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No. 2.

## THE SYSTEM OF THE BINGHAMTON RAILROAD COMPANY.

The Binghamton Railroad Company, which was chartered in 1892, and now owns all the street railway lines in the city, is a consolidation of the following companies: The Binghamton & Port Dickinson Railway Company, the Washington Street & State Asylum Railroad Company, the Park Avenue Railroad Company, the Washington Street, Asylum & Park Railroad Company, the Binghamton Central Railroad Company, the City Railway Company, the Court Street & East End Railroad Company, the West Side Street Railway Company and the Binghamton Street Railroad Company. The officers of the company are: President, G. T. Rogers; vice-president, J. B. Landfield; secretary, C. O. Root; treasurer, J. B. Rogers; general manager, J. P. E. Clark.

The first electric railway in the State of New York was installed by the Washington Street & State Asylum Railroad Company, of Binghamton, N. Y., which now forms a part of the Binghamton Railroad Company. The spirit of enterprise which dictated the adoption of electric power in the early history of its development has been characteristic of the management of the Binghamton street railway officials up to the present time. The system installed at that early date was the Van Depoele, and it is interesting to record that some of the original motors are still in use by the railway company, as power motors in its machine shops and various departments.

The Binghamton Railroad Company affords a characteristic example of the success which can be attained in cities of moderate size by careful management, judicious location of lines, and a study of the best methods for promoting traffic, added to skillful and careful financing. The comparative report of earnings and expenses of the railway for the last four years, given later, presents

indubitable proof of the favorable effect which this has had on the fortunes of the company.

### POWER STATION.

The power station of the company is located in the central portion of the city, on State Street close to the Chenango River. It is of brick, with iron truss roof covered with slate, and measures 65 × 128 ft. An exterior view of the station is given in Fig. 1.

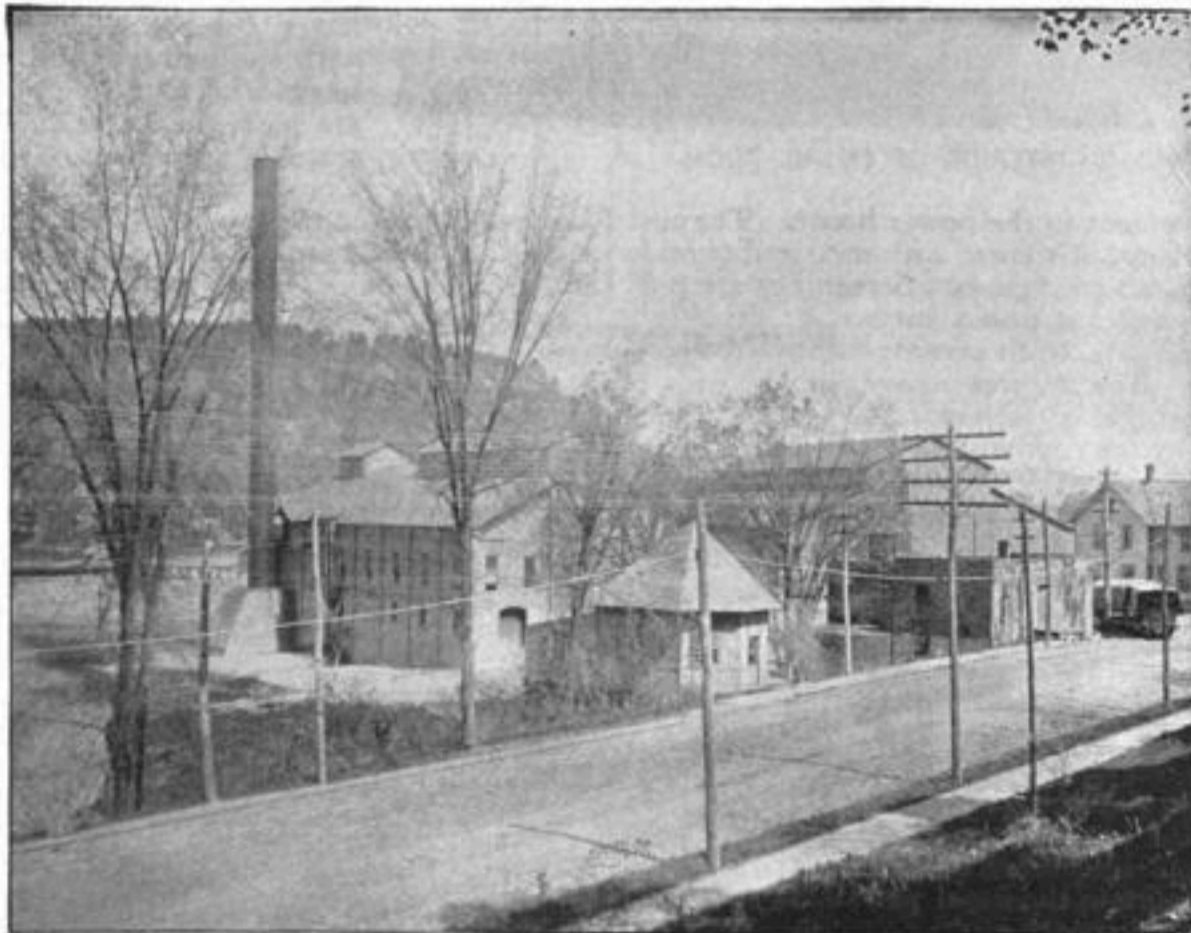


FIG. 1.—POWER STATION—BINGHAMTON RAILROAD CO.

The power station plant consists of one cross compound Ball & Wood engine, with cylinder dimensions 14 and 24 ins. × 16 ins. stroke, and two tandem compound engines of the same manufacturers, with cylinder dimensions 12 and 18 ins. × 14 ins. stroke. These operate directly two General Electric 80 k. w., bipolar generators, and two 100 k. w. generators of the same type. The switchboard is of the panel type and is of

slate mounted on an iron frame. The feeders are eight in number, and are each provided with automatic circuit breakers.

The boiler room contains three return tubular boilers, each measuring 6 × 18 ft., and supplied by Shapley & Wells, of Binghamton. The condensers are of the Conover type, and three National feedwater heaters are used. One Worthington 7½ and 4½ × 10 in. pump and one Buffalo 6 and 4 × 8 in. pump are employed.

The stack is self supporting, 120 ft. in height, and is of iron on a solid masonry base. The foundations for all machinery are carried down eighteen feet to piles which reach to gravel.

The building and foundations are erected with an idea to the development of the city, and are adequate for double the capacity now in service. The power plant is a model of convenience and completeness, and is provided

with all the latest and most approved appliances for successful and economical operation.

#### FUEL.

The fuel used is buckwheat coal and screenings. The former costs from \$1.65 to \$2.00 per ton on cars in the

repairs, keeping an experienced winder and helper for the purpose. All of this work, together with such miscellaneous machine work as may be required, is performed in a portion of the engine room which is devoted to this purpose. Here are a drill, planer and lathe, which are operated by a Van Depoele motor.

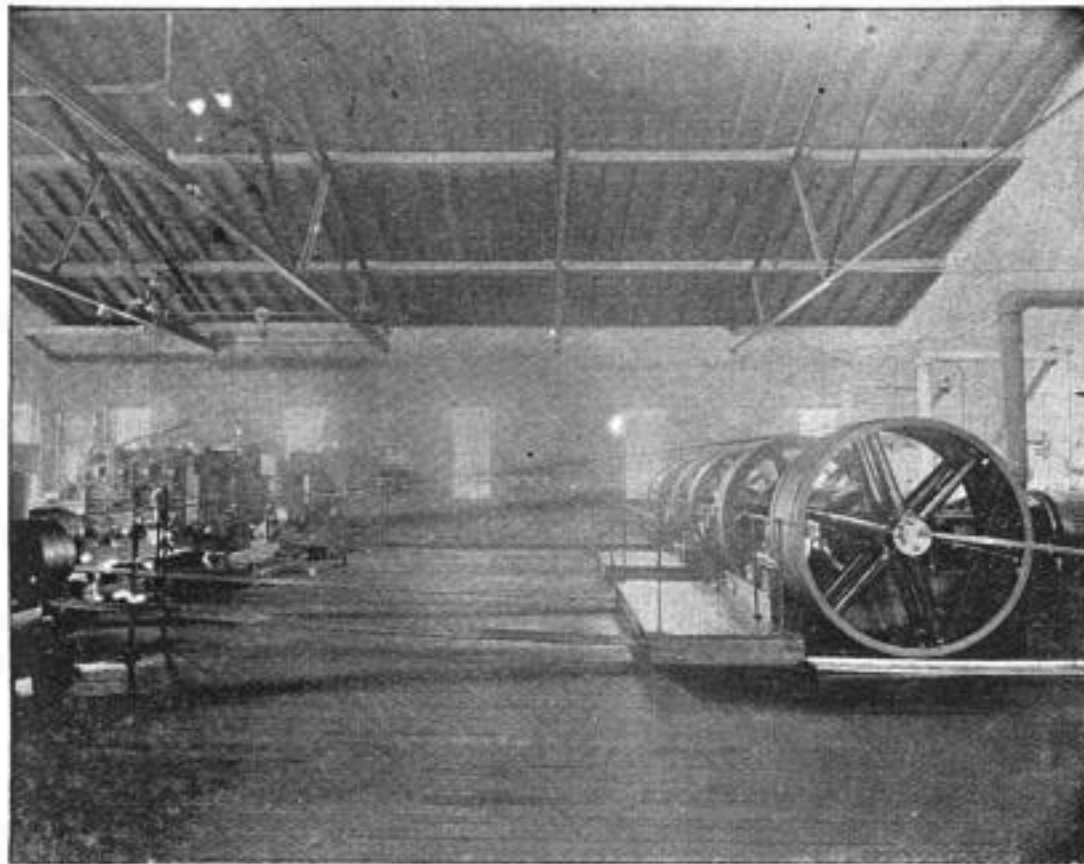


FIG. 2.—INTERIOR OF ENGINE ROOM.

railroad switch convenient to the power house. The cost of drawing a very short distance with man and team is not included in the above figures. Screenings are purchased at various yards, at prices varying from twelve and a half to seventy-five cents per ton. The figures above do not include cartage of screenings, which is also done by the company's own man and team. The proportion of screenings used, mixed with buckwheat coal, is about 55 per cent. of the total fuel consumed, provided screenings can be obtained in the necessary quantity. February and March are comparatively more expensive in operation than the other months, owing to heavy snow storms, sleet and ice, making extra power necessary. June and July, in the statement below, show greater expense than usual in those months, owing to the fact that the company could not obtain screenings in sufficient quantity to maintain the usual percentage of screenings to coal.

	Av. Daily Consumption Coal and Screenings.	Av. Daily Cost Fuel.	Av. Hourly Cost Fuel.
January	4 tons 1,813 lbs.	\$4.86	.26 $\frac{3}{4}$
February	5 " 434 "	5.32	.29 $\frac{1}{2}$
March	5 " 287 "	4.90	.27 $\frac{3}{8}$
April	4 " 1,691 "	4.69	.26 $\frac{1}{8}$
May	4 " 1,321 "	4.65	.25 $\frac{3}{8}$
June	4 " 1,622 "	5.14	.28 $\frac{3}{8}$
July	5 " 73 "	5.91	.32 $\frac{1}{2}$

Month.	Av. No. Cars Operated Daily.	Av. Daily Car Mileage per Car.	Av. No. of Hours Boilers Used Daily.
January	18	95	18 $\frac{1}{2}$
February	18	95	19 $\frac{1}{2}$
March	18	95	19 $\frac{1}{2}$
April	18	95	18 $\frac{1}{2}$
May	20	95	19
June	22	95	20
July	24	95	20

The company has always performed its own motor

#### CAR HOUSE AND ROLLING STOCK.

Close to the power station of the company is located the main car house. This is of wood covered with corrugated iron, and measures 130 X 118 ft. A second car house of about the same capacity and used entirely for storage purposes, is located on the Asylum division. Including the property upon which these buildings are located, the company owns about seven acres of land favorably located in the city.

The rolling stock consists of forty closed cars, of which thirty are motor cars and ten are trail cars, and the same number of open cars, of which thirty are motor cars and ten trail cars. Most of the closed cars have an eighteen foot body, though some of the old cars have a sixteen foot body and two of the latest a twenty foot body. The main panel is a handsome wine color lined with silver or gold, and bearing the car numeral. The lower concave panel is painted yellow, with the name of the company in silver lined with black. Most of the car bodies are from the works of the John Stephenson Company, Ltd., and the Laclède Car Company. The rolling stock also includes,

however, two handsome cars from the works of the American Car Company, one of which formed the exhibit of that company at the World's Fair, and the open car

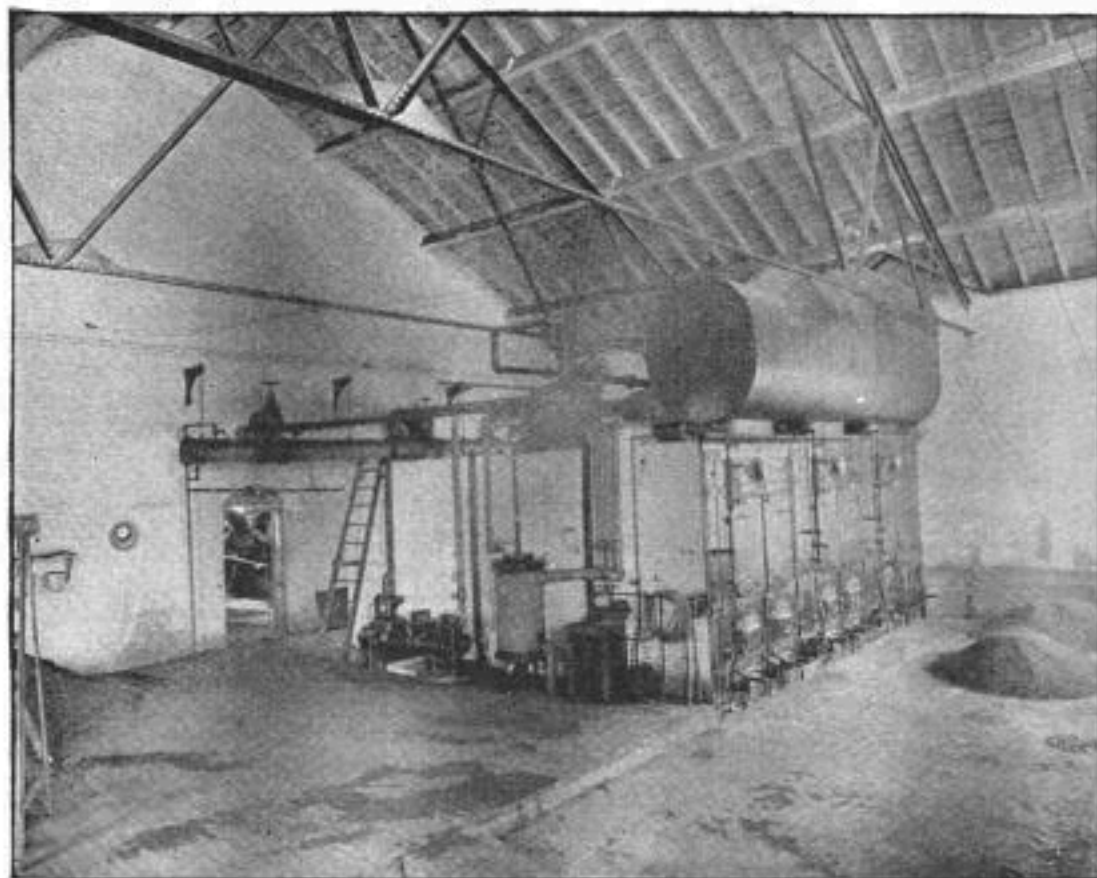


FIG. 3.—INTERIOR OF BOILER ROOM.

exhibited at the World's Fair by the Lamokin Car Company. Bemis, Taylor and Brill trucks are used.

The company owns twenty-five complete double electrical equipments, comprising for the most part General Electric W. P. motors of fifteen and twenty-five horse power each. There are a number of Sprague No 6 motors still in use, and giving excellent satisfaction with the General Electric K controller, which is employed exclusively. The equipment of the cars also includes Lewis & Fowler registers, Smith headlights, Rochester car wheels,

self oiling trolley wheels manufactured by the Pawtucket Brass Foundry, of Pawtucket, R. I., and Dorner & Dutton scrapers. A few of the cars are equipped with the Consolidated Car Heating Company's heaters, the rest being heated by stoves.

The rolling stock of the company also includes one Edward C. White rotary snow sweeper, operated by two Sprague motors.

The company purchases its general electrical supplies from F. P. Little & Company, of Buffalo, N. Y., and Smith & Wallace, of Boston, and its gears from the Superior Machine Company, of Cleveland, O.

#### TRACK.

The track of the company is twenty-seven miles in length, covering about twenty miles of street. This portion of the plant, in the opinion of the general manager of the company, is more important than any other, since a poor track construction with low joints will soon destroy the best rolling stock and equipment. For this reason the greatest care has always been taken in this part of the installation, and the managers have been pioneers in their advocacy of a heavy and substantial roadbed.

For standard city work the half grooved, nine inch rail shown in Fig. 8 is employed. This rail was rolled by the Johnson Company, and weighs ninety-four pounds to the yard. It is mounted on standard steam railroad ties, measuring seven to eight inches face, six inches in depth and eight feet in length. These are of chestnut, white, or rock oak, and are laid in concrete eighteen inches between centers, making a most substantial construction. The

Pa., and supported on 5 X 6 in. X 7 ft. ties, has been installed. For special work in paved streets the company is using made-up, nine inch special work of the Johnson Company, employing rails of 117 lbs. weight.

The management is enthusiastic on the use of the half grooved rail for paved streets. Careful measure-



FIG. 4.—T RAIL CONSTRUCTION—PARK AVENUE

ments made by the company do not show that this type of rail requires any more power to operate over than the T rail, and a noticeable feature of its use is that trucks and other vehicles do not use the rails of the company for driving upon. This is considered an advantage. It is needless to say that the rail offers but little obstruction to carriages and other vehicles crossing the track.

#### OVERHEAD CONSTRUCTION.

The overhead appliances used by the company are of the General Electric type, though on part of the line some of the old mica insulators, formerly manufactured by the Gould & Watson Company, of Boston, are still giving satisfactory service after five years of use. The trolley wire employed is mostly from Washburn & Moen and John A. Roebling's Sons Company, and feed wire of the Simplex type is used.

#### TRAFFIC.

Binghamton had a population in 1890 of 35,000 inhabitants, and at present it is estimated to contain 45,000 inhabitants within the city limits. Together with Lestershire and Port Dickinson, two neighboring towns reached by the line of the company, the district directly served has a total population of over 50,000. The city is most favorably situated for street railway business. It is located at the junction of the Chenango and Susquehanna Rivers, and radiates in four directions. The company is also fortunate in the matter of important terminals. Among these are the State Hospital for the Insane, National Commercial Travelers' Home, Ross Park, the public park and pleasure resort of the city, and several growing suburbs. There are also two other parks on the line of the street railroad, both public, although controlled by the railway company.

#### PARK ATTRACTIONS.

It has been in the development of traffic to these resorts, particularly to Ross Park, that the success of the



FIG. 5.—VIEW ON STATE STREET.

joint connections are made by heavy eight-bolt fishplates supported by an extra heavy tie directly under the joint. Tieplates 8 X 10 X 3/8 ins. are used.

For suburban construction in unpaved streets the company has the right to employ a T rail, and on such portions of the track a forty-eight pound T rail, supplied mainly by the Pennsylvania Steel Company, of Steelton,

company has been largely due, and the managers have no hesitation in saying that the establishment of a pleasure resort at the terminus of a street railway line is a most important factor in the growth of a system, and sufficient as a traffic producer to justify the expenditure of a considerable amount for its establishment and



FIG. 6.—GIRDER RAIL CONSTRUCTION.

maintenance in case one should not be in existence. As this theory has been followed out in practice with most satisfactory results in the case of the Binghamton Railroad Company, a brief description of the methods of that company to encourage pleasure riding of this description will not be without interest.

Ross Park is located about one and a half miles from the center of the city, and comprises 100 acres of natural wooded country. It is maintained by the city, but a contract has been made with the leading officials of the street railway company for the supply of attractions at

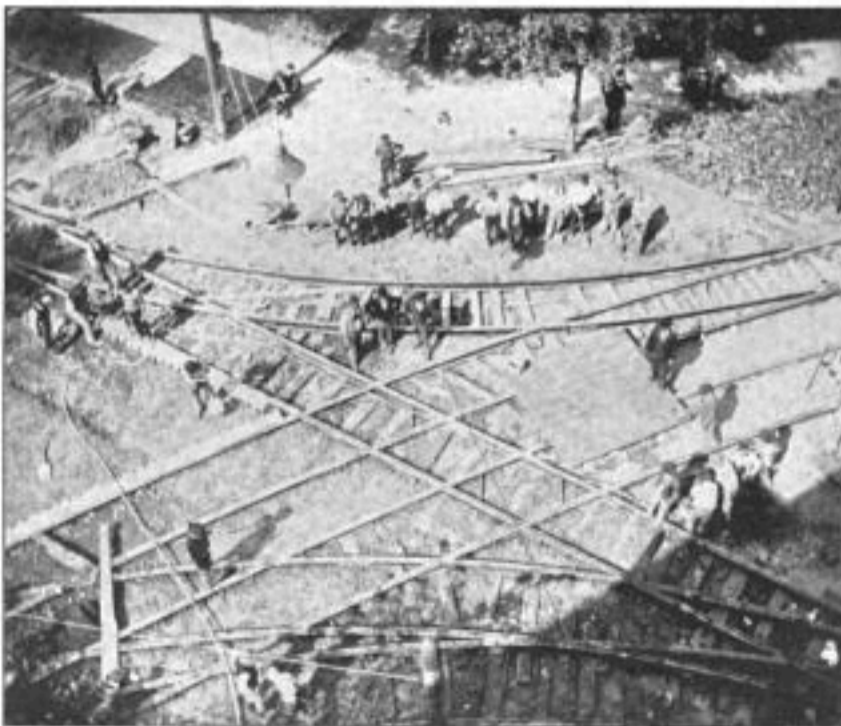


FIG. 7.—GIRDER RAIL SPECIAL WORK, AT CORNER OF LEWIS AND CHENANGO STREETS.

the park in consideration for amusement privileges. The latter include merry-go-round, switchback, restaurant privileges, etc.

The Park Amusement Company, which is the title of the corporation composed of the street railroad officials to which reference has been made, supplies a most varied programme. Free concerts are given daily, afternoon and evening, from June 1 to September 1, and on Sunday

sacred concerts are given to large crowds. In addition, balloon ascensions are provided at occasional intervals, and Japanese and Hindoo jugglers, trapeze performers and other out-of-door exhibitors are engaged to give free exhibitions. From five to six different acts are given daily in this way, at a cost of from \$250 to \$300 a week. The company also gave last season, twice a week, two exhibitions of fireworks. The theatrical exhibitors were secured from agencies devoted to that purpose in New York, and the fireworks from Boston. The expenses for all of these entertainments were more than defrayed by the receipts from the paying attractions, the principal of which were the merry-go-round, which is operated from the railway circuit by a Van Depoele motor, the switchback, shown in Fig. 10, a photograph gallery and refreshment booths. A number of these privileges were sub let, the popcorn franchise bringing in quite a large amount of money. Free tables and dishes for the benefit of excursionists who provide their own refreshments are furnished by the Park Commissioners, under whose jurisdiction the affairs of the park are administered.

The railroad receipts on this single line are largely increased during the summer, the park not only attracting a great many residents of the city, but also being visited by excursion parties, societies, etc., from neighboring towns. On certain days of last year as many as 28,000 people, or more than one-half the population of the city, have been carried by the cars of the company, while 12,000 people have often patronized them on pleasant afternoons.

Bennett Park is a private enterprise, the control of which is also with the railroad company. This park is devoted more to entertainments at which an admission fee can be charged, or to special excursions of societies where exclusive use of the grounds is desired. The company has here a large dancing pavilion, restaurant booths, and gives here occasional concerts. The baseball grounds, two trotting tracks and the Binghamton Industrial Exposition grounds are located upon the various divisions of the street railroad. The company has under its control still another resort called Glenwood Park, comprising ten acres, which, as yet, is undeveloped.

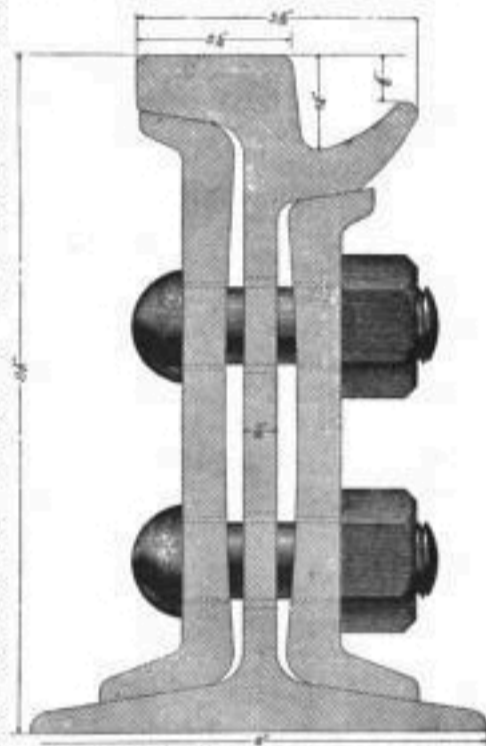


FIG. 8.—STANDARD 94 LB. HALF GROOVED RAIL—BINGHAMTON.

FARES.

The fare charged by the company is five cents, with transfers to any line. At first, twenty-five tickets were sold for \$1, and two cents charged for transfers, but the change to the present arrangement was made some time ago to the satisfaction of both the public and the railway company. All transfers are registered, and are balanced and charged up as cash fares.

MANAGEMENT.

The traffic returns and reports of the different departments are made to the general manager in a most systematic way. The daily record for each conductor is kept in a blank book provided for that purpose, containing the following headings:

- Record for..... Division..... 1894.
- Name of Conductor; Car Number; Day of Week;
- Date; Run; Cash Fare; Tickets Sold; Office Receipts;
- Transfers Issued; Tickets Received, Employes' Tickets Received; Special Tickets Received; Transfers Received;
- Passes; Police; Reported Register; Passengers; Day Pas-

sengers, Car Mileage; Daily Car Mileage; Daily Receipts; Earnings; Summary; Remarks. Under the latter is given the weather, temperature, and any other conditions which might affect the traffic.

There are thirty-two trip routes, and the crews are rotated every week. To encourage competition among conductors in the number of passengers carried, the names of the twenty conductors carrying the greatest number of passengers for the past month, the past four months and the past year are posted every month.

The summaries from the record book are transferred to a conductor's "average book" in which the headings are: Conductor's Name; Year Ending; Number of Days Worked; Number of Passengers Carried; Daily Average of Passengers Carried.

general condition of the cars, together with a statement of anything about any car which may be out of order, and the barn foreman gives a daily record of repairs made to cars or electrical equipment. The car starter makes a daily report of the motormen and conductors who fail to report for duty, with excuse for non-appearance, when known, and name of supply. The line and track superintendent reports on the men employed, and the hours, with work done; the fireman, as already described, on the amount of coal used, and the surgeon upon any injury to persons, with name, residence and full particulars.

In this way, the general manager, arriving at his office in the morning, can at a glance tell the condition of each department, the work which has been carried on

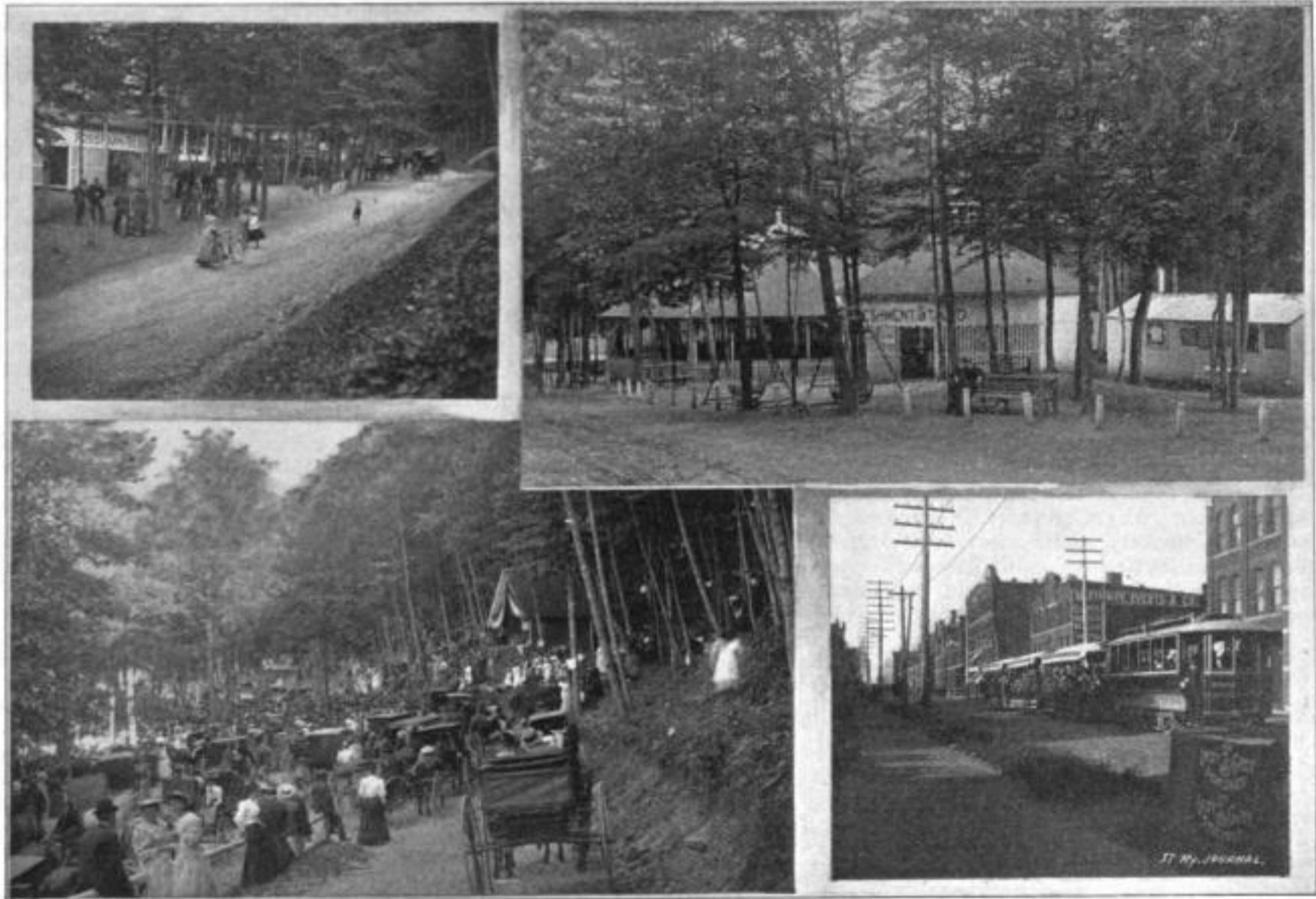


FIG 9.—VIEWS IN ROSS PARK.

In another book a comparative table of the earnings of the different lines is kept, with car averages for past years, and at the foot, spaces are provided for entering the net gain or loss for each division.

A careful account is kept of the fuel used. Every wheelbarrow load of fuel is weighed before being fed to the furnaces, and a slip is filled out giving the coal used. The tables for a day are entered into a book, giving fireman; coal; dust; number of boilers used; time condensers were used; time fire cleaned; time flues cleaned; number of hours force draft used; time fires banked; remarks. A recapitulation of these items is given at the foot of the page, giving the total amount of the fuel, coal and dust used, with the total cost and daily average amount of fuel consumed, with the cost. At the end of each month this record is compared with the ledger account of the price paid for fuel, and during the last six months there was a discrepancy of only about six tons, which included all waste, mistakes in weighing, etc. Each head of a department is obliged to make to the general manager a daily report regarding the condition of the work under his supervision. Thus the inspector reports the

during the preceding day, whether any repairs are needed, and so on. The system has been adopted on a number of other lines in its entirety. The insurance "rider," employed by the company in making its policies, was published in our September, 1894, issue.

#### FRANCHISES.

Each of the companies whose lines were merged into the Binghamton Railroad system had valuable franchises or licenses from the city, a large portion of which were exclusive. But the present management has secured from the City Council, by an ordinance passed March 28, 1892, a consolidated franchise and contract which virtually secures to all the properties in the consolidated system a perpetual franchise, and imposes only the obligation to pay for one-fifth of the original cost of paving between the tracks which is a particularly favorable concession, and puts at rest all annoying questions that might otherwise arise between the company and the city.

This contract between the city and company was legalized by the legislature of New York State, and approved by the Governor, March 28, 1893. The company

has also secured perpetual and exclusive franchises from the small villages of Port Dickinson and Lestershire, also contracts and ordinances with each, similar in

stock, tidy, courteous and intelligent employes, and the excellent system displayed in every department, is an endorsement of the management of the affairs of the company.

#### FINANCES.

The entire cost of the properties acquired by the company up to date is said to be more than \$1,000,000, this representing actual expenditures. The estimated value of the franchises granted to the company by the city and suburban villages is placed by conservative bankers and business men of Binghamton at \$1,000,000.

The issue of bonds upon this property is \$700,000, and the securities are rated among the very highest of their kind. A large portion of the bonds are owned and controlled by citizens and financial institutions of Binghamton, while 97 per cent. of the entire stock issue is owned by local parties. The following is a comparative statement of the gross earnings and operating expenses of the road for the fiscal years ending January 1, 1892, 1893, 1894 and 1895.

	1892.	1893.	1894.	1895.
Receipts.....	\$46,606.31	\$67,973.35	\$90,358.31	\$121,969.02
Operating expenses..	30,377.07	39,955.83	57,011.16	69,580.96
	\$16,229.24	\$28,017.52	\$42,347.15	\$52,388.06
Taxes.....	1,405.03	2,286.87	1,558.83	3,026.50
Net earnings.....	\$14,824.21	\$25,730.65	\$40,788.32	\$49,361.56
Operating percentage of receipts.....	65½	59	57½	57

terms and conditions to the one entered into with the city, both of which were legalized by the legislature and approved by the Governor.

The tracks of various roads merged into the Binghamton Railroad Company, cover all of the principal streets of the city, and reach directly the numerous public institutions and points of interest for which Binghamton is justly celebrated. This, in connection with the valuable suburban franchises above mentioned, and the

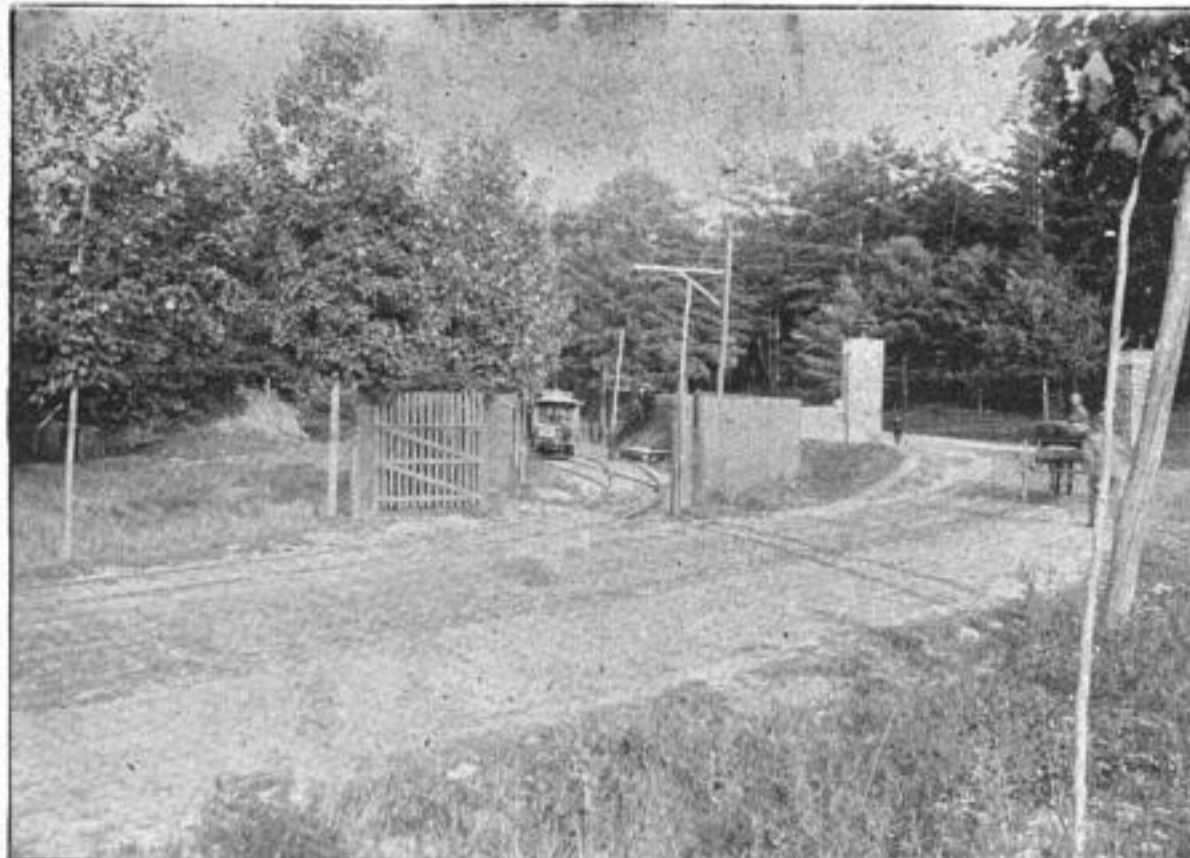


FIG. 11.—TERMINUS OF ROSS PARK LINE AND ENTRANCE TO PARK.

contemplated suburban lines to be constructed (one of which is now incorporated), precludes competition.

The service afforded by the Binghamton Railroad Company is up to, and even in advance of, the requirements of a bright, progressive city like Binghamton, and the general air of thrift and enterprise that surrounds the entire plant, including modern and well kept rolling

a contract with the post office department for the transportation of the mails in that city from the general post office to eight sub-stations. Considerable saving in time will be effected by this arrangement.

THE Gardner (Mass.) Electric Street Railway was put into operation last month.

#### Nassau Electric Railway.

The power station of the Nassau Railway Company of Brooklyn, N. Y., is rapidly approaching completion. It is located at the foot of 39th Street, South Brooklyn, and contains at present one 750 H. P. C. & G. Cooper cross compound engine directly connected to one Westinghouse generator. Two additional units of the same description are completed and will soon be in position, then the station will be ready for operation.

The boiler equipment consists of Babcock & Wilcox water tube boilers which are now being erected. The steam plant also includes Worthington independent, steam driven surface condensers, which are on the ground and are ready for erection. The stack is of iron, 175 ft. in height.

#### Mail Cars in Cleveland.

The Cleveland (O.) Electric Railway Company has entered into a contract with the post office department for the transportation of the mails in that city from the general post office to eight sub-stations. Considerable saving in time will be effected by this arrangement.