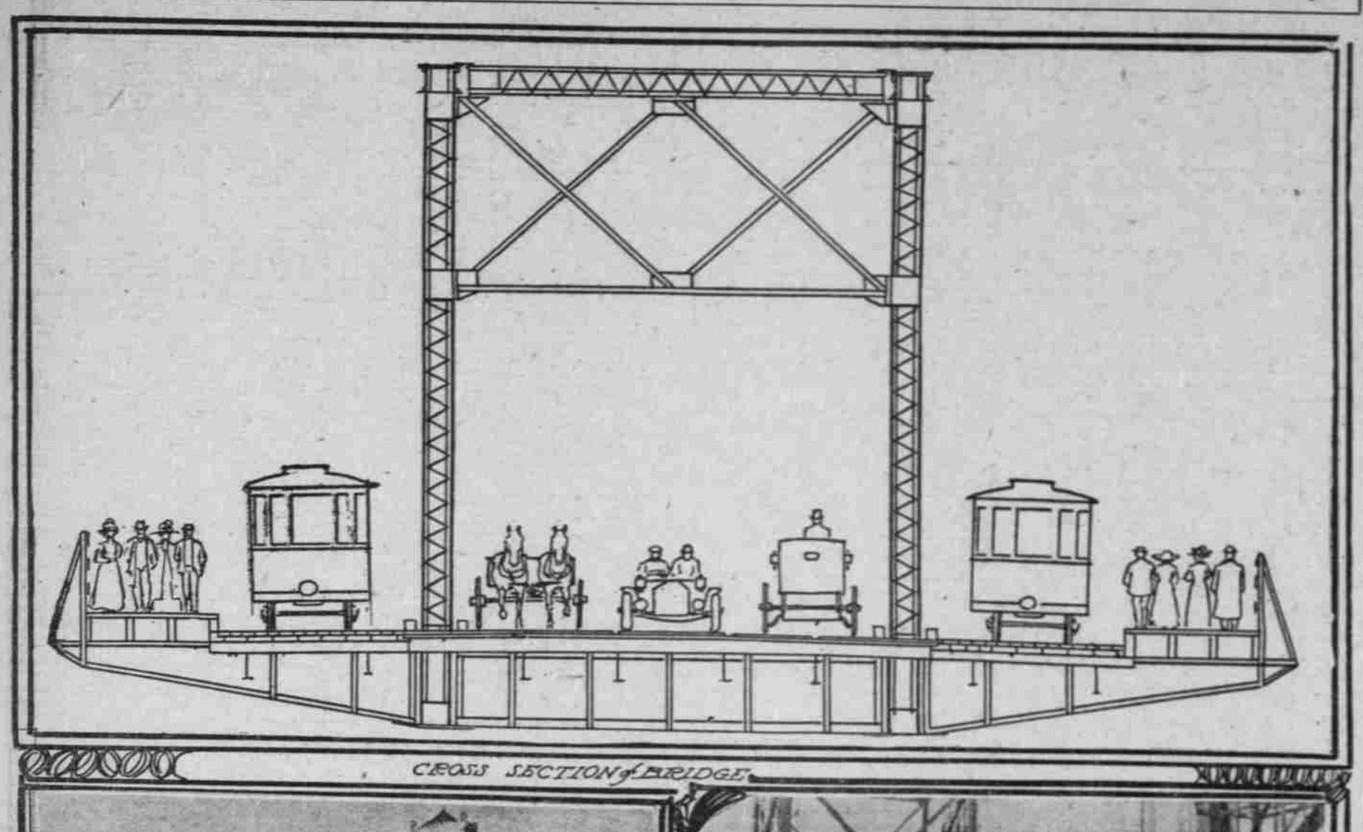
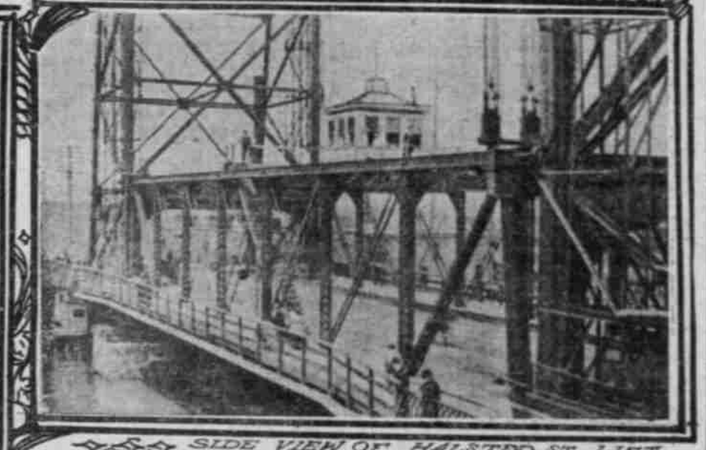
DRAW OF NEW MADISON STREET BRIDGE WILL BE LARGER THAN ANY OTHER IN WORLD

Diagram and Photograph of Waddell Lift Bridge, After Which Portland's New Bridge Is to Be Modeled, Give Idea of Its Style



GENERAL VIEW OF HALSTED ST LIFT BRIDGE OF CHICAGO WHEN SPAN IS LIFTED CLEAR UP. THIS SPAN CAN BE RAISED TO ENTIRE HEIGHT OF 140 FT. IN 34 SECONDS.



SIDE VIEW OF HALSTED ST. LIFT BRIDGE. SPAN DOWN AND BRIDGE OPEN FOR TRAFFIC

Portland will have the longest lift-draw in the world when the Madison-street steel bridge is completed, the draw being 248 feet long. The nearest approach to this length is a span now under course of construction in Chicago for the Pennsylvania Railroad system, which is but 220 feet long. This will be the first bridge of this type to be built here, and great things are expected from it. The draw can be lifted for the passing of a vessel in 34 seconds, so that the time is scarcely worth mention, and in the strongest contrast with the system in vogue on all of the other bridges spanning the Willamette River here.

Waddell & Harrington, of Kansas City, are the engineers employed by the City Executive Board, and they have furnished the plans shown in the accompanying illustrations. The bridge design was adopted by the board last Friday afternoon. Bids will be called for by publication, which will be circulated specially throughout the East and wherever there are bridge contracting firm. Instead of furnishing their own plans and designs, as heretofore, the contractors will simply put in bids on the design drafted by the city's engineer. Bids will be received by City Auditor Barbur up to 12 o'clock noon, Monday, June 21. The engineers of the city will superintend construction.

Details of Bridge Plans.

The arrangement of the roadway permits free passage of vehicles without interference by street cars, and is also of benefit to the patrons of the cars, because it will be possible to run them over the structure at full speed without having to delay because of danger of striking slow-moving trucks or horses at the side, as is the case on some of the present bridges. Fast-moving vehicles, such as automobiles, will naturally follow across in the streetcar portions; but with the width of the roadway portion proper, it will also be possible when there is a line of traffic in each direction for the faster lighter vehicles to pass in front of the slower ones.

The bridge is designed strong enough to take care of traffic moving at maximum speeds; that is to say, there could be three wagons abreast in the center, moving at a trot, there could be at the same time streetcars on each track, moving at the maximum usual speed on city streets, and also each sidewalk crowded with people. The only restriction on the speed of teams across the bridge will be such as maintains on a city street crowded with traffic.

There are questions now under consideration by the City Attorney concerning just what grade may be allowed, but it is considered highly desirable to place the structure at the heights shown in the general profile. This provides a clearance of 45 feet above mean high water without opening the bridge. This will be about 45 feet clear for the river in the state it has been for the last few weeks. To reach such height it is necessary to make a 2.48 per cent grade on the west approach. This is considered to be about the maximum grade that should be used for the heavy teaming traffic that is to pass over this bridge. (It is about the grade of Madison street from Third street to Fourth street.)

To the east end the bridge drops down on a 1.6 per cent grade to East Water street. This is substantially the grade of the east part of the present east approach. This arrangement will make the floor level of the new structure about 18 feet higher over the main channel than the floor of the present old bridge.

It is desirable, in order to cause as little interference with the traffic over the bridge as possible, to raise it as high as may be without making prohibitive grades on the approaches. Naturally, the more clearance that is given, the greater number of boats will be able to pass under the bridge without requiring traffic to be stopped.

Provisions for River Traffic.

To provide for the requirements of navigation one of the 248-foot spans is so arranged that it may be lifted between two towers, which are fastened to the adjacent spans, to a height of 125 feet above mean high water. It remains in a horizontal position during lifting, and is counter-weighted so that all of the work to be done in raising it, is to overcome the friction and the inertia of the mass. There is thus provided a clear opening between piers in the line of the bridge of about 225 feet, which makes a clear opening in the direction of the current of 200 feet. The clear height provided is the same as the Brooklyn bridge and is what the War Department is generally establishing for all harbors.

This kind of moving span was selected after carefully considering it in comparison with a usual swing span or a bascule span.

The advantages of the lift span above a draw span or a bascule span which led to its adoption are many. In the first place, it can be built for $15,000 less than a draw span, and more than $50,000 less than a bascule span. It is better for both the river traffic and for the street traffic, it is argued.

The advantages to the river traffic are that one wide opening is provided instead of two narrow openings; that there is no long draw rest in the stream, so boats may pass through at any angle under the bridge instead of having to pass through exactly parallel to a draw rest, as in the case of swing bridges.

Argument for Lift Draw.

The advantages to the traffic on the bridge of a lift span are the increased speed of operation and superior rigidity. In the first place, it is possible to lift the bridge to maximum height in much less time that it is possible to turn a swing span fully open. This span will be arranged to open to full height in less than one minute. In a majority of instances it will not be necessary to open it to the maximum height and it can be raised 10 feet or 20 feet, or whatever the need happens to be to admit the passage of a boat, and immediately lowered. The boat can approach to within a few yards of the bridge before it is necessary to raise the span. When the span is at its lowest position, it is stiff and rigid for the traffic, precisely like all the other spans of the bridge.

A swing span has to open to its extreme position for the smallest boat, and a bascule span has to be lifted to full height to provide full clear width of channel opening. The only bascule feasible for this length of opening would be a double-leaf bascule, and even if money and speed of operation were not considered, there would still remain serious objections to the bascule because of the uncertain action of the connection of the two leaves at the center of the opening and the lack of rigidity under the traffic, it is said.

The operation of the lift bridge is of the simplest possible character. It may be likened to an ordinary window hung on weights, which requires but small power to raise it and can be quickly lifted and lowered. The machinery is more simple and easy to build and operate than any other kind of moving bridge. The cost of operation per each time opened is less than any other kind, less power is required and for a shorter time.

There is now being constructed over the Mississippi River at Keithsburg, Ill., for the Iowa Central Railway Company, a lift bridge having a lifting span 256 feet long. It carries single track railway loading. There are several smaller lift bridges being built in different parts of the country. One is soon to be put in at Sand Point, Idaho.

All of these are built under the designs of Waddell & Harrington, who have patents covering all types of lift bridges.

Pioneer Lift Bridge.

The pioneer large lift bridge of the world is one designed by Dr. Waddell, and built about 15 years ago in Chicago. It has been in successful operation ever since that time. It is over the Chicago River at Halsted street, and consists of a span 120 feet long. This bridge carries usual Chicago street traffic with a double streetcar track. For some years it was operated by steam engines, but later electric motors were installed, and for the last several years have been used for operation. The cost of maintenance on this bridge has been very low. It has been lifted 50,000 times with no extra cost for renewals of machinery.

In summary it might be said that the Hawthorne-avenue bridge will be wider, stronger and more rapid in operation than any other in the city. It will have a wider channel for boats and less obstructions to their passage than any other bridge.

The consulting engineers were appointed by the Executive Board, April 30, and the work was started May 1. The engineers' representatives have collected the necessary data, soundings, borings, current surveys, etc., and sent them in to the main office by telegraph as quickly as collected. Preliminary studies, estimates and plans were made. The engineers selected what they considered best and sent them to the Executive Board. The board took them under immediate advisement and suggested certain changes and modifications. These were telegraphed in and the plans arranged accordingly.

Yesterday the engineers mailed to Portland complete binding plans, specifications and bidding papers. These will be placed on file, and extra copies can be secured at any time from the engineer's office. If it is the vote of the people at the coming election to go ahead with the Hawthorne-avenue bridge, contracts can be let immediately after the bids are in and construction work started at once.

The firm of Waddell & Harrington is well known in the engineering world. Dr. Waddell has been prominent for years as a professor of engineering, as a designer and supervisor of large construction works, and as a writer of technical literature. His books on bridge work are found in most of the colleges of the country. He has been in engineering work for over 20 years, 25 of which have been devoted solely to bridges.

Mr. Harrington has been in bridge work, mechanical work, and electrical work for about 14 years. For a time he was bridge engineer of the Baltimore & Ohio Railroad, and was connected at various times with different structural steel shops. He has designed and put in operation and managed after operation two bridge shops.

SKELETONS REVEAL GOLD

BONES OF TWO MINERS FOUND NEAR RICH LODE.

Peter Stone Stumbles Into Remains of Prospectors Who Died In Tunnel.

Two skeletons, supposed to be the remains of pioneer English prospectors, were found last week in an old mine tunnel situated in the Cascade forest reserve, at a point about 60 miles from Boring and 50 miles from the Sandy River. Near the skeletons were a shovel, pickax, frying pan and two rock drills. The finding of the bones led to the discovery of the existence of a rich vein of gold and silver ore.

The bones were located by Peter Stone, a hunter and trapper, who accidentally stumbled into the old tunnel, the entrance to which was overgrown by brush and small trees. The tunnel has a 45-foot face and a crosscut extending back 60 feet. Between the face and the crosscut were the bones and the implements.

Old settlers in the vicinity say that the remains are probably those of Englishmen who were prospecting in that vicinity and who were last seen in 1858. That the remains have been in the tunnel about 50 years was indicated by the presence of a tree 18 inches thick directly over the entrance. There was nothing to indicate the manner of the deaths, whether violent or from natural causes.

The old mine is close by a deep, narrow valley and a waterfall, and has been given the appropriate name of "Lost Mine." Ralph Trean, an assayist located in Portland, went to the place and returned with the report that a vein rich in gold, silver, lead and galena was tapped by the old tunnel. The lode has a 10-foot face and extends three miles. The ground has been taken possession of and will be worked for its full value.

FIRMS MOVING WESTWARD

W. P. Fuller & Co. Go to New Quarters Uptown.

As an indication of the trend of wholesale business from former quarters to the new district in the northwest end, it is announced that the wholesale firm of W. P. Fuller Co. will transfer its headquarters next Tuesday from Front street to its new building at Twelfth and Davis, after 25 years of continuous business in Portland on the old site.

The new building covers an entire block, bounded by Twelfth, Thirteenth, Davis and Couch, and is one of the great wholesale structures that are rapidly transforming that district of the city into a center.

Numbers of wholesale business firms are removing from the downtown locations to those further inland, some of those already announced being the Pacific Paper Company, Bushong & Co., Crane & Co., Robertson Hardware Co., Blake, McFall Co., Chicle Company and Gauld Company.

Willamette Valley Picture Display.

Commercial Club members and their friends have been invited to inspect a series of artistically colored photographs of the Willamette Valley, that will be on view at the club next Tuesday. The pictures are excellent and are wonderful reproductions of portions of the valley. They were taken at different points, principally at Eugene, and will be brought to Portland for exhibition by J. H. Hartog, manager of the Eugene Commercial Club. The Board of Governors of the Portland Commercial Club, by unanimous vote, has requested the presence of the women friends of the club members to view the exhibit from 9 to 11 A. M. and from 3 to 5 P. M. on Tuesday. The women are also expected to bring their friends. It is promised that the pictures will be well worth seeing, being very large panoramic views that give a true idea of the country pictured. Mrs. Robert Lathe, president of the Woman's Club, urges members of that organization to take advantage of this opportunity to see these views, and it is expected there will be a large attendance at the exhibition during the hours named.

EASTERN EXCURSIONS.

The Canadian Pacific is making very low round-trip rates to Eastern points. Tickets are good for stopovers, with long time limit. Consult them regarding the diverse routes and their new service. **