

Louis. In this system of construction, the prismatic footings are cast in place with proper recesses for the insertion of precast reinforced-concrete columns, which, in turn, are provided with grooves for the placing of the precast curtain-wall slabs, roof slabs and roof girders.

In the construction of the building, a very interesting detail was the reinforcement of the first placed footings, which were found to be not strong enough to carry the load for which they were designed.

The buildings are all founded on that part of the island at Galveston which has been filled in to a depth of from 5 to 10 ft. of fine sand pumped from the ocean. On this sort of material, local experience shows the proper

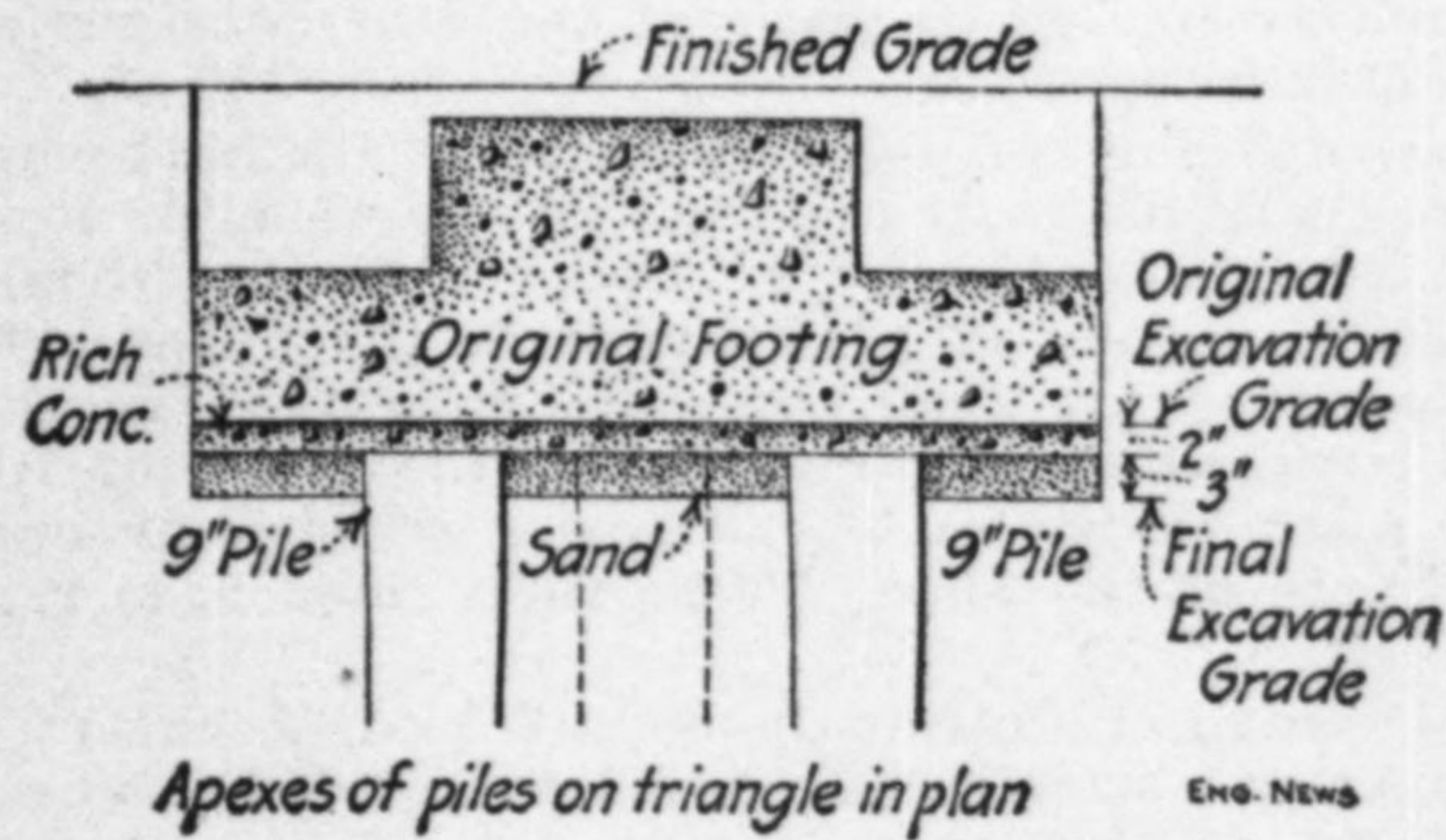


FIG. 4. METHOD OF UNDERPINNING FOOTING

unit pressure to be about 1500 lb. per sq.ft., and the footings are designed for this unit pressure. After the contract was let, and the contractor had inspected the site, doubt was felt as to whether the soil would bear even so small a unit loading, and a test was made on an 18x18-in. base. In this test, the footings settled 1/4 in. the first day, but, although it rained continuously for several days thereafter, no farther settlement was noted. Taking this as a conclusive test, the contractor proceeded to the con-

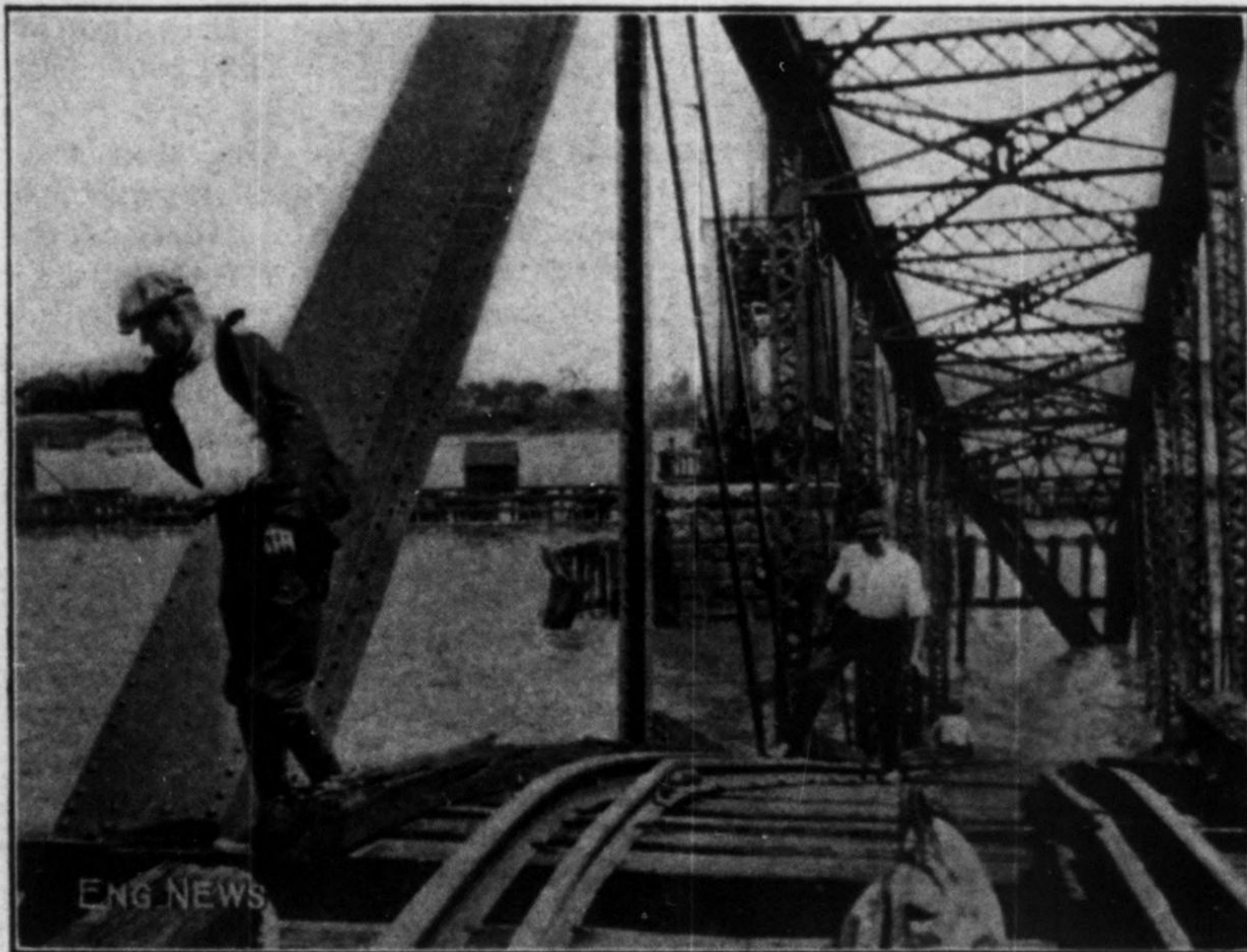
After some study, the procedure outlined below was taken to reinforce these fittings.

The column and wall units, which had been erected, were taken down and stored in piles. The prismatic footings, Fig. 4, were then lifted from their place by a locomotive crane, Fig. 2, and 5 in. additional was excavated below grade, grade being the bottom of the original footing. Under the place to be occupied by the footing, three 9-in. wooden piles were then driven to refusal and sawed off about 3 in. above the newly excavated grade and about 2 in. below the old grade, these three piles forming the apexes of a triangle with sides about 2 ft. 6 in. The next step was to fill in and pack solidly about the heads of the piles enough fine sand to bring the surface level with their tops. On this bed 2 in. of rich concrete was placed, bringing the surface up to the old excavated level.

The displaced footing was then picked up with the crane and set on the bed of new concrete. After being leveled to grade, this formed the final bedding on which were subsequently placed the precast columns.

### A Railway Bridge Span Pushed Off Its Pier by a Barge

A tow-barge pushed a 150-ft. span of the Wheeling & Lake Erie Ry. bridge over the Maumee River, off its pier at Toledo, Ohio, on June 14, 1914. The photographs herewith picture the effects of the collision. The barge pushed one end of the span off its bearings and across the length of the pier, so that both trusses cleared the pier and the span dropped into the river at that end. Span and pier were damaged slightly. The barge had a section of its bow crushed in. The city's fire-alarm and police wires crossing the bridge were broken by the accident.



WHEELING & LAKE ERIE RY. BRIDGE AT TOLEDO; SPAN PUSHED OFF PIER BY COLLIDING BARGE

struction of the footings as designed, and some time later commenced the erection on these footings of the present concrete columns.

After a portion of the work had been placed, it was found that the footings already in were not only settling, but were shifting sidwise as well. At this time about 420 separate footings had been placed containing 700 cu. yd. of concrete and covering an area of 140x1100 ft.

The wrecked span is just west of the drawspan of the bridge. A steamer towing a steel barge was entering the river, light from Cleveland to take on coal. They passed through a railway bridge below this one without trouble, but at the Wheeling & Lake Erie bridge, while the steamer was just passing through the west opening of the draw, a gust from the east slewed the barge over to the west. Although the steamer promptly cast off the

tow-line, the barge struck the end of the span just west of the draw, wrecking the span as noted.

The same bridge has been struck by vessels on two previous occasions, equally serious damage resulting. It is believed locally that the service of tugboats for tows of this kind should be made obligatory.

The Great Lakes Dredge & Dock Co. is replacing the span.

### City - Planning Competition Awards, Richmond, Calif.

A city-planning competition in which a number of engineers were among the 146 contestants and in which two of the five second-prize men were engineers, has recently been reported on. The competition was for the subdivision, largely for industrial purposes, of 350 acres of land at the end of the new river harbor of Richmond, Calif. The prizes (\$5000 for the first and \$1000 each for the five next in merit) were offered by H. C. Cutting, Monadnock Building, San Francisco, Calif., the owner of the land to be subdivided.

The first prize was awarded to Arthur C. Comey, Landscape Architect, Cambridge, Mass. We reproduce Mr. Comey's design and also one of the most interesting of the second-prize designs, which was by Taggart Aston, Civil Engineer, San Francisco. The other four second prizes were:

Philip W. Foster, Landscape Architect, Cambridge, Mass.  
Berthold Wuth, Assistant County Surveyor, Oakland, Calif.  
L. A. de Milt, Jr., Landscape Architect, Indianapolis, Ind.  
W. S. Farley, Civic Engineer, Stege, Calif.

Because of the number of engineers included we also give the list of those who received honorable mention:

J. H. Weatherford, Civil Engineer, Memphis, Tenn.  
Woollett & Woollett, Architects and Engineers, San Francisco, Calif.  
A. H. Payne, Civic Engineer, Memphis, Tenn.  
H. J. Bernier, Oakland, Calif.  
J. F. Beaman, San Rafael, Calif.  
Walker & Vawter, Architects, Los Angeles, Calif.  
F. C. Innes, Civil Engineer, Sheridan, Calif.  
R. H. Dobell, Architect, Portland, Ore.

The jury, which sat three days on the designs, was as follows.

Charles D. Heywood, Mayor of Berkeley, chosen by the contestants.

C. F. Michaels, President San Francisco Chamber of Commerce, representing the owner.

C. E. Grunsky, former City Engineer of San Francisco, of the San Francisco Association of Members of the American Society of Civil Engineers.

Louis C. Mullgardt, President San Francisco Society of Architects.

C. H. Cheney, City Planner and Advisor to the Competition.

We are informed by Mr. Cheney that:

It was necessary for the contestants to consider and solve the problem of docks, shipping facilities, a business district and railroad and water approaches.

The winning design presents a fairly feasible plan for a center of this type, with ample diagonal streets and careful location of districts—industrial, shipping and business, for the best cutting of the property. The designs submitted were distinctly above the average, and the owner of the property was much pleased with the results obtained.

In view of the likelihood that there will be many such competitions in the future and because it contains ideas on city planning which may be of assistance to our readers, we reprint the substance of "The Verdict of the Jury," as follows:

The tract to be subdivided is especially adapted for use in bringing ships and rail together. The proposed Government harbor can be conveniently and naturally extended into the tract and the harbor extension thus provided will be exceptionally well sheltered by the ridge of hills at the west. The transfer of freight from rail to boat and the transfer of freight from river steamers to ocean-going vessels over conveniently located docks or through water-front warehouses

has in this design been given due consideration. We feel that the plan could be improved by the adoption of simpler harbor lines. There should be no solid fill projecting out into the harbor in order that the length of water front to be bulk-headed may be kept at a minimum.

The harbor outline is such that all parts thereof can be made accessible by rail, and berth space for vessels can be provided adequate to meet the requirements of both the large ocean-going and the smaller bay and river craft.

The areas back from the water front will naturally be used for large and small manufacturing establishments whose proximity to a water front is an advantage. This use has been foreseen in this plan as in most of the designs submitted and suitable provision has been made, not alone for factory sites, and access to them by rail, but also for adequate streets. Where the plan shows a subdivision into units that are small, these can readily be modified to suit requirements.

The development of a business district along the northern edge of the tract, along and near Cutting Boulevard, is recognized in this as in many of the other designs and is a strong point in its favor.

An extension of the open waterway of the harbor to the extreme northern limits of the tract is objectionable for various reasons, notably because an excessive harbor length may result in the accumulation of foul waters in the upper end of the harbor, and because such extension would confine the traffic that will ultimately obtain between the heart of Richmond and the main harbor to too narrow a strip of ground at the easterly base of the hills. These facts have been recognized in the design.

The crossing of Cutting Boulevard by rail, except possibly at its extreme westerly end, should be avoided. Access to the water front of this property by rail should, therefore, be preferably from the southwest, by belt line railroad, and perhaps later from the east, across a water-front section of Richmond, which will, however, probably be the last of the water-front areas to be fully developed. For some time in the future no other access to the property by rail may be feasible, except from the northwest. Any arrangement providing for such a location of the tracks of the Southern Pacific or the Santa Fé should, if possible, be made with the understanding that in the course of time, when other facilities are provided, the use of any such tracks can be discontinued.

The location of the 350 acres under consideration is such that practically no portion thereof will ultimately be residence property. The reservation of areas thereon for parks and playgrounds is, therefore, regarded as of minor importance. There should be reservations upon the hills at the west and in the business and residence areas to the northward of Cutting Ave.; but some open spots, spots that can be adorned with trees and that can be made available for recreation, are nevertheless desirable and their inclusion in this and other projects is commended.

The alignment of principal streets in a direction from northwest to southeast with adequate streets passing the upper end of the harbor toward the northeast is in conformity with the ultimate demands of traffic as now foreseen.

As the entire tract of land is low and will require filling, it is desirable that the harbor area be kept fairly large, as it is to be assumed that most of the material for the fill will be excavated from the harbor. At the same time, the water surface must not be too large, because there would then be a needless sacrifice of area which would otherwise be available for commercial, industrial, and business purposes.

The other five designs which have been selected as being next in the order of merit have been passed on with reference to the degree in which they fulfill the general requirements of the problem as we see it, and with due regard also to the incorporation of novel ideas which have distinct merit.

There were 146 separate designs to be passed upon, eight of which had to be disqualified because they were received after the final hour set in Paragraph 16 of the program. Many of those not included among the first six have decided merit and you may yet find that someone not among those selected by us conforms better to your personal idea of the way in which the tract should be developed.

CHARS. D. HEYWOOD,  
C. E. GRUNSKY,  
C. F. MICHAELS,  
L. C. MULLGARDT,  
C. H. CHENEY,

Jury Selected for the Competition.

From the concluding paragraph, we infer that the conditions of the competition were such that the owner of the land and donor of the prizes may choose for execution any of the designs entered in the competition.