

## Handling Traffic at the Inter-State and West Indian Exposition, Charleston, S. C., Jan. 1 to May 31, 1902.

The Exposition at Charleston, S. C., which came to a close last month was devised, as its name partly suggests, for the purpose of exploiting the resources, industries and attractions of the states along the Atlantic seaboard south of Mason and Dixon line. The results predicted—and in a large measure secured—by the holding of this fair, were, the opening up of new foreign markets for the south principally in the West Indies, and the advertising and promoting of the silk, tea, cotton, tobacco and mineral resources and industries of the eastern southern states and the Mississippi Valley.

Although the Charleston Exposition was not designed on lines as broad as the Chicago World's Fair, the Omaha Exposition, the Pan-American or other similar enterprises of the past decade, it was thoroughly representative, and has been the means of bringing the attention of the world to the remarkable growth and development

Leading from one side of the Court of Palaces was the Midway with its many booths and buildings given over to amusement and pleasure. Here were the Old Mill, Thompson's scenic railway, stage for fireworks, etc. Opening from the opposite side of the main court was the section given over to art, transportation and machinery, stock and other exhibits and also the various state buildings. A miniature railway built according to the patents and designs of Cagney Brothers, of New York City, ran the length of the grounds and reached all the points of attraction.

Practically all of the exhibits pertaining to machinery and transportation were grouped in Machinery Hall and in the Transportation Building adjoining it. While not extensive, the contents of these buildings were instructive and worthy of careful study. The industrial activity of the South was well set forth by the number



THE CHARLESTON EXPOSITION AT NIGHT.

along industrial and commercial lines that have taken place in the South during recent years.

The site selected for the buildings and industrial palaces covered 200 acres of land on the eastern bank of the Ashley River within the corporate limits of the city of Charleston and about three miles from the business center of that city. The architectural and artistic landscape effects were typically southern in motif. Many of the chief buildings revealed traces of old southern colonial design, and southern palms and southern flora were left scattered through the grounds in the rich profusion of their natural state. Wide gravel and asphalt walks were laid out in all the sections, affording easy approach to buildings and providing attractive vistas, and these shaded walks with the beds of blooming flowers interspersed with groups of palms and live oaks formed an attraction hardly less delightful than the contents of the buildings. Occupying the central position of the site were the sunken or floating gardens where were planted rare tropical foliage, century plants, palmettos and flowers arranged in groups and beds with appropriate railings designed of mermaids, dolphins, sea shells and graceful and artistic statuary and figures. In the center of the gardens was placed an electric fountain, lending the final touch of perfection to the scene.

The illumination of the grounds and buildings was elaborate and artistic and some of the effects secured, especially in the sunken gardens, were entirely unique. The water from several streams winding in and out between the flower beds, finally flowed into a central lake through the pipes of a Macmonies Pan. In the center of the garden was a group representing the "triumph of electricity over water power." These effects were enhanced by many incandescent lights judiciously arranged, while the entire outline of both shores was accentuated by gaily colored lamp globes. Supplementing these main illuminations in the center of the gardens were thousands of incandescent lamps varied here and there with electric arc and acetylene gas lights outlining all the buildings and statuary, and scattered through the foliage, the whole making a scene of brilliancy and weird effects seldom equaled.

The artistic conception of the Exposition called for five main sections designated as the Art, Natural, Transportation, Midway and Live Stock. The most important buildings, namely the Cotton, Commerce and Architectural Palaces were grouped about the central Court of Palaces, an open space of over a mile in circumference. Connecting these buildings were colonnades and groups of smaller booths and structures containing the United States Government exhibits, minerals and forestry displays, negro exhibits, etc.

and variety of mechanical implements and machinery displayed by southern firms.

When it was decided to hold the South Carolina Interstate & West Indian Exposition in the city of Charleston, the street railway management controlling all the city and interurban electric lines serving the territory adjacent to the site selected for the exposition, was called upon to solve several perplexing questions. Serving a normal population of 55,000, and carrying an average of 12,000 passengers per day, the Consolidated company was confronted with the problem of so expanding its facilities as to enable it to transport to and



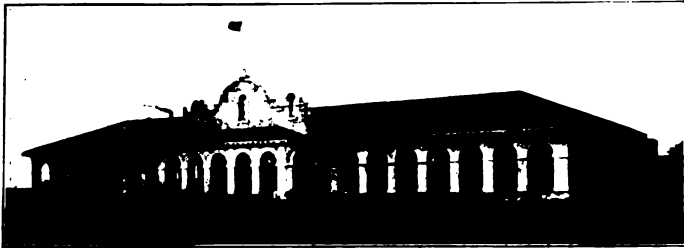
SUNKEN GARDENS.

from the exposition grounds from 75,000 to 100,000 people per day, when necessary. This was the estimated attendance for the special days, but as matter of fact, there was very little upon which to base an estimate of the total attendance or the average daily attendance, and this uncertainty added new complications to the task of preparing street railway accommodations for the influx of visitors.

In arranging for extensions to its tracks, new terminals, increased power capacity and additional rolling stock that were decided to be essential to the safe and economical handling of the exposition crowds, the management of the Charleston Consolidated Railway, Gas & Electric Co., following the example of the street railway companies of Buf-

falo in preparing for the Pan-American Exposition, determined to make all the improvements so far as consistent, permanent, instead of merely for the life of the exposition. By thus taking advantage of the opportunity offered, many permanent betterments to track, power house and cars have been made, that will greatly increase the future earning power and valuation of the property, and this has been accomplished without excessive outlay over the expenditure that would have been necessary for merely temporary extensions to plant.

The decisions reached by the Consolidated company in meeting the imposed conditions will be suggestive and valuable to managements everywhere who may be called upon to prepare for sudden and heavy increases in traffic, and with the constantly growing disposition of the American people to arrange expositions, fairs, carnivals, conventions and gatherings of all descriptions, this phase of



MACHINERY BUILDING.

street railroading is coming to be almost a science in itself. (For those seeking information on this subject, reference is especially made to the "Review" for June 15, 1901, page 335, where will be found the only complete published description of the plans adopted by the International Traction Co. of Buffalo, for handling the Pan-American crowds.)

At Charleston the same company that owns the street railway lines also owns the electric lighting and gas properties of the city, and was therefore in a position to undertake the work of lighting the exposition grounds and supplying power to exhibitors. This contract it secured and in re-arranging the power generation and distribution scheme, this load had to be provided for. The company owned two power houses: One small station on Sullivan's Island for furnishing power to what is termed the Sea Shore division, covering Mount Pleasant, Sullivan's Island and the Isle of Palms, and also for supplying electric lights for these islands; the second and main power house of the company is in the northern section of the city, not far from the Exposition site. In this plant are concentrated all the generating apparatus for both lighting and street railway purposes in the city and suburbs. To meet the needs of the Exposition as regards power and light, it was decided to install at this station two new three-phase alternating 60-cycle generating units, having a combined maximum capacity of 1,000 kw. From these machines current was transmitted to the grounds at 2,400 volts initial pressure.

By means of a 500-kw. converter and transformer in Machinery Hall at the Exposition, part of this current was changed to 550-volt direct current for use in motors at the different booths. At times of excessively heavy traffic, current from this converter was used to help out the street railway line running to the Exposition grounds. Ordinarily, however, the regular direct current units at the main power house were found adequate to handle the extra Exposition traffic in addition to the regular travel of the company, and no new direct current apparatus was purchased for the railway load.

The final disposition of the three-phase units has not been fully settled, but it is probable they will be retained at this station and used in the regular commercial and city lighting business. One was leased for the six months of the Exposition with the option of purchasing it at the end of that period. The rotary converter will undoubtedly be transferred to the Island station of the company, and will take current from the three-phase units for the use of the Sea Shore street railway division.

The present equipment of the company's two stations and the method of distributing current are noted elsewhere in this article.

The Exposition grounds covering 250 acres were about three miles from the hotel and business center. To reach the grounds a new double track line had to be built from the center of the city, and for doing this work it was thought best to organize a separate com-

pany known as the Exposition Traction Co. It was at first proposed to charge an additional 5-cent fare on this new line, but as there was some fear expressed that the double fare would injure the prospects of the Exposition, the company elected to accept the loss and abolish the additional fare, giving a straight 5-cent rate from any part of the city to the grounds.

The Exposition line was built with second-hand 60-lb. T-rails, as only a portion of it will be required after the Exposition closes.

The arrangement of the Exposition terminal will be understood by reference to the diagram. The main Exposition line passes the gate of the Midway, and then continues on and makes a loop in front of the main entrance. Passengers are discharged at one side of the loop, and board the cars at the other side. The line and loop are enclosed with the American Steel & Wire Co.'s wire fencing and entrance and exit are through turn-stiles.

Going from the Exposition passengers purchased tickets at booths and dropped them in turn-stile boxes before entering the cars. Going toward the Exposition, fares were collected on the cars by the conductors but an inspector was stationed at Line St., the main transfer point, and where the bulk of the Exposition traffic was obtained, in order to insure that all fares were properly registered before the car left that point.

By the arrangements mentioned, the company was sure that none of the Exposition fares into the city, and none of the fares below Line St. going out, these including all fares from the hotel and depot districts, would be missed by reason of the crowded condition of the cars.

Mr. T. W. Passailaigue, superintendent of the Consolidated company, states that the most annoying feature of handling a temporary increase of traffic of this kind, is that there is a class of men who make a business of following up Expositions, and other events likely to draw many visitors, with the view of securing employment on the street railways. Inasmuch as these men are seeking only temporary employment, they lack steadiness and reliability and by their carelessness cause serious loss to the company. He finally adopted the rule of engaging only experienced motormen and only green conductors, and by adhering to this regulation, he avoided a great deal of trouble. As an extra inducement to good men to apply for position on the cars, the company arranged to guarantee all extra men at least a half-day's pay each day, whether they were



COTTON PALACE AT NIGHT.

assigned to a car or not, provided, of course, they reported at the barn each day. This insured each man at least enough to pay his board and necessary incidentals.

The volume of Exposition traffic was very erratic, dropping, for instance, from 50,000 passengers, carried on President's Day to 12,000 the following day, and the company had to maintain a considerable force of extra men to call on in emergencies. The company feels the amount of money paid to the employes when they were not actually working, was well invested, for it provided a body of trained conductors and motormen, who could always be called to man the cars on short notice.

Another department that was directly affected by the increase in business, due to the Exposition, was the auditor's. In order to properly show on the company's books certain expenses and receipts directly chargeable to the Exposition business, the general accounting scheme had to be made somewhat more comprehensive to take in certain new accounts. Mr. P. J. Balaguer, the company's auditor, was fully equal to the task laid down, and there has been not the slightest hitch or confusion in the auditing and accounting department and the books show the exact results of the Exposition as far as the Consolidated company is concerned.

As previously stated, a separate Exposition Traction Co. was formed to care for the Exposition traffic, but as finally arranged, all receipts for the Exposition period went directly into the Consolidated company's account.

A separate item was opened on the books for car tickets which were sold at booths and collected at the street railway turn-stiles just outside the Exposition grounds. The tickets were numbered consecutively, and were treated much the same as register readings on the cars. Each ticket seller was charged with a certain number of tickets and reported every day the opening and closing numbers of the strip of tickets given him in the morning. Mr. Balaguer devised a blank form that greatly facilitated the work of making these daily ticket reports. The form was printed on a slip 10½x4 in. and had spaces enabling the ticket seller to enter at the end of every

the regular business of the company, the exhibitors being regarded as new customers.

For the six months of the show most of the car routes were changed to meet the temporary conditions, and to permit all lines to connect, either directly or by transfer, with the Exposition grounds. The final adjustment of the routes gave universal satisfaction, and some of the principles followed in planning the arrangement would seem to be applicable to almost any average city under similar conditions.

Briefly described, the routes included an outer and an inner belt line, one direct line from the hotel and depot district to the Exposition grounds, a line serving a portion of the hotel and depot section and transferring to the main Exposition line, and a suburban park line carrying visitors to the cemeteries and parks. In addition there



TRACK LAID IN SAND—SULLIVAN'S ISLAND.

was the Sea Shore line, running on some of the islands in the harbor, and connecting with the city lines by ferries owned by the Consolidated company. The different routes were designated as follows:

The Belt Line making the circuit of the city, taking in some of the better residential streets, a portion of Meeting St. (a leading business street) passing the Post Office and City Hall, and lower part of Broad St. (the money center), East Bay (headquarters of the wholesalers) and the docks and shipping.

The Broad St. Line, making an inner circuit, covering another good residential section, and many important business streets.

The King St. Exposition Line, running on the central street of the business section, covering especially the retail district, and within easy reach of the hotels and depots, and making the most direct route to the Exposition grounds.

The Meeting St. Line, traversing one of the more important business thoroughfares, running parallel to King St., and transferring to the King St. cars by cross lines at two points; this line reached a number of the leading hotels and the Post Office, and the finer residences in the southern portion of the city.

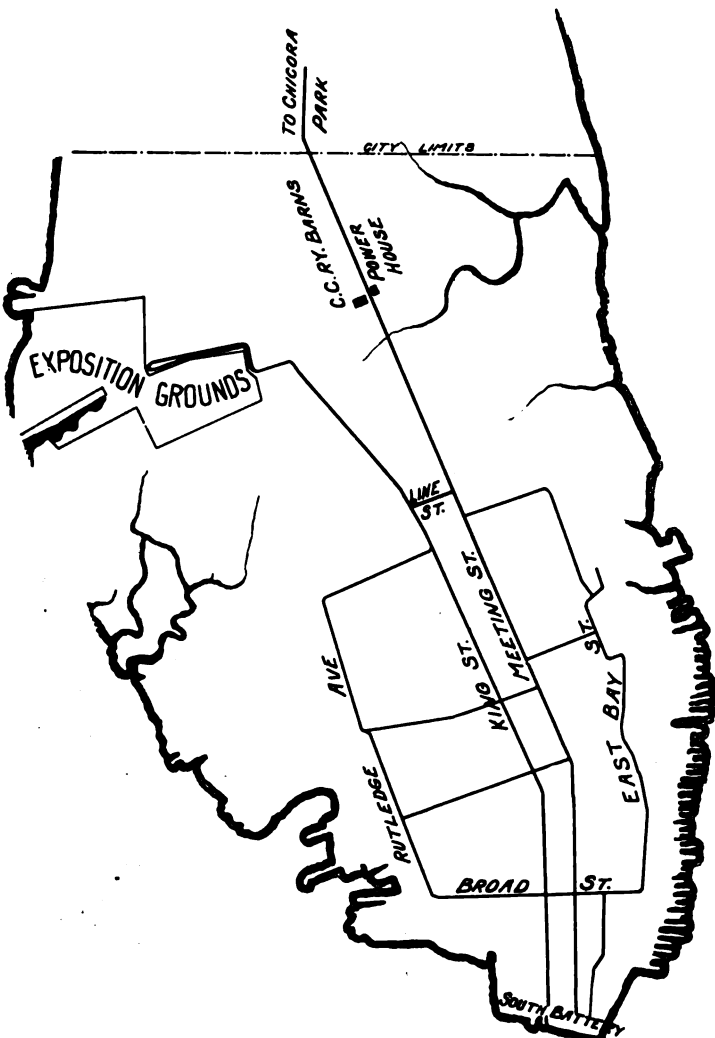
The Suburban and Chicora Park Line, running out Meeting St. and serving the cemeteries and Chicora Park.

The Sea Shore division, affording visitors a fine opportunity to see Charleston from the harbor, Fort Sumter and Moultrie, and the Isle of Palms.

The schedule on these various routes ranged from a minute to an hour, according to the demands of the traffic.

It should be added in this connection that the city of Charleston is laid out similarly to the city of New York. It is on a long, narrow strip of land, running practically north and south between two rivers which come together at the southern point of the city and form a magnificent bay. The southernmost point of the city is called the Battery, which, unlike New York's "Battery," is given over to fine residences and is the aristocratic section of the town.

In the matter of rolling stock, the Consolidated company was exceptionally well prepared for the Exposition demands. It had a number of long closed double truck cars, that had been used on the Sea Shore division as trailers. These were brought to the Charleston side, equipped with two G. E. 57 motors each, and put on the Exposition line. The company owns 26 double truck cars, equipped with two G. E. 57 motors to each car; 16 single truck cars, fitted



CHARLESTON STREET RAILWAY LINES.  
(All city lines are double track.)

two hours of the day, the "number commencing," the "number ending" and the "difference." In this way he was able to account for all tickets in his possession. In another column was entered "Cash from Tickets" and the blank as a whole therefore gave a complete record of the street railway tickets sold and cash received by each seller. The readings from the turn-stiles through which the passengers passed as they deposited their tickets before entering the cars were kept and reported in the same way, and furnished an additional check on the seller's reports.

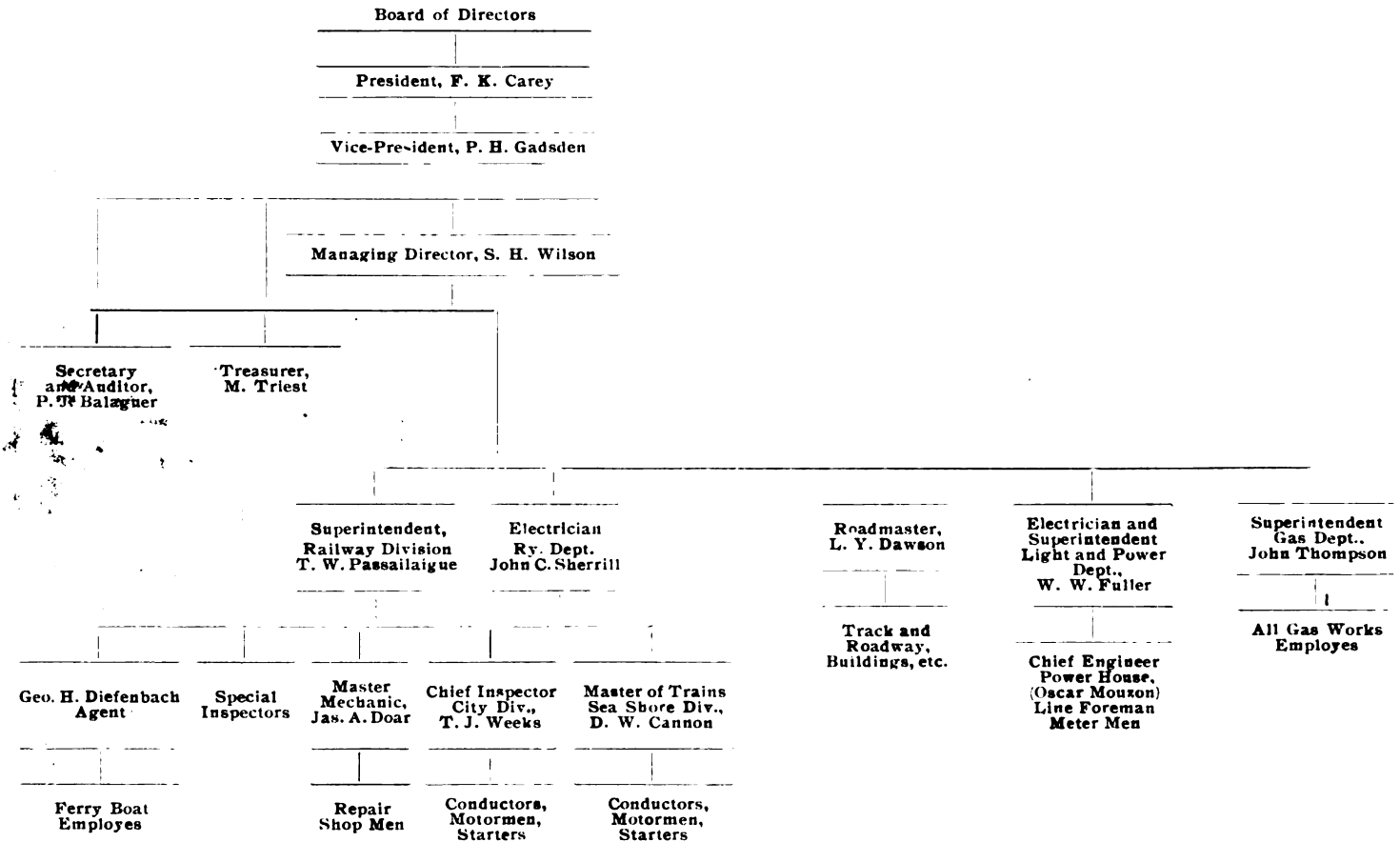
The business of lighting the grounds was handled the same as

with two G. E. 1,000 motors to each car; and 26 single truck cars, fitted with one G. E. 1,000 motor to each car. It might be noticed here that many of the southern roads are still using a single motor to the car, a practice as may be imagined that is not conducive to low cost of maintaining electrical equipment. But these older equipments are still capable of doing good work, and many of the companies do not feel justified in sacrificing them in favor of more

One 250-kw. alternator and one 150-kw. alternator supplying lighting current at 1,150 volts. These are belted to two Harrisburg engines, one rated at 450 h. p. and one at 250 h. p.

One 500-kw. alternator and one 300-kw. alternator supplying current to the Exposition at 2,400 volts, 60-cycles, three-phase distribution. These are belted to Harrisburg engines, one rated at 750 h. p. and one at 450 h. p. These three-phase units as previously

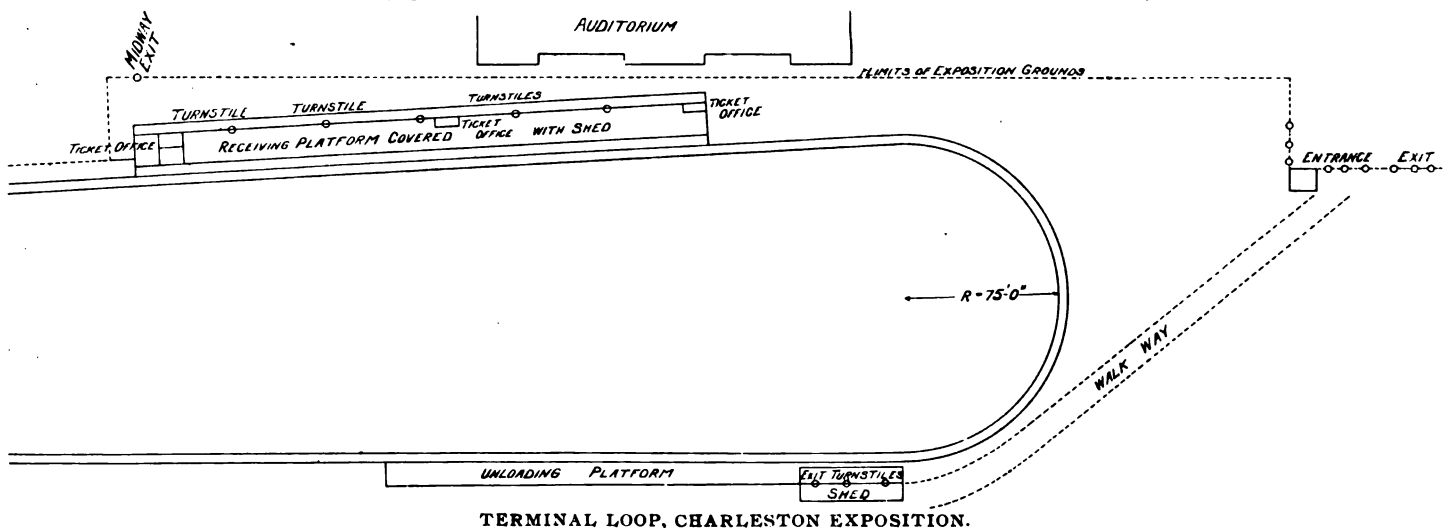
**DIAGRAM OF ORGANIZATION OF THE CHARLESTON CONSOLIDATED RAILWAY, GAS & ELECTRIC CO.**



modern apparatus. On level roads, as at Charleston, the single motor under an 18-ft. body serves every purpose, although armatures, bearings and other parts are naturally subjected to greater wear and tear. The cars at Charleston are of various makes. The single trucks are Peckham No. 7; the double trucks du Pont.

mentioned will probably be retained for the regular lighting service and also for furnishing light and street railway power on the islands in the harbor.

At the city station there is also a 300-kw. motor driven booster, 550 to 750 volts, that is used to help out the Island station. When necessary this booster feeds the distant end of the Sea Shore division, a transmission distance of 17 miles.



**TERMINAL LOOP, CHARLESTON EXPOSITION.**

to a 350-h. p. Ball & Wood tandem compound engine, 16 and 27x 16 in.

One 525-kw. railway generator, direct connected to a 750-h. p. Ball & Wood compound marine type engine, 22 and 48½x24 in.

One 225-kw. railway generator, belted to a 350-h. p. Harrisburg standard engine, 16 and 30x16 in.

One 325-kw. railway generator, belted to a 550-h. p. Harrisburg standard engine, 17 and 35x18 in.

The Island station, which serves the Sea Shore division of the street railway system and also furnishes lighting current, contains one 225 kw. railway generator belted to a Harrisburg engine; and also the necessary lighting apparatus for lighting the islands, particularly the Isle of Palms, where a hotel, pavilion and pleasure resort has been established.

The following statistical statements are furnished us through the courtesy of Mr. Balaguer:

REPORT CHARLESTON CITY DIVISION, CHARLESTON RAILWAY, GAS AND ELECTRIC CO.

	Year Ending Feb. 28, 1902.	Year Ending Feb. 28, 1901.
Total number paying passengers carried.....	4,281,332	3,867,053
Car trips .....	262,273	267,326
Car miles.....	1,431,040	1,286,705
Car hours.....	184,680	172,954
Receipts per trip.....	\$ .883	\$ .728
Receipts per mile.....	\$ .162	\$ .151
Receipts per car hour.....	\$ 1.250	\$ 1.125
Gross receipts .....	\$231,739	\$194,595
Operating expenses per car mile.....	\$ .093	\$ .087
Operating expenses per trip.....	\$ .510	\$ .416
Operating expenses per car hour.....	\$ .725	\$ .644
Output in kw. h., City Ry. division.....	2,495,318	2,150,512
Output in kw. lighting and power.....	1,939,786	1,446,976
Output in kw. total.....	4,435,054	3,597,488
Total coal consumed at station (lb.).....	28,162,228	21,307,514
Coal in lb. per kw. h.....	6.3	5.93
Cost of coal consumed.....	\$46,447	\$32,627
Power plant wages.....	\$10,112	\$9,699
Oil and waste.....	\$1,561	\$1,063
Cost water .....	\$558	\$1,744
Power plant maintenance.....	\$4,576	\$2,087
Output cost at station per kw. h.....	\$ .0143	\$ .0131

General expenses.....	37,697.03	10,842.73	9,703.12	58,242.88
Total operating expenses .....	\$196,392.12	\$48,463.27	\$89,480.18	\$334,335.57
Net earnings .....	\$107,136.87	\$48,369.32	\$59,679.03	\$215,185.22
Fixed charges .....				\$153,437.49
Net income .....				\$61,747.73

Comparative Statement of Earnings and Expenses for Months of March and April, 1902.

	Railways.	Electric.	Gas.	Total.
Operating expenses:				
Gross receipts .....	\$83,779.05	\$28,072.10	\$27,825.24	\$139,676.39
Maintaining way and structures .....	\$5,401.44	\$123.41	\$1,834.85	\$7,359.70
Maint. Equipment .....	4,769.31	1,167.69	489.26	6,426.26
Transportation and manufacture .....	26,357.28	8,171.55	12,923.31	47,452.14
General expenses .....	10,245.93	2,858.94	1,997.98	15,102.85
Total operating expenses .....	\$46,773.96	\$12,321.59	\$17,245.40	\$76,340.95
Net earnings .....	\$37,005.09	\$15,750.51	\$10,579.84	\$63,335.44
Fixed charges .....				\$25,231.67
Net income.....				\$38,103.77

**EXPOSITION TRACTION COMPANY.**

Ticket Agent's Statement..... 190

Agent .....

Window No. ....

Time		STRAIGHT TRIP TICKETS		Cash From Tickets
		Whole	Half	
A. M.	N.E.			
7	N.C.			
	D.			
9	N.E.			
	N.C.			
	D.			
12	D.			
Total Tickets,				
Total Cash,				

TICKET RECORD.

THE CHARLESTON CONSOLIDATED RAILWAY, GAS AND ELECTRIC COMPANY, CHARLESTON, S. C.

Comparative Statement of Earnings and Expenses, for Fiscal Year Ending February 28, 1902.

	Railways.	Electric.	Gas.	Total.
Gross receipts .....	\$303,528.99	\$96,832.59	\$149,159.21	\$549,520.79
Operating expenses:				
Maintaining way and structures .....	\$13,319.30	\$1,568.88	\$8,657.13	\$23,545.31
Maintenance equipment .....	21,729.35	3,465.08	2,812.62	28,007.05
Transportation and manufacture .....	123,646.44	32,586.58	68,307.31	224,540.33

**EVERETT-MOORE SYNDICATE.**

On June 4th it was announced that, up to that date, 26,000 shares of the Everett-Moore holdings in the Detroit United Ry. had been sold by the syndicate at prices ranging from 71 to 80½. The stock has been absorbed piecemeal by New York, Cleveland and Detroit capitalists, the parties to whom an option on the Everett-Moore holdings in the Detroit property was originally offered at 70 having failed to take advantage of the offer. Members of the banker's committee in charge of the syndicate's affairs are quoted as stating that Messrs. Everett and Moore retain from 12,000 to 15,000 shares in the Detroit United Ry., and will continue to manage the property.

The syndicate has also disposed of 40,000 shares in the Toledo Railways & Light Co. to Kean, Van Courtland & Co., of New York, at \$22 per share; this leaves 40,000 shares still in the hands of Messrs. Everett and Moore, but there is a probability that the control of the business will be in the hands of the purchasers. The stock was purchased at \$14 per share, so there has been a profit of \$8 per share on the stock since it went into the hands of the syndicate. The only change that will be made is to increase the board of directors by two in order to give the purchasers a representation in the company.

**SALE AT PROVIDENCE, R. I.**

On May 27th the terms under which the United Improvement Co., of Philadelphia, would acquire the United Traction & Electric Co., of Providence, were announced. There has been organized a Rhode Island corporation known as the Rhode Island Co. to take over such properties as the United Improvement Co. may buy.

The announcement to the United Traction stockholders is that the Rhode Island Co. will guarantee 5 per cent on the Traction company's stock and in addition will give one share of its own stock for every four shares of Traction stock. The stock at present pays 4 per cent and is quoted at 121.

It is understood that the Philadelphia concern expects to combine in the Rhode Island Co. the Providence Gas Co. and the Narragansett Electric Lighting Co.

The Milwaukee Electric Railway & Light Co. has awarded a contract amounting to \$200,000 for the structural steel to be used in the erection of its new office building and terminal station.