Tablets for Making Ink.

"Fluid inks having advanced over 100 per cent in price, we will hereafter furnish tablets from which the red and blue black can be manufactured. Sixteen tablets blue black will make one quart of ink; 16 red tablets will make one pint. The directions for making are simple: Fill a quart or pint bottle with clean water (warm water dissolves the tablets quickly), drop in the required number of tablets, turn the bottle over a few times to throw the color into solution, and the ink is ready for use. Where ink wells are left open evaporation takes place, and it is advisable to add a little water occasionally instead of changing the ink in the stand. Where water contains iron, etc., good results cannot be obtained and, therefore, in some localities it is advisable to use distilled water. When water free from iron, etc., is used the results need not be feared, as the ink will flow freely, will remain permanent and will not corrode the pen. It is also a good ink for fountain pens.

Misuse of Signal Oil.

"Oftentimes we find that section foremen, agents and bridge and building foremen keep signal oil in cans with neither top cork nor hole in the top of can covered, which causes the oil to lose its burning power; and sometimes cans are picked up by the supply train in which the oil has remained so long that it is of no use whatever. This same condition is found to be true in many cases with lanterns, the oil having remained in them so long that a crust has formed on the wick which prevents them from burning, following which complaints are made as to the quality of the oil. If each person concerned would draw only the amount of oil necessary for each month's consumption, these complaints would be eliminated.

Ink from Discarded Typewriter Ribbons.

"The majority of our people perhaps do not know that an excellent grade of ink can be made from worn out copying typewriter ribbons: Fill a quart bottle with water and allow the ribbon to remain 24 hours until the coloring matter has been dissolved, and you will have as good a grade of writing ink as can be purchased on the market. This ink will not copy unless an impression is taken immediately after writing. This also makes an excellent ink for fountain pen use.

Bridge Timbers.

"When timbers have been distributed on the line for the repair of bridges and cotton platforms, the grass and weeds should be cleaned away from around the piles so the timber will not catch fire readily, as yellow pine timber will ignite very easily during dry seasons.

Improper Shipments of Oil Cans.

"It is noticed that in most cases where four or more cans are shipped in they are tied together in such a manner that each can does not bear its own weight upon the floor of the supply car, which in the handling of the train, loading and unloading, causes breakage among these cans which have to bear the burden of those that do not support themselves. To avoid this trouble, don't tie cans together when returning them."

Construction of Two Concrete Arch Bridges at Rosalia, Wash.

By J. F. Pinson, C. M. & St. P. Ry.

From the report on "Efficient Methods of Handling Work and Men," presented at the annual meeting of the American Railway Bridge and Building Association, New Orleans, La., Oct. 17, 1916.

In 1915 the Chicago Milwaukee & St. Paul Ry. completed two single-track reinforced concrete arch viaducts on its Puget Sound line near Rosalia, Washington. These bridges replaced a frame trestle 60 ft. high and about 2100 ft. long which was built in 1907. The line is on a 3-deg. curve to the left, and crosses successively the Palouse line of the Northern Pacific, a private road, Pine creek, a state highway, the tracks of the Spokane and Inland Empire electric railway, and another private road. The distance between the two railway crossings is about 850 ft. At the time the construction of the concrete structures was begun there were two timber trestles with an embankment 334 ft. long between, the filling having been completed in 1911 before any definite design had been decided upon for the permanent structure. The easterly structure consists of a 107-ft. 6-in. reinforced concrete trestle abutment, a 100-ft. spandrel arch span and a 79-ft. 6-in. reinforced concrete trestle abutment. The westerly structure consists of a 77-ft. reinforced concrete abutment, three 77-ft. 6-in. and one 68-ft. 4-in. reinforced spandrel arches, one 58-ft. 6-in. encased steel girder and a combination trestle and U-abutment. The high fill east of and between the two bridges, and a side hill cut at the west end made it impracticable to place the plant on the track grade.

After considerable study it was decided to locate the plant under the westerly bridge and this was done as shown in the diagram, Fig. 1. The crushed rock and sand were delivered in hopper-bottom cars and unloaded through chutes to the ground below, and then handled to storage piles by a stiff-leg derrick with orange-peel bucket located so as to handle this material to the storage piles and from the storage piles to hoppers for loading the small cars, in which it was hauled to the mixer. The mixer and tower were placed on a traveling platform that could be moved along the north side of the bridge. In this way most of the concrete for the westerly bridge was spouted directly into the forms. One hoisting engine on this traveling platform did the hoisting of the concrete and also hauled the cars containing the dry material from the loading hoppers. The empty cars were hauled back to the loading hoppers by a counterweight

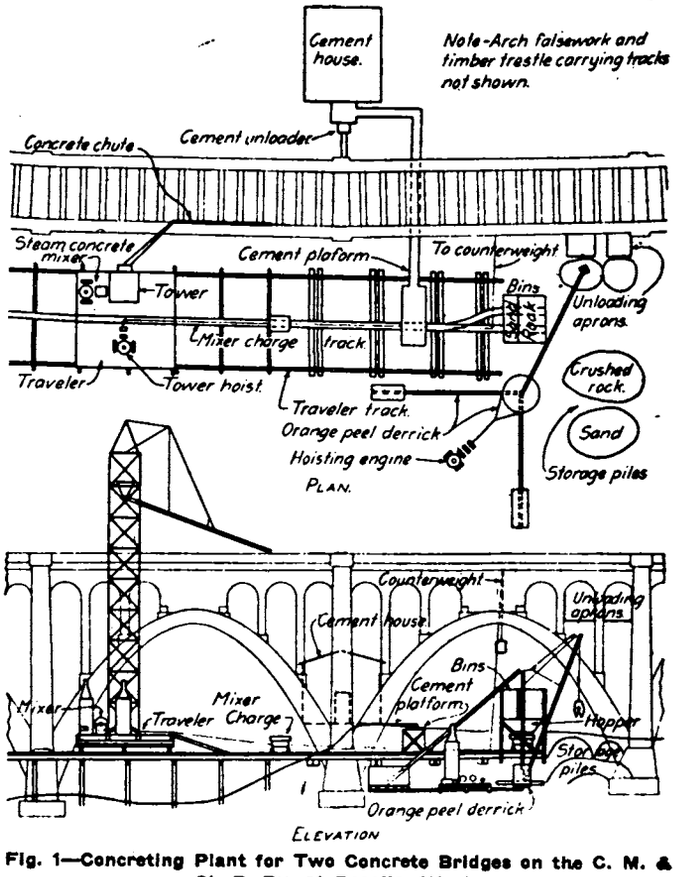

Fig. 1—Concreting Plant for Two Concrete Bridges on the C. M. & St. P. Ry. at Rosalia, Wash.

fastened to the bridge, as shown in Fig. 1. The cement was unloaded into a storage house immediately underneath and south of the bridge by means of an endless belt with a friction brake which enabled the lowering of the cement at slow speed to prevent damage to sacks by tearing or burning. The cement was then wheeled directly to the cars as they left the loading hoppers.

The concrete for the easterly bridge was mixed by this same plant and hoisted into small cars on a narrow-gage track on the north side of the main line and hauled by a gasoline locomotive. Concrete was mixed and placed in the easterly bridge for as low as 34 cts. per cu. yd. in this way, although the average was considerably above this on account of the inability to make continuous runs while concreting.

The steel reinforcement was all cut and bent on the platform at the west end of the westerly bridge and lowered into place from the track level. Portable forms were also built at the same point and handled in the same way. Water was obtained from city mains and in this way the necessity of installing a pump was avoided.

The excavation for foundations for the piers encountered very little difficulty, rock being struck at from 4 to 10 ft. below the creek bed. The excavations for columns in the abutments, however, were more difficult, particularly for those coming high up in the fill, six of which required excavations to be made through the fill to a depth of approximately 60 ft. These were made by sinking a shaft and timbering with second-hand 8x8-in. bridge ties. The material was hoisted by means of buckets. Water was encountered in the bottom of these foundations and was taken care of by driving a 2-in. pipe through the fill into a shaft near the bottom and installing 2-in. Pemberthy ejectors. No attempt was made to remove the cribbing or forms from the columns in these shafts below the top of the fill.

The organization of the forces was as follows:

One general foreman	$150.00	per mo.
One timekeeper	75.00	" "
One carpenter foreman	3.50	per 10 hrs.
One blacksmith	3.25	" 10 "
One labor foreman	$3.00	per 10 hrs.
Two sub-foremen	3.25	" 10 "
Twenty-six carpenters	3.00	" 10 "
Two engineers	3.00	" 10 "
One engineer (gasoline)	2.50	" 10 "
One fireman	2.50	" 10 "
Ten carpenter helpers	2.25	" 10 "
Twenty-four laborers	2.00	" 10 "

The size of the crew varied considerably on account of the difficulty in obtaining men and on account of some delay in obtaining material and plans at various times. During the progress of the work the average traffic was eight passenger and about twelve freight trains per 24 hrs. There was an average of four passenger and four freight trains on the Northern Pacific track under the easterly bridge; eight passenger and four freight trains on the Spokane & Inland Empire tracks under the westerly bridge and heavy team and automobile travel on the state highway, so that it was necessary to provide special falsework in each case to avoid blocking traffic.

At the time of filling the easterly and center portions of the bridge in 1911 the bents in the trestle were crowded badly out of position; some of the bents being as much as 24 in. out of plumb. This made necessary the placing of heavy struts and shores, and in order to avoid disturbing the old bents as much as possible a special plan of supports for arch forms was devised as shown in Fig. 2. This was constructed so as to be entirely free and independent of the old bents and proved very economical, as second hand timber was largely used.

The derrick used for handling the crushed rock and sand was of the ordinary stiff-leg type fitted with a 60-ft. boom and orange-peel bucket. The engine used to operate the derrick was a double drum engine fitted with a Dake swinging gear connected to a bullwheel on the base of the mast for swinging the derrick. Attention is called to the construction of the tower on the traveler, enabling the moving of the tower along the bridge and the use of the counterweight for hauling back the empty material cars; also the method employed to avoid damage to cement sacks while unloading.

The total excavation for foundations was 5014 cu. yds., of which 6 per cent was rock, the average price being $1.73 per cu. yd. The total amount of reinforcing placed was 960,157 lbs. at $1.80 per cwt. The total amount of concrete placed was 5924 cu. yds. at an average cost of $7.56 for both labor and material.

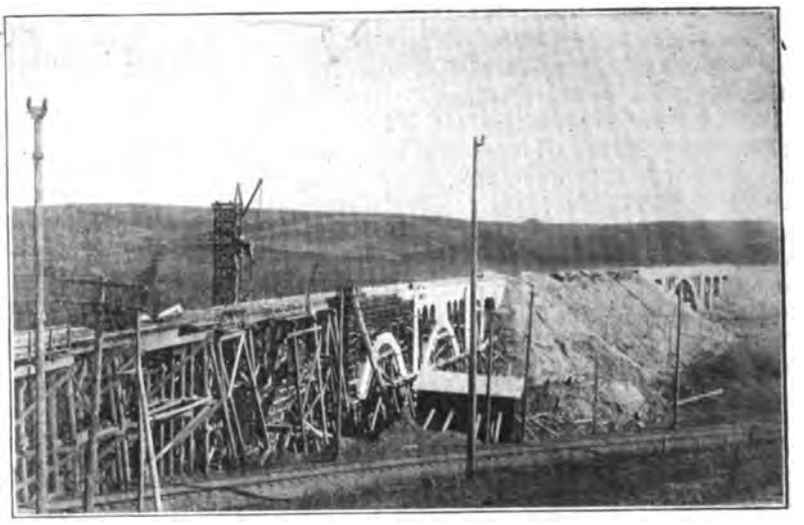

Fig. 2—Old Trestle and Supports for Arch Forms, Rosalia Bridges.

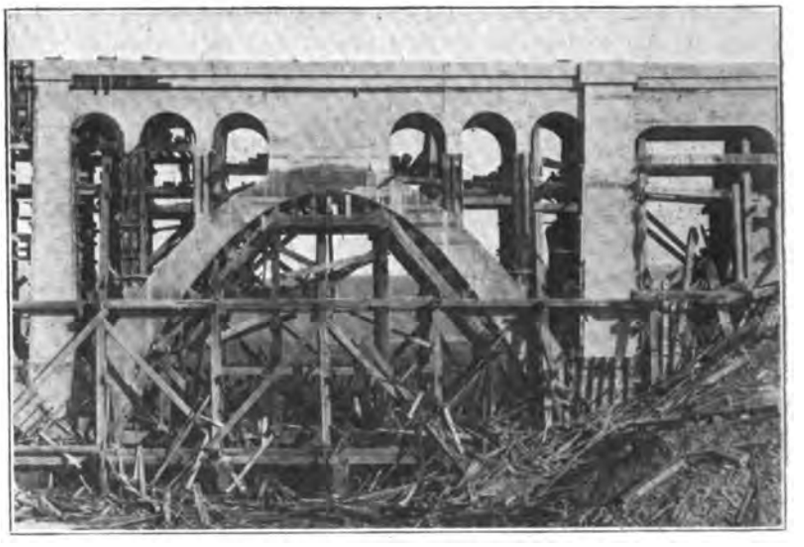

Fig. 3—Near View of One of the Arches of the Rosalia Bridges.

The Car Shortage.

Commissioner C. C. McChord, of the Interstate Commerce Commission, opened in Louisville, Ky., November 3, an informal hearing to inquire into the car shortage situation in Kentucky and neighboring states. As the result of developments at the first day's session, Mr. McChord telegraphed the Interstate Commerce Commission recommending that a formal hearing be ordered immediately. The commission complied on November 4 by entering an order for a general investigation into the supply, exchange, inter-

change and return of freight cars, together with all regulations and practices relating thereto. The initial hearing was set for Wednesday, November 8, at Louisville, before Commissioner McChord. Subsequent hearings probably will be held in such shipping centers as New York, Chicago, Omaha, St. Louis, Kansas City, and other places.

A communication from railroad representatives was submitted to Mr. McChord, November 4, recommending that for the immediate relief of the country-wide car shortage the Interstate Commerce Commission call a conference of the executive heads of the railroad conferences of the East, South and West. The communication declares it the sense of the railroad representatives that "the immediate action desired by you in the present situation can best be obtained by a request upon Messrs. A. H. Smith, Fairfax Harrison and R. H. Aishton, chairmen of the conferences of the East, the South and the West, respectively, to meet you upon such date as you may fix, together with such of the members of their conferences as they may designate, in order that a committee with power may be constituted to confer with the commission."

The Louisville & Nashville R. R. filed a statement in printed form giving that company's answer to the questions propounded as the basis of Mr. McChord's investigation. It showed, among other things, that the percentage of cars on a number of lines October 1 to the total number owned, ranged from 33 for the Queen & Crescent route to 397 for the Central New England. In the case of the Long Island railroad, according to the statement, the percentage of cars on its lines October 1 to the number owned was 311; for the Boston & Maine, 153.9; New York New Haven and Hartford, 126.1; Boston & Albany, 113.7; Philadelphia & Reading, 121; Erie, 119; Cincinnati Hamilton & Dayton, 174; Lake Erie & Western, 154; Michigan Central, 125; Chicago St. Paul Minneapolis & Omaha, 130; Vandalia, 130; Wabash, 125; Southern, 109; Sunset Central, 121; Grand Trunk, 125; Pere Marquette, 134; Big Four, 107. Lines on which the number of cars showed a percentage less than the total number owned by them include the Louisville & Nashville, 65; Baltimore & Ohio, 96; Mobile & Ohio, 58; Queen & Crescent, 33; Atlanta Birmingham & Atlantic, 79; Chicago & Eastern Illinois, 75; Union Pacific, 88; Southern Pacific, 83; St. Louis Southwestern, 45; Pennsylvania, 98.

The Interstate Commerce Commission opened its formal investigation, November 8, by hearing testimony of representative shippers from widely separated sections, that the car shortage is cutting their business in half and threatening the public utilities companies with complete suspension of operation in some cases. Owners of public utilities, including coal, coke, gas, ice and electric light plants, appeared in person to tell the commission that the situation had become so serious they were already taking steps to restrict the supply to their customers. Organizations of coal mine operators, grain interests and manufacturers also joined in the appeal to the government to take control. On Thursday, Michigan shippers representing eight manufacturing districts united in a charge that coal brokers, particularly Chicago brokers, who were "unable" to furnish the public utility corporations of the state with coal cars at normal prices, were giving immediate delivery when prives five times the contract prices were offered. They testified that the coal shortage had become so acute that they were compelled to pay the prices demanded or shut down their water, gas, light and coke plants serving a population of 500,000 people. They appealed to the commission to revise the railroad reconsignment rules, under which, they explained, the speculators were able to tie up the coal market under present conditions.

George Hodges, representing the American Railway Association, who has just completed a study of conditions on 107 railroads, reported that he had discovered 40,000 violations of the car service rules. He intimated that the railroad executives, who are to meet in Denver beginning November 15, would work out a solution of the problem, and hoped to report to the commission before any decision in the present hearing.

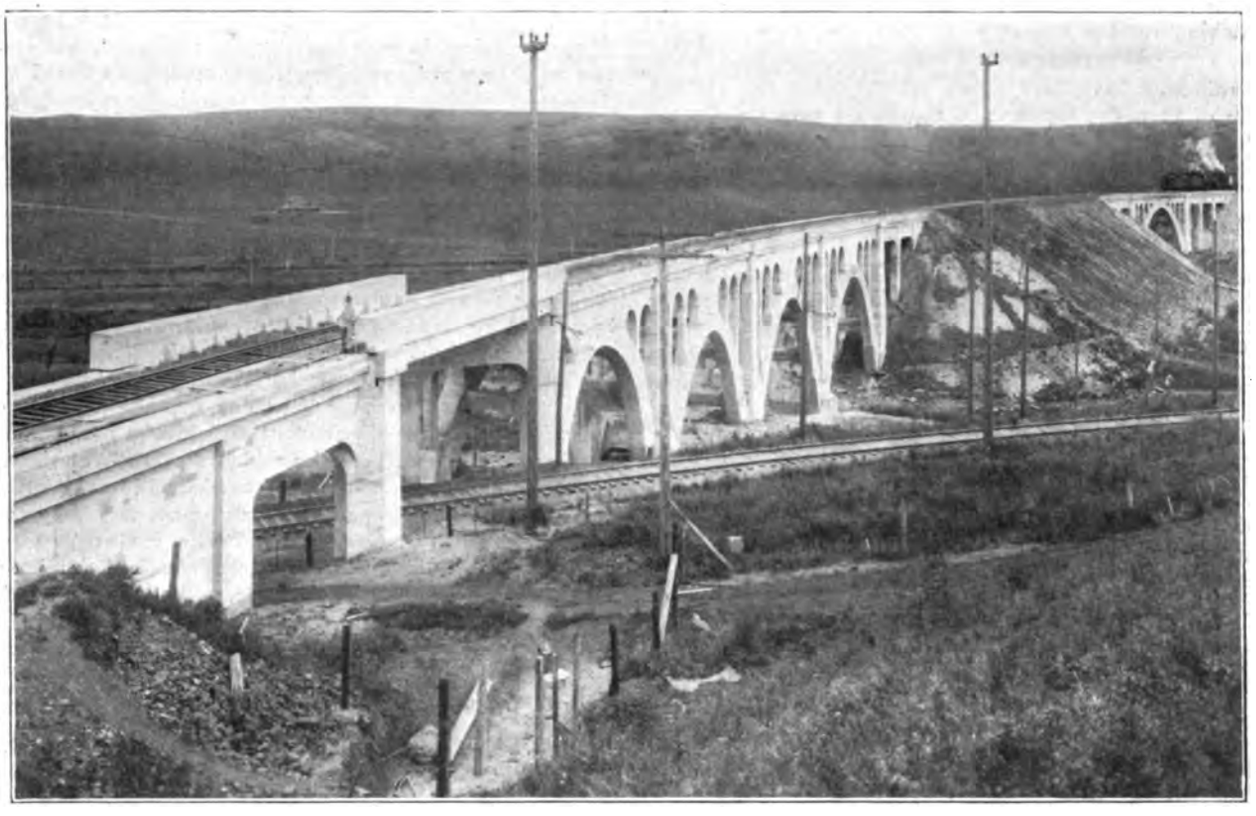

Fig. 4—General View of Two Concrete Bridges on the C. M. & St. P. Ry., at Rosalia, Wash.