for a small electric plant for lighting the yard. There will be 30 stone and lime) (2,050 tons), other important ones being cotton goods, rice, manufactured iron and steel and kerosene. The largest of the exports was Indian corn and other grains (1,561 tons), and the only others of any account were raw skins and potatoes.

A review of the report for the preceding year was published in the *Railroad Gazette* of August 26, 1904.

NEW PUBLICATIONS.

Advanced Mechanical Drawing.—By Alpha Pierce Jamison, M.E., Assistant Professor of Mechanical Drawing, Purdue University. New York: John Wiley & Sons. 1905. Cloth, 6 in. x 9 in.; 177 pages; 27 full page plates and 117 figures. Price, $2.

Professor Jamison has made a contribution to the already numerous works on this subject. This book is devoted to the advanced stages of mechanical drawing only and does not treat of the fundamental principle, such as the proper methods of handling the instruments, etc.; nor does it treat of design, it being preliminary to this subject. It consists principally of a series of progressive notes which are calculated to impart a working knowledge of the principles of graphic representation and at the same time a number of examples are offered which will acquaint the student with the conventions of the art. Part I is intended for the freshman year and contains three chapters on the following subjects: Isometric drawing, cavalier projection, shadows and perspective drawing. Part II is intended for the sophomore year and is to be used in connection with the class room and lecture work in descriptive geometry. It contains two chapters which treat of theoretical and practical problems in both plane and perspective drawing, such as developments, practical perspective, lettering, etc. The discussions are brief and clearly written, and the illustrations throughout are excellent. The work no doubt will be of great value when used, as intended, in class room work.

TRADE CATALOGUES.

The Ganz System of Electric Traction.—The Railway Electric Power Company, New York, sends a 30-page catalogue 11 in. x 14 in. descriptive of the Ganz three-phase alternating current traction system. A detailed description and illustrations of the apparatus used is given, and particular mention is made of the results obtained from its three years' use abroad. A full detailed description of this system as used on the Valtellina line, a part of the Adriatic system of the Italian Government railroads, was given in the *Railroad Gazette* September 30, 1904.

Pilot Couplers.—The Washburn Coupler Co., Minneapolis, Minn., is sending out an illustrated sheet showing its locomotive pilot couplers. The styles are illustrated on one side of the sheet by half-tone engravings showing the application to the pilot, and on the reverse side by detailed drawings. Schedules of parts also are given.

Car Journal Lubricators.—The Harrison-Williams Co., Toledo, Ohio, sends a small illustrated booklet in which is given a detailed description and illustrations of the Harrison car journal lubricator. A short talk on car journal lubrication is also given and the advantages derived from the use of this device are set forth.

CONTRIBUTIONS

The Cost of Locomotive General Repairs.

New York, Sept. 9, 1905.

TO THE EDITOR OF THE RAILROAD GAZETTE:

With reference to Mr. Geo. R. Henderson's article on "Locomotive Operation" in your Sept. 8 number, we do not quite understand his statement in regard to the cost of general repairs. He gives the impression that the cost of general repairs would average about one cent per mile. The cost for locomotive repairs on various railroads is as follows:

	Per mile.
Pennsylvania Railroad. 1903	7.74 cts.
Chicago & Alton. 1903	6.35 "
Louisville & Nashville. 1903	6.96 "
Northern Pacific. 1903	7.24 "
Missouri Pacific. 1903	7.27 "

It would seem from the above figures as though one cent per mile for general repairs is too low a charge, as the running repairs would hardly equal half the amount paid out for repairs.

The question of locomotive repairs is one of particular interest to us, and we should be glad to have some further information in regard to the data used in Mr. Henderson's article.

NILES-BEMENT-POND COMPANY,
M. ESTABROOK.

[It is always well, in attempting to correct an error, to give some additional information, and Mr. Estabrook has done this. Nevertheless, Mr. Henderson made no error. The even figure, one cent, was taken simply for the purpose of making the arithmetic easy when showing what happens when the mileage is increased or decreased, the effect of different waters, etc. Mr. Henderson will treat of actual costs in a subsequent paper.—EDITOR.]

New Dolton Yards of the Chicago & Eastern Illinois.

The Chicago & Eastern Illinois Railroad, which is the Chicago link of the Frisco System, has its principal freight terminal at Dolton, just south of the southern limits of the city. Its passenger trains enter Chicago over the tracks of the Chicago & Western Indiana and the Rock Island in the order named, and use the passenger terminal of the latter. The road enjoys a large coal traffic, which has been steadily growing and which has reached a volume that taxed the existing facilities at many points beyond their capacity. Of these, Dolton yard was the most in need of revision and material enlargement. This yard was built five years ago. It was not a gravity yard and its plan was not suited for the expeditious handling of business according to present standards. Besides, the traffic had completely outgrown it.

In order to permit of enlargement, considerable new property had to first be acquired and a tract of land of about 160 acres was bought. This land is south of the old yard and east of the main line. On this tract a complete new northbound gravity yard is being built and the old yard is being rearranged as a southbound gravity yard. Plans of both yards are shown in the accompanying illustrations.

The northbound yard extends from 159th to 147th streets and the southbound yard from 147th street north to beyond Frederick street, the total length of the two being something under two and one-half miles. Each is adjacent to the track of the same name; that is, the two yards lie on opposite sides of the main line, and communication between them is across main line traffic, the crossover being protected by interlocking.

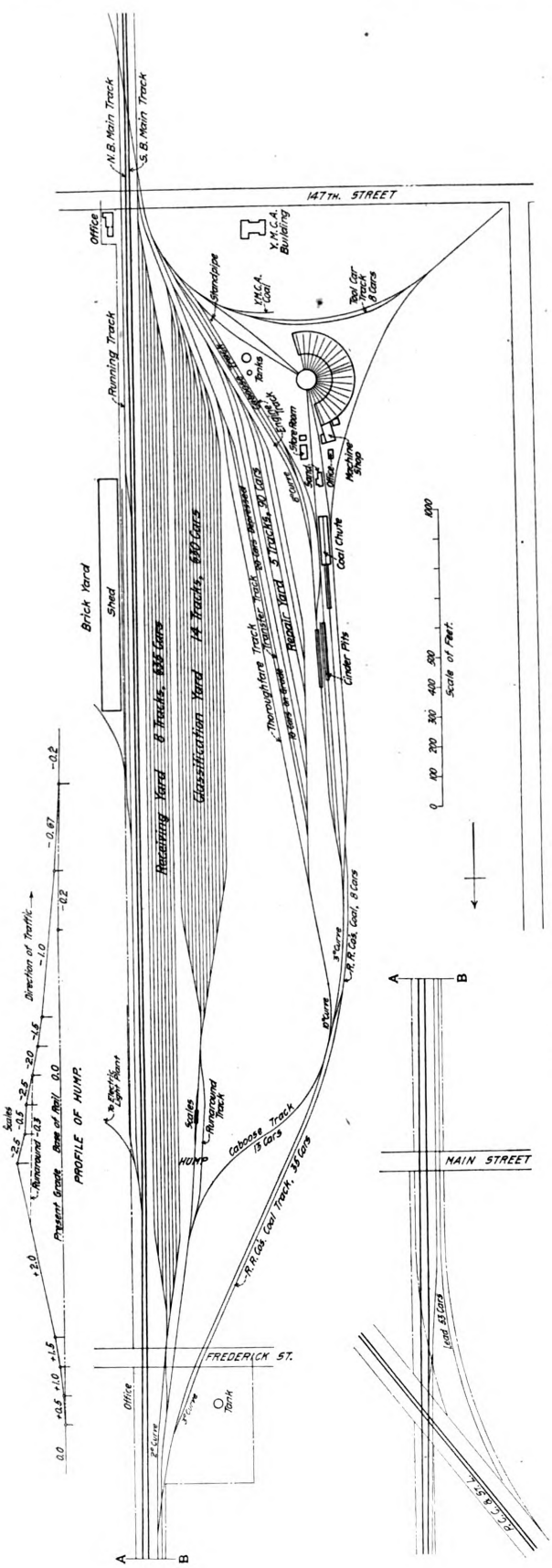
The northbound yard, when completed in accordance with the ultimate plan, will have a capacity for about 3,200 cars. The present work includes all of the tracks shown in solid lines on the plan. The receiving yard will have an immediate capacity of 636 cars on ten tracks, with provision for adding four tracks, holding 188 cars. Passing over the hump, a profile of which is shown, the cars are distributed in a classification yard of 16 tracks, having a capacity for 607 cars. East of and parallel to this yard are two storage yards. Storage yard No. 1 has a capacity of 640 cars and storage yard No. 2 for 528 cars. Both of these yards and all of storage yard No. 3, except six tracks, will be completed by December 1st, making a total available storage capacity of 1,568 cars. These storage tracks are needed to provide for the large number of loaded coal cars which often accumulate. For at times there are several thousand on hand at this and the smaller yards which the company has in several parts of the city.

Two caboose and two set-out tracks for bad order cars are located just west of the main hump track with a connection to the receiving yard ladder just ahead of the hump lead. The receiving yard, as will be seen from the plan, is crossed midway by the Little Calumet river, the width of the stream at this point being about 200 ft. The initial crossing will be a pile trestle structure, having continuous caps on the bents for the ten tracks, the bents being placed 14 ft. on centers. A floor will be laid between the tracks. It is expected that ultimately an arched concrete bridge will replace this wooden structure.

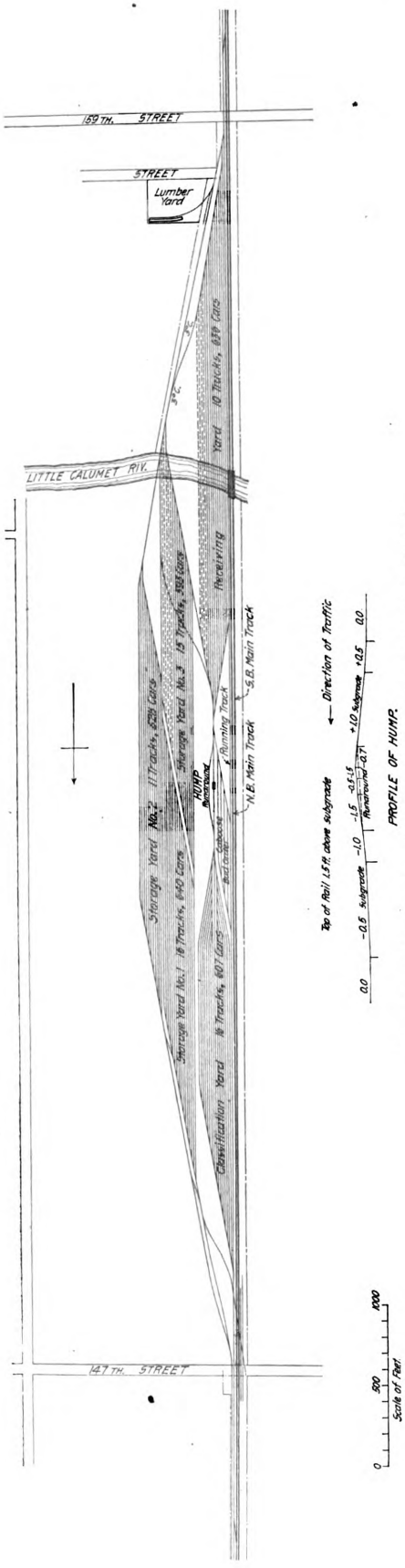
The southbound yard represents an adaptation of requirements to fit existing conditions. The land on which it is to be located was the site of the old yards, and, although containing 120 acres, is not shaped for a gravity yard plan as in the case of the northbound yard. This southbound yard will have as the larger part of its business the handling of empty coal cars to be returned to the mines. The receiving yard has a capacity of 635 cars, apportioned to eight tracks, the longest of which will hold 84 cars. The classification yard adjoins the receiving yard, the hump being at the north end. This yard has 14 tracks, which hold 630 cars. The repair yard is west of this and adjoining the latter are the locomotive terminal facilities, which will remain practically the same as formerly, except for a few improvements.

On the west side of the main line, near the hump in the northbound yard, a Davidson water softening plant is being installed by the Otto Gas Engine Works. The water is taken from the Little Calumet river, which is quite close to this point. The two tanks of the softening plant have a capacity of 85,000 gals. each, and the treated water is pumped to two service tanks of 100,000 gals. and one tank of 75,000 gals. capacity, the two former being located in the southbound yard and the latter in the northbound yard.

The machine shop annex of the roundhouse is to be enlarged somewhat to provide for increased boiler capacity and make room



South Bound Dolton Yard—Chicago & Eastern Illinois Railroad.



North Bound Dolton Yard—Chicago & Eastern Illinois Railroad.

series arc-lights and 350 16-c.p. incandescents; the latter will take current from the arc circuit through transformers. The electric plant will have a capacity for a 20 per cent. increase in this load.

The terminal headquarters will be in a building adjacent to the northbound hump. For the present, all switches will be manually operated. The mileage of the yards when finally completed will be in excess of 30 miles, and their capacity 4,550 cars. The grading for the two yards amounted to upwards 111,000 cu. yds., and almost all of the material used in the construction is new. The switching leads are of 85-lb. steel throughout and the remaining rail is of 70-lb.

The plans were prepared under the direction of Mr. W. S. Dawley, Engineer Maintenance of Way; Messrs. R. Y. Maxen, R. H. Howard and M. Hoffman assisting. Mr. Percy Jones is resident engineer in charge of the work.

Disastrous Wreck on the Manhattan Elevated.

On the morning of Monday, September 11, about 7 o'clock, a southbound passenger train on the Manhattan Elevated Railroad, New York City, was derailed at a sharp curve at Fifty-third street and Ninth avenue, in consequence of running through the curve at high speed, and the second car of the train was overturned and fell to the street below, about 15 feet. The car was packed with passengers, probably from 75 to 100 men and women, and a few children, and eight persons were killed in the fall. Four others died within a few hours, and there were 50 or more injuries besides these, some of them probably fatal.

The conductor of the train, riding on the forward platform of the second car, escaped. The motorman also escaped, and absconded. The third car was thrown part way off the structure and struck the dwelling house at the corner of Ninth avenue and Fifty-third street; and most of its occupants got out by crawling into this dwelling, through a second-story window. The roof of the second car was ruptured, as the car fell over, and some of the victims fell out of the opening and to the ground in advance of the car and were crushed by it. The first car of the train, a motor, and heavier than the second and third, was not derailed.

What are called the Sixth avenue and the Ninth avenue lines of the Manhattan Elevated Railway (operated by the Interborough Rapid Transit Company) are one and the same line from the northern terminus at 155th street southward to Fifty-third street. Here Sixth avenue trains turn eastward through a curve of 125 ft. radius. Disk signals 50 ft. back, and 500 ft. back, indicate the position of the switch. The train which was wrecked was bound for Ninth avenue, and as the Ninth avenue line is straight at the junction no reduction of speed is necessary; but the switch was set for the Sixth avenue line, and the motorman, disregarding the indication of the signal, went on as though his route were clear. It is said that the speed was 20 or 25 miles an hour. The signalman says that the indicators on the top of the front car of the train indicated a Sixth avenue train, and he set the switch accordingly. Immediately after the accident these indicators were found set to show Ninth avenue. To change them from one position to the other is but the work of a moment, the disks being turned by a handle projecting downward through the hood over the platform of the car.

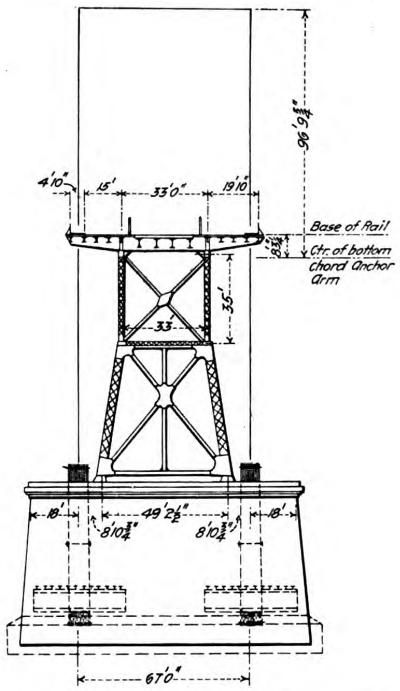
It is said that two or three men (passengers) riding in the first car noticed the motorman's error, before he passed the stop signal, and shouted to him. Stories are printed to the effect that the motorman claimed that the switch was turned immediately in front of him, too late to permit him to stop, but these are as yet unverified.

The following details of the accident are taken from the report of the New York *Sun*: The racket was fiendish. The wheels of the second car jammed over on to the third rail. This caused an explosion and a flash of electric flames which shot up past the windows of the toppling car and dazzled people blocks away. The men and women who filled the train screamed helplessly. Those in the second car, which was turning over, were silent for two or three heartbeats; then, realizing their situation, they shrieked horribly until their cries were drowned by the wrenching and clangor of resounding steel and the rending of woodwork and the clatter of splintering glass. Things happened faster than it is possible to tell them. The second car, whose passengers were doomed, nearly all of them, to death or maiming, turned over slowly and was thrust straight out above the street. The car was twisted and battered and rent by the strain and went all to pieces in the air, so that men and women came dropping down out of it like seeds from a bursting pod. So sudden had the catastrophe been that some of them clutched newspapers in both hands as they plunged. The roof of the car was undermost. It split and broke in ten places, and whenever it buckled and gaped people fell through the holes. Some cried aloud and some were silent. Slowly the wrenched wreck of a car tipped over until one end of it hit the Fifty-third street sidewalk. Then it ran into itself, crumpling itself together into a mass of kindling wood, with a score of people writhing and striking out through the chaos. The electricity of the third rail kept flaring up.

The St. Lawrence River Bridge at Quebec, Canada.

The St. Lawrence River bridge, which is being built for the Quebec Bridge & Railway Co. by the Phœnix Bridge Co., Phœnixville, Pa., and of which a brief description was given in the *Railroad Gazette* Dec. 2, 1904, is to cross the St. Lawrence River about six miles above Quebec, Canada, and about 165 miles below the city of Montreal, and some 800 miles from the sea. There is no bridge over the St. Lawrence between Montreal and Quebec, nor is there any suitable location for a bridge structure immediately below the city of Quebec, as the St. Lawrence widens out to such an extent as to make it impossible to bridge the river below that city. This bridge which is now under construction at Quebec will therefore be the only crossing of the river for a distance of about 160 miles, and will be of increasing value in serving the population on each side of the river, and it will be the only means of crossing the river by railroad and highway traffic. The bridge, upon its completion, will make it possible to transfer business between the Great Northern Railway of Canada, The Quebec & Lake St. John R. R. and the Canadian Pacific on the north side of the river, and the Grand Trunk R. R., Intercolonial R. R. and the Quebec Central Ry. on the south side of the river. The new Grand Trunk Pacific Transcontinental Line is planned to cross this bridge.

The bridge proper consists of two 210 ft. pin connected deck



Pier and Cross Section of Approach—St. Lawrence River Bridge.

approach spans; two 500 ft. anchor spans, and one 1,800 ft. central span. The bridge is designed to carry two lines of railroad, two trolley lines, two highways and two sidewalks. The sidewalks are carried on the outside of the trusses, the balance of the traffic is carried between the trusses. The trusses are placed 67 ft. between centers and the clear headway above maximum high water mark is 150 ft.

The main piers and the approaches which are now completed were built by M. P. Davis, of Ottawa, Canada. The main bridge is of pin connected cantilever design. The eyebars are in general 15 in. and 16 in. in width, and for a few special details they will probably be 18 in. in width. The majority of the pins are 12 in. in diameter, but the main lower pin at the shoe is 24 in. in diameter. The main chords are 54 in. deep by 68 in. wide. The main post over river pier is 10 ft. in width by 4 ft. deep. The main intermediate posts are from 40 in. to 48 in. in width, and the main plate floor-beams are 10 ft. deep. The suspended span is 675 ft. long and 130 ft. deep at the center. The general outline of the main span, giving the heights at various panel points and other information is shown in the accompanying line drawings.

The main shoes and pedestals are of built up wrought steel girders, no castings being used in the entire construction. The falsework under anchor arm consists of two main parts. The central