The overhead costs, amounting to 45 per cent. of the cost of oiling, seem rather high at first glance. This cost is detailed under the caption "Recapitulation."

The first item for repairs refers to labor of putting the carts into condition for the season's work, several of them being very old and practically unfit for service. Depreciation is figured on basis of 10 per cent. per annum.

Table B.—District Comparative Analysis of Oiling and Screening.

District No.	Analysis of Oiling. Labor cost. $	Material cost. $	Oil per sq. yd.	Analysis of Screening. Labor cost. $	Material cost. $	Screenings per sq. yd., lbs.
1	.00094	.0153	.1577	.00217	.00122	3
2	.00051	.0125	.1271	.00108	.00068	2
3	.00058	.0116	.1164	.00119	.00095	2¼
4	.00050	.0123	.1253	.00112	.00085	2
5	.00044	.0158	.1614	.00110	.00093	2⅓
6	.00063	.0159	.1614	.00141	.00112	2¾
7	.00060	.0160	.1644	.00170	.00150	3½
8	.00099	.0229	.2341	.00213	.00232	5½

Engineering expense refers to the work of making the necessary measurements upon which the statement is based. This item might rightfully be distributed over a term of years as the information will now be available for future use as long as the street is oiled. It was necessary to make the charge in this manner, however, as each year must bear the full cost of the season's work.

Table B2.

NOTE: Re cost of screening—

Total area oiled	834,395 sq. yds.
Area of streets oiled but not screened..	30,999 sq. yds.
Area of streets screened	803,396 sq. yds.
Total cost of screening	$1,860.61

Actual flat cost of area screened...$ .00231 per sq. yd.
Actual flat cost of area screened...$ .231 per 100 sq. yds.

TORONTO-HAMILTON HIGHWAY MAINTENANCE

The maintenance gang on the Toronto and Hamilton cement concrete highway discontinued the use of a horse and wagon and a 3-bbl. tar kettle in filling the cracks and joints this season. A tar kettle having a capacity of only one barrel was substituted and was moved along the highway by the men. A ½-ton motor truck conveyed the men to and from work, transported the tar and blanketing material and hauled the tar kettle when long moves were made. During much of the time the truck and driver were employed by the construction department for a part of the day.

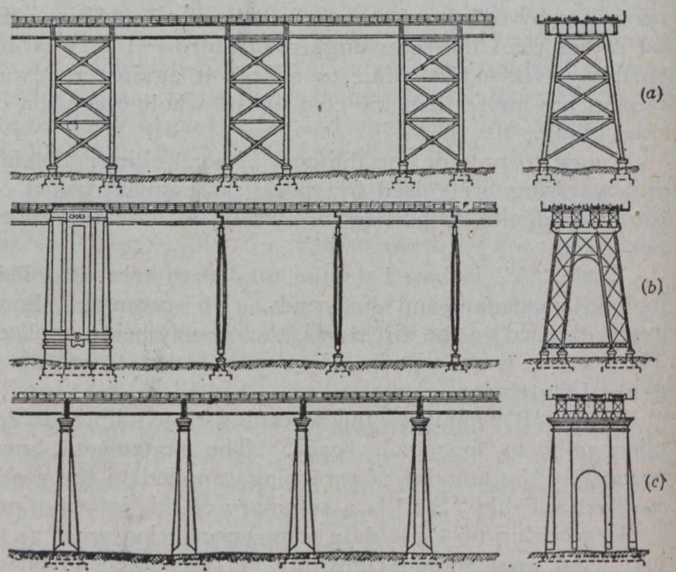
In some of the wider openings the objectionable settling away of the tar was avoided by caulking the bottom of the cracks with oakum. This treatment also effected a saving in the quantity of tar required, as none of it flowed away underneath the slab.

In an endeavor to clean out the openings quickly, a bellows was tried out, but the results were not satisfactory. All of the cracks were carefully cleaned and the narrow ones were chiseled down to a depth of about ½ in. An attempt was made to have the opening wider at the bottom than the top, so that the tar would tend to remain in place. Up to the present, substantially all of the tar poured this season is still adhering.—(By H. S. Van Scoyoc, chief engineer of the Toronto and Hamilton Highway Commission, writing in the November 29th, 1917, issue of Engineering News-Record of New York.)

COMPARATIVE DESIGNS OF PLATE GIRDER VIADUCTS*

By O. H. Ammann

TYPICAL portions of two preliminary designs for the plate girder viaducts and the design adopted are shown in Fig. 1. The top drawing (a) represents the typical American trestle viaduct with alternate tower spans, 40 ft. long and intermediate spans of 80 ft. This type, the advantages of which were cheapness and rapidity of erection, is now gradually being displaced by types of greater rigidity and durability, and better appearance. It would have been inappropriate and inadequate for the approaches to the Hell Gate Bridge. The drawing (b) (Fig. 1) represents the design made by Gustav Lindenthal in 1906. It consists of plate girders, of nearly uniform span length of from 70 to 80 ft., resting on steel rocker bents. To resist the longitudinal forces from braking and traction solid masonry piers (stability piers) were to be provided about every tenth span. This design is superior in general appearance to the trestle design. The stability piers convey the impression of rigidity, and give opportunity for architectural treatment. The arch form selected for the steel rocker bents, although somewhat more expensive, is more pleasing than the ordinary two-column bent with single intersection diagonals. This type of viaduct is also stiffer, in the longitudinal direction at least, than the trestle type. The design (c) (Fig. 1) represents the type finally adopted, with concrete piers. It is superior to the other two types in appearance, rigidity, and durability, and is less costly to maintain.



Designs for Plate Girder Viaduct Approaches to Hell Gate Bridge

(*Concluded on page 498.*)

*Abstracted from paper in Transactions of American Society of Civil Engineers.