Mississippi to the Pacific between 1803 and 1890. The dramatic story began with the Louisiana Purchase and reached a climax in 1890 when the Census Bureau found that western settlement finally had eliminated the "frontier line" created when the first permanent English settlement was made in 1607.

Fittingly, 84 acres on the St. Louis riverfront — site of Pierre Laclede's 1764 trading post — were chosen for the memorial. Laclede's isolated outpost became both the entry-way for explorers, fur traders, homeseeking pioneers, miners, and soldiers passing westward, and a mighty emporium for the natural wealth they found in the West. St. Louis well deserved its title, "Gateway to the West." The towering Gateway Arch symbolizes the proud role of St. Louis in western settlement.

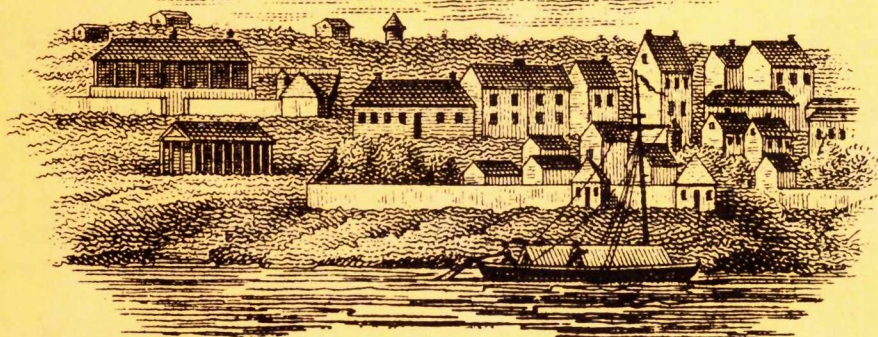


History of St. Louis

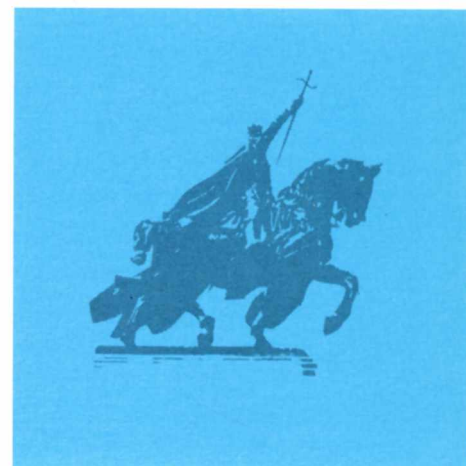
St. Louis was founded as a fur trade center in 1764 by Frenchman Pierre Laclede. For the next 39 years the little outpost grew slowly. Then, in 1803 with United States acquisition of the Louisiana Territory, St. Louis became the gateway for the American Nation's westward expansion. In his classic, *The American Fur Trade of the Far West*, Hiram M. Chittenden wrote:

It is doubtful if history affords the example of another city which has been the exclusive mart for so vast an extent of country as that which was tributary to St. Louis . . . Every route of trade or adventure to the remote regions of the West centered in St. Louis . . . Following the lines of trade, all travel to the Far West, whether for pleasure or for scientific research, all exploring expeditions, all military movements, all intercourse with the Indians, and even the enterprises of the missionaries in that country, made St. Louis their starting point and base of operations.

It is this epic story of the Nation's westward advance from the Mississippi to the Pacific Ocean that Jefferson National Expansion Memorial was created to commemorate and retell; and St. Louis' proud role in that drama, as gateway to the west, is symbolized by the Memorial's towering Gateway Arch.



St. Louis — 1817. Earliest view of the town.



St. Louis — 1840. Front Street looking north from Walnut Street.



St. Louis Riverfront — 1872. View from the eastern bank of the river.

Dreams of a Bold Undertaking

The Memorial owes its existence to the vision and unrelenting determination of a group of St. Louis civic leaders known as the Jefferson National Expansion Memorial Association. But for their efforts, this area would be nothing more today than it was when the Memorial idea was conceived — 40 blocks of old business buildings, largely untenanted and decaying.

Luther Ely Smith (1873-1951) first suggested the idea to St. Louis Mayor Bernard Dickmann in the fall of 1933. It was a bold thought in the depth of the Great Depression to tear out a large chunk of downtown St. Louis for a memorial to Thomas Jefferson, the Louisiana Purchase, and the opening of the trans-Mississippi West, in which the city had played such an important role.

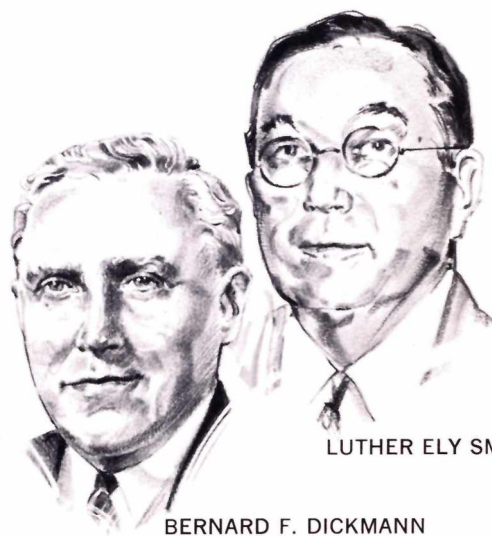
Mr. Smith's idea drew an enthusiastic response from St. Louis Civic leaders. In April, 1934, Mr. Smith became chairman of the Jefferson National Expansion Memorial Association, chartered by the State of Missouri as a non-profit corporation.

Seeing the proposed memorial as a national undertaking, JNEMA planned a joint project in which the Federal Government would aid the City by supplying three-fourths of the estimated \$30 million required. First, the Association petitioned Congress to establish a United States Territorial Expansion Memorial Commission to plan the memorial. The resolution passed by Congress and signed by President Roosevelt on June 19, 1934, set up a commission of three Presidential appointees, three representatives, and six members of JNEMA.

St. Louis voters approved a bond issue for the City's share, and President Roosevelt signed an executive order on December 22, 1935, designating the area a unit of the National Park System. It was christened "Jefferson National Expansion Memorial National Historic Site," but popular usage omits the last three words of this redundant title.

JNEMA has worked continually to keep the project alive: securing the successive Congressional appropriations to bring the Federal share up to its authorized total; monitoring the City's land purchases, clearing of the area, and the construction program for the Memorial; stimulating local interest by a continuing information program; and helping the National Park Service acquire some of the rare items of Americans needed for the Museum of Westward Expansion.

But — next to securing establishment of JNEMA — the Association's most valuable contribution was its sponsorship of a nationwide architectural competition in 1947 to find the most appropriate possible design for the Memorial. The majestic Gateway Arch is the inspired result. An enduring monument to an epic of American history, the Arch also reminds us of the vision of those who made the Memorial a reality.



LUTHER ELY SMITH

BERNARD F. DICKMANN

History of Jefferson National Expansion Memorial 1935-1960

Jefferson National Expansion Memorial was established by an executive order signed by President Franklin D. Roosevelt on December 22, 1935. The order designated the National Park Service as the executive agency to acquire and develop the Memorial, with an allocation of \$6,750,000 of Federal funds, to be matched by \$2,250,000 from the City. On June 22, 1936, the National Park Service established an office in St. Louis for development of the Memorial.

Land acquisition began in June, 1937. Within 13 months the Government filed 40 petitions for land condemnation — one for each block within the proposed boundaries of the Memorial. Title to most of the Memorial area was vested in the United States on June 14, 1939, though the last condemnation suit was not settled until 1944.

Building demolition began on October 10, 1939. By the time it was complete, World War II had brought development to a halt. The cleared area became a civic parking lot.

A major development problem was what to do about the unsightly elevated railroad tracks along the riverfront in the Memorial area. Obviously, they must be removed — but how, at what cost, and at whose expense? The solution, reached by conference among the interested parties in 1958, was a series of open and covered cuts which effectively blended the tracks into the Memorial development plan.



Aerial view of the Memorial Site in 1940, prior to the razing of business and industrial buildings.



Elevated railroad tracks over Wharf Street before removal.



EERO SAARINEN

Although the theme and purpose of the Memorial were fixed from the beginning, development plans were revised several times between 1933 and 1948.

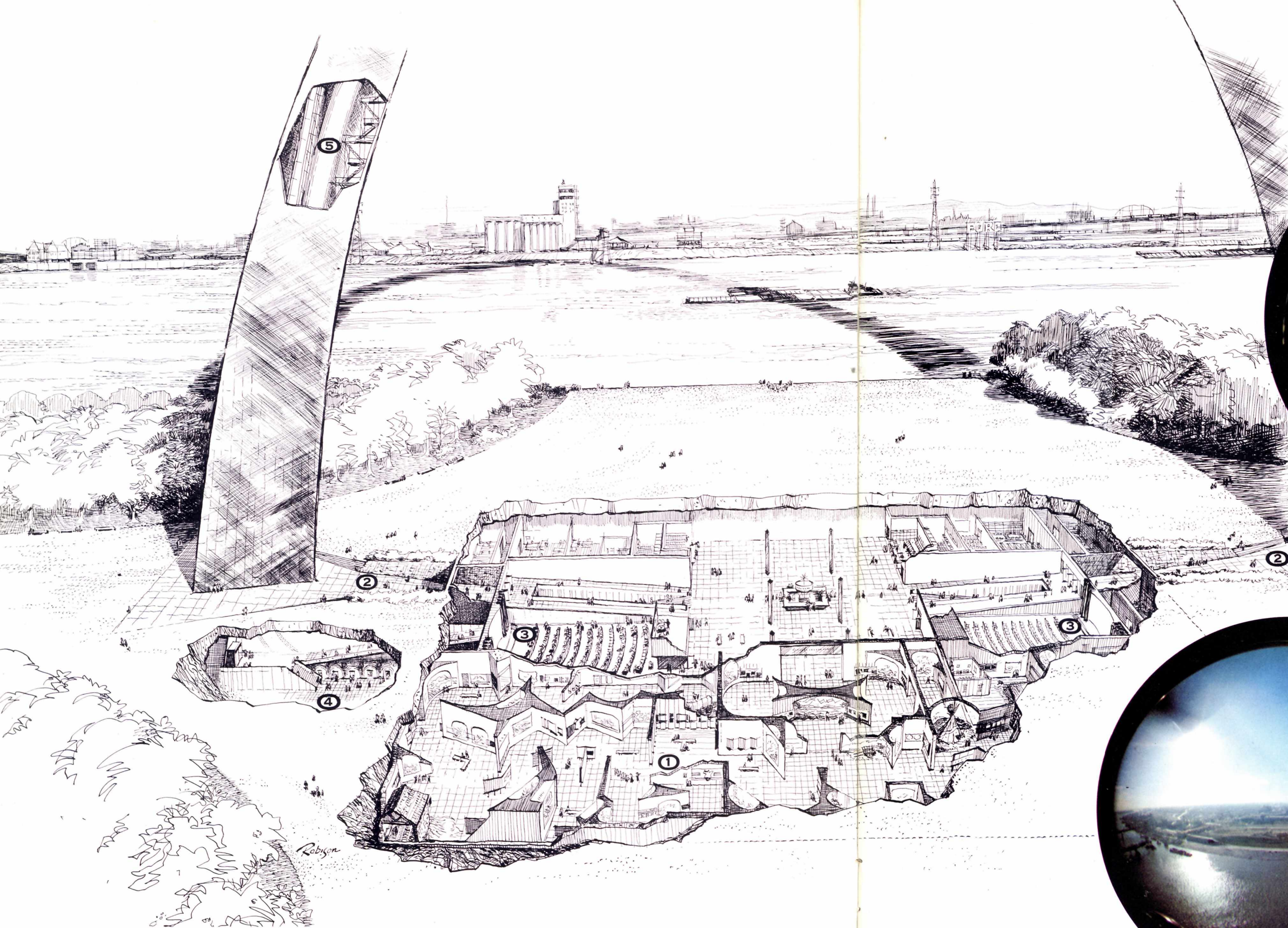
The first plan called for seven groups of buildings and statuary, the largest commemorating Jefferson and the Louisiana Purchase. A second plan provided for a huge statue of Jefferson facing the Mississippi, three museums, and tall obelisks surrounded by statuary at the north and south ends of the Memorial. A third plan reduced the number of buildings to two.

The final design for the Memorial resulted from the nationwide architectural competition which JNEMA sponsored in 1947. In a two year campaign beginning in 1945, the Association raised \$225,000. Offering five semi-final prizes of \$10,000 each and a grand prize of \$50,000, the competition drew 172 entries from leading American architects. The winner announced on February 19, 1948, was Eero Saarinen, a young architect of Finnish descent.

The essentials of the Saarinen design — the two river overlooks and the Gateway Arch — have been retained but the winning plan has been otherwise modified. It called for a campfire theatre, a pioneer village, a court of restored St. Louis buildings around the Old Cathedral, two ground level museums, two restaurants, and a long arcade with sculptures and paintings of historic personages and scenes. As construction plans were advanced, the museums were combined in the underground Visitor Center, and the other modifications were made.

The Old Courthouse was added to the Memorial in May, 1940, when President Roosevelt approved its acceptance from the City of St. Louis. Extensive restoration of the building enabled the National Park Service to establish headquarters there on December 1, 1941.

Interpretive planning began soon after establishment of the Memorial, and a Museum of National Expansion was opened in the Old Courthouse on October 20, 1942. Accelerated planning for the Museum of Westward Expansion in the underground Visitor Center began early in 1960.



Visitor Center

- 1. Museum of Westward Expansion
- 2. Entrance to Visitor Center

- 3. Theaters
- 4. Passenger Loading Area
- 5. Arch Transportation Systems





"Into the Unknown" painting by J. K. Ralston shows Lewis & Clark meeting the Shoshone Indians on the bank of the Beaverhead River, Southwestern Montana, August 17, 1805. Painting on display at the Old Courthouse.



The Museum of Westward Expansion



ENTRANCE



LOBBY

The underground Visitor Center beneath the Gateway Arch will contain the Museum of Westward Expansion, interpretive focus of the Memorial, wherein the epic story of the trans-Mississippi West will be dramatically presented to visitors. Here will be the visual resources through which the historic western American expansion will be translated into meaningful and imaginative exhibits.

American westward expansion in the 19th century covers so vast and varied a subject that only the most important facets of the story can be adequately detailed in the underground museum. The museum planning was concentrated on four major subjects; the land; how it was acquired; the men who mastered it; and the significance and meaning of westward expansion to our nation and our people.

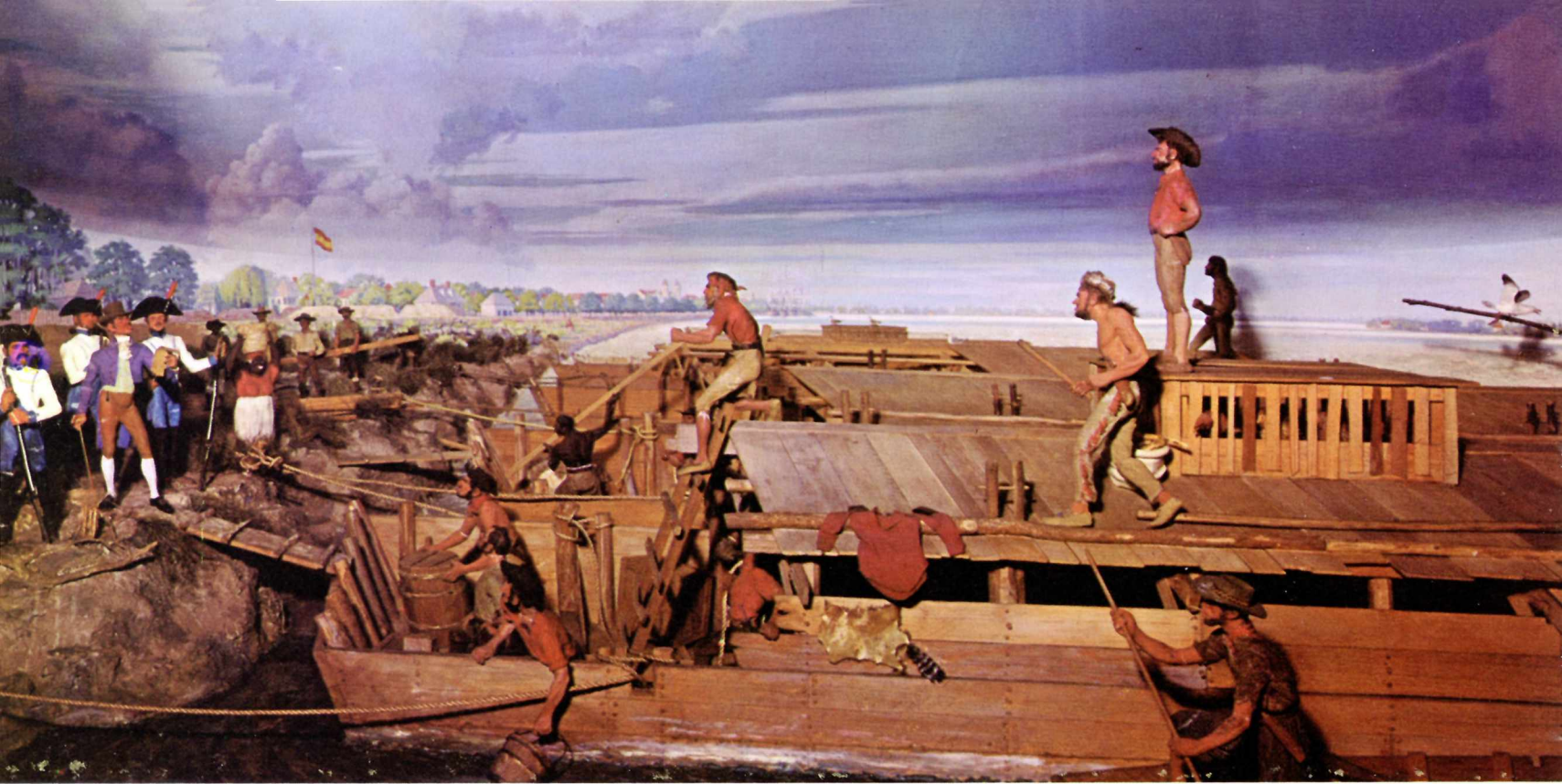


Exhibit depicting American farmers enraged by the Spanish Proclamation of Oct. 16, 1802, which denied them the right of deposit at New Orleans.



Guthrie, Oklahoma, April 22, 1889. Scene of the Last Land Rush is depicted in this exhibit.

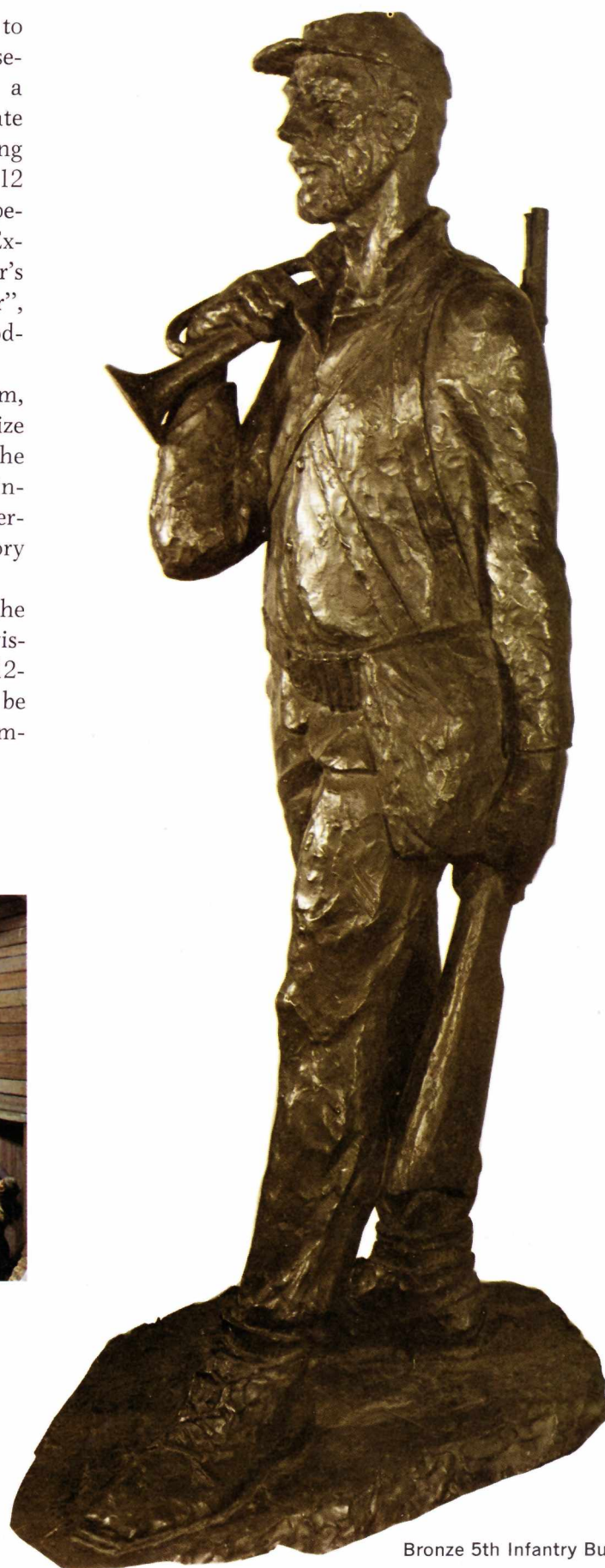
The exhibits were researched and designed to convey the western drama to the visitor as a sequence of personal experiences—to relate in a compelling manner what it was like to participate in various aspects of westward expansion during the years of the 19th century. Nine of the 12 museums galleries are cast in this personal experience mold: “The Overland Experience”, “Explorers of a Wilderness”, “Trapper’s and Trader’s Frontier”, “Indian’s Frontier”, “Soldier’s Frontier”, “Miner’s Frontier”, “Cattleman’s Frontier”, “Sodbuster’s Frontier”, and “Settler’s to the West”.

A 40-minute interpretive documentary film, “Time of the West”, will introduce and summarize westward expansion in two theaters adjacent to the Museum of Westward Expansion. This film is intended to prepare the visitor to absorb and understand more fully the various phases of the story presented in the museum.

The Museum of Westward Expansion will be the first single museum to present a comprehensive visual interpretation of westward expansion. The 12-gallery museum and the orientation film will be fitting companion achievements to the soaring symbolism of the Gateway Arch.



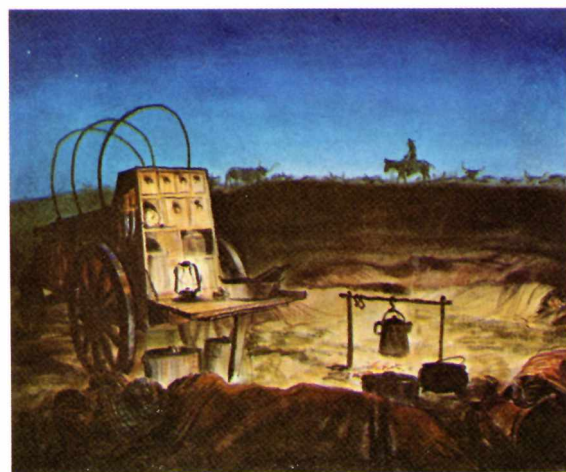
Exhibit depicting Fort Union, a fur trading post on the upper Missouri River, built in 1882.



Bronze 5th Infantry Bugler, C. 1877.



THE WAGON-BOX FIGHT took place near Fort Phil Kearny, Wyoming in the morning of August 2, 1867.



THE CHUCK WAGON was the focus of night-time activity on the cattle drive.



Three part mosaic mural portrays the aspirations, union and strength of our emerging nation.





The final section being eased into position.



Excavation beginning for footings for 630-foot Gateway Arch.

Construction

Actual construction of the Memorial began on June 23, 1959, when groundbreaking ceremonies were held for relocation of the railroad tracks. The first train passed over the relocated tracks on November 21, 1961.

The second phase of construction which began on February 11, 1961, involved excavation for the Visitor Center and the foundations of the Gateway Arch, as well as redevelopment of the levee along the east side of the Memorial. This work was completed late in 1963.

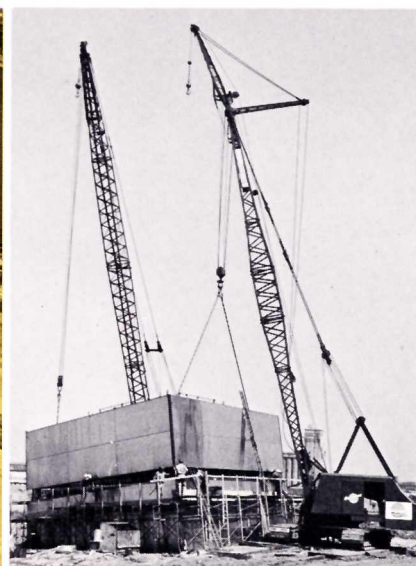
In March of 1962 a contract for nearly 11½

million dollars was awarded to the McDonald Construction Company of St. Louis to build the Gateway Arch and the underground Visitor Center. Two months later the National Park Service signed a cooperative agreement with the Bi-State Development Agency to construct and operate the Arch transportation system.

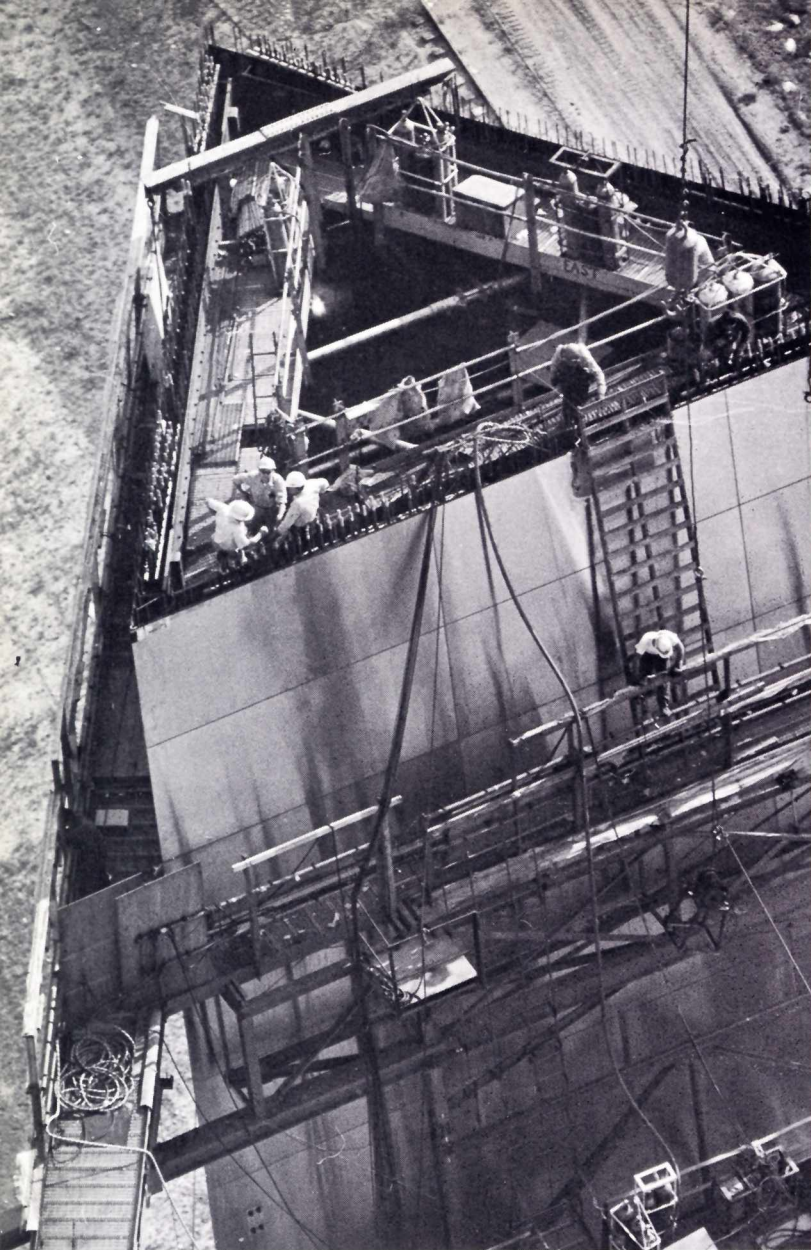
The concrete shell of the Visitor Center was substantially completed during 1962 and the first stainless steel section of the Arch was placed on the south leg on February 12, 1963. The section, an equilateral triangle 12 feet high and 54 feet on a side, weighed 101,500 pounds.



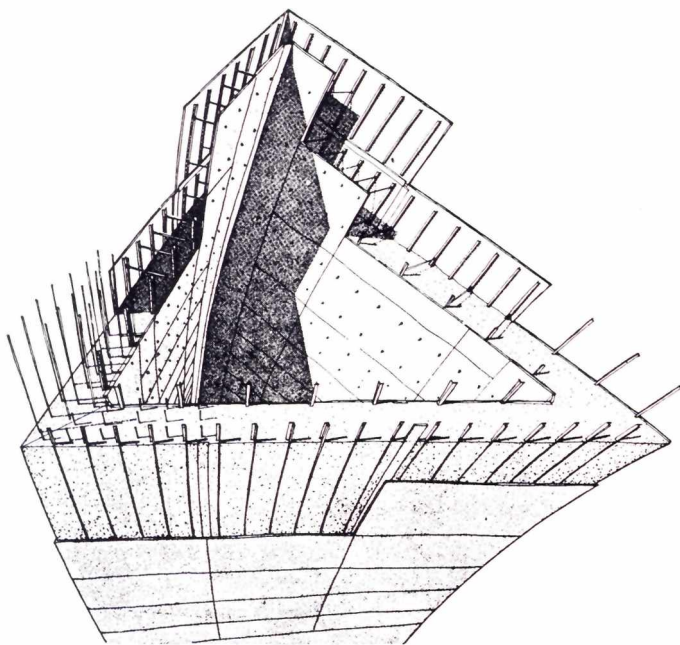
The "legs" of the Arch begin their ascent as the underground Visitor Center between them is covered with earth.



The second triangular section is placed on the south "leg."



Bird's eye view of south "leg" of Arch during construction.



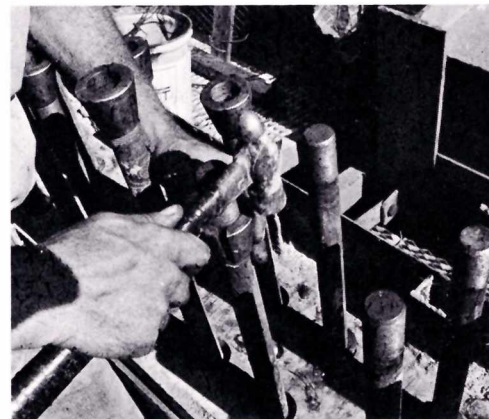
Cutaway illustration shows double walls filled with steel reinforced concrete. The Arch is designed to withstand a 150-mile-an-hour wind.

When they undertook construction of the Arch, the McDonald Company and its subcontractor for the Arch shell, the Pittsburgh-Des Moines Steel Company, found themselves faced with a problem unique in building history. Nothing just like the Arch had ever been constructed before. The intricate engineering calculations and the actual stainless steel construction were carried out by PDM under supervision of the National Park Service and Eero Saarinen Associates.

The Arch is what is known among engineers as an inverted, weighted catenary curve. A catenary curve is the shape assumed by a chain hanging freely between two points of support. Inverted means the curve is projected upward to form an arch. Weighted means the legs are larger than the upper portion. In the catenary, structurally the soundest of all arches, the thrust passes through the legs and is absorbed in the foundation.

It demanded extremely sophisticated engineering. A deviation of any magnitude between the bases could result in the legs of the Arch failing to meet perfectly when they reached the top. Added to the construction problem extreme care had to be exercised to protect the gleaming surface of the stainless steel composing the Arch's outer skin.

The solution came in what was called a creeper derrick, an 80-ton assembly which was, essentially, a tiltable platform mounted on tracks fastened to the Arch itself and supporting a stiff-legged derrick. This rig climbed the Arch to set at predetermined stations and then lifted the sections with the derrick and put them in place. The derrick also had to be leveled each time it was raised.



Post tensioning rods.



80-ton creeper derricks which lifted the temporary strut shown on the ground.



Gateway Arch under construction as seen from north of the historic Eads Bridge.

The first six sections of each leg, to a height of 72 feet, were put in place with conventional cranes. Then the creeper derricks took over. The platform for the derricks were 43 feet by 32 feet and each had its own tool shed, a heated shack for the workmen, sanitary facilities and communication equipment.

The Arch has a span between the two legs equal to its height, 630 feet. In cross section each leg is a double steel-walled equilateral triangle, each side measuring 54 feet at the base and 17 feet at the top. The double walls are 3 feet apart at the bottom, diminishing to $7\frac{5}{8}$ inches at the upper sections, leaving a hollow core 48 feet wide at the base and tapering to $15\frac{1}{2}$ feet at the top.

The stainless steel panels on the outside of the Arch diminish in size, as it goes up, from 6 by 18 feet to 4 x $5\frac{1}{2}$ feet, each $\frac{1}{4}$ of an inch thick. To com-

plete the Arch required 900 tons of stainless steel. The interior walls are composed of approximately 2200 tons of carbon steel plates, $\frac{3}{8}$ -inches thick with $1\frac{3}{4}$ inch plates at the corners.

As the legs of the Arch went up independently, they were additionally strengthened by pre-stressed steel rods embedded in concrete up to the 300-foot level. Above that height steel stiffeners were used between the skins in lieu of concrete.

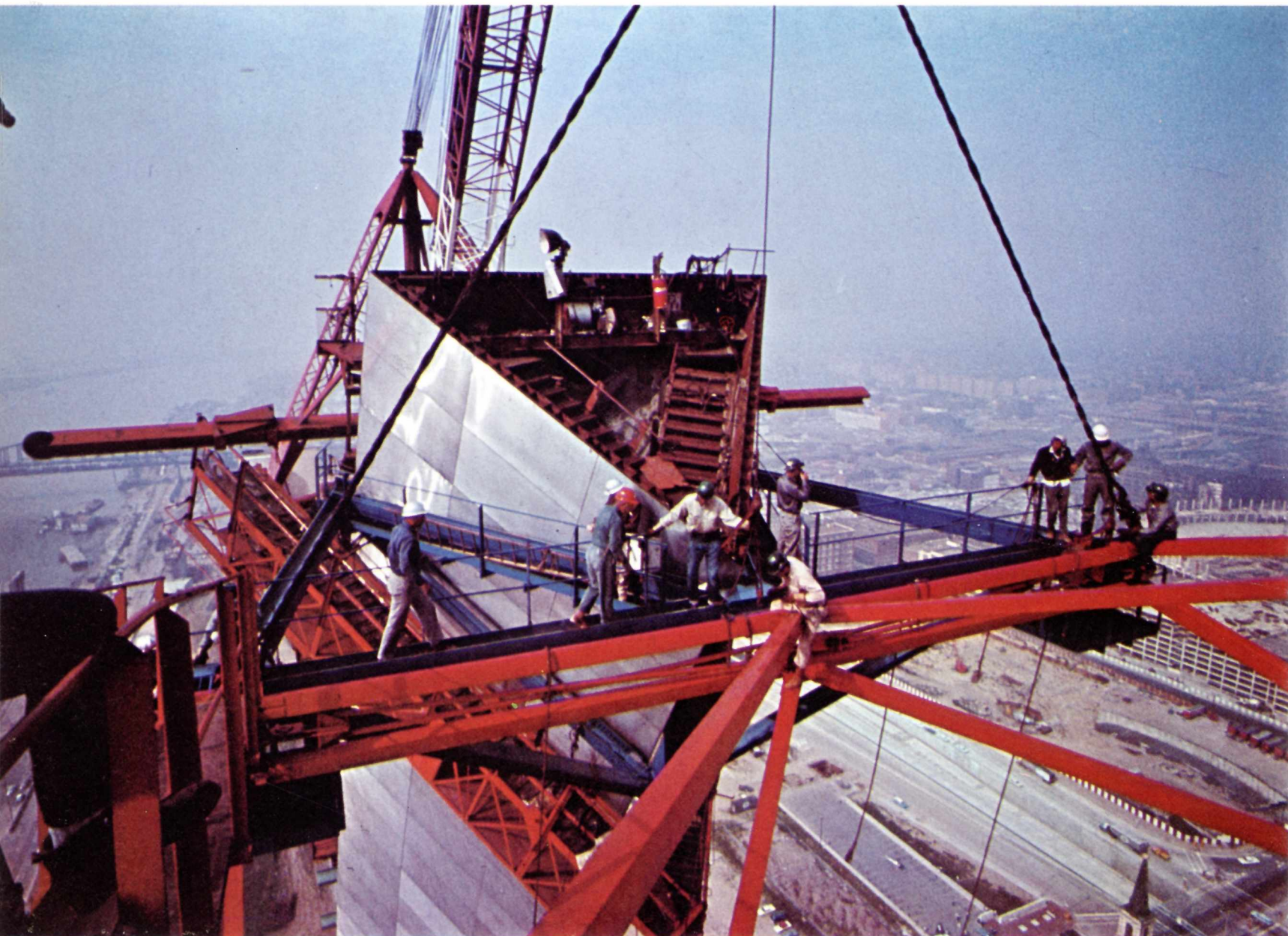
Despite the Arch's great height and comparatively small size at the top, extreme wind pressures will be hardly noticeable to visitors at the top. It is designed to withstand a wind load of 55 pounds per square foot, the equivalent of a wind with the velocity of 150 miles per hour. And even under this unlikely pressure the Arch would deflect in an east and west direction only 18 inches.



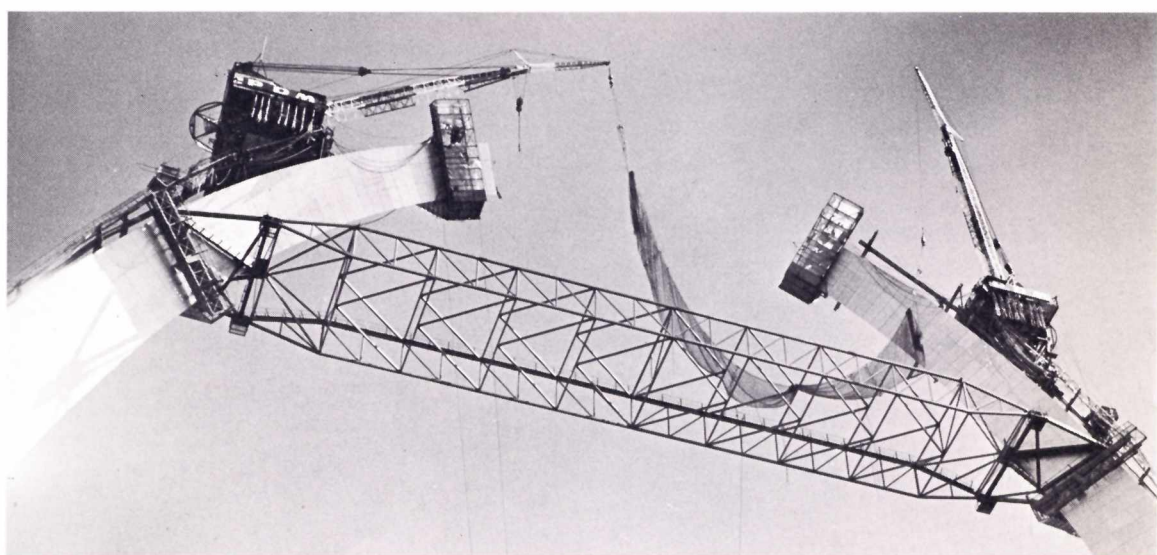
Gateway Arch from East Shore of the Mississippi River.



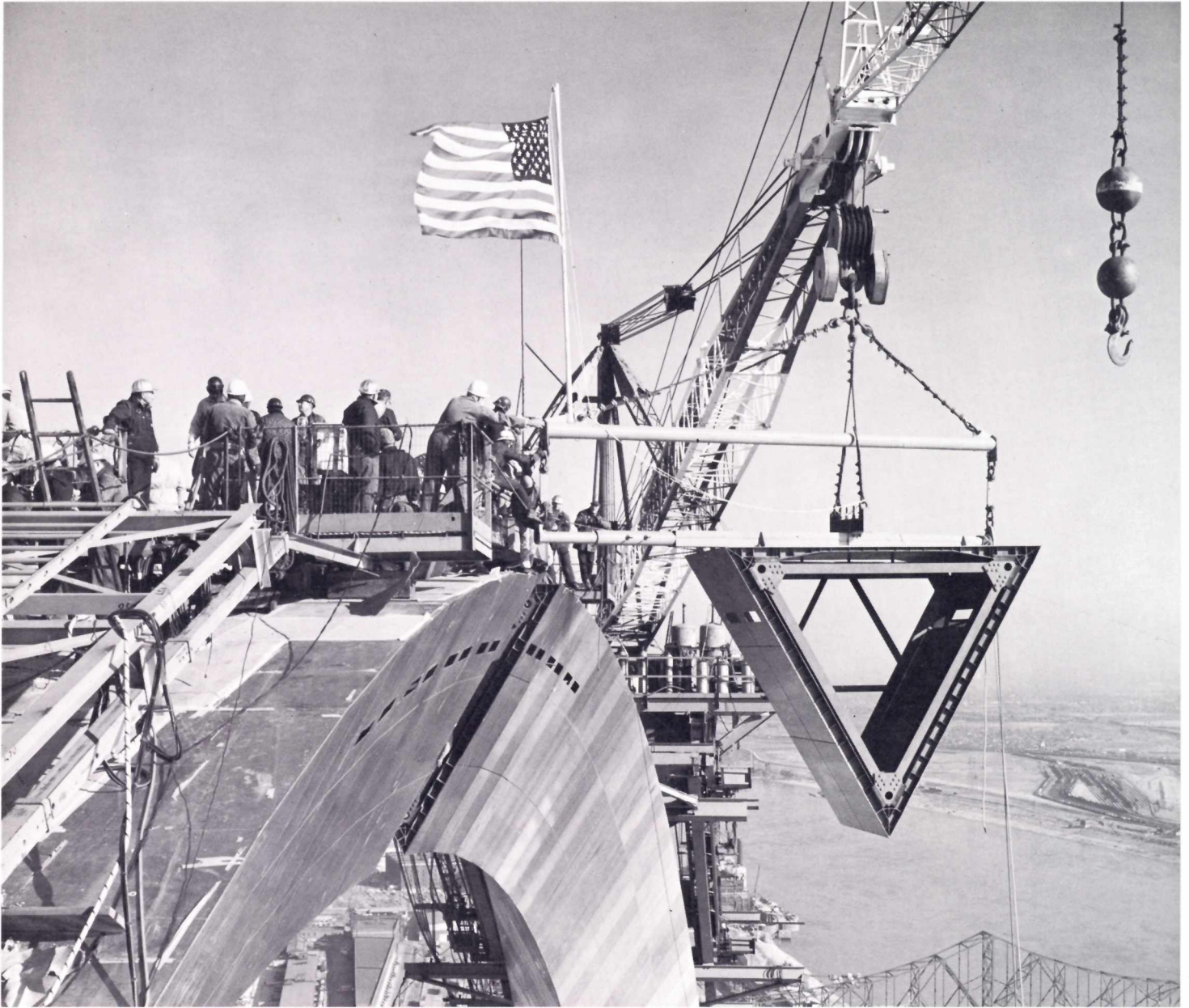
Concrete being poured to fill the void between inner and outer skins.



Attaching temporary strut to south leg of Arch.



Stretching safety net between the "legs" of the Gateway Arch.



The final section being eased into position.

One of the most interesting operations was that involved in setting the last section of the Arch in place. This occurred after the creeper derricks had climbed to the 610 foot level, by which time they were working on a near horizontal plane. A 80-ton stabilizing truss was installed between the two legs at the 530 foot level to support them until they should be joined.

After the next-to-last section was placed, only a 2-foot gap remained. Then jacks mounted on the top opened the gap to 8 feet to allow the last section to be inserted. When this was done and the jack pressure released, the natural thrust of the legs clamped the section in place. Once it was welded, the jacks and stabilizer truss were removed, and the creeper derricks lowered themselves down the tracks. As they went down, the derrick tracking was removed, the bolt holes repaired, and the stainless steel surfaces were polished.



Welding stainless steel sections together.



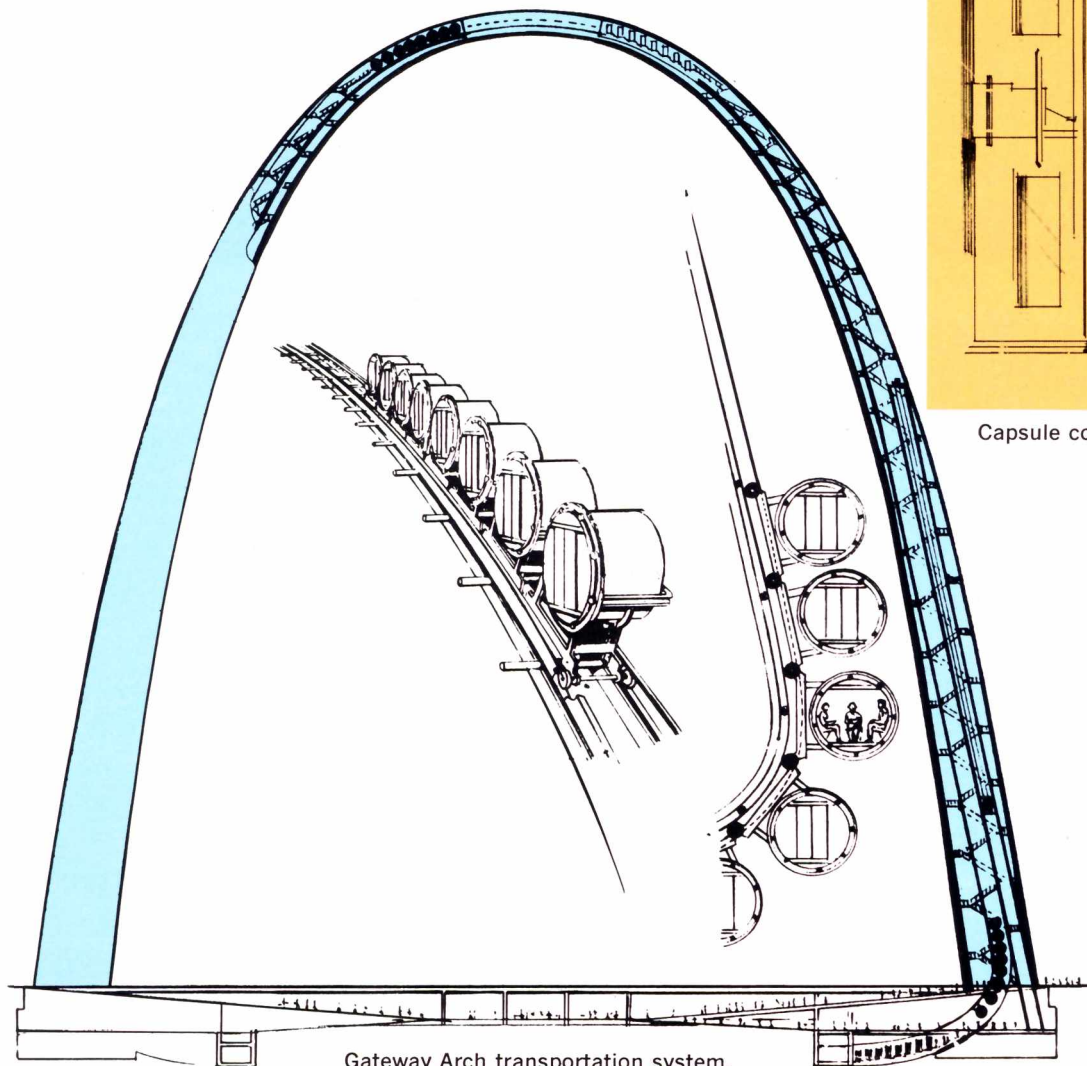
Size comparison — the Gateway Arch and other renowned structures.

Each leg contains a service stairway of 1076 steps from the visitor center below to an observation platform on top; also an eight-car transporter to the observation platform, and a service elevator to the 372-foot level.

The Gateway Arch is the nation's tallest monument, 75 feet higher than the Washington Monument. It would tower 180 feet over the Great Pyramid of Cheops in Egypt. There are only 16 buildings in the United States taller than the Arch, and the only taller non-functional structure in the world is the Eiffel Tower.



Capsule comfortably seats five people.



Gateway Arch transportation system.

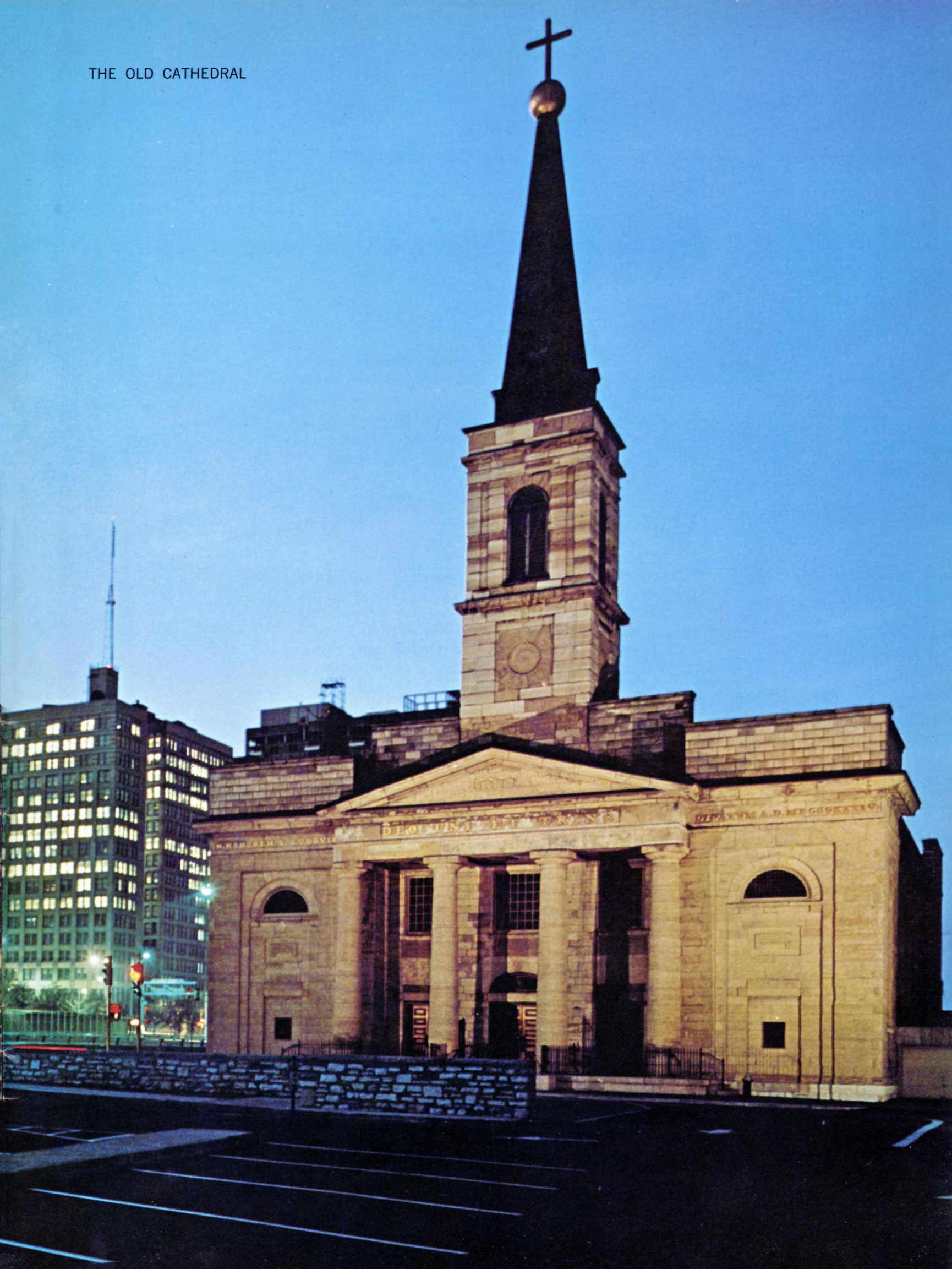




THE OLD COURT HOUSE



THE OLD CATHEDRAL



The Memorial as you see it now is an inspiring sight. The gleaming Gateway Arch, the majestic Old Courthouse, the two river overlooks, the railroad blending gracefully into its riverfront surroundings — these represent the flowering of a magnificent dream, but they are not the total achievement of the plan.

The Future

will include the vast Museum of Westward Expansion, focal point of the dramatic story of westward expansion; the Museum of River Transportation and the Museum of Rail Transportation, located respectively in the south and north overlooks; and landscape design to provide a proper setting for the gleaming jewel that is the Gateway Arch.

When all these things are achieved, the dream will be realized — and the Memorial will stand as a worthy monument to pioneer courage, and to the vision and tenacity of those who brought it into being.



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