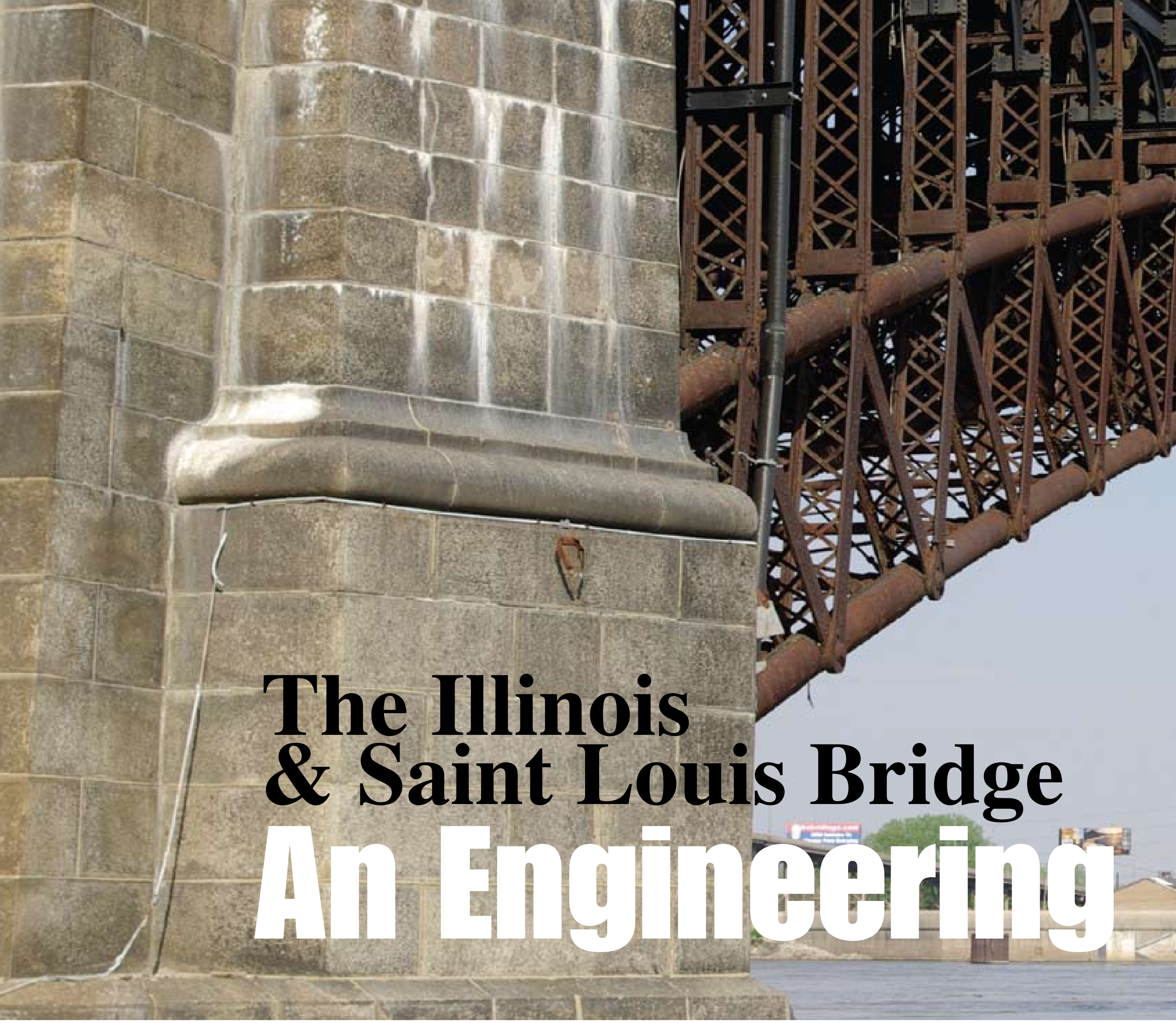


The Illinois & Saint Louis Bridge An Engineering

(Photo: C. W. Woodward, *A History of the St. Louis Bridge*, 1881, Western Historical Manuscript Collection)

By the end of the Civil War, accelerated westward expansion required better means of crossing the Mississippi River. The Chicago & Rock Island Railroad had already completed one bridge across the Mississippi in 1856, giving Saint Louis' northern competitors an added edge in building western commerce. Saint Louis businessmen, still reliant on the Wiggins Ferry to float rail cars across the river, started the process of building its own bridge just after the war and hired the Keystone Bridge Company, under the leadership of future robber baron Andrew Carnegie, as the construction firm; James Buchanan Eads (1820-1887) was to be the engineer designing it.

As early as 1842, Eads was known for his invention of a diving bell, which was used to retrieve the cargos of

steamboats that frequently sank because of snags in the river, or whose boilers had exploded. Thanks to his success at this enterprise, Eads was perhaps the most knowledgeable man in America about the Mississippi riverbed and currents. This, along with his friendship with Attorney General (and fellow Saint Louisan) Edward Bates, later relayed into government contracts to create iron-clad steamers for the Union during the Civil War.

Two years after the War, the Illinois and Saint Louis Bridge Company began work on the momentous project. Eads was able to use his diving bell (also called a caisson) to assist in the construction of pylons upon which the Mississippi bridge rested on bedrock. This helped prevent the problem of decompression sickness that resulted from workers rising too quickly from great depths. When the Illinois and St. Louis Bridge (later dubbed the "Eads Bridge") was completed in 1874, it was the longest arch bridge in the world at 6,442 feet.

Not long after the completion of the bridge, Eads was awarded another contract that set out to make the Mississippi navigable year-round near its mouth. By 1879, Eads succeeded in satisfying the U.S. Army Corps of Engineers and, as a result, became one of the wealthiest men in the United States.

What follows is an article originally published in 1871 in *Scribner's Monthly Magazine*, describing a visit to the next engineering marvel yet under construction.

— Paul Huffman

The St. Louis Bridge, later named for engineer James Buchanan Eads, as it appeared about the time of publication of this article in *Scribner's Magazine*. (Photo: C. W. Woodward, *A History of the St. Louis Bridge*, 1881, Western Historical Manuscript Collection)

The feeling of admiration with which one surveys the rapidly advancing work of bridging the Mississippi at St. Louis is blended with a certain poetic sadness—a sentiment excited by the contrast between the present and the past.

Twenty years ago this mighty river was mistress of the West; her levees were crowded with merchandise seeking transportation; and eager throngs, hurrying up and down the land, depended upon her aid in reaching their destination. A queenly superiority seemed to be the natural right of this noble river, and with her importance to the commerce of the country constantly increasing, it was supposed that no rival could possible appear.

But there was something of the usurper in the Mississippi, even from the first. People said her very name was stolen and that her magnificent claims were all pretence. They declared that the Missouri had the prior right to the homage paid to the Mississippi, because it furnished the greater volume of water pouring through this channel to the Gulf, and also gave its own color, its mud, and its fertilizing properties to the majestic stream.

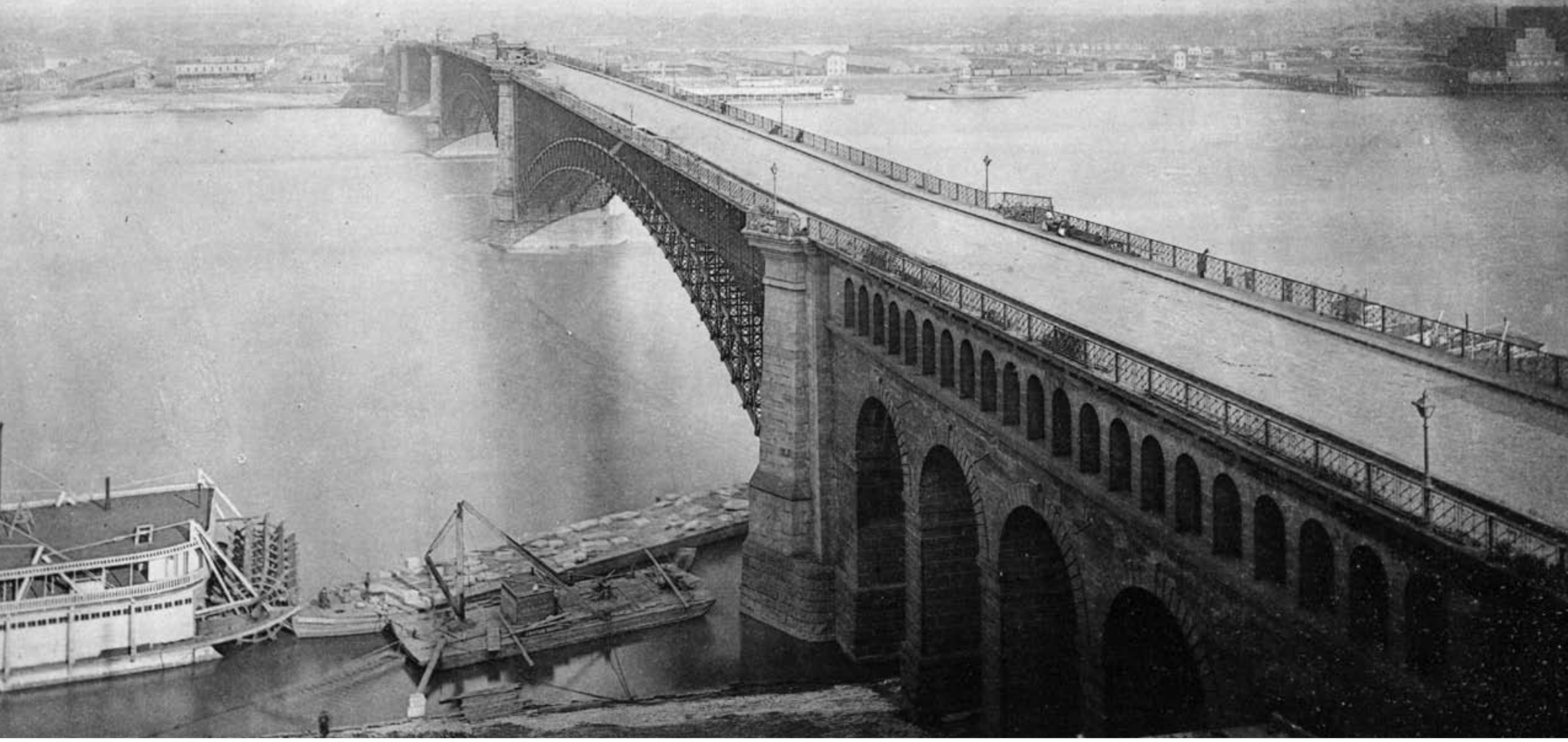
To all this the river in possession has never deigned to give an answer, but superbly rolling on her way, had exulted until now in her undisturbed supremacy. Sometimes, to show her power, she wrested a forest or a hamlet from its hold upon her banks; or turning uneasily in her bed, swept new channels for her course, regardless whether the being who made unrequited use of her energies, survived her pleasantries or perished in her remorseless arms.

This queenly river, however, happens to slow southward. Had her direction been east or west, her sway might have continued for a longer time; but Providence, by cutting out her course, cut short the term of her supremacy. Westward flows the stream of human life upon this continent. No highways leading north or south can possibly compete in the race for fortune with those tending towards the setting sun.

When, then, the Railroad appeared, running wherever it would, and able to overcome on land the resistance of gravity—not so easily mastered on the water—it at once became the autocrat of western transportation, overthrowing all rivalry, distancing all competition, and making the water-courses tributary to its advancing domination.

It was early seen that the struggle would be a stern one and that the river would yield only to the prowess of a master-mind; to find the man able and willing to cope with such an adversary, on the gigantic scale needed for the consummation of a permanent success, was no easy task. At last, fortunately, the choice was made of Chief Engineer James B. Eads.

The country is already indebted to his skill and perseverance for many important works. He built the vessels "Benton," "Baron de Kalb," "Cincinnati," and others used so effectively by Admiral Foote before the fight of the Monitor and Merrimac. Afterwards, he constructed 14 ironclads for the United States and had invented various improvements in naval and military defenses. He was the first man in Europe or America to devise successful means for operating heavy ordnance by steam. Mr. Stevens of Hoboken devised a means, never since used, for sponging and loading the gun by steam, the muzzle being turned down to a hood on the deck, thus bringing the bore in line with a steam cylinder beneath the deck, the piston of which carried the sponge or shot into the bore of the gun. Mr. Ericsson, by the rotating turret, trained the guns by steam; but in the turrets designed by



The upper roadway of the recently completed bridge looking east, c. 1874. (Photo: C. W. Woodward, *A History of the St. Louis Bridge*, 1881, Western Historical Manuscript Collection)

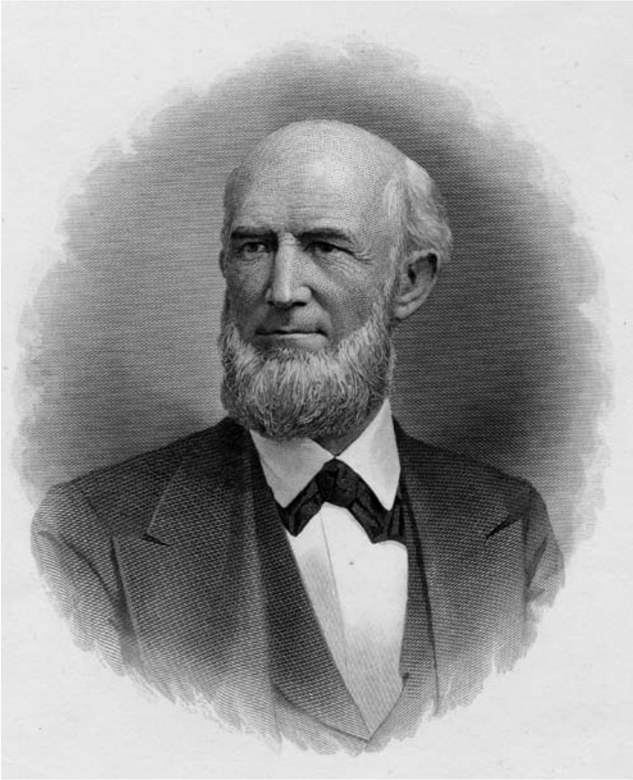
Captain Eads, not only was this done, but the guns were lowered below deck for loading, raised again for firing, run into the ports, and the recoil checked, all by steam, and so rapidly that 2 eleven-inch guns were each loaded and fired every 40 seconds in each turret. The government is today making trial of a gun-carriage, of novel construction, invented by Captain Eads, generously allowing him to pay the cost of the carriage if it fails, with nothing but reputation as a reward if it succeeds.

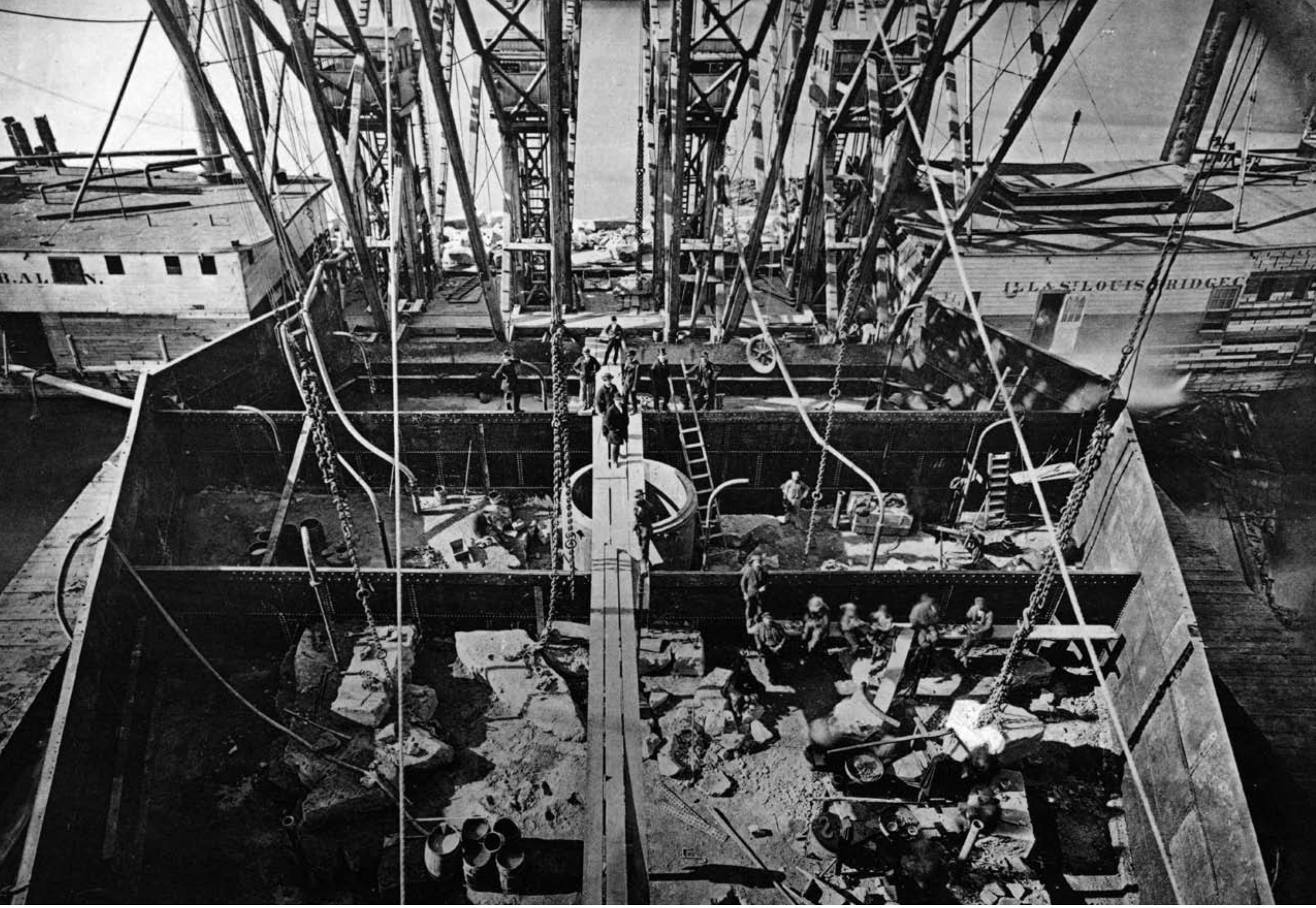
When Capt. Eads visited Europe after the war, with a Government Commission to examine naval construction, he was most cordially received by Count Bismarck and General von Roon, the Prussian Minister of War; and commissions of officers visited his apartments to examine his models. Many of these officers have distinguished themselves in the late war. To show the difference between French and Prussian military management, it may be mentioned that when the Captain was at Paris, although Mr. Dayton, our minister to France, informed the Imperial authorities of the arrival of plans and models of such importance, they merely replied that if the inventor would carry them to a certain office, a report would be made upon them. Of course, no notice whatever was taken of this ungracious answer to a most generous offer on the part of the owner of the inventions, who had no idea of acting the part of a vendor of patent rights.

Having, then, introduced our readers to the Chief Engineer, to who they will be mainly indebted for the pleasure and information given in the remainder of this article, let us step aboard a tug with the Captain and steam out from the west shore of the Mississippi to see what has thus far been done in the great work we are considering.

Three problems are to be solved in carrying out the gigantic scheme. The first is a question of engineering

James Buchanan Eads started his career on the Mississippi salvaging sunken steamboats, and designed ironclad riverboats during the Civil War. When the bridge was completed, Eads probably knew more about the Mississippi and its patterns than anyone alive. (Photo: C. W. Woodward, *A History of the St. Louis Bridge*, 1881, Western Historical Manuscript Collection)





Construction of caissons allowed Keystone Bridge Company, the construction company hired to build Eads' design, to reach all the way to bedrock below the riverbed. Here, workers are sinking the east abutment, laying masonry on the floating caisson. (Photo: C. W. Woodward, *A History of the St. Louis Bridge*, 1881, Western Historical Manuscript Collection)

skill: How can the bridge be constructed so as to overcome the obstacles presented by the width, depth, and shifting sands of the great river? The second is a question of commercial importance: How can the bridge be made to accommodate the greatest amount of transit, at the same time obstructing navigation as little as possible? The third question is financial: How can this bridge be built so as to pay the largest dividends to stockholders?

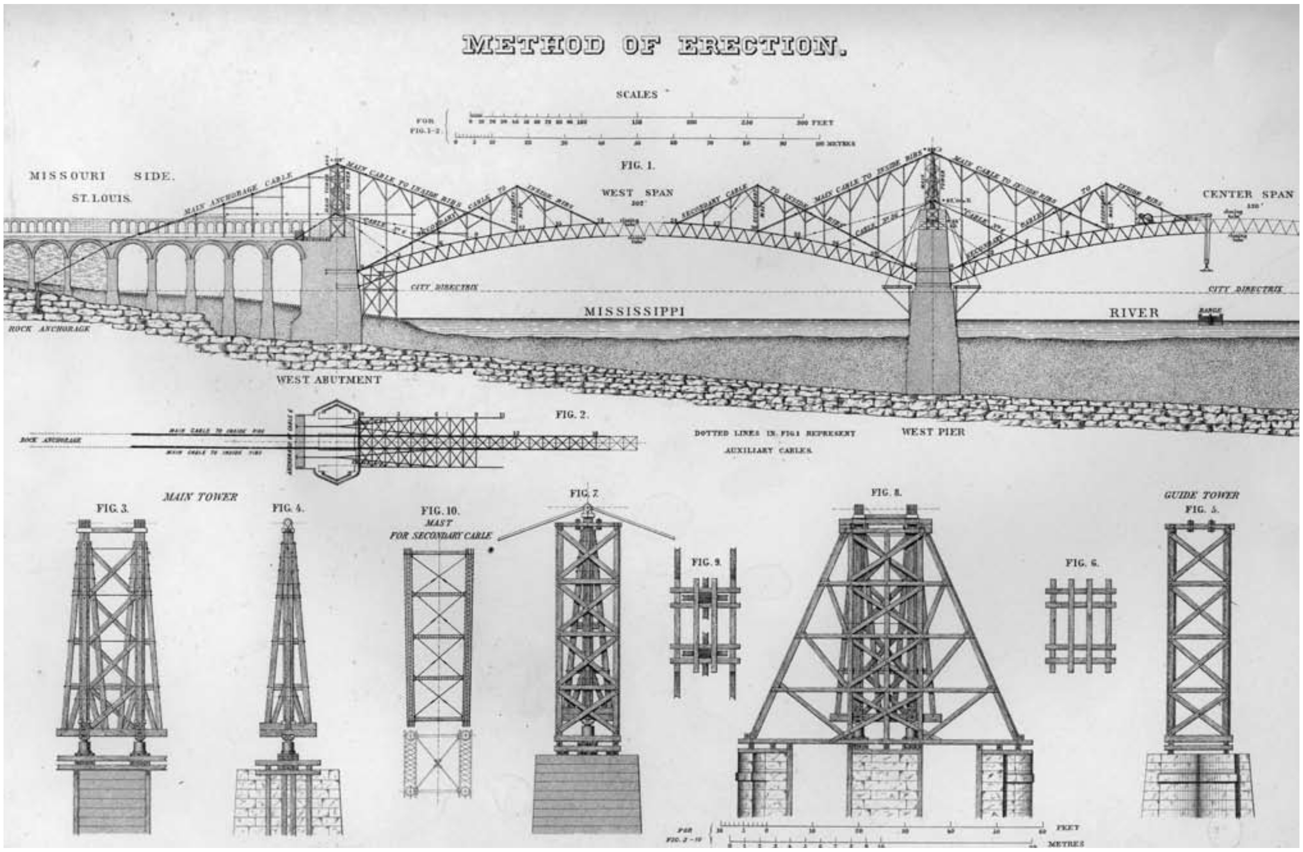
As we are not, however, to attempt a problem in Euclid, but only to take a pleasure excursion of an hour, picking up such information as we can by the way, we will answer the above questions by looking at, rather than by computing the scientific data of the structure, taking as a sample of the whole, the pier on which the little tug now lands the party, ladies and all.

This pier (of which you have a view in the accompanying picture, from a photograph taken Sept. 20, 1870) looks modest enough as it rises out of the river, now as placid as a lake. But let us see what it costs of brain and courage and life to achieve this work.

There are to be two piers in the stream and two abutments. The height of the eastern pier, when completed, 10 feet above low-water mark, will be 97 feet and that of the other, 69 feet above the rock. About 78 feet in depth of sand will be encountered in sinking the one and 50 feet in the other, with about 20 feet of water on the site of each pier. The base of each pier is 82 feet long—the eastern being 60 feet wide, and the other 48 feet wide. The larger one will cover an area of 4,020 square feet and the other 3,360 square feet.

Glancing at the drawing of the "Section of east pier and caisson," the reader will be able to follow a brief explanation of the magnitude of the enterprise.

A coffer-dam, or diving bell is constructed and floated to the place where the pier is to be built. This coffer-dam is to be loaded above the water with the masonry for the pier and is to be allowed gradually to descend to the bottom of the river, carrying with it the superstructure which is to form the pier. In this way, all the stone for the structure is laid in cement above the water and is kept from the water, till the pier is finished by iron water-tight sides extended above the water as the floating pier sinks deeper and deeper, with its increasing burden of stone and cement. The gradual descent of the pier is managed by screws, supported on false works, erected around and over the site of the pier.



Engineer's detail drawings of bridge construction. (Photo: C. W. Woodward, *A History of the St. Louis Bridge*, 1881, Western Historical Manuscript Collection)

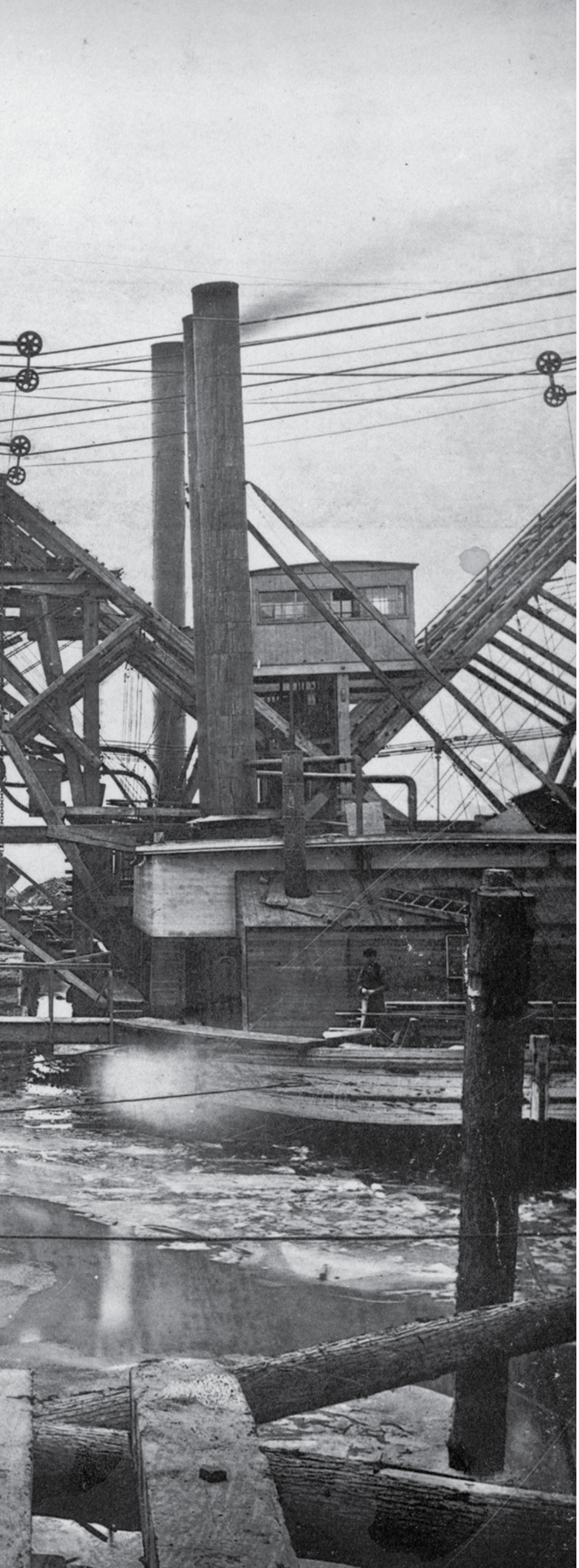
It is intended that the pier shall sink clear through the sand, to the rock bed of the river. When the sides of the caisson touch the sand, that sand must be removed in order to let down the pier. This is done by sand-pumps, which carry off the sand as fast as men in the air-chamber can shovel it to the mouths of the tubes. For these operations, as well as for others of which we shall soon speak, it is necessary to provide tubes through the masonry, leading down into the air-chamber, for the passage of the workmen; and also through which air may be forced to expel the water from the chamber; and eventually by which the sand may be pumped out. These tubes must have airlocks or valves in them, to be closed behind the workmen and materials in their passage, to prevent the escape of the compressed air in the chamber.

With these explanations given you by Captain Eads, as you stand on the pier, you are prepared to descend down the "Main Entrance Shaft." You go down a winding stairway, and experience little inconvenience until you enter the air-valve where, if the compressed air from the air-chamber is let out rapidly, you will feel a painful pressure in one ear or both. If this is your first visit, it may be 15 minutes before it will be safe to let you pass into the air-chamber where the men are at work; but by gradually admitting the compressed air, no permanent ill effect will be received.

If the painful pressure continues more than an instant after entering the valve, you will be told to close the nostrils between the thumb and finger, shutting the lips tightly, and inflating the cheeks, thus opening the Eustachian tubes and equalizing the pressure of the inner and outer surfaces of the tympanum. These tubes are a provision of nature to relieve the ears of such barometric changes as occur in the atmosphere in which we live, but are too minute to meet an unusual outer pressure of air with a counter-current of air from the lungs. But passing through the airlock you can remain safely in the air-chamber for a considerable length of time. These air-chambers, even after they had reached the bed-rock, 60 to 80 feet below the surface, were visited by thousands of persons, including many delicate ladies, without any of them experiencing the slightest ill effects from the pressure.

It is, however, somewhat startling to find one's self so far underground, in a dim light, with the consciousness that too long a visit would turn this chamber into a tomb. About 30 workmen, out of 352 employed in a single air-chamber, were affected with more or less muscular paralysis; and 12 cases out of the 30 proved fatal. Nearly or quite all of these deaths happened to men unaccustomed to the work; several of them to men who had worked but one watch of 2 hours.


OMEGA



Sinking of the west pier; note the ice breaker in the foreground. (Photo: C. W. Woodward, *A History of the St. Louis Bridge*, 1881, Western Historical Manuscript Collection)

Down in this dungeon, 9 feet high, and which, filled with concrete, by and by, is to be the base of the solid pier, you will see some very startling phenomena. Blow out the flame of a candle and it immediately returns to the wick. At the depth of 100 feet, candles are consumed in about three-fifths of the time required in the open air. Large quantities of smoke are emitted from the flames; and the air is filled with particles of floating carbon, which can only be thoroughly removed by placing a rose-jet on the nozzle of a water hose in the chamber and discharging the spray in every direction.

There is great difficulty in extinguishing fire in an atmosphere of such density; and the clothing of one of the men, although of a woolen fabric, having on one occasion taken fire, it was exceedingly difficult to quench the flame. A kind of glove has therefore been invented by which a candle will burn under the normal pressure of the atmosphere. Another curious phenomenon, observed at 108 feet below the surface, is the reappearance of flame, by placing the unquenched sparks of two wicks in contact, when separately, each fails to possess sufficient heat to restore the flame. One is pleased to hear, in the midst of these unusual appearances, the familiar click of the telegraph, putting the solitary band of men, working far under the bed of a mighty river, in connection with the outer world. The wires communicate with the derrick-boat and central office in St. Louis, so that directions can be given to the workmen; and progress reported by them at any instant.

But retreating from this somber visit to the lower depths, somewhat after the fashion of the ascent one makes in crawling up into the ball of St. Peter's at Rome, and feeling a little exhausted as the passage through the air-valve is made, we climb the stairway, glad to know that a "lift" is to be put into the east abutment pier to avoid the labor of walking up a circular stair of 120 feet in height. This, it is believed, will greatly relieve the workmen from the exhaustion consequent upon the change from a pressure of air of 45 or 50 pounds extra to that of the natural atmosphere.

We now stand under the open sky, resume our ordinary self-assurance, and, considerably elated (especially the ladies) with our experience underground, listen submissively as Captain Eads explains the derrick-boats and the operation of their immense traveling gear stretching high above our heads. This is tame business compared with the descent into the shades below, and yet the machinery for this part of the enterprise is as wonderful in its complications and adaptations as that of any other portions of the work. The accompanying representation of the construction works and machinery for sinking the caisson and laying the masonry of the East Pier will give an idea of the process.

Here you see the caisson in position; the guide piles driven into the sand to steady in its descent; derrick boats moored on either side, having engines for working the machinery and driving the air- and sand-pumps. Outside these derrick-boats barges are lying with the stone on board.

Frameworks 50 feet high support, as you observe, strong wire cables along which "travelers" with wheels are arranged to run for hoisting and transporting the stone. In the picture, the "traveler" on the right is just lifting a block of granite; the one on the left is depositing a block on the roof of the caisson; and the beauty of the thing is, that a single man, stationed in one of those small cabins above the derrick-boats controls the "traveling" process by which 12 stones, each of 7 tons weight, can be raised and placed in position at one and the same time. An average of 10,000 cubic feet of masonry can be laid in a day. Three minutes only are required to make fast to the largest stone on a barge and to place it in the hands of the mason over the spot that it is to occupy in the pier. These "travelers," 24 in number, employ 14,780 feet of wire rope in this work.

A complete picture of this machinery is given in the annexed view of the construction work of the East Pier, from a photograph taken in August of last year.

The sand-pumps, used for removing the sand from the caissons as the piers descend, must not be forgotten. They are of a simple but novel and ingenious construction, never having been in use before.

One of these, of 3-inch bore, discharges 10 cubic yards of sand in an hour; and gravel stones 2-1/4 inches in diameter are discharged by it with as much facility as sand. A stream of water is forced down through one pipe and caused to discharge near the sand into another pipe in an annular jet and in an upward direction. The jet creates a vacuum below it, by which the sand is drawn into the second pipe or pump, the lower end of which is in the sand. The force of the jet drives the sand up to the surface as fast as it enters the second pipe.

The superiority of this pump consists in the fact that the requisite supply of water for keeping the sand in a fluid condition is constant, while the suction-pipe is inserted directly in the sand. It is scarcely possible for the pump to become clogged; and it works admirably, even with the end of the pipe 19 feet deep in the sand.

After witnessing the satisfactory operation of the derrick-boats and the sand-pumps, the only item left about which to ask for information is the method of filling up the air-chamber after the structure has reached the rock-bed. The whole pier must be solid, and the method of making it so is simple enough to be readily explained. Of course, it is understood that the air-chamber is of immense strength, braced and girded in every part, with a roof of iron plates half an inch thick, and strong timber girders, intended to rest upon the sand or rock, to support the roof from below.

As soon, then as the iron edge of the caisson (projecting downwards a little below its wooden interior walls) has struck the rock, the space remaining between these wooden walls and the rock is thoroughly concreted. The chamber is then ready to be filled up. In the channel piers, the rock was cleared of sand; and layers of concrete 9 or 10 inches in thickness were placed directly upon it. The closing courses under the roof of the chamber were stoutly rammed in place, and then the air-locks and finally the shafts were filled with the same material.

But for the east abutment pier, the necessity of this very tedious process was obviated by using sand instead of concrete for filling the air-chamber. The wooden walls of this chamber are strong enough to resist the pressure of the sand with which it is to be filled, even should the iron used in its construction corrode entirely away. The sand upon the outside also exerts a counterbalancing pressure, it being scarcely possible that the sand surrounding this pier should ever be scoured away by the action of the stream.

To make the filling of sand compact, the air in the chamber is allowed to escape and water is introduced, after which sand is shoveled down through the vertical shafts or pipes; when the chamber is nearly full of sand and water, the air is again forced in, expelling the water and enabling the workmen to go down and fill the remaining space with concrete, ramming it under the roof of the chamber. When this is done and the shafts and pipes filled up, the whole thing is as solid and substantial as if built of granite from the top to the bottom. Nothing but an earthquake will be able to dislodge the massive structure from the rock on which it rests.

Just at this point the younger members of the party descry the camera of a photographer, at work 60 feet above water from a frame-work on the shore. They immediately climb the frame-work and get a bird's-eye view of the caisson of the east abutment, on which our party is assembled.

We give the result of the photographer's skill in the accompanying cut. It allows you to look down upon the top of the pier in process of construction. You see the iron-plated walls of the caisson, the large round entrance of the main shaft, the projecting ends of the tubes for the sand pumps, and the India-rubber hose and wire tubing, conducted over several wheels, conveying the compressed air from the air-pumps on the derrick boats to the air-chamber of the caisson. You will also observe several blocks of stone just lowered into place at the end of iron chains. The workmen, seated on a long board, having come up to lunch in the open air, do not look as if they have suffered very severely form their subterranean (or rather "subfluvial") exploits. But lest it should be supposed that these operations, described so easily on paper, are as easy in practical performance, let Captain Eads give a brief chapter of his experience, before we leave the piers to speak of the other parts of the work on the bridge.

"This is a very fickle and unstable stream," said he. "I had occasion to examine the bottom of the Mississippi below Cairo, during the flood of 1851, and at sixty-five feet below the surface, I found the bed of the river, for at least three feet in depth, a moving mass, and so unstable, that in endeavoring to find footing on it beneath my diving bell, my feet penetrated through it until I could feel the sand rushing past my hands, although I was standing erect at the time." He added, "About thirty-three years ago a steamboat, the ‘America,’ was sunk one hundred miles below the mouth of the Ohio; an island was formed on it by the deposits of the river, and a farm established on the island. Cotton-wood trees grew there, and became large enough to be cut down and sold for fuel to the passing steamers. But two floods removed every vestige of the island, uncovering the wreck of the ‘America,’ and leaving it forty feet below low-water mark. When the wretch was recovered, about thirteen years ago, the main channel of the Mississippi was over it, and the shore had receded from it, by the abrasion of the stream, nearly half a mile.”

To deal with such a fickle, headstrong antagonist is no child’s play, as the bridge company found out to their cost in two instances. In one case, the sand was scoured away outside the caisson, causing the sand inside (put there to equalize the pressure) to burst the walls; and in the other case, the strength of the current forcing out some bolts, the friction of the sand prevented the dam, with the pier, from settling properly in its place.

These disturbances, which were disastrous, owing to the failure of a contracting party to deliver granite in time, were indulged in by the river, at a cost to the company of not less than $50,000. Another habit of the river, of impinging upon any disagreeable obstructions with a battering-ram of ice, extending upstream a good many miles towards the Arctic regions, has proved a source of inconvenience to the company. This way the river has of trying, when chilled through, to get to a warmer climate has made it necessary to construct enormous breakwaters, having ice aprons of strong oak timber to protect the work at the channel piers.

Even at the banks, difficulties of a tedious and perplexing sort were encountered, especially at the site of the west abutment. This site had been for over 60 years a part of the steamboat wharf of the city; and all sorts of useless material had been thrown from the boats, forming a deposit averaging 12 feet in depth over the rock. Old sheet iron, grate-bars, parts of smoke-stacks, stone-coal, cinders and clinkers, formed the mass at the bottom, over which the hulls and machinery of two steamers, burnt in 1849, lay imbedded in the stones and rubbish from the city, with which a few years ago, the authorities had widened the wharf at this place.

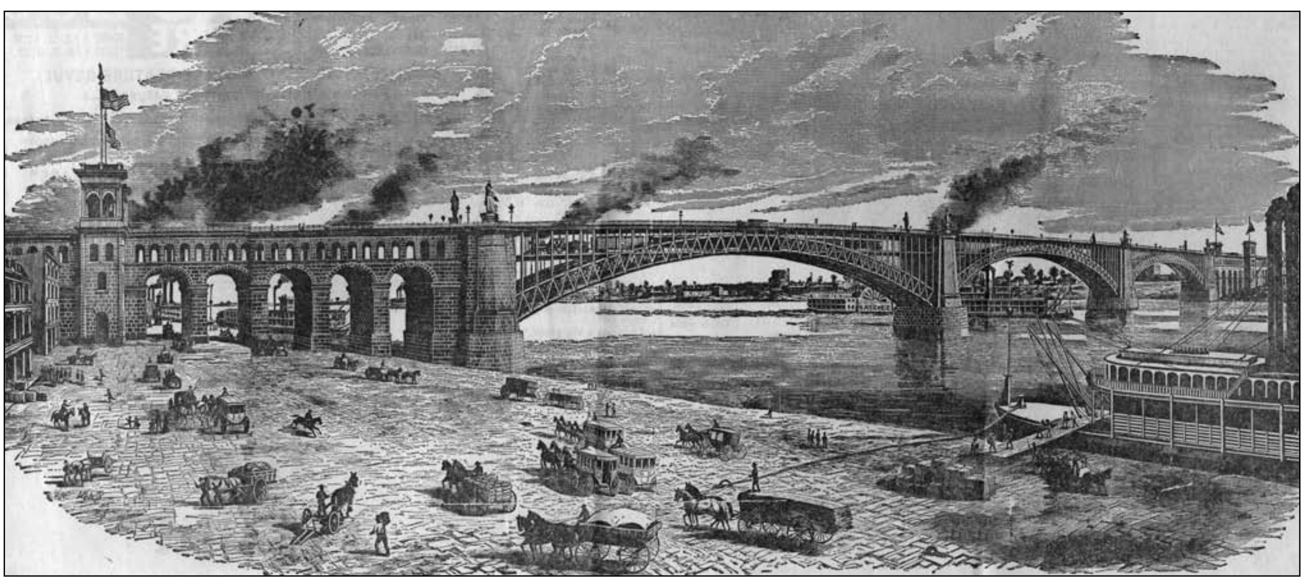
The coffer-dam, constructed to enclose this site, had to be put down through these obstructions; oak beams armed with huge steel chisels were forced down by a steam pile driver, and then withdrawn to allow sheet piles to be driven down permanently.

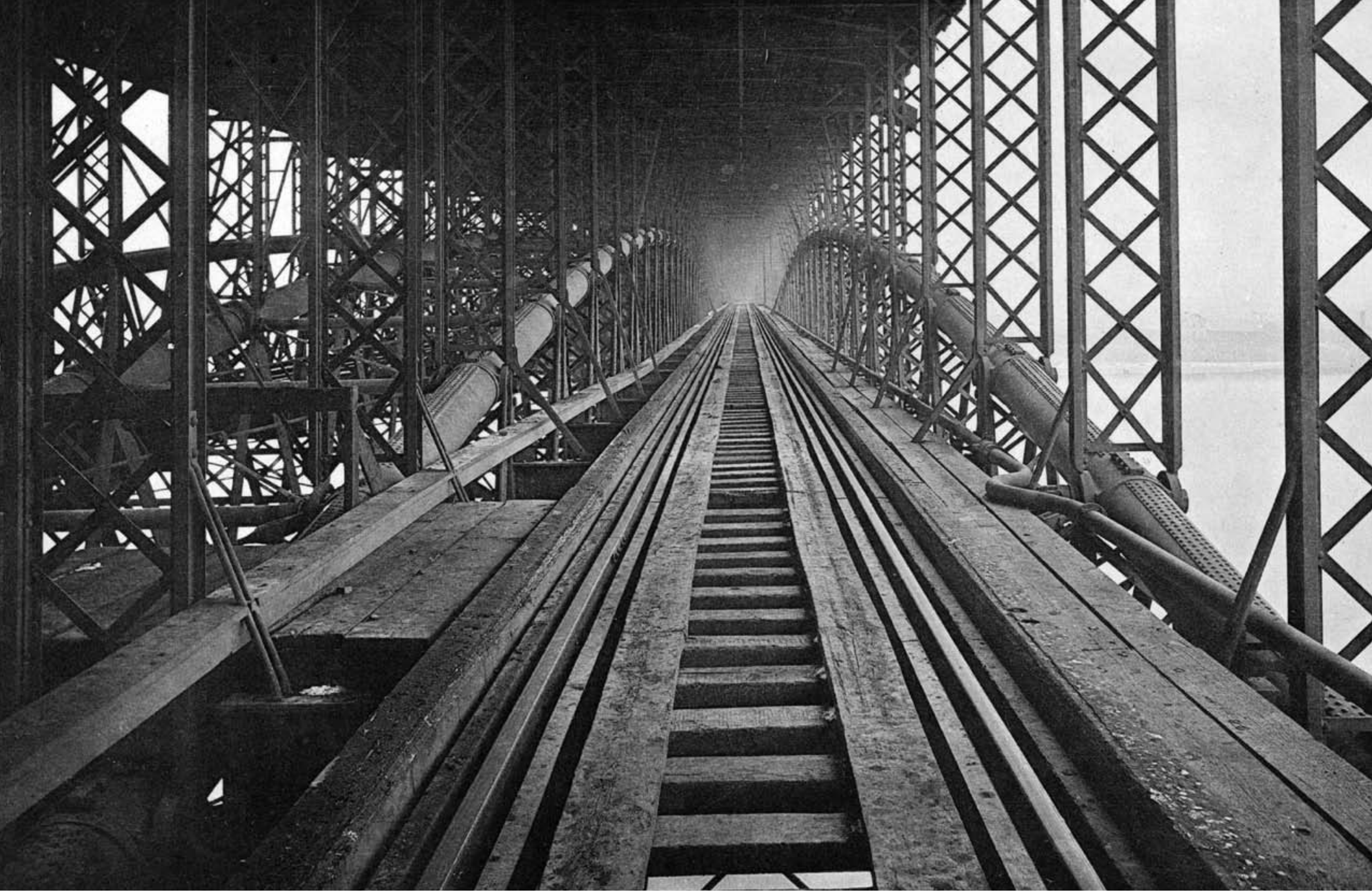
The first attempt only served to make a good enclosure for the water to enter, and a double course of sheet-piles was needed to make the dam at least water-tight. Even then the structure proved to have its foundation on a water-wheel of one of the wrecks (the crank of an engine, attached to the head of the shaft of the wheel, being just within the enclosure), as if the old forces, fast losing ground before the swifter mode for railway transportation, were making a last attempt to hinder the triumph of the rival power. The excavation, as it progressed, unearthed wrecks of barges of a kind in use before steam was employed, which thus joined in the efforts of submerged machinery to delay the work.

But resistance was in vain; and now underneath that mass of masonry (of which you have a view in the picture of the western abutment), lies the iron driving-beam of the last steamboat that will ever dare to contend for the inland supremacy of the paddle-wheel over the iron track.

We now turn to an imaginary sketch of the completed structure. In the drawing, stretching up and down the page, you have a general view of the great work as it will be, it is hoped, within a year.

The newly opened St. Louis Bridge was portrayed as the pinnacle of progress, complete with commerce on the levee, people gathering, and belching smokestacks. (Photo: C. W. Woodward, *A History of the St. Louis Bridge*, 1881, Western Historical Manuscript Collection)





The railroad platform as seen by the railroad engineer driving across the bridge; today, this level is used by Metrolink. (Photo: C. W. Woodward, *A History of the St. Louis Bridge*, 1881, Western Historical Manuscript Collection; Photo: Christopher Duggan)

The bridge as you perceive, will have 3 spans, each formed with 4 ribbed arches made of cast steel. The center span will be 515 feet, and the side ones 497 feet each, in the clear. The form adopted for the spans is what is usually termed the ribbed arch. You observe 2 curved members or ribs, to each arch, extending from pier to pier. This double rib arrangement enables the arch to preserve its shape, under all circumstances of unequal pressure upon its parts, while obviating the necessity of a spandrel bracing. A moving load has no effect on the curve of this double arch, however unequally distributed its weight may be.

The upper roadway (as seen in the engraving), is for carriages, horse-cars if desired, and foot passengers. It is 50 feet wide between the railings, the roadway being 34 feet wide and the foot-walks each 8 feet wide.

The railway passages below the carriage-way will be each 13 feet 6 inches in the clear and 18 feet high and will extend through arched openings of equal size in the abutments and piers. The railways will be carried over the wharves on each side of the river on 5 stone arches, each 20 feet wide and will be enclosed throughout this distance by a cut-stone arcade of 20 arches, supporting the upper road way.

After passing over those stone arches, the railways will be carried through the blocks between the wharf and the third street parallel to it, on brick arches, into a tunnel.

The city of St. Louis rises from the river to a considerable elevation, affording an excellent opportunity to tunnel under that portion of the city which fronts on the levee to a more central part where, in a depression, will be built an immense Union Depot.

On the Illinois shore, the railways will curve off to the North and South, immediately after crossing the last one of the stone arches; and with a descending grade of 1 foot in 100, extending about 3,000 feet and supported on trestle-work a part of the way, they will reach the grade of the railways on the Illinois side. The carriage road will begin to descend with a grade of 5 feet in 100, at the eastern end to the bride, immediately after the railway tracks curve away from the latter; and on the Missouri side, the carriage-way will be continued on a level grade over the railway tracks from the bridge to the third street of the city parallel with the river.

These details are necessary to give our readers an idea of the completed work; and here we finish our answer to the engineering problem: "How can the bridge be constructed so as to overcome the obstacles of the breadth, depth, and shifting sands of the mighty river?"

The remaining commercial and financial problems are more easily disposed of, at least on paper, and not having any stock invested in the enterprise ourselves, we go gaily back to the engineer's office to look over some statements and figures, that we may give our readers the results in a brief and compendious form.

Let us stand, however, for a few moments, on the wharf of the western shore of the Mississippi and take a general survey of the work. Our readers can follow our description by the aid of the picture. On the opposite Illinois shore are seen the depots of several railways, a couple of hotels, and the woody landscape beyond. In the stream are the derrick-boats, machines, and breakwaters, marking the positions of the piers. On this shore, that which seems to an Eastern eye a beach, with gangways resting upon it near the water's edge, is the St. Louis wharf, or levee. On a busy afternoon, at any other season but winter, across these gangways porters may be seen carrying boxes and bales, while passengers are embarking on the scores of steamers advertised to sail promptly for every landing on the river, but seldom getting off within a day or two of the appointed time.

This drawing depicted the future of progress for St. Louis, with horse-drawn wagons on the top level and a locomotive on the bottom, removing the need for ferries across the river. (Photo: C. W. Woodward, *A History of the St. Louis Bridge*, 1881, Western Historical Manuscript Collection)