Equipment of Concreting Trains

Two concreting trains, each consisting of a mixer car, four to seven stone cars and two to four cars of sand, have been designed and fitted up by the engineers of the Chicago & Western Indiana R.R. for placing 30,000 cu.yd. of concrete in track-elevation work this season. The entire work involves the elevation of 45 mi. of main and yard tracks in Chicago and necessitates the building of retaining walls and abutments, sand fills, steel bridges and 15 subways. There will be grade separation between passenger and freight traffic. The railway is doing the work by its own forces.

The mixer car is placed in the middle of the train, with the cars of stone at one end, the sand at the other and the cement car behind the sand. This arrangement minimizes the distance that materials must be wheeled, calling for a smaller mixer gang. Placing the mixer car at the head of the train in similar work was described in *Engineering News* of Aug. 12, 1915.

A feature of the present work is the use of cement in bulk.

The mixer car is a 35-ft. flat-car, equipped with a $\frac{2}{3}$-yd. Smith nontilting mixer, 10-hp. vertical engine, 20-hp. vertical boiler, 700-gal. storage tank and 60-gal. feed tank for the mixer. The machinery is housed, the roof of the car being higher at the discharging hopper than at the ends of the car, thus forming an easy incline from the runways on top of the gondola cars to the charging hopper above the mixer. The mixer is located about 8 ft. from one end of the car and faces the end (Fig. 2). It discharges the concrete into a swiveling chute, which may be swung to discharge from the end or from either side of the car. This arrangement of pouring at different angles, or from either end of the train, eliminates the necessity of turning the mixer car (as required with other types) and makes a considerable saving in work-train service.

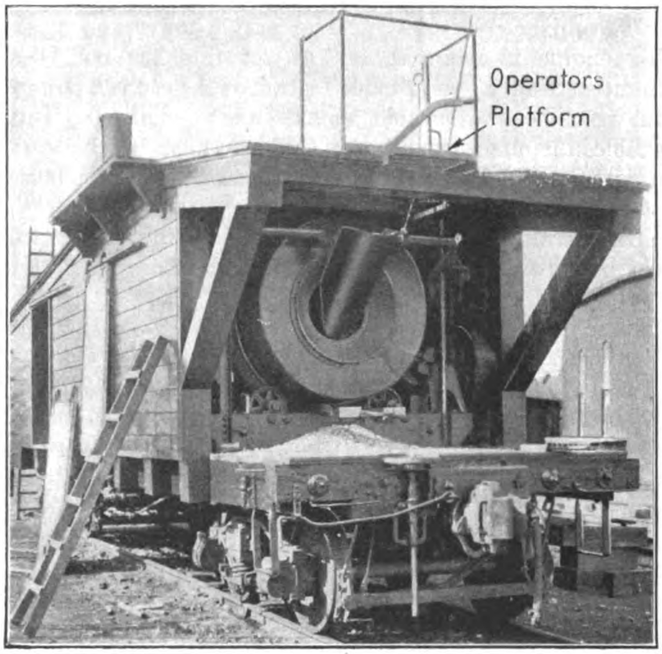


FIG. 2. HEAD OF CONCRETE-MIXER CAR AS USED ON CHICAGO & WESTERN INDIANA R.R.

The chute has intermediate openings, so that concrete can be discharged at different points. A man on top of the car regulates the charging of the mixer, the supply of water and the dumping of the concrete. Usually the mixer trains stand on trestles and the concrete is spouted to the forms for the abutments and piers beneath, as shown in Fig. 1. For the upper part of the piers it has been necessary to elevate the concrete, a crane and bucket being used to place the concrete in the forms.

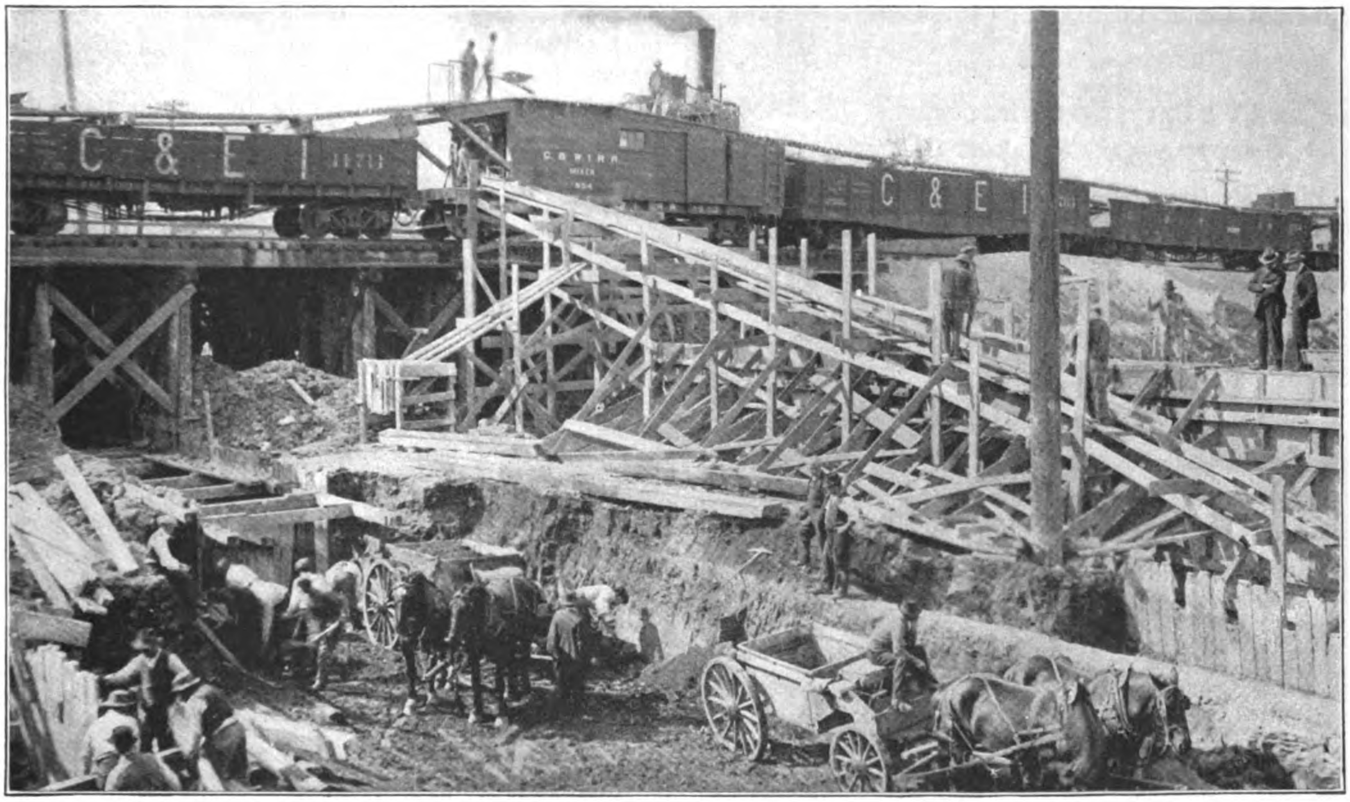


FIG. 1. CONCRETING TRAIN PLACING THE FOUNDATIONS FOR BRIDGE ABUTMENTS AND RETAINING WALLS; CHICAGO & WESTERN INDIANA R.R.

The mixer car is designed to carry a tower and hoisting engine if required, but as yet this has not been found necessary. A valuable feature of the car is a powerful winch head for a cable, which is anchored ahead. This enables the mixer car to move the train along as the work progresses, thus dispensing with the constant attendance of locomotive and crew.

Each train is placing at the rate of from 20 to 30 cu.yd. per hour, with a monthly total for both trains of 11,000 yd. of concrete. The mixer trains are switched during the night by a regular night crew. Part of the mixer gang is called at 6 a.m., so as to have all chutes and runways placed before 7 a.m., when the full concreting gang starts work.

The work is under the direction of E. H. Lee, Vice-President and Chief Engineer of the Chicago & Western Indiana R.R.; F. E. Morrow, Assistant Chief Engineer; V. R. Walling, Principal Assistant Engineer, and C. E. Minor, Assistant Engineer in Charge.

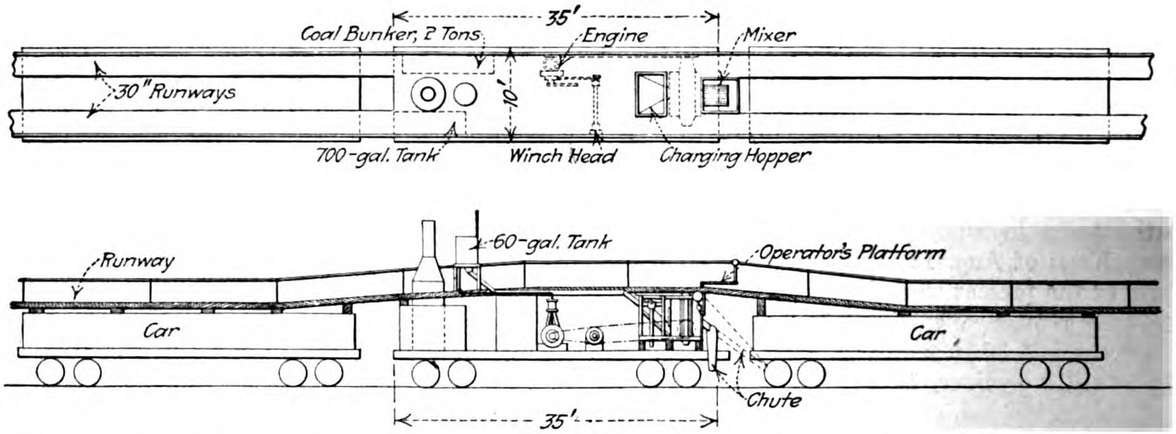
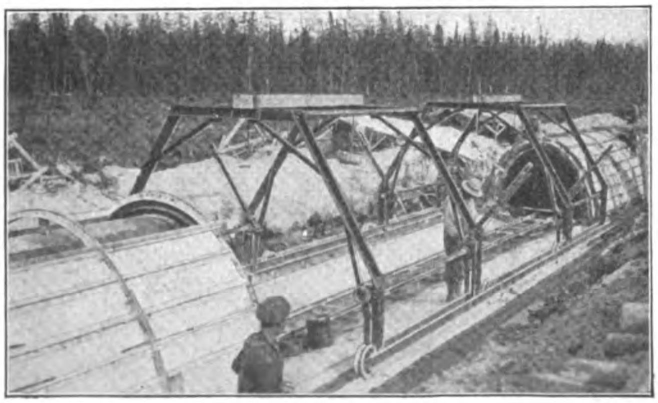


FIG. 3. CONCRETING TRAIN FOR TRACK-ELEVATION WORK; CHICAGO & WESTERN INDIANA R.R.

Traveler for Moving Steel Forms of Water Conduit

Light steel travelers are used to move ahead the arch forms of the Greater Winnipeg water-supply aqueduct now under construction for Winnipeg, St. Boniface, Transcona and several adjacent rural municipalities in Canada. The travelers which handle the interior forms run on a 2-ft.-gage track laid on blocks upon the invert floor. The forms are carried on jacks which form a part of the traveler, and are lined up by turnbuckles on rods which are hinged to the traveler frame. By this method a full arch section of forms 45 ft. in length can be moved at a time. As soon as a section of interior forms is placed, the traveler is run out from under it and the forms are bolted up.



TRAVELER MOVES FORMS IN COMPLETE SECTIONS WITHOUT DISTURBING ALIGNMENT

The exterior forms are in 5-ft. sections, which are bolted together to form the full 45-ft. length. These forms are handled variously by the different contractors. In some cases they are taken apart and moved by hand; in others they are lifted as a unit and swung forward by a derrick, while in still other instances a special carrier is employed which straddles the whole construction in the trench, as shown in the illustration. In this case the traveler running on an auxiliary track outside the arch, picks up the outside form (45 ft. long) and transports it to the next section. To remove the outside form, it is suspended by hooks from the roof of the traveler and the sides of the form are connected to the traveler by ratchets operated by long handles. Tightening the ratchets lifts and loosens the form from the hardened concrete. The traveler was built in Winnipeg for the Winnipeg Aqueduct Construction Co.

Building an Oil-Storage Plant Under Difficulties

A new fuel-oil storage plant has been completed in Providence, R. I., for the Mexican Petroleum Co.—the first of several plants to be built in that locality for supplying oil to various mills. Owing to the small tract of land available on the water front, a number of engineering difficulties were encountered.

Two steel storage tanks were decided upon—one 144½ ft. in diameter and the other 94½ ft. These were placed 3 ft. above mean water, and owing to the unsatisfactory ground, this was excavated to mean high water. Then 55-ft. piles were driven to refusal—700 for tank No. 1 and 500 for tank No. 2. The piles were cut off 6 in. above mean high water, and a 3-ft. slab of concrete was laid on them. In placing the concrete a narrow-gage track was laid, and steel dump cars were run from a ¾-yd. cube mixer. As high as 125 cu.yd. was laid in a 10-hr. day.

Fire walls being necessary, for the larger tank an earth bank was thrown up to 16 ft. above mean high