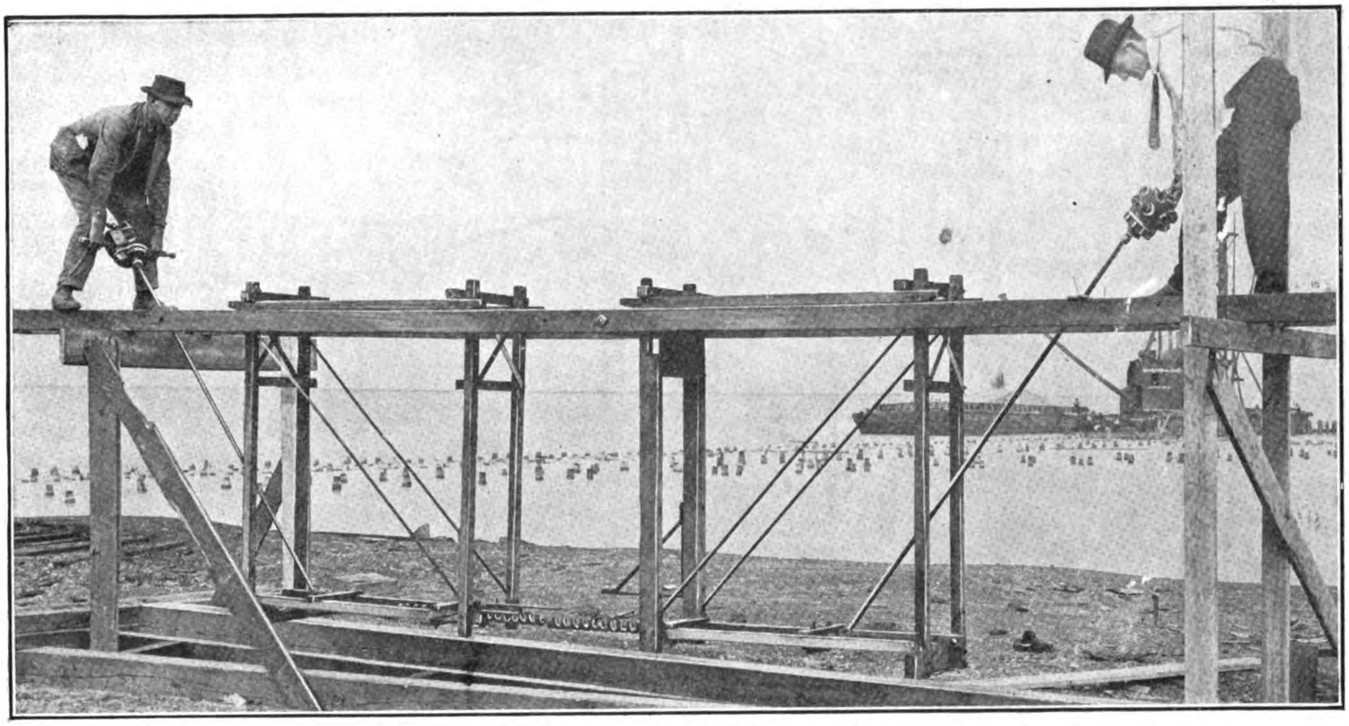

MACHINE FOR BORING TIE-ROD HOLES IN PILES UNDER WATER, CHICAGO MUNICIPAL RY.
In service, the sills on which the men are standing rest on the pile heads

still hot, is marked off into cakes approximately 2 ft. square, care being taken not to pack or compress this hot mixture in any way while it is cooling. When cool the asphalt layer is easily broken up into cakes and is ready for use.

Our emergency-repair equipment consists of a small motor truck with a sheet-iron heating pan with gasoline burners. These burners are so placed that they are not only used to heat the contents of the pan, but to heat the tamping and smoothing irons as well. The truck is then loaded with the asphalt cakes, which are carried to the cuts to be repaired. While the cut is being prepared, the asphalt cakes are heated in the pan and brought to their original plastic consistency. The cut is filled, tamped, smoothed and finished in the usual manner. The truck driver and two men make a crew, and the cost of this work is surprisingly low per square yard.

The value of the results obtained in keeping holes and cuts promptly repaired is obvious. Such repairs can be made in freezing weather, even when it is necessary to sweep away snow to get at the pavement. Oftentimes when a small gas- or water-pipe cut is partly filled with ice, the big warming pan is placed directly over the cut while the asphalt cake is being heated, and the cut is dried out at the same time and with the same heat. This method can be used to equal advantage in small towns or on highways, where permanent asphalt-mixing plants are not always available.

Machine for Boring Under-Water Holes in Piles

The new 3000-ft. Municipal Pier at Chicago has on each side a concrete wall supported on three lines of round piles and a line of sheet piling. Tie-rods extend between the rows of piles, and in the outer part of the pier there are heavy tie-rods extending across the entire width of the pier, to tie the walls together. The boring of these numerous tie-rod holes under water, and keeping them in proper line and level in the piles and sheet-piling, would have been a tedious and troublesome job. Therefore a special machine, shown in the accompanying view, was devised and built by the contractor, the Great Lakes Dredge & Dock Co., of Chicago.

The machine consists of a pair of sills 30-ft. long, with two depending frames, which slide along them and carry horizontal guides for the augers. The end of each auger rod is connected by a universal joint to a long rod driven by a pneumatic drill held by a man on top of the frame, as shown. The sills rested on the pile heads and the auger guides were set at the desired height and position. With the holes bored in this way there was no difficulty in placing the tie-rods.

Concreting Trains for Track-Elevation Work

For building the concrete retaining walls and bridge abutments on the Chicago track elevation of the New York, Chicago & St. Louis R.R. an outfit of concreting trains has been used by the Brownell Improvement Co., of Chicago, which has the contract for the work. One of these trains is shown in Fig. 1; the towers of two other trains may be seen in the distance.

The special features of the arrangement are that the train is a complete unit of material cars and mixing plant and that all material is handled directly upon the train. This latter point is important when the train is located beside (or sometimes between) main tracks and there is practically no space available outside of the construction train. The mixer car is at the head of the train, then come two cars of broken stone, two cars of screenings and a boxcar for cement (in sacks).

Planks laid across the open cars carry two runways, each two planks wide. If the load is piled up so that the cross-timbers cannot be placed, brackets are fitted

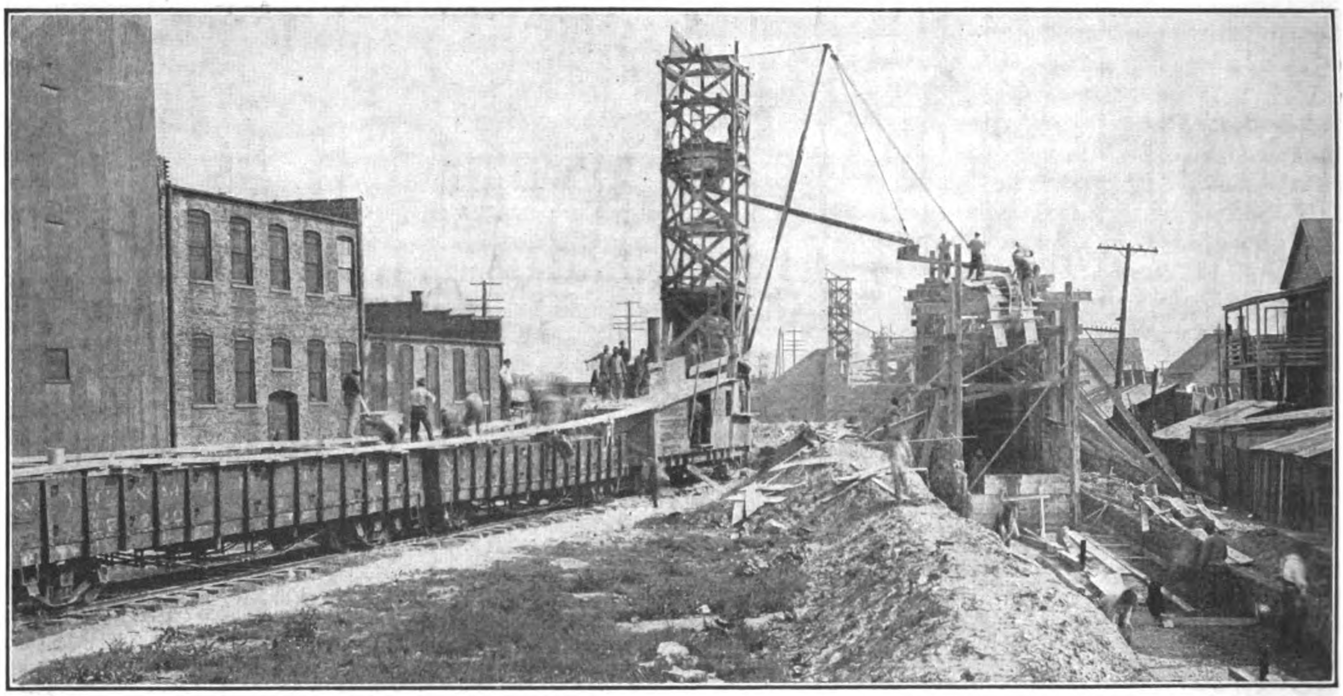

FIG. 1. CONCRETING TRAIN FOR BUILDING ABUTMENTS AND RETAINING WALLS ON TRACK ELEVATION WORK AT CHICAGO; NEW YORK, CHICAGO & ST. LOUIS R.R.

The towers of two similar trains on the same work can be seen in the background

on the side of the car, carrying the runway planks at the proper elevation. Similar brackets are fitted on the sides of the boxcar. The cement, stone and screenings are loaded into wheelbarrows and wheeled to the mixer, the empties returning on the same runway.

When the material cars are empty the planks and brackets are thrown off and the cars are hauled away, while another set of five loaded cars is run up to the mixer car. The runways are quickly set in position and work is resumed. It takes only from 15 to 25 min. to switch the cars and get the work started again.

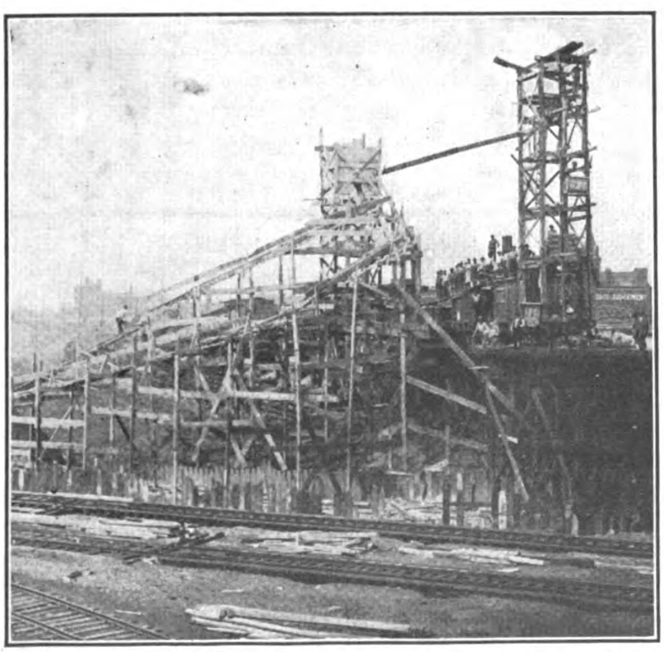

FIG. 2. SPOUTING CONCRETE ACROSS MAIN-LINE RAILWAY TRACKS

Pennsylvania Lines. Track elevation work at South Chicago, Ill. The taller tower, with elevator bucket, is on the front car of the concreting train. The steel chute carries the concrete across the two main tracks to the stationary tower, from which several lines of chutes extend to the forms.

The mixer plant consists of a special boxcar, with a 1-yd. drum mixer mounted at the forward end. Behind this are the engine and boiler, while the sloping roof forms the wheeling platform, with a charging chute to the mixer. Directly over the mixer is a tower 8 ft. square, and about 55 ft. high above the rails. In this is mounted the receiving hopper of the distributing spout. The elevator bucket travels on leads placed not in the tower but ahead of it, far enough from the front face of the tower to enable the bucket to clear the end sill and drop below the level of the car floor to receive the concrete from the mixer.

The bucket is narrow and deep, and, at the upper end of its travel, rollers on the top engage inclined guide rails so that the bucket is pulled over, tilting to such an angle as to insure complete discharge of the material. The two jointed sections of the steel spout, each about 28 ft. long, are guyed from a 31-ft. boom stepped on the tower. Fig. 1 shows a third spout laid longitudinally along the forms and delivering the concrete in place.

With this arrangement the concrete can be spouted across running tracks. This was done on the South Chicago track-elevation work of the Pennsylvania lines, where the two main tracks extended between the concreting train and the retaining walls. There was no trouble from the spattering of concrete upon the trains. This South Chicago work is shown in Fig. 2.

In the view Fig. 1 the tower is guyed to a building. This was done because the train stood on a rough temporary track. Ordinarily no such support is needed. The tower is not built in removable sections, but that part extending above the roof of the car must be dismantled when bridges are to be passed or the outfit is to be shifted. The machinery is selected to suit the contractors' ideas as to the best combination, and on the outfits shown herewith it includes a Foote concrete mixer, Archer elevator bucket and steel spouting, and a Clyde hoist and engine. For the temporary trestle of the south approach to the elevation of the New York, Chicago & St. Louis R.R., the piles were driven by a McMyler 35-ton piledriver running on a track parallel to the trestle. This machine has a revolving horizontal truss, the outer end of which carries the 53-ft. leads.

This arrangement of concreting trains has been used by the Brownell Improvement Co. on nearly all its numerous contracts for track-elevation work in Chicago. The work was in charge of A. H. Bannister, General Superintendent of the company. With three of these trains on the New York, Chicago & St. Louis R.R. work shown in Fig. 1 about 27,000 cu.yd. of concrete were placed in 62 working days.

Portable Track Crossings in a Contractor's Yard

Portable track crossings in a construction track layout are in use at the temporary storage yard of Walter H. Gahagan, Inc., contracting engineer, at East New York, Borough of Brooklyn, New York City. A narrow-gage construction track turns out of a standard-gage track, a third rail being laid in the spur. A stub switch in one rail provides the connection.

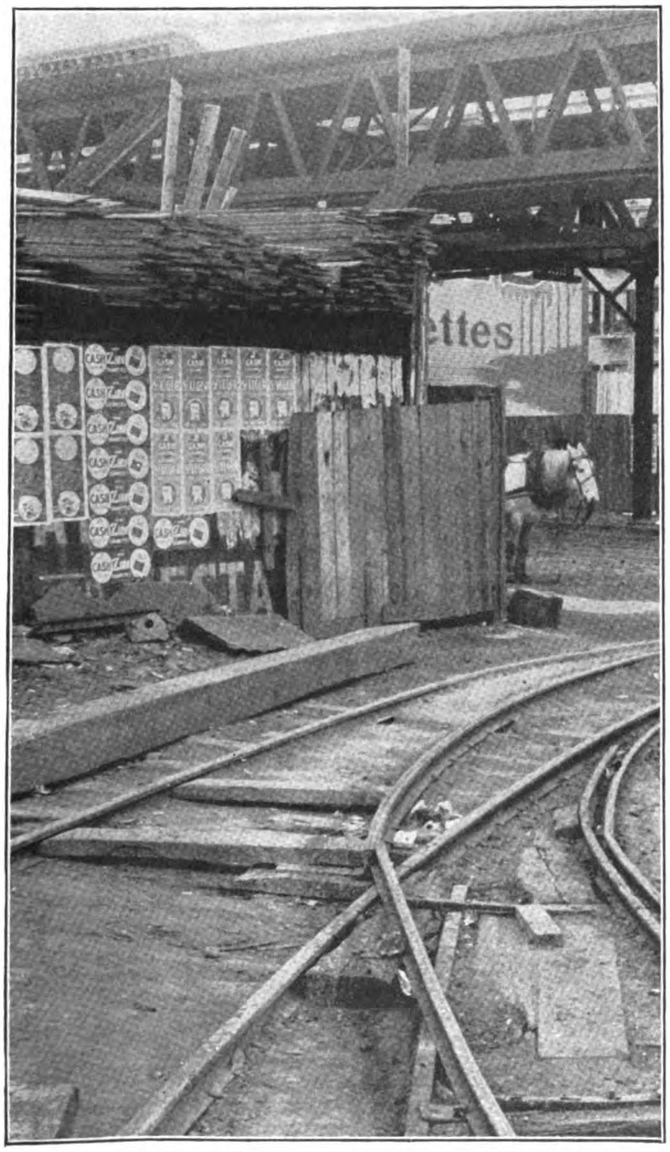

FIG. 1. MOVABLE RAIL IN PLACE OF FROG

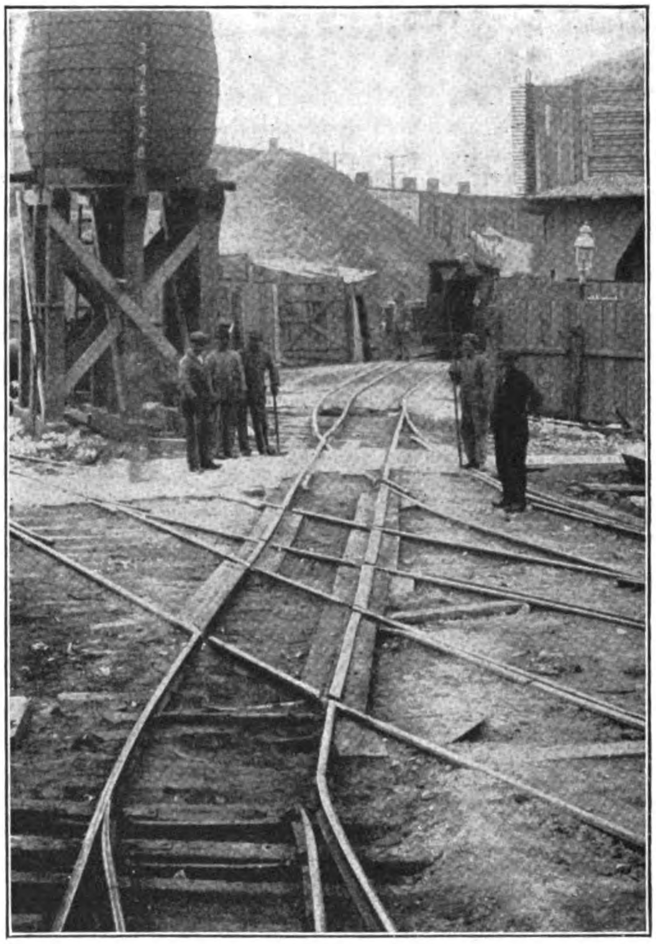

FIG. 2. ANGLE IRONS FOR RAILS OF NARROW-GAGE TRACK AT CROSSING

To avoid the cost of a special frog, a frogless crossing was designed. The outer rail of the narrow-gage turnout is raised to cross over one rail of the standard-gage track. This crossing rail can be swung off the standard-gage rail by hand, to allow cars to move on the latter track. When the swinging-rail is in place to allow standard-gage movement, it is braced by a bar placed between it and the opposite narrow-gage rail. This arrangement, shown in Fig. 1, is a simplification of the frogless turnout used to a limited extent in main-track service.

At the other end of the yard, where the narrow-gage track crosses several standard-gage tracks, angle irons supported by timbers are used instead of rails for the narrow-gage track. This does away with the necessity of blocking up the small narrow-gage rails to the height of the standard-gage rails. The arrangement is shown in Fig. 2.

Water-Works Transportation Methods were made the subject of thorough study in Chicago, Ill., in 1914. A transportation section was organized in the division of water-supply extension with a head motor-truck driver in charge. One 5-ton and three 2-ton Pierce-Arrow trucks were used in the experiments. The cost of hauling averaged about 13c. per ton mi. for the 5-ton truck and varied from 14c. to 32c. per ton mi. for the 2-ton trucks, depending on the conditions and efficiency with which they were used. The hauling under contract by teams cost on an average 26.9c. per ton mi. The hauling by teams hired by the day was still higher. The recent annual report of the city engineer for the year 1914 states that the use of motor trucks and the general study of transportation have shown that the motor trucks are economical and efficient when properly handled, that the hauling of certain materials by contract is advisable, and that teams hired by the day are not efficient.