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Contributions

Rolling Lift and Trunnion Bascule Bridges.

The Scherzer Rolling Lift Bridge Co., } Chicago, July 14, 1902. }

TO THE EDITOR OF THE RAILROAD GAZETTE:

The Railroad Gazette of the 11th inst. contained an illustration showing a general plan of the Clybourn Place trunnion bascule bridge, Chicago. In the article on the same page referring to this bridge it is reported, after mentioning the fact that the plans of the bridge were prepared by the engineering department of the City of Chicago, that "before preparing the design a committee appointed to submit plans made a careful study of the information on movable bridges of the United States and Europe, and decided on the trunnion bascule type as more fully meeting the requirements from a scientific, economical and practical standpoint than any other available type."

This untrue and sweeping statement is injurious to our business interests because of the wide circulation and high standing of the Railroad Gazette, both at home and abroad, and we hope that you will give equal publicity to the following statement of facts:

The only committee in connection with the Clybourn Place bridge that we know of was one which, we are informed, was composed of Messrs. E. L. Cooley (brother of Lyman Cooley), Ralph Modjeska and Byron B. Carter. From a report of the action of this committee as contained in the Engineering Record of July 2, 1900, it appears that this committee was appointed by an official of the present Chicago city administration to pass only upon the plans prepared by its appointed city engineer, Mr. John Ericson, and that these plans consisted of three designs of trunnion bascule bridges prepared under his charge.

This report does not mention any other type of bascule bridge than the trunnion bascule bridge, and we believe that this committee did not pass upon the comparative "scientific, economical and practical" values of other types of bascule bridges. We did not receive notice of the appointment or meetings of this committee, nor were we ever invited to attend or be represented at any of its meetings.

If, however, a committee claims, as reported in the article in the Railroad Gazette, that it has made a careful study of the information on movable bridges in the United States and Europe and decided on the trunnion bascule type as "more fully meeting the requirements from a scientific, economical and practical standpoint than any other available type," then such committee has ignored many prominent successful existing movable bridges, well-known facts and public records easily accessible. The ability of such a committee to hold a position of trust and render a final decision settling a subject of such great importance to all governments, municipalities and railroad companies must be questioned.

The Scherzer rolling lift or bascule bridge was invented, patented and used nearly 10 years ago because the trunnion type of bascule bridge was inadequate to meet the requirements of the Metropolitan Elevated Railroad of Chicago. The Scherzer rolling lift bridge is more modern, scientific, economical and practical than the trunnion bascule bridge.

1. The trunnion bascule bridge is not the most scientific movable bridge. The reasons are so numerous that we can mention only a few of them.

A. Fundamentally the great sliding friction of the trunnions of the trunnion bascule bridge is unscientific as compared with the virtual absence of friction of the large rollers of the Scherzer rolling lift or bascule bridge. This is especially valuable in a movable bridge because of the large masses or weight to be supported and rapidly moved.

B. The trunnion bascule bridge does not move back from the waterway when it is opened. It, therefore, requires a longer span than the Scherzer rolling lift bridge in order to provide an equal width of clear channel for navigation. The Scherzer rolling lift bridge provides the maximum width of clear channel for navigation with the shortest possible span because the Scherzer rolling lift bridge moves back and away from the channel when it is opened.

This advantage of the Scherzer rolling lift bridge has a large, economical and practical as well as scientific value over the trunnion bascule bridge. Every foot saved by a reduction of span of a movable bridge means a large saving in structural steel, counterweight, machinery, operating equipment and substructure, and consequently in the cost of the bridge.

Because the Clybourn Place bridge is a trunnion bascule bridge it requires a movable span 18 ft. longer than a Scherzer rolling lift bridge, giving the same width of clear channel. This advantage of the Scherzer rolling lift bridge alone would save more than \$25,000 on the cost of the Clybourn Place trunnion bridge.

C. The Clybourn Place trunnion bridge is a through bridge and has large, deep and very expensive counterweight pits in the substructure. A through Scherzer rolling lift bridge would not require any counterweight pits whatever, and the substructure is comparatively small, as shown by the design of the much larger Scherzer rolling lift bridge under construction at the mouth of Newtown Creek, New York City, illustrated and described in the Railroad Gazette of Nov. 29, 1901, on page 822, and by a large number of other through Scherzer rolling lift bridges.

D. In the description of the Clybourn Place trunnion bridge attention is called to a very small by-pass under each tail pit designed to provide additional waterflow. Scherzer rolling lift bridges whenever desired have been and are built to provide a very much larger waterflow, as has been done in many cases, and is illustrated in the design for the Newtown Creek bridge without the special and expensive construction for by-passes used at the Clybourn Place trunnion bridge.

2. All Scherzer rolling lift bridges have been and are constructed more economically than the Clybourn Place trunnion bridge. We mention only a few which were constructed for in the same city, under the same market conditions, over the same river, with the same bridge company as contractor for construction as the Clybourn Place trunnion bridge.

A. The Scherzer rolling lift bridge across the Chicago River at Main street gives the same width of roadway and sidewalks as the Clybourn Place trunnion bridge, but it provides a clear channel for navigation 140 ft. wide, while the Clybourn Place trunnion bridge provides a clear channel for navigation only 100 ft. wide, a very material difference in a movable bridge.

Yet the bids received for the construction of this much larger Scherzer rolling lift bridge amounted to \$120,388, while the bids received under the same market conditions for the construction of the Clybourn Place bridge amounted to \$147,486.

B. Had the clear waterway provided by the Clybourn Place trunnion bridge been as wide as that provided by the Scherzer rolling lift bridge at Main street, namely, 140 ft. wide instead of 100 ft. wide, the proportionate additional cost would have been at least \$100,000 more, making the cost of the trunnion bridge for a 140 ft. channel at least \$250,000.

C. Had the Main street Scherzer rolling lift bridge been a through bridge similar to the Clybourn Place bridge instead of an arched deck bridge, which design was demanded by the Municipal Art League of Chicago, for artistic reasons, then there would have been a saving on the Main street bridge of at least \$17,000, making the total cost of a through Scherzer rolling lift bridge providing a clear channel of 140 ft., giving the same width of roadway and sidewalks as the Clybourn Place bridge, \$103,000, which would show a saving in cost of construction of \$147,000 in favor of the Scherzer rolling lift bridge.

D. The State street bridge, the most important highway bridge at Chicago, is being built under the plans of The Scherzer Rolling Lift Bridge Company. This is also an arched deck structure, this form being also selected for artistic reasons. It has wider roadways and sidewalks than the Clybourn Place bridge, and it also provides a clear channel for navigation 140 ft. wide in place of only 100 ft. provided by the Clybourn Place trunnion bridge. The masonry of the substructure extends 7 ft. deeper than the masonry of the Clybourn Place trunnion bridge to provide for a 30-ft. depth of water, while the Clybourn Place bridge provides only for a 21-ft. depth of water. Yet this much larger, more important and prominent Scherzer rolling lift bridge costs less than the Clybourn Place trunnion bridge.

E. Highway Scherzer rolling lift bridges constructed, under construction and contracted for in Chicago at North Halsted street, Taylor street, Canal street, Eighteenth street, Polk street and Harrison street, in addition to the railroad bridges at Chicago used by the Metro-

politan Elevated Railroad, Chicago Terminal Transfer Railroad, Baltimore & Ohio Railroad, Chicago & Great Western Railroad, Pittsburgh, Cincinnati, Chicago & St. Louis Railroad, and the Chicago Junction Railroad, and numerous other railroad and highway bridges elsewhere further substantiate the very great economy, practicality and scientific value of the Scherzer rolling lift bridges over the trunnion type of bascule bridge.

F. As a further proof that the Scherzer rolling lift bridge is more scientific, economical and practical than the trunnion bascule bridge we offer to furnish two Scherzer rolling lift bridges of the size and capacity of the Clybourn Place trunnion bascule bridge for the cost of that one bridge, or one Scherzer rolling lift bridge for one-half of the cost of the Clybourn Place trunnion bascule bridge, and will guarantee that any of these Scherzer rolling lift bridges will operate more rapidly and with less power than the Clybourn Place trunnion bridge. We will furnish, simultaneously with the receipt of the order and the signing of the contract by a responsible party, an amount of money in cash or bonds equal to the cost of the Scherzer rolling lift bridges ordered, to be held as a guarantee for the faithful fulfillment of our contract. We will be glad to receive any number of orders on this basis at any time within the next two years.

G. More Scherzer rolling lift bridges have already been built than all other types of bascule bridges combined. If simplicity of construction, economy of material and cost of construction, economy of operation, economy of maintenance, certainty of successful and rapid operation, and maximum attainable waterway and waterflow control the selection of the type of movable bridge, then the Scherzer rolling lift bridge merits the success which it has already attained, and, we believe, will not be superseded in the immediate future where merit controls.

Two additional trunnion bascule bridges, according to the plans of the city engineer of Chicago, similar to the Clybourn Place trunnion bridge but even more costly, have been under construction for several years by the city administration.

At least one-half of the money being expended for the construction of trunnion bascule bridges could be saved to the City of Chicago if Scherzer rolling lift bridges were used by the present city administration, as has been done by former city administrations, and as has been done and is being done by the Sanitary District of Chicago at the most important streets crossing the Chicago River.

THE SCHERZER ROLLING LIFT BRIDGE CO., By ALBERT H. SCHERZER, President.

What is Bird's-Eye Maple?

New York, July 8.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The question has lately been asked, "What is bird's-eye maple?"

Any one who has been in the woods of the Mississippi valley will have noticed that the trees grow to a considerable height before branching. I have seen maples, and made sugar from their sap, on which the lowest branches were not less than 50 ft. from the ground.

When the surrounding trees have been cut away, giving free access of light to the trunks of the maples the trees will send out great numbers of small branches that give the tree the appearance of being wrapped in a dense brushwood with a tuft of the original branches at the top. I do not know of any other species of forest tree that acts in the same way when a clearing is made around it.

It is well known that knots in lumber show the positions of branches. The birds' eyes are small knots surrounded by the usual curl in the grain and produced no doubt by the numberless small branches that are sent out after the tree has stood comparatively alone for some time.

Curly maple may arise from a very different cause, as in the case of curliness in any other kind of wood; but it is entirely consistent that the bird's-eye maple should be curly in places where the eyes are absent.

CHARLES J. BATES.

[Mr. Bates' guess that the beautiful variant known as "bird's-eye" in the grain of some maples is a knot is not a new one. He has been supported, momentarily, by a very large number of people who have for the first time glanced at it without examining it closely. The essential element of a knot is a branch passing through the outer rings of growth, and this is not present in the bird's-eye. Expert timber men cannot surely identify a bird's-eye maple trunk by a study of the bark. It may occur in a straight shaft, with no branches or indications of branches which once existed. The only sure test is to cut it. This whole subject of variants in the form and direction of the grain and of colorings of fine woods is an exceedingly interesting one, but no one that we know of has been able to assign the causes or to surely diagnose the tree or the log without cutting it. It would be a highly valuable knowledge. Many years ago the lumber buyer for the Pullman Company was offered for \$3,000 a mahogany log. It was supposed from the surface indications to be "plum pudding" mahogany, but this could not be surely determined before passing it through the veneering cutter. The buyer referred the matter to the late George M. Pullman, who had an ex-