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## Subway Report

The report of B. J. Arnold on the traffic of the New York subway, which appears elsewhere in this issue, shows that the maximum number of seats for each express track per hour which can be operated, even after all the changes now suggested have been completed, is only 18,000. No further changes, barring practically complete reconstruction of the subway, can increase this maximum seated carrying capacity. The present peak load is more than 22,000 passengers per hour, and it is estimated that by the time the contemplated improvements could be made the peak load will have increased to 36,000 passengers per hour, or 100 per cent more than the maximum seated capacity. Overcrowding during rush hours, therefore, cannot be reduced and if no new rapid transit lines are built, will probably increase. The only remedies, then, are more subways, and, if possible, extensions of the present elevated railway facilities. Significant phases of the future development of the present subway traffic are that all extensions of the outlying districts of the city will tend to increase inevitably the average length of haul on the subway, that the consequent further crowding of the express trains will drive many long-distance riders to the local trains, and that, according to the report, the long-haul traffic, when separated from the short-haul business, is unprofitable. Mr. Arnold shows the wisdom of development of the short-haul business, and makes the suggestion that this perhaps can best be accomplished through the construction of a movable sidewalk.

## Electric Railway Parks

This is the season when the manager's fancy lightly turns to thoughts of amusement parks. So many roads have had a try at the business that discussion would seem almost needless were it not that amusement parks are not always successful from the business standpoint. A park is a somewhat considerable investment if it is really attractive, and it must gather in large traffic to get back the total expense. The main thing in planning a park annex is to gage accurately the temperament and habits of the community with respect to amusements, and this is not always an easy task. The attractions that are successful in one place may fall flat in another for no exactly assignable reason. For instance, the biergarten, that is a fixture, and a most agreeable one, in Continental life, could not be commended in a prohibition community. It has, more's the pity, shown on American soil a rather uniform tendency to degenerate into unqualified toughness. Again, in some cases, too much money has been spent to develop the park, and as the cost of maintaining the attractions is constant, the park property represents a large annual outlay. Viewing the situation generally, however, most managers are firm advocates of the practice of establishing street railway parks, and can testify to their advantages from a monetary standpoint. Certainly, most of the projected electric railways whose plans are reported in these columns contemplate the ownership of parks, and many companies are expecting to extend and improve their park properties during the coming year. Following a custom initiated several years ago, this paper will devote two issues during the winter and early spring especially to the sub-

ject of street railway parks, and this number is the first of the series.

Broadly speaking, parks controlled by city railway companies can be divided into two classes. The first includes those parks which are designed to cater to the cosmopolitan population of a large city where expensive amusements can profitably be installed and where a fare of 10 cents, or even 15 cents, can be charged for transportation in each direction. The second class belongs to cities of, say, 60,000 inhabitants and under, where the charge for entertainments, if provided, should be small, and where, as a rule, the park should be located within a 5-cent zone.

A number of interurban railways have developed parks along lines which are quite different from the typical park of a city railway system. These parks are, more properly speaking, picnic or assembly grounds, and their equipment is quite simple and inexpensive. The cost of operation is correspondingly low, as no amusement devices other than boats or a carousel are usually operated. These parks are commonly located at some point along the main line where the natural beauty of the grounds is sufficient to attract pleasure seekers. Such parks, if properly advertised, can be made to yield the railway company a satisfactory income on the sale of excursion tickets only. If the rates are made low enough, traffic can be obtained from distances as great as 40 or 50 miles on special occasions. On pleasant days during the summer months considerable additional traffic revenue is obtained from small family parties at practically no expense and with no increase in the number of cars required to handle the traffic.

Many treatises have been written on the proper surroundings, general scheme of arrangement of buildings and proper methods of conducting the operation of a park. It will be impossible to analyze here all of the factors which go to make up the success of a resort of this kind. It might be well, however, to call attention to two fundamental features which are common to all. One relates to the question of transportation to and from the park, the other to the general arrangement of the grounds and buildings themselves.

## Transportation to the Park

Some roads have made a mistake in placing their parks at too great a distance. This means long hauls for the patrons and the consumption of a good deal of time, which has indirectly the effect of cutting down patronage for a considerable part of the season. One must, of course, get away from the immediate surroundings of the city, but it is very easy to go out too far. During what is usually a very brief season of extreme heat people like a long car ride or lake side all the better. Such traffic, however, falls off at once as the hot season wanes, and leaves the expense still going on. It strikes us that a shorter ride with more going on at the end of it is likely to draw for more days in the year than the more remote attractions. Such a plan practically increases the available length of the park season. If pleasant amusements are not too distant, people will slip out to them more readily and frequently. Of course, available space is cheaper at a considerable distance. It is not, however, so much area that is needed as the successful use of it. A small and accessible park thoroughly worked up, with a big casino and plenty going on in it, seems likely to get a larger total attendance than anything else, and what it may lose in attendance during the few very hot days will more than likely be made up during the early and late season.

The quality of the transportation is equally essential. The facilities for carrying the passengers on the line or lines serving the park should be such as not to occasion serious delays or much crowding at the time when the people want to travel. Preferably, a park should be on the main line. If this is not possible, it should be provided with ample terminal facilities so that delays in the late afternoon or evening in returning home will not discourage a second visit. In all cases a single-track line with turnouts should be avoided. Even a slow rate of travel is much less annoying to the average pleasure-seeker, when on either his outward or return trip, than waiting on a turnout or siding. Moreover, it is very difficult to dispatch a number of cars at the close of a day or evening on a single-track road, whereas the headway can be made as long or short as may be necessary when the line is double track.

## Park Amusements and Buildings

The question of amusements, like that of the poor, is always with us. Certain attractions, like the old-fashioned, but never unpopular, carousel, will probably always remain a safe selection. As the patronage increases, good music and vaudeville will have their place, and undoubtedly will prove as satisfactory as any attraction which can be provided. In occasional places winter sports have been tried with some success. The proper selection of entertainment depends, as we have already intimated, on the community and the general nature of the patronage. No one recipe for success can be written. The thing to be cultivated is the amusement park habit among the patrons, and this requires a rapid shifting of attractions and correspondingly vigorous advertising. A single show, even a very good one, cannot hold people for long, while one success whets the appetite of people for another, and presently they fall into the pleasant usage of looking ahead for what is coming and making a point of seeing it.

An important factor in the success of the different attractions at the park is the systematic location of the buildings and different concessions with reference to each other. Every effort should be made to keep them as close together as the circumstances permit. Enthusiasm and curiosity are contagious, and to both of these qualities appeal must be made if the different forms of entertainment are to be well patronized. Both also are born of a crowd, and there is usually no greater inducement to try some form of recreation than to see others busily engaged in the same sport or to enter a theater than to see a long crowd standing in front of the box office and imagine that all the best seats will be gone unless a ticket is secured forthwith. The manifest desirability of grouping the different forms of entertainment does not mean that it is necessary to place the carousel directly behind the music stand or in front of the theater entrance. It should be far

enough away so that its organ will not interfere with the pleasure of the auditors at the quieter performances. But a few hundred feet will usually suffice for this result, and there will be no violation of the principle of keeping fairly close together those who like the light and glare of the arc lamps and to be in and a part of the crowd of pleasure seekers.

## A Failure in Park Location

We have referred to the importance of studying the local conditions and the habits of the community served in all plans relating to the establishment of parks. An incident illustrates the importance of this policy. An electric railway company, operating in two not-greatly distant towns, owned a small park in each. The chief industry was manufacturing, and both parks were well patronized. Subsequently the company joined the two cities by an interurban connection, and the company conceived the plan of replacing the two small parks by a single large one half-way between the neighboring communities. The original pleasure resorts were pleasant natural groves, with no pretentious attractions, cost little to maintain and were accessible for a 5-cent fare. The large park was laid out as an elaborate resort, with numerous special pay attractions. To reach the park a 10-cent fare was necessary. Unfortunately, the laudable desire of the traction company to confer Coney Island pleasures on its patrons met with little encouragement. Ere many days had sped the tinseled Heidelberg castle became as forlorn as the ruins of its prototype on the Rhine, and the Streets of Cairo might well have been renamed the Streets of Pompeii, so lacking were they of life. On the other hand, the patrons of the road were discontented because they had been deprived of the old-time playgrounds, which had become a fixed part of their summer pleasures.

Doubtless, the principal reason for the failure of this project was the change from a 5-cent to a 10-cent fare. Most of the people are factory hands, who had gladly availed themselves of every opportunity for open-air enjoyment at their home parks. Under the new conditions, however, the difference in fare was too great a drain on their scanty purses, especially when a family outing was planned and the children would want to try everything in sight and hearing. The greater distance of the new park also deterred mothers from undertaking frequent week-day excursions with their children. Formerly it was a simple matter to go off for a half-day's sport, then return in time to prepare dinner and attend to other household duties. Had the same pleasure resort been close to larger or more wealthy cities, the result might and probably would have been far different. But no good purpose is attained by attempting to serve the public with what they are unable or unwilling to purchase.

This does not necessarily mean, however, that a community cannot be educated, or that what would prove unsuccessful one year would certainly meet with popular disfavor a season or two later. A better plan is to add gradually such features as seem desirable, a course which has the double advantage of proportioning expenditures to the patronage and of imparting novelty to the attractions available each year.

## Truck Adjustments and Motor Flashing

The prevention of motor flashes in electric railway service is an ever-present problem on large systems operating great numbers of cars in varied traffic. Rolling stock experts have studied this question with increasing interest in the last few years, particularly in relation to the application of multiple-unit control apparatus in city and suburban car service. The intimate connection between the mechanical adjustment of the trucks and motors and the prevalence of flashing is not always appreciated. Many carhouse employees are inclined to the idea that flashing is mainly an electrical difficulty, but experience shows that loose parts of the truck are quite as prolific causes of flashing as any other improper condition. It is not proper always to assume that two motors in a car equipment are running together in parallel with an equal division of the load between them, since an examination of the conditions with an ammeter in the circuit of each machine may show a decided difference in the work done. It is often instructive to install a wattmeter in the circuit of each motor on both a two- and a four-motor car and to study the energy input among the separate units. When this is done in a thorough way for service of definite character the data secured is frequently very suggestive to the mechanical department. For most conditions, however, the ammeter will supply all the necessary quantitative information needed to enable one to check the mutual performance of motors on single car equipments.

Loose suspension is a fertile cause of trouble, but one of the less widely realized causes is excessive play or lost motion between the journal boxes and the pedestals. This accumulates through wear and tear and is dependent somewhat upon the direction in which the car is running. In one direction the tendency is for the motor to force the motor wheel up against the pedestal, bringing the wheel against the brake shoe. The movement of the truck in a forward direction causes the corresponding trailer wheel to come back against the pedestal, assuming one motor per truck, and the trailer wheel is likewise forced against the shoe. On the other truck of the car the reverse condition occurs. The motor on the second truck may be hung so that it tends to drive forward and thus travel away from the nearest shoe, clearing the wheel. The resulting condition of uneven distribution of work through the irregular and dissimilar mechanical status of the wheels may easily cause one motor to spin, and in passing from series to multiple, when flashes are especially likely to occur, a short circuit may result from feeding the controller too fast. The motor which spins becomes a generator with practically a heavy short circuit across its terminals and the flash resulting frequently causes trouble through the introduction of the line current in the controller case. The prevention of the trouble is obviously the proper and frequent mechanical adjustment of loose truck parts, but in cases where the wheels spin and acceleration is delayed the motorman can do a good deal to avoid trouble by working the car forward slowly and keeping out of the multiple notches of the controller until the speed begins to pick up normally. Weak release springs on the brakes and too tight brake adjustment are similar predisposing causes of flashing.

## BINGHAMTON (N. Y.) RAILWAY AND PARK SYSTEM

Binghamton, N. Y., is a progressive community of some 45,000 people, and forms one of the important towns in the so-called southern tier of counties in New York State just north of Pennsylvania. It is located in a valley formed by the junction of the Susquehanna and Chenango rivers, and, set within its mountain frame, makes an ideal residential city. The manufactures are numerous and varied enough to diffuse the general air of prosperity essential to the success of a street railway system, but as many of the shops are within reasonable walking distance, a frequent and comfortable car service must be given to induce short distance riding. Such a railway service is given by the Binghamton Railway Company, which operates about 47 miles of track, 35 miles of which are within the city limits and the balance, a 6-mile double track line extending westward through Lestershire, Endicott and Union. This extension is largely on private right-of-way and carries a heavy summer traffic.

In the natural endeavor to build up its business the Binghamton Railway Company not only has made large num-

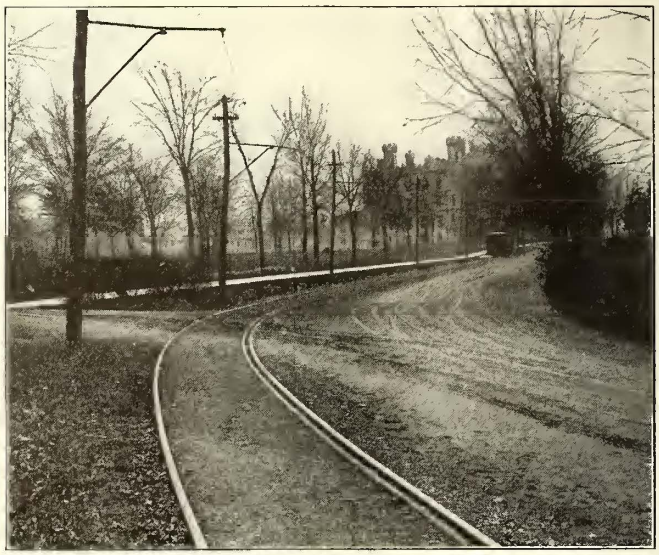

**Binghamton Railway—Looking East Along Court Street in Binghamton**

bers of people familiar with the advantages of this district through its park system and annual agricultural fair, but also has been responsible for creating the prosperous manufacturing town of Endicott, in which over 3,000 people are now employed. As this realty undertaking has proved so successful, a brief history of its inception and present state may be in order.

### ENDICOTT, "CITY OF PAYROLLS"

About 1903 interests connected with the Binghamton Railway Company and organized as the Endicott Land Company were the owners of 1100 acres of open country some 8 miles west of Binghamton, consisting of land adjacent to the Erie Railroad and but ½ mile distant from the Lackawanna Railroad, on the opposite bank of the Susquehanna River. The double-track electric railway to Union, 1 mile further, passes directly through the grounds, and, in fact, is the same line which has served this company's Casino Park for years. Consequently, no additional railway facilities were needed immediately for the development of the property.

At this time the Endicott-Johnson Company, a large shoe manufacturer, was contemplating an extension of its works in Lestershire, which is practically a westerly continuation of Binghamton. As the new territory had the necessary railway facilities and could offer a lower tax rate, the shoe company was induced to purchase 250 acres,



**Binghamton Railway—The State Hospital Terminal on the Easterly Outskirts of Binghamton**

reserving 80 acres for building lots. This was the nucleus of Endicott, which has grown from a straggling 10-house hamlet to a flourishing town with half a dozen important industries and several hundred trim business and residential structures. There is also a modern hotel, which is used as a noon-day dining club by the clerical forces of the Endicott factories.

All of the streets have a uniform width of 60 ft. The streets are graded, have sidewalks, drainage systems, water supply, etc. All of the factories have private fire protection in addition to the public fire department. The streets and many of the houses are electrically lighted by current from the nearby substation of the Binghamton Railway Company.

**Binghamton Railway—A Busy Day at the Fair Grounds**

While the Endicott Land Company conducts an energetic lot-selling campaign and the different manufacturers are building homes for their employees on part payment conditions, many of the workers live in Binghamton or Lestershire. By arrangement with these firms, most of the em-

ployees are brought in the trains to and from the factories at certain hours for a special fare presented from a book containing 100 tickets. During the day a half-hour service is maintained for the usual 12½-cent fare. No transfers are given on the Endicott line except in the town itself, where a branch line has been built to the works of the

when there are so many places where work can be done under more favorable conditions.

ANNUAL FAIR AND PARK BUSINESS

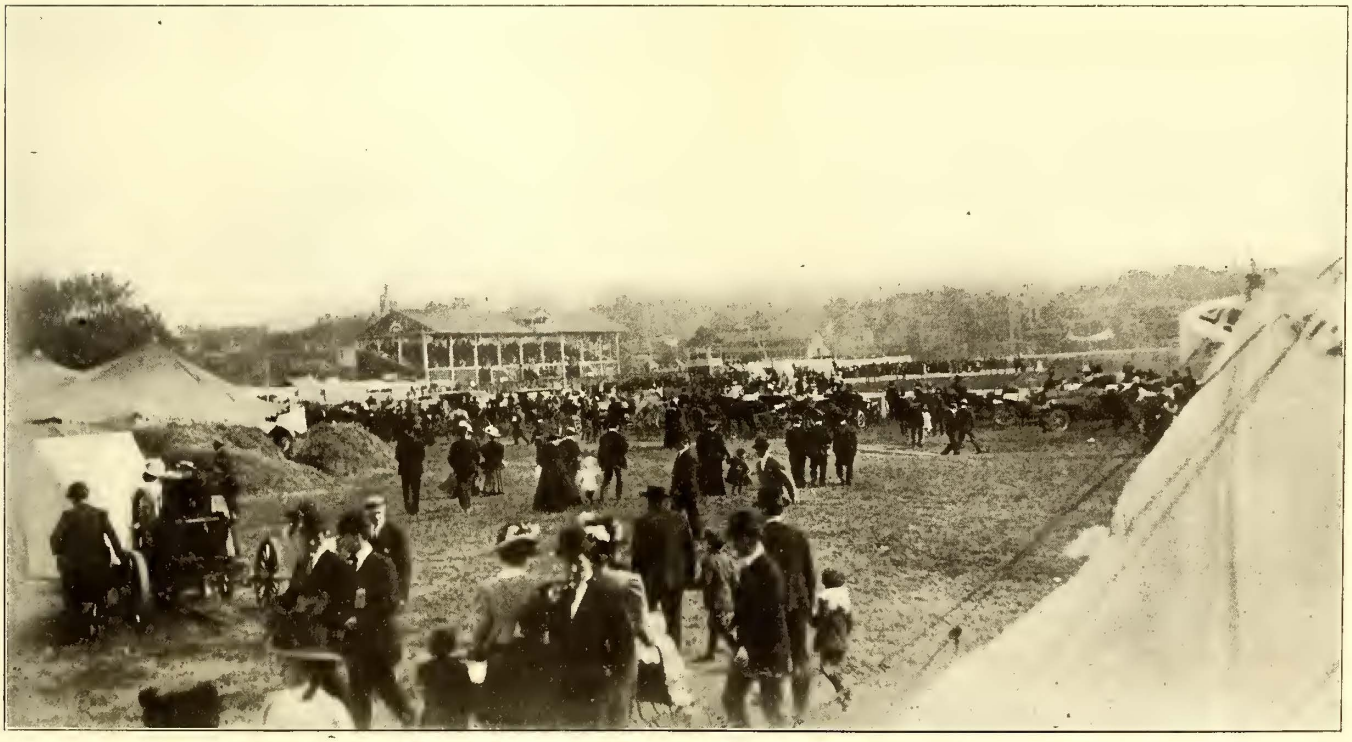
Another departure from the humdrum activities of an electric railway is the annual fair, known as the Binghamton Industrial Exposition, conducted by the Bingham-

**Binghamton Railway—Fair Grounds, Base Ball Diamond and Race Track, Comprising 55 Acres in Binghamton**

International Time Recorder Company, maker of the Bundy clock. The Erie Railroad operates one morning and evening train between Endicott and Binghamton for a 5-cent fare, but the electric railway gets the bulk of the travel, because it runs along the principal street in Lestershire and Binghamton.

It will be understood from the foregoing how the Binghamton Railway Company has built up a profitable long-haul business through a judicious presentation of the advantages manufacturers and their employees could obtain by building a city deliberately designed for their mutual

ton Railway Company. This gathering is second only to the exhibition at Syracuse, and familiarizes many thousands of strangers with the advantages of Binghamton. The operation of an agricultural fair by an electric railway is exceptional, of course, but in this instance is due largely to the fact that the railway owned a large, convenient plot in Binghamton adjacent to its power station and car houses. Here a grandstand has been erected overlooking a half-mile race course, and all the necessary provisions made for handling a full-fledged agricultural fair and the accompanying entertainments. At other



**Binghamton Railway—General View of the Fair Grounds Looking Toward the Grand Stand and Race Track**

convenience. Happily, the benefits are not confined to the projectors, for Endicott represents to both classes the partial solution, at least, of a great economic problem. Its success emphasizes the truth that it is a good thing to break away from the instinct of herding in large cities

times these grounds are placed at the free disposal of local educational institutions for baseball, football and other athletic events. The posters, folders, signs and similar advertising matter are designed by the railway. It also arranges the fireworks for both the fair and park events.

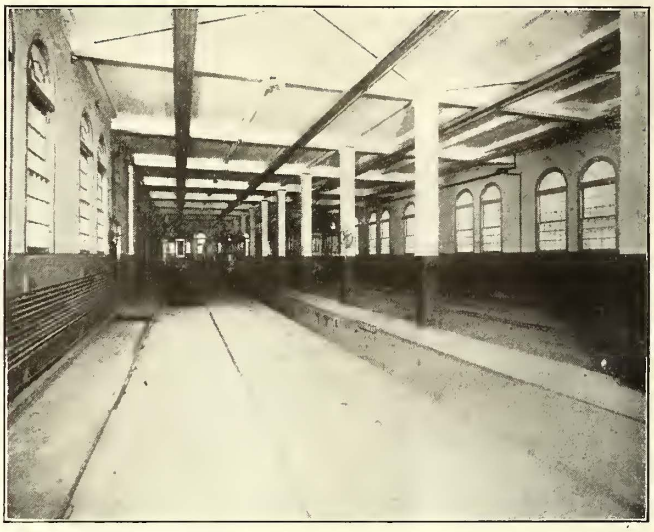
The park business of the railway company differs in some respects from common practice, inasmuch as one of the parks is leased public property and the other has been developed to such a degree that it is visited by thousands of people from neighboring cities. There is no admission charged to either park.

The land owned by the city is Ross Park, located 1½ miles from the center of Binghamton and reached for 5 cents. The railway company operates the park under a long-term lease, books all attractions and sublets the concessions on a percentage basis. Ross Park is 100 acres in extent and is made doubly attractive for picnics by abundantly providing such facilities as tables, benches, cook houses and dishes. The other attractions at this park include Sunday afternoon band concerts and open air vaudeville, with a small number of pay seats reserved as an accommodation. Fireworks are also given weekly and on holidays.

The other park, which is owned by the railway, is known as the Casino, after its principal building. The playground has an area of 30 acres and is about 9 miles from Binghamton, from which it is reached by a 25-cent excursion fare. Band concerts and vaudeville attractions are presented alternately at this place and Ross Park, but its location along the Susquehanna has given it the added attraction of water sports. Besides this, there are two electric fountains, baseball, tennis and croquet grounds, etc. As at Ross Park, kitchen facilities are provided, together with an eating pavilion for 500 people. The Casino theater contains 700 chairs, for which 5 cents each is charged at performances. This park also contains a small animal and bird exhibit housed in Ross Park during the winter.

In general, the grounds are tastefully laid out with many flower beds, and the rest is carefully sodded. At night the park is brilliantly illuminated by 1,400 lights, including a considerable number of arch lamps. The substation adjacent contains two 250-kw G. E. rotaries for the railway service and one 150-kw motor generator for lighting the park and Endicott. The drinking water comes from an artesian well on the park grounds. The park buildings are protected from fire by a fully-equipped hose cart and fire hydrants located throughout the grounds.

The Casino has become favorably known in other cities in this territory besides Binghamton. For instance, from July 14 to 28 next season it will be turned over, without cost, for the annual encampment of the Royal Lancers, an organization of Catholic total-abstainers from Scranton, Wilkes-Barre and other cities in the anthracite district of Pennsylvania. This body, composed of two regiments of 500 each, will bring its own tenting and cooking equipment, with 50 waiters, military band of 40 pieces, vaudeville, minstrel show and other amusements, to which the general public will be welcome. It will give a dress parade every day, and on Sundays 60 priests will conduct the open-air services. It goes without saying that an encampment of this kind is a splendid attraction, and one which incidentally promotes a better understanding between neighboring communities. At the Lancers' encampments last year in Cooperstown, N. Y., over 20,000 visitors were entertained in one day.

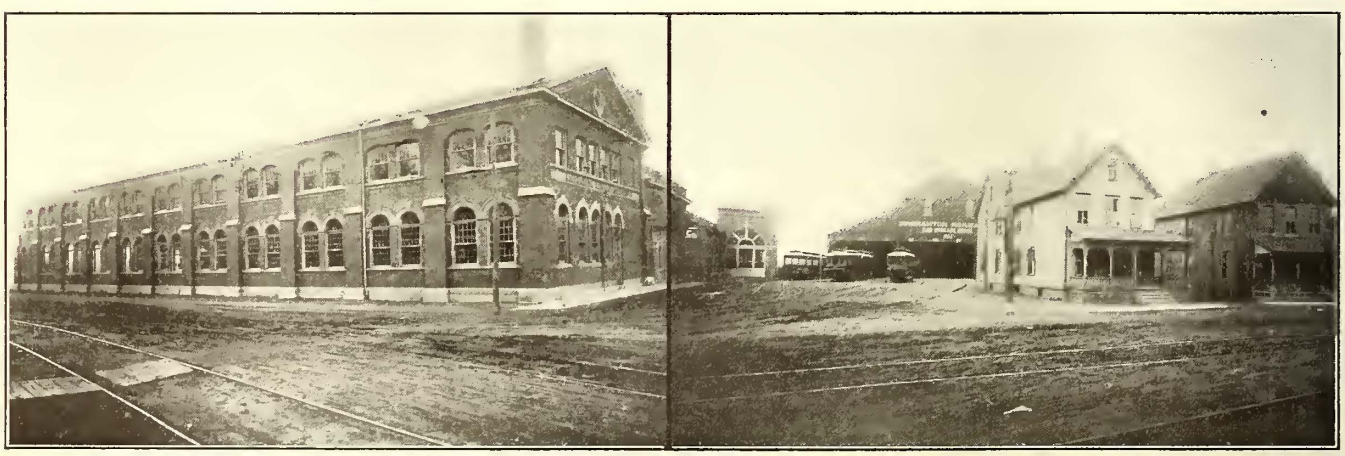


**Binghamton Railway—Interior of Utilities Building, Showing General Construction of Pits, Lighting and Heating**

### CONSTRUCTIONAL STANDARDS AND BUILDINGS

Despite the industrial depresssion this year, the Binghamton Railway Company rebuilt 3½ miles to 4 miles of double track in paved streets with 94-lb. Lorain girder rail laid on rock oak or chestnut ties in gravel or concrete, and recently placed in operation a 1-mile extension known as the Beethoven Street division, on which it is using 60-lb. T-rail.

The rolling stock embraces several types of open and closed cars with single or double trucks. The closed single-truck cars are 32 ft. over all, with 22-ft. bodies, and



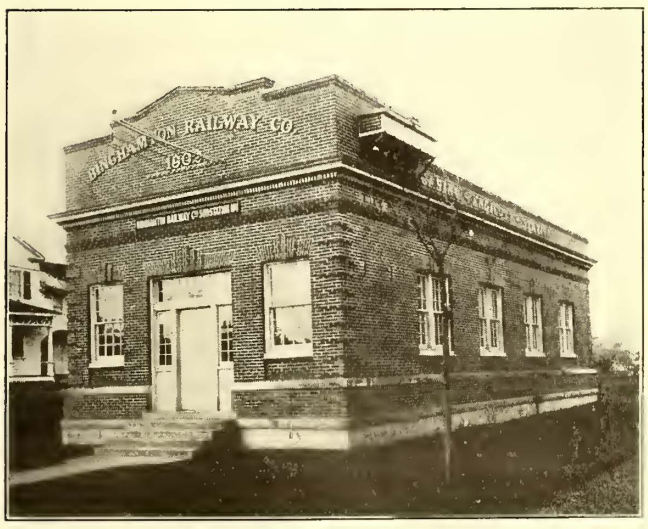
**Binghamton Railway—General Headquarters, Showing Combined Shop and Office Building at the Left, Old Car Storage Sheds in the Middle and Two Employees' Houses on the Right**

carry two GE-67 or two GE-800 motors. The double-truck cars, which are used in the Endicott service, are 37 ft. over all, with 28-ft. bodies, with four GE-67 or four GE-800 motors and Christensen air brakes; three of these cars have smoking compartments. During busy hours the double-truck cars are used in connection with single-truck motor cars as trailers. No record is kept of the trailer mileage, as the saving is confined to a reduction in the crews rather than in power. The single-truck open cars are of either 8 or 10-bench capacity, with two GE-67 motors; the larger cars have 15 benches and have four GE-800 motors. Both open and closed cars are provided with Consolidated fenders.

The location of the power house, car storage repair shop and offices at one place, five minutes from the heart of Binghamton, has proved a most economical arrangement. The power house and car sheds are comparatively old structures, but later the company erected a brick storage battery house for chloride accumulators, and in 1906 completed a model combination repair shop and general office building. This building was described in the STREET RAILWAY REVIEW of April 15, 1906, but a recapitulation of its principal features may be given here.

The foundation and floors are of concrete, the side walls of brick and the roof is supported by concrete-encased steel girders. The steel columns supporting the roof are also strengthened and protected from fire by a covering of concrete and wire mesh reinforcement faced with cement. The building is heated with steam from the adjacent boiler house, cast-iron piping being used in the shop and radiators in the office. The ground floor is divided into three sections, having brick partition walls and standard sliding fire doors to protect the openings. The largest division contains two storage tracks and two pit tracks, with 3-ton hydraulic hoists. A fireproof vault for documents and the toilets are located in the rear of this bay.

The middle section is used as a general repair shop, and in addition to the smaller hydraulic jacks has one of 30-ton capacity for raising car bodies. The pits in this section

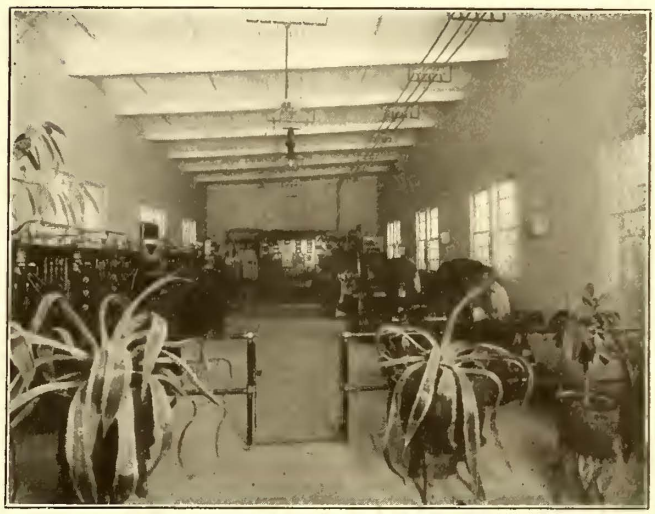


**Binghamton Railway—Sub-Station No. 1 at Endicott, N. Y., Showing the Neat Effect Attainable with Brick**

are of the open type, with track rails carried on I-beams resting on brick piers. The rear portion of this bay, used for carpentry, contains an hydraulic elevator for transporting armatures and supplies between the winding shop and stock room above.

The third bay is subdivided by a brick wall, to isolate the blacksmith and paint shops. The paint shop is forward and has two tracks.

The second floor of this building is carried over the storage section only. It is divided into a handsomely appointed office section and an L-shaped room which is used for preparing advertising signs, coil winding and stock supplies. The partition walls and ceilings on this floor



**Binghamton Railway—Interior of Sub-Station No. 1 at Endicott, N. Y.**

are of asbestos composition and finished with wood-pulp plaster. The floor in the office is of inlaid tiles and the rest of concrete.

The fire protection of the building resides not only in its construction, but in the installation of standpipes with hose, fire pails and extinguishers. The insurance rate is only $0.086 per $1,000 carried.

### COIL IMPREGNATING PRACTICE

In these times, when the use of ovens and vacuum treatment for field and armature coils has become rather common, it is interesting to note that this railway is securing satisfactory insulation with the simplest means. The master mechanic of this railway believes that the heat of the oven hardens the varnish to a degree which impairs the pliability of the coils and which may even cause the varnish to check or crack when the wires are heated by heavy currents or when being wound.

Armature coils receive the following treatment: After being wound, that portion of each coil forming an armature slot is glued with fish paper pressed on with a hot iron. The entire coil is then taped with linen and dipped into a shallow pan containing Sterling armature varnish, where it remains for 20 minutes. After being allowed to dry in the open room, which is never below 60 deg. F., the coil is taped with oil linen and the leads are covered with cotton sleeving. Another linen tape is put on from the point where the wires enter the slot, and then the coil is ready for its second dip. It is immersed for 20 minutes and allowed to dry out for three or four days. Finally, the coil is sprinkled with ground soapstone, to enable it to slip into the slots more easily, and it is then pressed into form ready for use.

Fields are insulated as follows: After forming a coil, it is dipped, before taping, 10 hours in a vertical pan containing Sterling insulating varnish. After drying, the coil is covered with two layers of oil paper and three layers of No. 250 drilling cloth lapped over the corners to

strengthen and cushion the coil. The final covering consists of two layers of oil paper and two layers of drilling, and then the coil is ready for the second dip, which lasts 30 minutes. One day is allowed for drying.

### HANDLING CAR MEN

The Binghamton Railway management uses no printed rule book, believing that the fundamental rules of car operation can be instilled without one. No book, of course, really can be complete, and some form of bulletin board is necessary to post the occasional orders issued to meet special traffic and weather conditions. In Binghamton all such orders are posted in typewritten form on a board in the car house and removed for filing by the master mechanic. The more general rules relating to operating changes are kept on view for 30 days. A typical special order refers to the opening of the new Beethoven Street line, and calls upon the car men to exercise particular care in familiarizing themselves with traffic conditions at all crossings, and in general to do all in their power to create and hold the new business. The bulletin board bears one permanent order signed by the general manager: "All employees must look to daily order board daily for instruction." To railway managers interested in this matter from a legal standpoint it may be stated that this company's bulletin order practice has been examined by a representative of the Public Service Commission and found satisfactory.

For emergency purposes a smaller board next to the bulletin carries the name and address of every platform man in the service. The runs are not assigned in the car house, however, but from an assembly room in the city, where most of the lines center. A rotation board in the car house shows the company's method of assigning the crews to a different run every week. There are 42 runs in all, and the rotation of crews on them has been found to be an effective method of checking up the average income of each run, and thereby detecting irregularities.

### EMPLOYEES' AID ASSOCIATION

The employees of the Binghamton Railway Company have one of the first street railway aid associations in the United States, having been organized since October, 1895. The society has enjoyed a most successful career, having always remained self-supporting, despite the grueling ordeal of a strike which lasted from April 26 to July 20, 1907. It has two classes of membership—the sick aid society proper, with about 180 members (50 per cent of all employees), and a death benefit fund, with 140 to 145 members. The railway management is cordially interested in the association and gives it free meeting rooms, the use of Casino Park for an annual field day and prepares the advertising material for the annual ball. While the company stands ready to make good any deficits, this has never been necessary. On the contrary, since 1899 the association has distributed over $1,500 in dividends to members and purchased $550 of new furniture. The quarterly report of the aid association, ending June 30, 1908, showed receipts of $426.70 and disbursements of $414.25, including two death claims. Similarly, the annual report for the year ending Dec. 31, 1907, showed a favorable balance of $1,145.61.

Any employee of the railway company in good health is eligible for admission to the association, and can remain a member as long as he pays his dues in accordance with the rules, whether or not he remains in the company's service. This retention of membership principle is an important feature, as it removes much of the distrust that some men feel toward joining organizations of this character. It is a guarantee that no matter where they may work in future, their money has not been wasted.

The initiation fee is $2 and the monthly dues 50 cents. In case of total disability to perform regular duties, members receive $5 a week up to 10 weeks in any 12 months. While no benefit is paid for periods of disablement less than one week, it should be noted that when payments are made they include the first week as well as any fraction of a week (on a pro rata basis) within the maximum sick benefit period.

Money received is distributed as follows: Benefit fund, 75 per cent; management fund, 15 per cent; benevolent fund, 5 per cent, and amusement fund, 5 per cent. If the surpluses of these funds respectively exceed $375, $75, $25 and $25 per 100 members, a dividend is declared. Dividends are not given to members of less than two years' standing. They are disbursed at the rate of $10 each in the order of membership certificate numbers. Should any fund fall below the mark, money from some other fund is transferred to it by a two-thirds vote of the members present at a meeting.

Members may join the special death benefit fund by paying an initiation fee of $1.10. An assessment of $1 is levied upon the death of any member of said fund, and 50 cents upon the death of any member's wife or child between the ages of 7 days and 14 years. This class of insurance is popular with family men because of its low cost.

The salary expenses of the aid association are confined to the following: Financial secretary, $50; recording secretary, $20, and treasurer, $50. The financial secretary and treasurer must give bonds for at least double the amount handled by them.

The association's physicians are those regularly employed by the Binghamton Railway Company in claim work and examination of employment applicants. The association gives free treatment to indigent members from the benevolent fund money.

The government of the association is vested in a board of trustees consisting of one motorman, one conductor and some other employee, thus giving the platform men majority control at all times. A trustee's term is three years. Trusteeship, presidential and other elections are held annually. Regular meetings are held once a month, when a full financial report must be presented to the members.

The association has, of course, the usual relief, law and other committees required in organizations of this character.

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The new Italian electric railway from Castle Raymondo to Camerino is 10 miles long and has several heavy grades up to 10 per cent, but is built throughout as an adhesion road. Water power is utilized to generate three-phase current, which is converted to direct current before feeding to the trolley line.

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The first electric street railway to be operated in Warsaw, Russia, was put in service in April, 1908, and will be managed by a syndicate which has a contract with the city until 1922. The company operates 304 cars and charges 3.6 cents for first-class passengers and 2.5 cents for second-class. The daily hours of labor for employees are from 7 a.m. to 11:30 p.m., for which motormen receive 62 cents to 67 cents and conductors are paid 62 cents to 83 cents.

## PARKS OF THE AURORA, ELGIN & CHICAGO RAILROAD

The Aurora, Elgin & Chicago Railroad Company owns and operates two parks, known as "Riverview" and "Glenwood." Although both of these parks are favored with natural attractiveness, they differ in that Glenwood has been improved with a view to affording a wooded spot suitable for picnicking, while Riverview has been built into an amusement resort.

### RIVERVIEW PARK

Riverview Park is especially interesting because it has been laid out in accordance with a systematic plan, and all

**Riverview Park—Novel Gateway and Illumination**

improvements have been made to harmonize with this scheme. The park is located on the Fox River, 3 miles south of Aurora, Ill., a city of 30,000 people and the terminus of two divisions of the Aurora, Elgin & Chicago Railroad. The business district of Chicago is one hour distant by the high-speed trains of the company, and an interurban trolley line which runs along the Fox River connects the property with Aurora, Geneva, Elgin and Carpentersville.

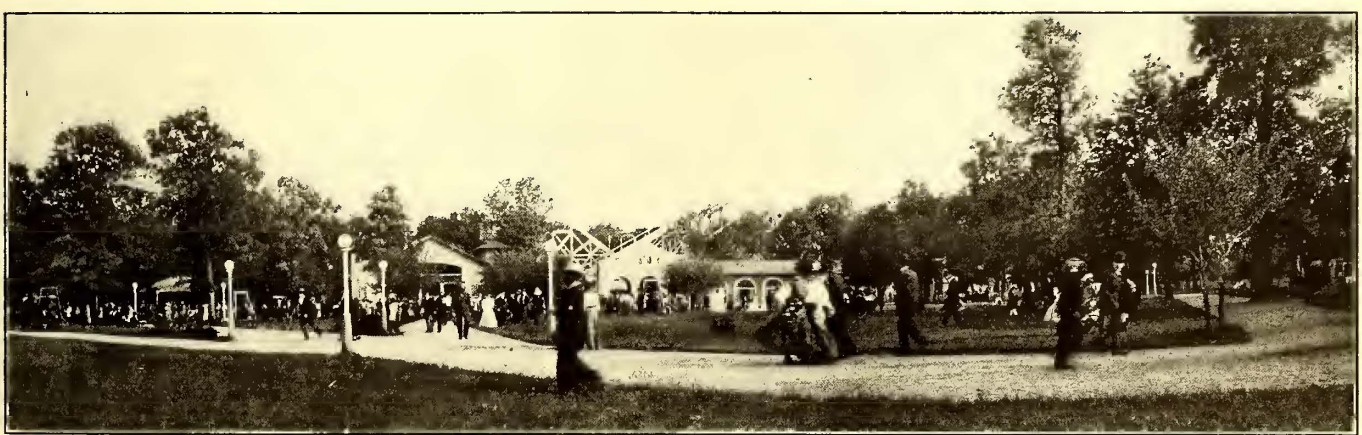
Two years ago, when the company decided to enlarge the park, it possessed few attractions other than those bestowed by nature, and the few structures within its boundaries were unsymmetrically located. The first step taken was to adopt a comprehensive plan for development, by which full use should be made of the naturally attractive topographical features of Riverview. It was also decided that the plan should be so broad in scope that as money was available from year to year various additions to the park could be made, all in harmony with the general scheme.

This method of park development by units has many features to commend it. It is necessary in an amusement resort of this kind, which caters to a city of from 30,000 to 50,000 people, to add something new each year if the interest of the public in it is to be maintained. The unit development scheme suits this need admirably. Only such improvements need be made as the earnings of each year warrant, but as they are added the property becomes continually more efficient and profitable.

An engraving shows the general arrangement followed. It will be noted that a main thoroughfare extends across the park, from the entrance at the electric railway station to a bridge leading to a pavilion on the wooded island. All of the concessions and amusement features are to be arranged symmetrically on this thoroughfare. After arrival at the park, the visitor passes through an attractive gateway, which gives an impression of stability and good taste. The large pillars shown in the illustration are of timber covered with rough plaster, and each is surmounted by a pedestal of artistic design bearing five lamps within frosted spheres. Within the gate the visitor finds numerous paths leading to a semi-circular thoroughfare, around which the concessions are grouped.

The plan of arranging the buildings in semi-circular form was chosen because it was believed that the best impression is thus made on the incoming visitor. It has also been found very desirable to keep the attractions grouped closely together. In a resort of this kind the crowds will form and unconsciously move in a body from one concession to another. Thus if the concessions are in line or adjoining each other, there is a tendency to form a crowd which will in itself add to the enthusiasm.

All of the space set apart for concessions around this semi-circle is not yet occupied, but as rapidly as new buildings are put up from year to year they will be connected with the other structure by an ornamental wall or peristyle,



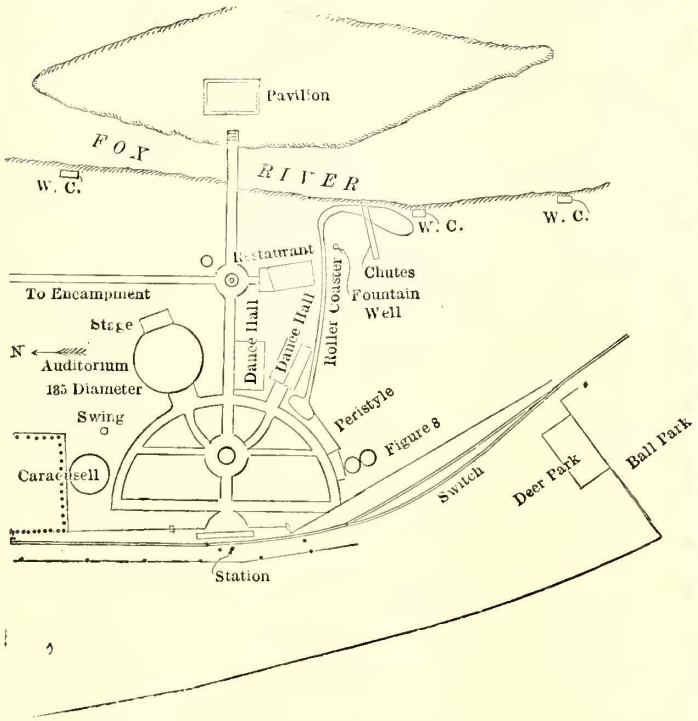
**Riverview Park—A General View of the Grounds, Showing the Wide Paths, Wide Grass-Covered Areas, Lighting Scheme and Some of the Amusement Buildings**

so that finally the eye of the visitor as he enters the park will be greeted by a complete semi-circle of amusement structures with ornamental connections.

As mentioned earlier, when the present plan for the development of this park was adopted two years ago, several buildings were located promiscuously among the trees. When the new work was begun in earnest, these structures were moved at a cost of approximately $1,000, so that now

in their new locations they form a part of the general scheme.

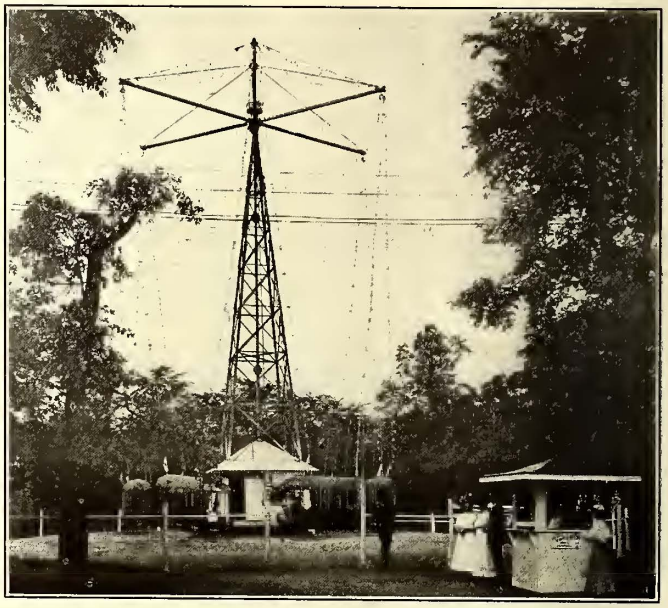
At present the following amusement features, all located on the semi-circle, are operated: Figure eight; roller coaster, 3000 ft. long, extending to the river bank and back to the circle; dance hall; restaurant; Chautauqua




**Riverview Park—Plan Showing Location of Amusement and Utility Structures**

building; merry widow swing (illustrated). An ornamental peristyle connects the roller coaster and the figure eight, making complete the southern end of the circular row of building fronts. In this peristyle are a penny arcade and a Japanese novelty booth. There are yet unoccupied spaces for three concessions on the circle. The Coaster Construction Company, Chicago, Ill., was the builder of the roller coaster, figure eight and merry widow swing.

An illustration is presented showing the attractive front of the restaurant, located among the trees and about halfway down the center thoroughfare between the circle and the river. This restaurant building, before the present improvements were made, did not conform to the alignment of the general scheme, so a new front in the "Mission"



**Riverview Park—The Merry Widow Swing**

style of architecture was added. The change improved the general appearance of the circle marvelously.

Reference to the plan of the park will show that the central thoroughfare leads across the river to a pavilion on the island. This pavilion or casino and the bridge have not yet been built, but will form a part of the fully developed park. From the central point on the main thoroughfare a lateral walk leads to an encampment ground, which is available for Chautauqua purposes. At the opposite ex-

**Riverview Park—A Never-Failing Attraction Which Needs No Description**

tremity of the park is a well-built and equipped baseball diamond and athletic field, an illustration of which is presented. The auditorium, which fronts on the semi-circle, has an umbrella type of roof supported by a steel structure 135 ft. in diameter. This auditorium has a seating

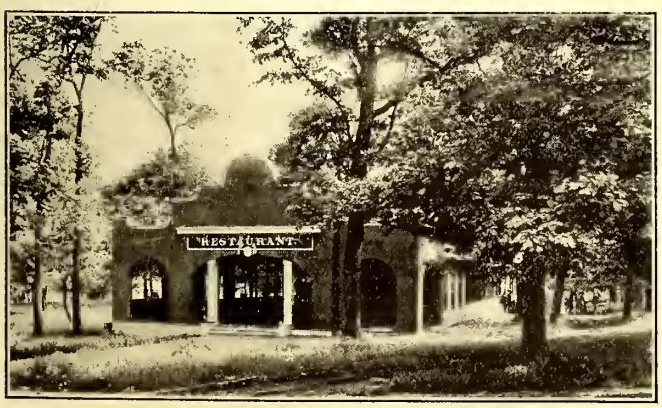
capacity for 3500 and is provided with an enclosed stage. As a part of the stage equipment are dressing rooms and a complete installation of theater properties, dimmers and similar mechanisms for artificial lighting.

Good music in the form of orchestral or band concerts has been found to be a most important feature. The whole territory tributary to the Aurora, Elgin & Chicago Railroad Company's service is an attractive farming and woodland country, so that it is necessary for the company to offer at this park something more than shade trees. It has been found that the music meets the approval of the

**Riverview Park—Comfortable Cars to Add to the Pleasures on the Scenic Railway**

patrons, and it has also been demonstrated that when vaudeville attractions are presented they must be short and the price of admission must be low. People who go to a park do not care to sit for an hour and a half in a theater on a pleasant afternoon or evening.

A restaurant, it is said, needs close attention, and if properly handled is an important factor in a park drawing its patronage from a small community. At Riverview



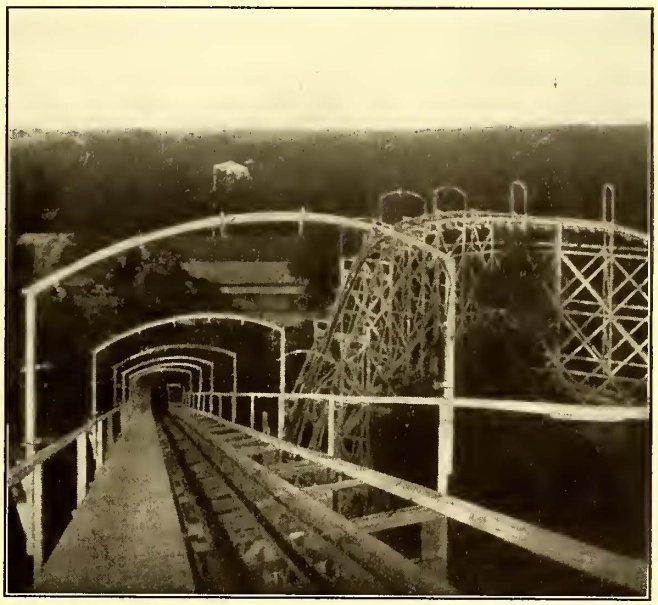

**Riverview Park—The Handsome Refreshment Pavilion**

endeavor is made to give service to the full value of the patrons' bills and to make no profit on the restaurant feature. No admission is charged to Riverview Park, and accommodations are provided for automobiles and other vehicles. A 5-cent fare is charged on the company's cars from Aurora to the park.

Special efforts are made in the early summer thoroughly to advertise the park. Local papers are used freely and special folders are issued. Some space also is devoted to the park in the regular railroad timetable folders. Whenever baseball games are to be played at Riverview they are advertised by means of large posters and by cards in the local papers.

### GLENWOOD PARK

Glenwood Park is located on the Fox River, near the company's central power station, at Batavia, Ill., and the railroad company has been successful in securing large



**Riverview Park—Up and Down the Dizzy Grades of the Scenic Railway**

picnic parties for this place. Excursion parties of from 4000 to 5000 people are brought here from Chicago, and while it is 40 miles from this city, these parties are handled easily and rapidly in 10-car trains, which cover the distance in 70 minutes.

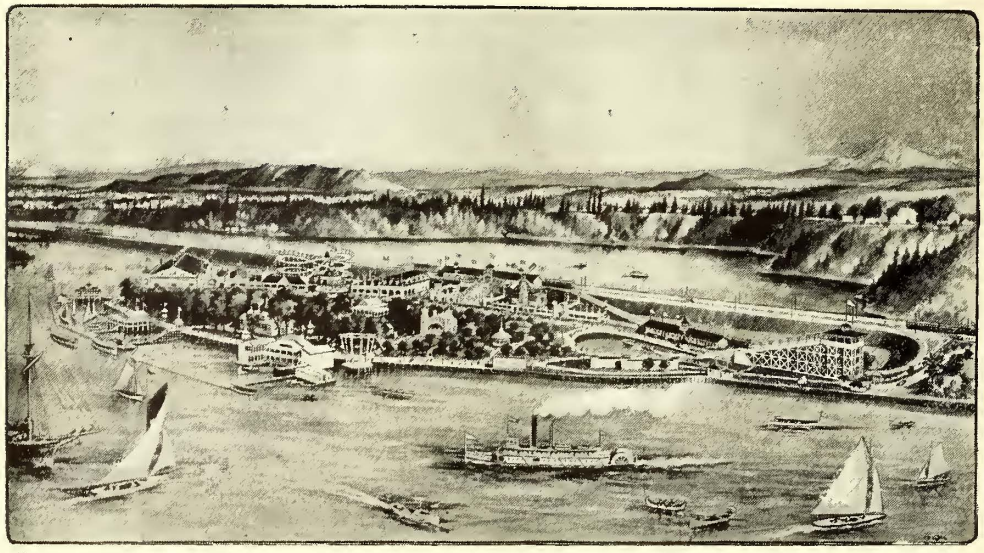
This park is a beautifully wooded spot, and, excepting for the care given to the trees and shrubs, has had no improvements other than a restaurant and dancing pavilion. It has been found that picnic parties from Chicago go to the country for a day's outing and select a park having natural beauty in preference to a resort whose main feature is an aggregation of amusement devices.

The Ft. Wayne & Wabash Valley Traction Company will improve its Spencer Park at Logansport, Ind., by adding a scenic railway.

The Grand Rapids, Holland & Chicago Railway Company has an amusement park on the shore of Macatawa Bay, close to Lake Michigan. This park is 30 miles from Grand Rapids and 6 miles from Holland. The ride is so long that no great crowds make the trip from Grand Rapids, but there is a large all-summer business from the nearby resorts and an average of about one picnic a day from Grand Rapids. For the picnic business an excursion rate of 50 cents for the round trip is made. During the past four years the company has steadily added concessions comprising the usual amusement devices. The boat livery is said to be one of the most profitable concessions. No admission is charged to the park, as it is maintained principally for excursion parties.

## THE OAKS, PORTLAND, OREGON

The Portland Railway & Light Company, Portland, Ore., is making extensive preparations to increase the attractiveness of its park property, "The Oaks," for the coming season. Owing to the milder climate on the Pacific Coast, the park season extends from May 1 to Oct. 1, inclusive. This favorable condition makes it practicable to make more liberal expenditures for attractions, and, of course, also shortens the interval during which the park investment is idle. The attendance during 1907 was about 350,000 for four months, equivalent to over three visits per inhabitant of Portland and vicinity. On Sundays and other holidays the attendance runs from 15,000 to 30,000.



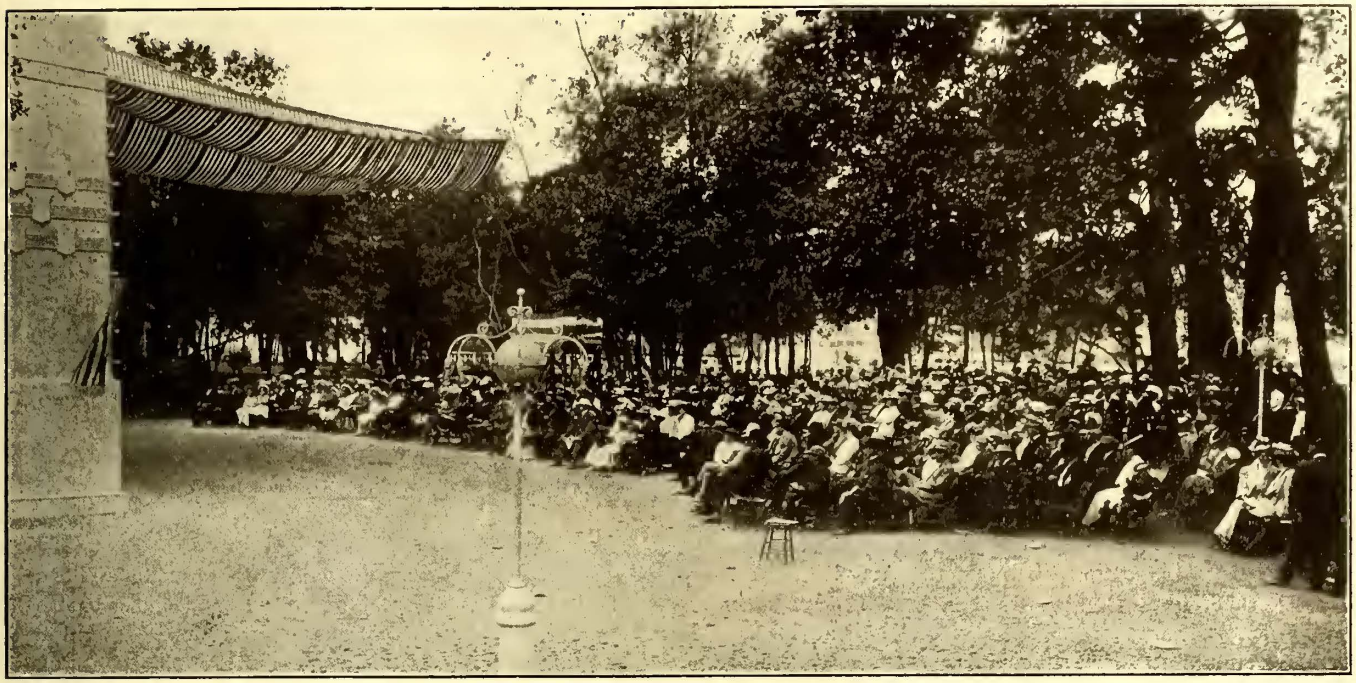
The Oaks, Portland, Ore.—A View from the Willamette River

"The Oaks" is a natural park, situated about 4 miles south of Portland, along the regular line running to Oregon City. The company owns a very large tract of land in the vicinity of the park, but the actual amusement property covers not more than 22 acres or 23 acres of high land along the banks of the Willamette River. This portion is densely covered by a grove of oak trees, from which the park derives its name. In laying out the grounds for pleasure purposes this natural forest beauty has been retained as much as possible, and even enhanced in various ways by flower gardens and lawns.

During the park season the company runs separate trains, consisting of a motor car and from two to three large open trailers. Each trailer has a seating capacity of about 150, thus making a full train load of about 500 people. During weekdays these special trains run at intervals of from 10 to 15 minutes, and on Sundays and special occasions from 5 to 7 minutes. The fare to "The Oaks" is only 5 cents, and passengers can transfer from any of the city lines without paying extra fare. All of the passengers are unloaded from the cars on one large platform used for entrance only, another platform serving exclusively for exit. Home-going passengers purchase their tickets at the latter platform, and also have the privilege of transferring to any city line.


The Oaks, Portland, Ore.—Along the Trail, with the Concessions on One Side and Oak Trees on the Other

The principal attraction at "The Oaks" usually is some celebrated band giving afternoon and evening concerts, with programs made up to suit both classical and popular tastes. During 1908 the company had such bands part of the season and comic opera and vaudeville at other times. The shows are given on a large covered stage, from which projects a large covered "Airdome," having a seating capacity of about 2000.



The Oaks, Portland, Ore.—Listening to the Music

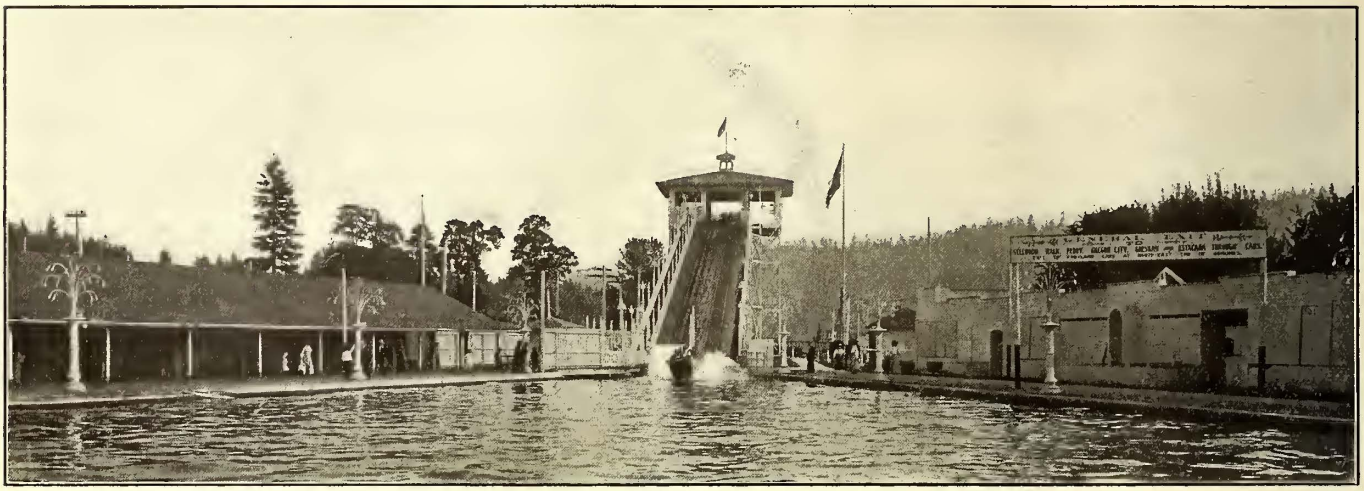
The other standard attractions in the park are the trail, on which are installed the figure 8 roller coaster, the merry-go-round, the "Old Mill," "The Tickler," laughing gallery, "Bump-the-Bumps," "Giant Whirl," and a large roller skating rink having a floor space of 200 ft. x 400 ft. There is also a large dance pavilion. This trail continues around to the side facing the river, where there is a large restaurant with a roof garden and a wide porch surrounding all sides. The swimming tank is placed right in the Willamette River. During each season there are other special attractions, such as balloons, loop-the-loop automobiles, high-wire performers, etc.

Fireworks constitute another attraction, and are usually displayed on Saturdays and holidays. At night, when the fireworks are most elaborate, they are discharged from a large barge placed about 200 ft. from the river bank. This arrangement makes it possible for crowds of 10,000 to 12,000 people to have an unobstructed view from the high ground along the river.

The Oaks, Portland, Ore.—Along the Trail, Showing also the Lighting Sprays

Considerable money is being spent this year to beautify

the grounds by laying out almost the entire vacant part with beds of roses. The idea is to make a rose park in which roses will be in bloom from the opening of the season until the close. This novel horticultural feature is expected to prove exceptionally interesting to visitors from the Eastern States.



The Oaks, Portland, Ore.—The Water Chutes between the Entrance and Exit Platforms

The natural beauty of "The Oaks" makes it an ideal resort for family and society picnics, separate days being set aside for the larger organizations. Every attention is given to encourage the women and children to attend so that they may feel at home and enjoy themselves without feeling that the presence of undesirable elements will require an escort. Each season a special prize is given on Children's Day. Last year the prize was a Shetland pony and cart, complete, valued at $350.

The good reputation of the park is kept up by the company's special police corps, the force being increased on special occasions whenever necessary. "The Oaks" has the splendid record of no reported robbery or other violence since its opening, so it is no wonder that it has become popular with the great majority of Portland people.

Of the illustrations, one on page 180 is an excellent view of "The Oaks" taken from the river. A second on page 181 shows part of the trail and the ground covered with a mass of oak trees. The spray design electric fixtures which can be seen in this picture are used all over the trail and part of the grounds. They are the same handsome design employed for similar purposes at the Lewis & Clark Fair held in Portland in 1905. The total amount of lighting in this park is equivalent to about 13,000 lamps. A very good view of the water chute, and incidentally of the exits and entrance platforms on opposite sides, is also reproduced. Other views show an afternoon audience on a hot summer's day listening to the band and a part of the trail or boardwalk on Sunday afternoon. It will be noticed that most of the concessions are placed on one side, so that visitors will not forget that they are in a real forest park, and not on a sun-baked boardwalk.

## PARKS OF THE SAN BERNARDINO (CAL.) VALLEY TRACTION COMPANY

The San Bernardino Valley Traction Company, of San Bernardino, Cal., owns and operates two parks, both of which have some rather novel features. Urbita Hot Springs Park, located between San Bernardino and Colton, has the unusual feature of an artesian well of sulphur water which reaches the plunge and tub baths at 110 deg. Fahr. There is also a bath house with a plunge 50 ft. x 100 ft. and dressing rooms for about 100 people. Porcelain tub baths are available for 40 patrons at a time. Other water pleasures are to be had on a 7-acre lake which is provided with gasoline motor and rowboats. Several attractions appealing especially to young folks are a zoo, a merry-go-round and store building containing stands for soft drinks, candies, post cards, etc. There is also a 50-ft. x 100-ft. dance hall

Urbita Hot Springs Park—In the Cool, Deep Shadows

Urbita Hot Springs Park—Along the Lake

which the company proposes to use as a skating rink in the near future. As shown in the accompanying views, Urbita Park is also especially attractive for its semi-tropical woodland features.

The other pleasure resort operated by this company is the Association Park race track between Redlands and San Bernardino, where the principal attractions are racing for horses, automobiles, bicycles and motor cycles. Both parks are in charge of A. B. Merrihew, manager of the railway company.

## KEYSTONE PARK, SAYRE, PA.

On July 9, 1908, the Waverly, Sayre & Athens Traction Company, operating between Waverly, N. Y., and Sayre and Athens, Pa., opened a 5-acre pleasure ground known as Keystone Park. This is located on the main line joining these contiguous towns and can be reached for a 5-cent fare over the company's lines by about 20,000 people. The park is only 1¼ miles from Waverly and Sayre and 3 miles from Athens. There is no admission charge to the railway company's patrons and but 5 cents is demanded of other visitors. The park was well patronized during its first season extending from July 9 to Sept. 18, entertaining 85,000 visitors, 10,000 of whom paid gate admission.

Keystone Park has been laid out along modest yet attractive lines. It is a well-wooded grove with numerous flower beds and plenty of rustic furniture for the convenience of the patrons. Illumination has received careful attention, there being installed over 600 16-cp lamps which are strung between the trees at intervals of 12 ft. in the manner illustrated. The entrance to the park is equipped with a large illuminated sign giving the name of the park in addition to the flaming keystone.

The park is particularly attractive to picnic parties through the installation of a public kitchen and tables to accommodate over 350 people at one time. The kitchen matron has charge of a large supply of dishes, which are loaned to picnickers for the nominal charge of 5 cents per dozen to cover expenses.

The costliest attraction is a local band of 23 pieces which gives concerts Tuesday, Thursday and Saturday evenings and Saturday and Sunday afternoons. The orchestra engaged for the dancing pavilion plays on a per cent partnership basis. The railway company furnishes the pavilion and lighting, and charges 5 cents per couple.

Special events the first season included a balloon ascension every other Saturday, trapeze performances and fireworks. Toward the end of the season the management tried out several vaudeville acts, and as these found approval with the public, this class of entertainment will be given on a larger scale next summer.


Keystone Park—Rustic Entrance

Keystone Park—Flower Beds and Lighting Scheme

Keystone Park—Plenty of Trees, Wide Walks and Benches

Keystone Park—Shooting Gallery

The park contains the usual merry-go-round, miniature railway, swings, shooting gallery, moving picture-theater, photograph gallery, candy stands, etc., all of which are in the hands of concessionaires on a percentage basis. The merry-go-round proved the best money-maker last season.

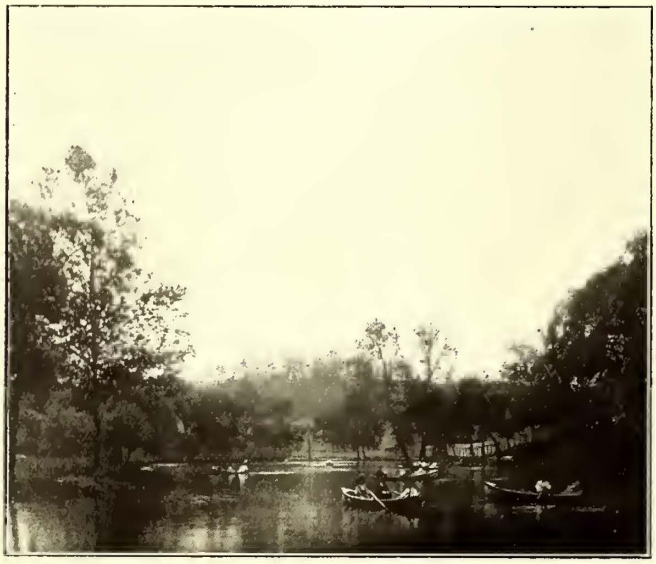
The results of the first year's operation of Keystone Park have shown that conducted along the lines described, it is more than likely to pay its own way besides inducing a large short-haul traffic.

## PAXTANG PARK, HARRISBURG, PA.

One of the prettiest and best-kept pleasure grounds in Pennsylvania is Paxtang Park, a 35-acre amusement property owned and operated by the Central Pennsylvania Traction Company, of Harrisburg. The park is about ¼ mile from the main line and is served by a double-track on which crowds can be transported for a 5-cent fare as fast as cars can be made available for them. The tendency of the company is to eliminate gradually the use of open cars in this and other service, as Harrisburg is in a region of sudden and heavy rainstorms.

The park is situated in a district of great natural beauty and the constant effort of the park management has been to retain this inherent advantage by soliciting only the patronage of the best classes of people. There are no sensational amusements of the kind which are expensive to install and soon cloy the public. Instead, the grounds are made as attractive as possible by an abundant supply of standard amusements. In the absence of a dancing pavilion this park is unusual, but this omission was made purposely to avoid undesirable patronage. For the same excellent reason, no liquors are sold in the park, and thus disorder of any kind is a rarity.

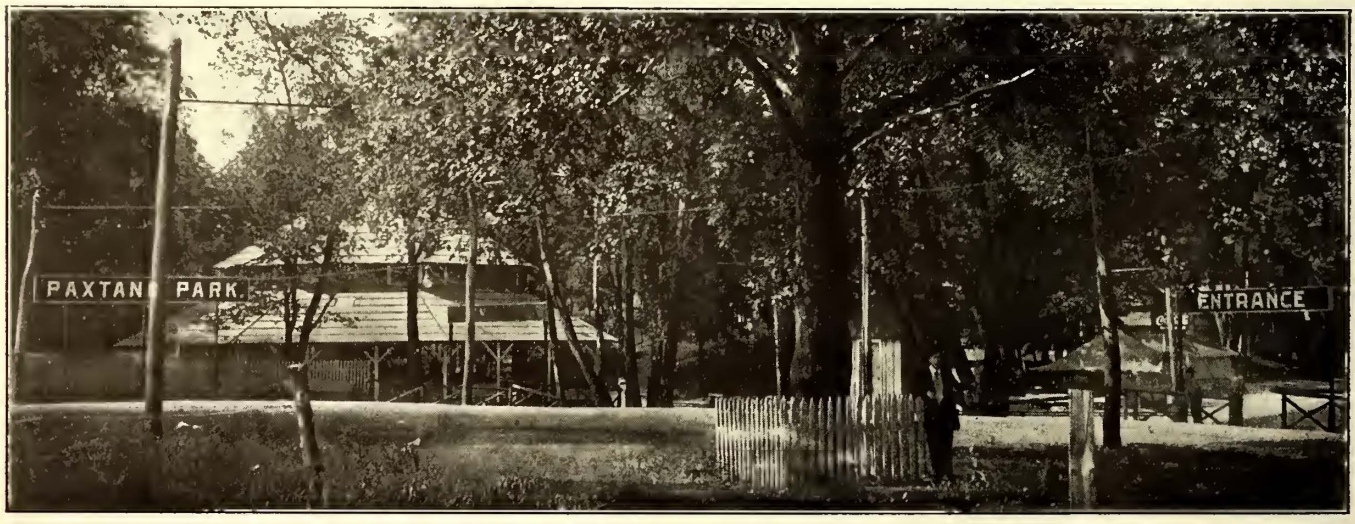
During the last season the park entertained 197,866 visitors from a territory of about 100,000 population. As the season does not extend over 15 weeks, this is really a fine record. The attendance in 1908 was about 20,000 less than in 1907 on account of the depression in the iron and railroad industries, which severely affected Harrisburg. Decoration Day usually marks the opening of all the principal entertainments.



Paxtang Park—Boating Among the Hills

Paxtang Park—A Turn in the Lake

Paxtang Park is not operated on an admission-fee basis as the company is satisfied simply to have the park pay its own way. The principal pay attraction is high-grade vaudeville from the William Morris circuit, which is given in a building with open sides. This structure has 800 seats, of which 300 are reserved at 15 cents and the balance made




Paxtang Park—Entrance to the Grounds, Illustrating the Rustic Simplicity of the Park Buildings

available for 10 cents. It is a noteworthy fact that despite the reduced attendance last year the vaudeville suffered less than other attractions. The people did not have as much money to spend, but were willing to economize in popcorn and sodas that they might forget their financial worries by going to the theater.

The natural configuration of the grounds has made it possible to provide a fine lake for boating and a concrete swimming pool, both of which are very popular. A spring of pure cold water bubbling forth from a great jagged rock is another attraction best appreciated in hot weather. It is hardly necessary to say anything about the artistic appearance of the grounds as this will be noted from the accompanying illustrations taken last summer. Tables and benches, of course, are numerous as befits such a place for family and association meetings. Many of these benches formerly did faithful service on the old-time open cars. As indicated in the illustrations, both arc and incandescent lamps are used liberally for the illumination of the grounds and buildings.

Paxtang Park is especially attractive to the younger element because of the numerous swings, the safe boating, the merry-go-round, the miniature railway, figure-eight roller coaster, box-ball alleys and the swimming pool. These, together with the vaudeville, comprise the principal pleasures aside from such special events as balloon ascensions. Among the other standbys are the shooting gallery, photograph gallery, soda booth and the usual stands, including one in which post-card souvenirs of the park are sold.

**Paxtang Park—One of the Shelter Houses with the Scenic Railway in the Background**

**Paxtang Park—The Starting Point of the Miniature Railway**

The merry-go-round and theater are managed directly by the company. The boating and swimming privilege is sold for $500 a season, the concessionaire in turn charging 25 cents an hour for the former and 25 cents for the latter, including a suit. The operators of the roller coaster and miniature railway respectively pay the company 25 per cent and 25 per cent of their gross receipts. Miniature railway rides are six for 25 cents and for the roller coaster 5 cents per trip is charged, or six tickets are sold for 25 cents.

Paxtang Park is under the direction of F. M. Davis, superintendent of transportation and park manager of the Central Pennsylvania Traction Company. Acknowledgment is due Mr. Davis and F. B. Musser, president of the company, for the views and information from which this description was prepared.

**Paxtang Park—The Concrete Swimming Pool and Steps for Diving**

**Paxtang Park—Benches for the Weary and a Bridge for the Thoughtful**

## THE PROBLEM OF REDUCING ACCIDENT DAMAGES—IV.

BY FREDERICK W. JOHNSON, ASSISTANT GENERAL CLAIM AGENT, PHILADELPHIA RAPID TRANSIT COMPANY

In the month of July, 1907, the Philadelphia Rapid Transit Company still further took up the matter of the systematic instruction of car men in the various branches of accident work. The Frankford barn, at which between 500 and 600 conductors and motormen report, was assigned to the claim department for experimental purposes.

This barn was selected for the purpose for several reasons. It was, first of all, a barn of fairly good size. Secondly, its lines operated principally through congested portions of the city, where accident conditions were anything but of the best. Thirdly, in several essential respects the accident work of the men of this barn was felt to be open to improvement. The intention was to test certain suggested improvements under unfavorable, rather than under favorable, circumstances.

Accordingly, the men of this barn were gathered together into classes, about six in number, for the first series of meetings. In point of attendance, the classes ranged from 40 to over 120. A remarkably well-appointed assembly room at the barn afforded ample accommodations for the purpose. The first meeting was held at night, and was attended by the superintendent and a number of officials of the company, in order that the men might understand from the start that the work had the approval and support of the company.

The classes averaged one hour in length. The men manifested their interest in the subject from the very beginning, a number seeking the privilege of attending more than one of the meetings. At this time only rudimentary principles in accident work were discussed, the intention being to start in at the very bottom for the purpose of laying as good a foundation as circumstances would permit. The series passed without special incident.

Early in the following October a second series of meetings was arrarged at the same barn. Again the same interest was apparent upon the part of the men. The instruction given this time was a little more advanced in character. The classes were reduced to four in number, which gave a somewhat higher average attendance per class. Superintendent Gutherman attended practically all of these first classes and endeavored in every way within his power to advance the success of the work among the men of his barn. This series likewise terminated without special incident.

On Feb. 18, 1908, the first issue of the company's weekly accident bulletin in connection with its instruction work appeared. This and subsequent issues for some time were confined entirely to the Frankford barn. The bulletin was issued in individual form, a copy being handed to every conductor and motorman with his pay check each week. This idea also seemed to meet with the approval of the men on the cars, and it proved a source of no little encouragement to find that they looked forward from week to week for the next issue of the bulletin. When a man unintentionally was overlooked in the distribution of bulletins, he invariably made it his business to step up to the desk and to ask for one.

During all of this time no effort was made to "prevent" accidents; rather was every endeavor bent in the direction of teaching the men how to handle certain types of accidents properly. The reason for adopting this course has been discussed at some length in a former article. In a word, experience has demonstrated the fact that prevention of accident work cannot be prosecuted successfully without the construction first of a suitable foundation. For the time being it was believed that the importance of submitting a prompt report upon every accident and of obtaining an adequate number of witnesses to these accidents afforded abundant opportunity for missionary work.

What about results? Well, the results were nothing startling. They never are in accident work. The company was contending with conditions which had been in force for many, many years past. It was not to be expected that a grand upheaval would follow as a result of a few months' work. But, for all that, there were encouraging features about the work of the men. The number of "unreported accidents" ceased to show an increase, and gradually began to decrease, very slowly to be sure, but the drift, nevertheless, was in the proper direction. The accident reports submitted by the men began to show an improvement in their recital of important facts. The average number of witnesses obtained per accident increased steadily from month to month, while the barn meanwhile went from the foot of the list in this respect to the very top, and then stayed there. In such branches of the work as were touched upon the Frankford barn readily outdistanced the other 18 of the company.

### EXTENSION OF THE WORK

During the following April Mr. Goshorn, head of the company's claim department, received authority to extend the work of instruction throughout the entire system. Schedules were immediately drawn to cover all of the barns. Plans were rearranged, material for lectures prepared, advance bulletins printed and a corps of instructors selected. Arrangements were perfected for meeting places and for innumerable other details incident to the instruction of about 7000 conductors and motormen.

By the middle of the month the department was prepared to go ahead with the work. It required 12 working days for the corps of seven instructors to cover the system. The men were allowed their regular rate of wage for time used in attending classes. Throughout the course of meetings but a single instance of inattention or discourtesy developed, and this was upon the part of but one man. Upon completion of the classes the company's accident bulletins were promptly swung into operation. Various other innovations were introduced at short intervals, all of which have since demonstrated their value toward the end sought, but which do not properly come within the scope of these articles.

Immediately upon completion of this series of meetings a school for the instruction of new employees was established at headquarters. To this school all new men are sent by the various superintendents immediately upon completion of their period of probation on the cars. No attempt is made, however, to give the new employees a full detailed history of accident work from the time of the big wind down to the present. For one hour they receive good, solid instruction upon a number of vitally essential features in connection with accident work. They are then given return cards to their superintendent, certifying their attendance at the school. From this point on the new man is given a copy of the bulletin each week, but receives no further verbal instruction until the next regularly scheduled series of classes, in the fall or the spring following. To this school also are sent experienced conductors and motormen who demonstrate their need of further instruction from time to time.

Again, during the latter part of September, a second series of meetings was conducted successfully throughout the system, present arrangements calling for but two talks a year, one in the spring, the other in the fall. This series likewise was marked by the closest attention upon the part of the men, and proved most encouraging in every way.

To date the work has been confined principally to a consideration of such subjects as the importance of reporting promptly all accidents; suggestions regarding the method of making out accident reports; the matter of colliding cars, and the work of obtaining witnesses to accidents, with occasional references to other topics with a view to guarding against any possibility that the work might become monotonous because of the instructor holding too closely to any particular topic.

### THE UNREPORTED ACCIDENT

The "unreported accident" unquestionably is one of the most serious problems with which the average street railway claim department is confronted to-day. It is demoralizing in its effect upon the men upon the cars; one man neglects to report an accident and possibly gets off scot-free because of the fact that the company is unable to determine the guilty person; the next man obeys orders, sends in a prompt report of his accident, and possibly is rewarded with a lay-off or dismissal, because of some alleged carelessness or neglect. Hence, there is a constant temptation upon the part of the men to conceal the occurrence of accidents. It is more or less disconcerting to the superintendent, inasmuch as he is frequently under fire from headquarters because of the unfavorable showing of his barn or division in the "unreported accident" column; especially so, if his showing is growing progressively worse.

It is detrimental in its effect upon the claim department because of the fact that the department is forced to grope its way in darkness in dealing with claims of this character. It necessitates additional help which otherwise would not be required. It strangles the customary careful investigation of claims for the protection of the company, and oftentimes reduces the disposition of a claim or lawsuit to a matter of mere guesswork, for the simple reason that the average claim agent is neither a mind-reader, second-sight artist nor clairvoyant. With many companies the expenditure of thousands of dollars each year depends upon the judgment and experience of their claim agents in considering blind claims of this sort.

It is discouraging in its effect upon the legal representatives of a company in that it forces them to trial upon cases concerning the real merits of which they know but little. It is not to be supposed, of course, that every blind claim will be adjusted simply because it is blind. Hundreds of them crumble away when exposed to the light of day. But for all that, the average trial attorney prefers to know something definite and tangible regarding the merits of a case at issue.

It is harmful in its effect upon the claimant who really has a just cause of action, in that it necessarily places his claim temporarily upon the suspicious list. The accident complained of may have happened, and it may not. That question must first be determined as clearly as possible, one way or the other, before action can be taken by the company upon the matter of the disposition of the claim. It is only in this way that the honest claimant can be distinguished from the fraudulent.

And, lastly, the "unreported accident" is a menace to the best interests of a company by reason of the fact that it strikes directly at its resources. An increase in accident damages is equivalent to a proportionate decrease in revenue. The "unreported accident" column includes, of course, accidents for which the company's employees were responsible, as well as those for which they were not responsible. In either event, however, the results are pretty much the same, inasmuch as the company is ever at a disadvantage in dealing with cases of this character.

That has been, and is to-day, the experience of many an otherwise well-managed street railway property. And the really surprising feature of the whole situation is that many of these same companies view this state of affairs with a marvelous degree of complacency. It has been going on for so long that they have sort of become accustomed to it. Time and time again have substantial verdicts been rendered against them upon blind, unreported accidents, yet to-day they are doing practically nothing to alleviate so unsatisfactory a condition. Far be it from them to admit that such is the case, yet facts are stubborn things. But with these same companies let the cost of operation of a certain line vary four-tenths of a cent per day, or the expense of labor in a certain car barn show an increase of $1.38, and the official board of inquiry immediately springs into commendable activity.

The larger the system the greater the spread of the "unreported accident" evil. Various reasons contribute to this end. First, the matter of labor; the larger the city the more unstable the grade of men available. Secondly, the comparative ease with which the occurrence of accidents may temporarily be concealed. Thirdly, the utter impossibility of as close a relationship between the men upon the cars and the officials of the company, as upon smaller systems. A company of moderate size, employing a larger percentage of natives upon its cars as conductors and motormen should experience comparatively little difficulty in practically eliminating the "unreported accident" for all time, if only the problem be approached from the proper angle and in an intelligent, energetic, broad-gaged manner.

### REDUCTION IN UNREPORTED ACCIDENTS IN PHILADELPHIA

The following figures are given as bearing upon a portion of the work covered to date by the work of the Philadelphia Rapid Transit Company. No claims of any description are made in connection with them. Whether the results thus far accomplished are due in part to this work or to some other contributing cause will be left for the future to determine. Whether the apparent improvement is permanent or temporary will also be left as an open question. If the results merely chance to be coincident with the inauguration of instruction work they are none the less acceptable for that fact.

Taking up the "unreported accident" problem as the first of three subjects toward which especial attention has been directed thus far, the following results are submitted. The result for each month is obtained by comparing its totals with those of the corresponding month in 1907:

REDUCTION IN NUMBER OF UNREPORTED ACCIDENTS.

| | Per cent |
|---|---|
| June | 45 |
| July | 60 |
| August | 54 |
| September | 54 |
| October | 63 |
| November | 60 |
| December | 45 |

The work has been in actual operation throughout the system for but nine months, and as the plan of campaign is mapped out upon a basis of two years, it will readily be

seen that the major portion of the work still lies in the future.

For the five months immediately preceding the inauguration of the first classes in April last the average number of witnesses obtained per accident for the system stood at 3.1.

For the month of April the average number of witnesses obtained per accident for the system increased to 4.5.

The following month of May showed a still further increase, the general average for this month standing at 5.5.

The next month, June, rolled up a general average of 7.3.

The month of July rounded out a general average of 7.0. August likewise turned in an average of 7.0 witnesses per accident for the entire system.

Below is given the individual standing of the various barns for the month of October. The figures denote the average number of witnesses obtained per accident by each barn:

| | | | |
|---|---|---|---|
| 1. | Richmond ..... 11.1 | 9. | Second & Wyoming..... 8.0 |
| 2. | Folsom ..... 10.1 | 10. | Hancock & Lehigh..... 7.8 |
| 3. | Second & Third..... 9.2 | 11. | Sixteenth & Jackson..... 7.6 |
| 4. | Fifth & Sixth..... 9.1 | 12. | Twenty-sixth & Allegheny.. 7.5 |
| 5. | Fifteenth & Cumberland.... 8.8 | 13. | Ridge Avenue..... 7.1 |
| | Tenth & Eleventh..... 8.8 | | Hestonville ..... 7.1 |
| 6. | Market Street..... 8.7 | 14. | Twenty-seventh & Girard.. 6.6 |
| 7. | Lancaster Avenue..... 8.5 | 15. | Woodland Avenue..... 6.3 |
| 8. | Pelham ..... 8.4 | 16. | Gray's Ferry..... 5.9 |
| | Willow Grove..... 8.4 | | |

General average for the entire system, 8.0.

It is also interesting to note that during Founders' Week in Philadelphia, when travel upon the cars was exceptionally heavy (the company's record for the number of passengers handled during a single day being bettered twice during the week), the average number of witnesses obtained per accident reached 8.3 for the period of seven days, the actual figures for each day being as follows:

| | | | |
|---|---|---|---|
| Sunday | 7.2 | Thursday | 9.3 |
| Monday | 8.7 | Friday | 8.8 |
| Tuesday | 8.0 | Saturday | 7.7 |
| Wednesday | 8.0 | Average for entire week | 8.3 |

November, the first of the winter months, returned a general average of 6.6 witnesses per accident, while December averaged 6.0. It is expected that during the winter months, when it is a somewhat more difficult proposition to secure the names of witnesses than during the other three seasons of the year, the general average will fluctuate between 6.0 and 6.6. In connection with this it might be explained that the standing of all barns is furnished the men each month through the bulletin just as it appears in the foregoing table, in order that they may be kept advised of the progress of the work.

A natural inquiry is, "How does the proportion of fictitious witnesses to the total number of names secured at the present time compare with conditions prior to the increase above noted?" As far as it has been able to determine the ratio of "fakes" to the total number of witnesses obtained remains at about the same proportion as heretofore.

With regard to the subject of collisions of cars the records of the department furnish the following statistics. The result for each month is obtained by comparing its totals with those of the corresponding month in 1907:

REDUCTION IN NUMBER OF COLLISIONS.

| | Per cent |
|---|---|
| May | 48 |
| June | 59 |
| July | 58 |
| August | 59 |
| September | 42 |
| October | 57 |
| November | 56 |
| December | 56 |

The next and concluding paper will touch upon the value of printed matter in connection with instruction work of this character.

*(To be continued)*

## ARNOLD REPORT ON NEW YORK SUBWAY TRAFFIC

The sixth report in the series relating to the subway of the Interborough Rapid Transit Company, New York, prepared by Bion J. Arnold for the New York Public Service Commission, First District, has been issued. This report is on the traffic of the subway, and is dated Dec. 31, 1908. In his letter of transmittal Mr. Arnold says:

ADVANTAGES OF SUBWAY

This report shows the advantages that are being enjoyed by the citizens of Greater New York as a result of the operation of the present subway. To design, build and operate an expensive system of subsurface transportation furnishing facilities for a 17½-mile continuous ride at high speed through the heart of a crowded city and underneath a broad river for one 5-cent fare is an accomplishment which appears more creditable as the difficulties of duplicating it become appreciated.

The information in this report emphasizes the fact that has already been pointed out—that one of the most serious defects of the present subway is its lack of overload capacity; that is, its inability properly to carry the peak-load traffic which must be handled twice each business day. In the building of future subways this defect should be remedied, and in the operation of the present subway every effort should be made to increase the carrying capacity during these rush-hour periods.

During the past few months the carrying capacity during rush hours of the express tracks of the subway has been increased about 10 per cent by changes in the signal system, and of the improvements that will further increase this capacity there still remain to be carried out the following:

1. Additional doors in each side of each car. (Now being installed on experimental trains.)

2. Speed control signals at the approach to each express station. (Now being developed and in operation at one point.)

3. The elimination of the Ninety-sixth Street crossover and the introduction of reservoir tracks at this point. (Now under construction.)

4. The running of all express trains to Brooklyn by providing a shuttle-train service between Bowling Green and South Ferry. (Necessary changes to accomplish this now under construction.)

5. The adding of an additional car to each express train during the rush-hour periods.

6. The adoption of an automatic coupler so that trains can be quickly made up and broken up at intermediate points to save dead-car mileage.

Much has been said in regard to furnishing "a seat for every passenger." With the present subway there are more seat-miles operated each day than there are passenger-miles traveled, and therefore, if the passenger movement could be made to coincide with the seat movement there would be a seat for every passenger and some seats to spare. However, as the passengers cannot be expected to travel to fit the convenience of railroad operations, unremitting efforts should be made to move the seats coincident with the passenger movement. In adopting a method of regulation for the future car movement of the present subway upon a basis which will not be unjust to the subway company, my recommendation is to divide the probable number of passengers by a constant determined as shown in the report, in order to establish the number of car-miles that should be run, and then prepare a schedule calling for this number of car-miles so distributed as to carry the greatest number of seated passengers.

DESIRABILITY OF SUBWAY

In the introduction to the report Mr. Arnold says that the technical success of the subway during the three years a large part of it has been running demonstrates the practicability and desirability of a subsurface system of transportation under the conditions existing in New York City. An abstract of the report follows:

VARIATIONS IN YEARLY TRAFFIC

In order that a comprehensive idea of the magnitude and

growth of the passenger traffic of the subway may be obtained this data may be studied to advantage.

COMPARATIVE PASSENGER TRAFFIC BY YEARS.

| Period. | Tickets sold. |
|---|---|
| *Oct. 27, 1904, to Dec. 31, 1904 | 16,241,869 |
| Jan. 1, 1905, to Dec. 31, 1905 | 116,209,313 |
| Jan. 1, 1906, to Dec. 31, 1906 | 149,778,370 |
| Jan. 1, 1907, to Dec. 31, 1907 | 182,559,990 |
| Jan. 1, 1908, to Dec. 31, 1908 | 220,991,212 |

*The date the subway was opened to traffic.

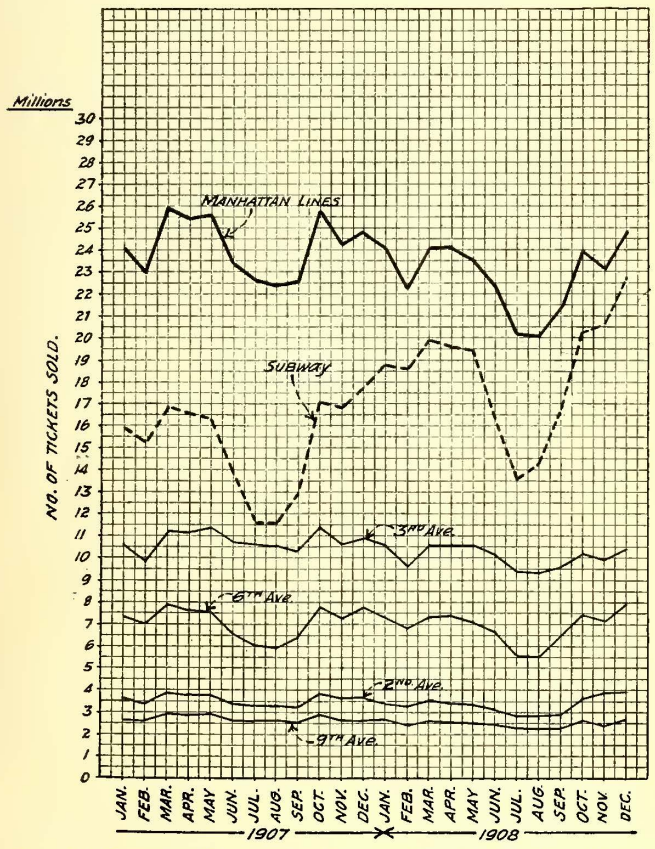
COMPARATIVE TRAFFIC FIGURES FOR ONE YEAR.

| | Miles of single track operated. | Car-miles, total. | Number of passengers, total. | Number of passengers per mile of road. | Number of passengers per mile of single track. | Ratio passengers to car-miles. |
|---|---|---|---|---|---|---|
| Interborough subway | 69.9 | 44,005,211 | 200,415,050 | 7,819,549 | 2,870,172 | 4.56 |
| Manhattan elevated.. | 90.66 | 64.584,611 | 282,870,590 | 7,523,153 | 3,120,125 | 4.38 |
| *London underground tubes..... | 167.3 | 32,728,130 | 160,000,998 | 4,010,024 | 958,762 | 4.90 |
| Chicago elev'd rds. | 150.53 | 39,264,008 | 147,267,113 | 4,134,390 | 981,780 | 3.75 |

*In order to compare the New York subway with enterprises of a similar character, the results of six months' operation of the subways of London, England, ended June 30, 1908, have been doubled so as to show a period of one year, and these figures are compared to the corresponding results with the Interborough, or New York, subway for the year ended June 30, 1908, with the results of the four Manhattan elevated lines for the same year, and with the four Chicago elevated roads for the year 1907. Each mile of track in the New York subway is used on an average of three times as efficiently for moving both cars and passengers as is the case with the London tubes, and on both the elevated and subway tracks of New York City there are also three times as many passengers moved each year as are handled on an average on each mile of single track of all of the Chicago elevated roads, including the Union Loop.

TRAFFIC BY STATIONS

The business at the Times Square station is increasing more rapidly than the business at the Grand Central station,

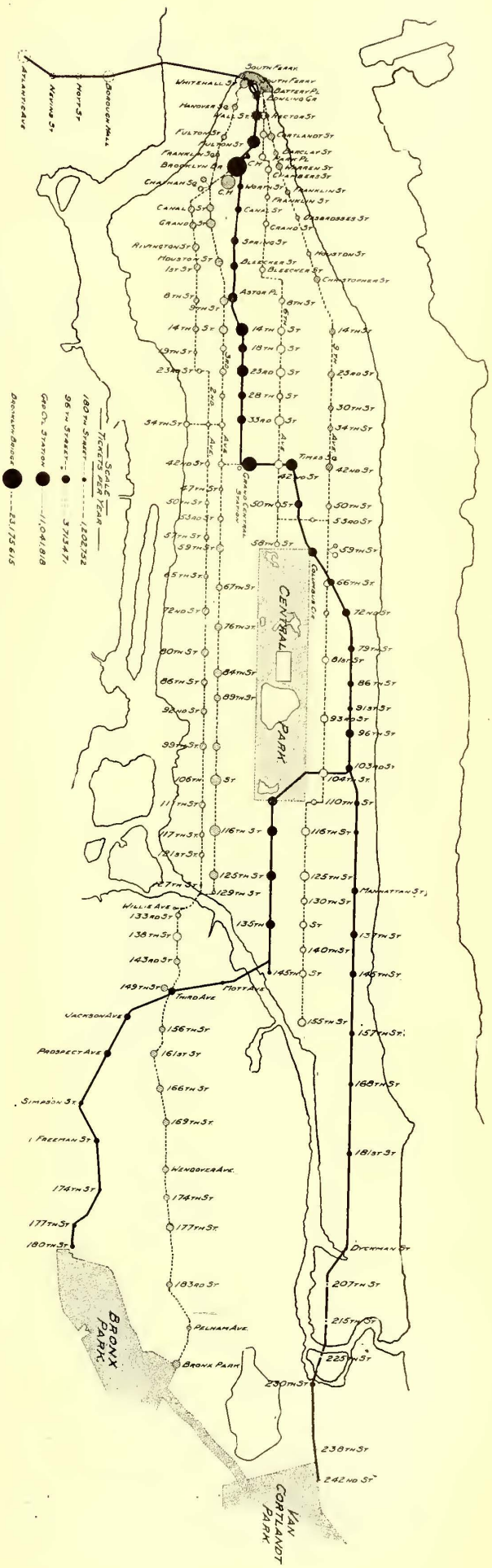



**Arnold Report—Chart of Comparative Traffic by Months of Subway and Elevated Lines**

making it probable that the Times Square station may soon handle as many pay passengers as those who now purchase tickets at the Grand Central station.

The Lenox branch is much better patronized than the Broadway line and attention is at once attracted to the fact that the stations at the outlying ends of both branches show comparatively the least number of ticket sales.

The opening of the Brooklyn extension to Borough Hall

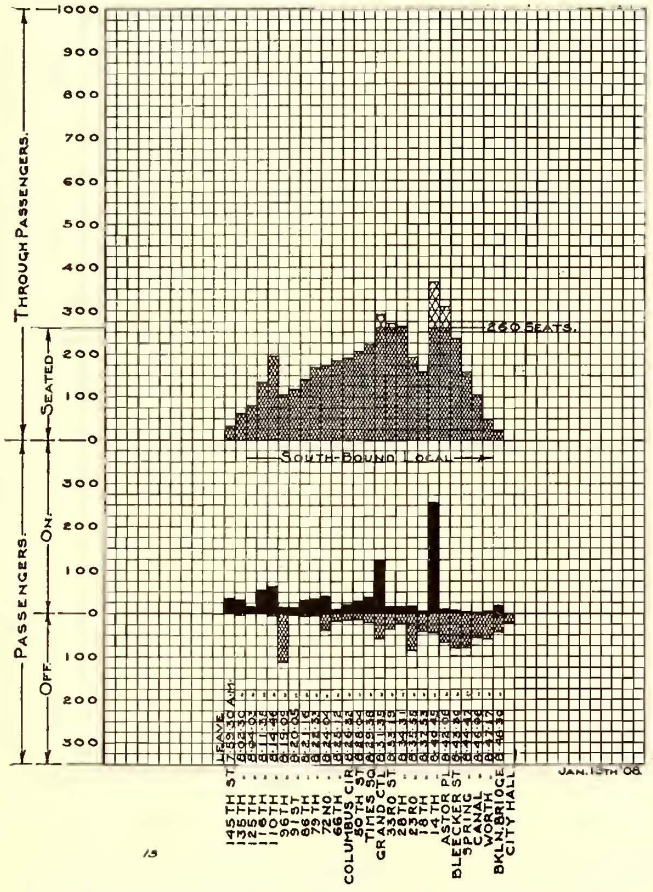



Arnold Report—Chart of Comparative Ticket Sales at Stations on Subway and Elevated Lines for 1907

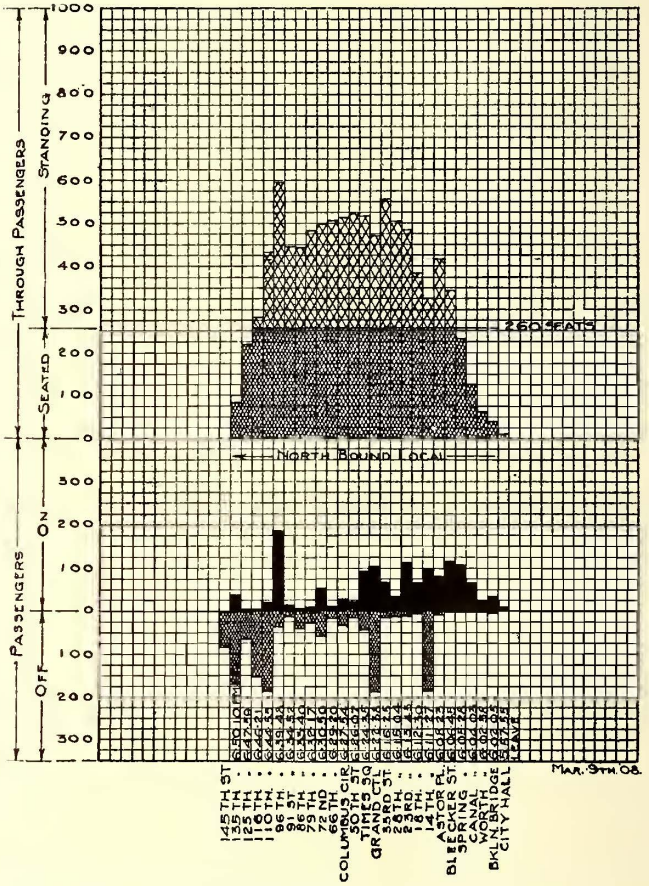
station on Jan. 1, 1908, and to Atlantic Avenue on May 1, 1908, has decreased the number of ticket sales sold at the Brooklyn Bridge station by over 20 per cent and at the same time has increased considerably the ticket sales at Bowling Green, Wall Street and Fulton Street. The total increase in ticket sales at these three stations will show an increase of approximately 5,000,000 tickets during 1908 which will offset the falling off of ticket sales at Brooklyn Bridge. As a result the entire ticket sales on the Brooklyn side of the tubes under the East River may be taken as the measure of the influence of the Brooklyn extension on the earning power of the subway. As near as the earnings can be estimated at present the ticket sales at the various Brooklyn stations after May 1, 1908, will be at about the following rates per year:

| | |
|---|---|
| Borough Hall | 7,500,000 |
| Atlantic Avenue | 9,500,000 |
| Nevins Street | 2,500,000 |
| Hoyt Street | 2,500,000 |

—or a total for the Brooklyn extension of 22,000,000 passengers per year. The passenger traffic to and from Brooklyn is a fortunate addition to the subway business, as a large portion of the Brooklyn passengers ride a comparatively short distance and in a direction opposite to the Manhattan load tending to use more effectively the return cars and thus cut down the proportion of empty seats.




Arnold Report—Loading Diagram of Southbound Local Train, Morning Rush Hour




Arnold Report—Loading Diagram of Northbound Local Train, Evening Rush Hour

### MONTHLY VARIATIONS IN TRAFFIC

The ticket sales from month to month show a characteristic variation throughout the year, the lowest values occurring during July and August of each year and the highest during December. The percentage relation of the lowest and highest monthly values to the average monthly value for the corresponding year and the ratio each year between the maximum month and the minimum month are shown in the accompanying table. It will be noticed that this latter ratio is decreasing; that is, that the falling off in patronage during the summer months is less evidenced each year.

The decrease in the traffic of the subway during the summer months is much more marked than the decrease in patronage of the elevated roads during the same time. Some of the patrons of the subway leave the city for the summer months while many other passengers who regularly ride in the subway prefer the elevated and surface cars during the summer. While the subway does not get its proportion of passengers during the summer months it more than makes up this loss in the winter months, when riding in the subway is more comfortable than in the surface or elevated cars.

| Year. | Monthly average. | Lowest month. | Percentage of mo. average. | Highest month. | Percentage of mo. average. | Ratio of max. mo. to min. month. |
|---|---|---|---|---|---|---|
| 1905.. | 9,684,109 | 6,070,908 | 62.7 | 13,704,576 | 141.5 | 2.25 |
| 1906.. | 12,481,530 | 8,555,795 | 68.67 | 15,609,516 | 125.1 | 1.82 |
| 1907.. | 15,502,000 | 11,550,000 | 76. | 17,750,000 | 116.8 | 1.58 |

### DAILY VARIATION IN TRAFFIC

Information with regard to the daily variation in traffic has not been shown as the ticket sales cannot be considered a measure of the number of passengers carried, since many persons acquire a small stock of tickets for convenience, thus apparently increasing the day's traffic. The effect of such practice on the apparent volume of traffic when considering periods of more than a day, however, is minimized to such an extent that it can be neglected. As a matter of general observation, it may be stated that the lightest traffic occurs on Sunday and the heaviest on Monday, the latter being due to the travel of shoppers attracted by the advertising in the Sunday papers.

At the present time the subway is carrying from 650,000 to 750,000 passengers per day. At the time of writing this report the heaviest record of ticket sales for one day was 886,000 on Monday, Dec. 21, 1908.

Upon Sunday the traffic fluctuates between 350,000 and 450,000 passengers per day except in bad weather.

### DAILY SCHEDULES

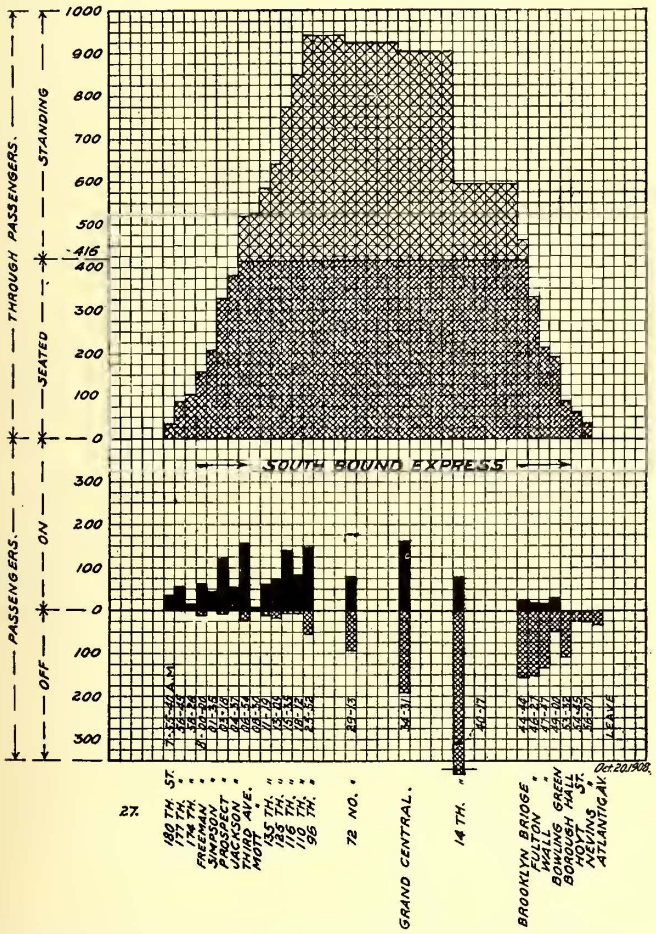
Upon ordinary week days the cars and trains are run upon pre-determined schedules. These schedules, as at present operated, dispatch the cars from five different points and the table on the opposite page shows these routes, distances and running times.

ACTUAL TIME AS COMPARED WITH SCHEDULE TIME

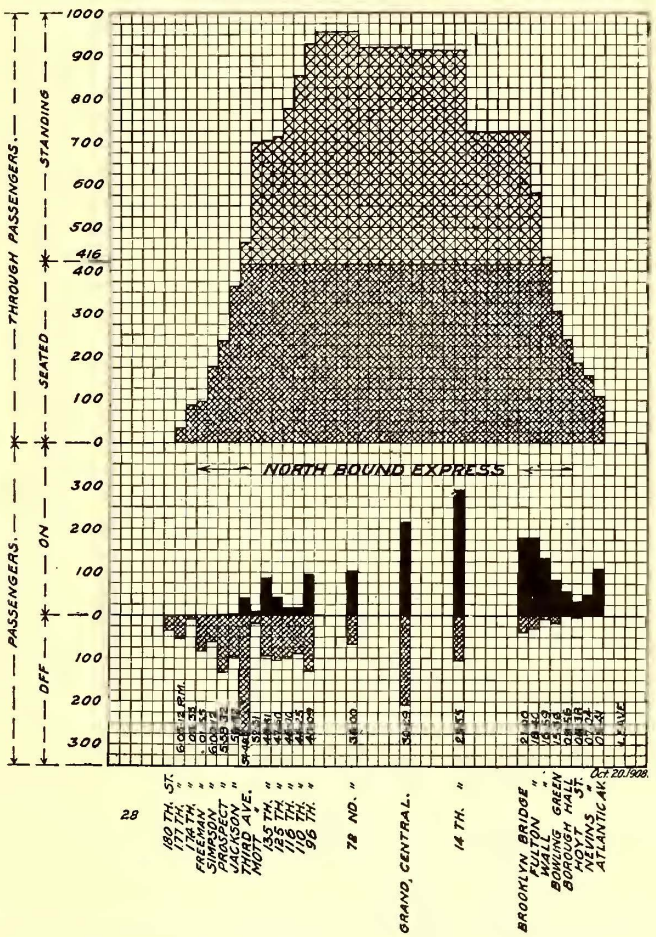
Under normal conditions and in non-rush hours the trains are generally on time, showing that the time cards are not

| | Length of route in miles. | Cars each way each day. | Min. number of cars to maintain schedule. | Total time to run one way, minutes. |
|---|---|---|---|---|
| Broadway Lines: | | | | |
| Local from 137th Street to Brooklyn Bridge | 8.55 | 954 | 90 | 33 |
| Local-Express from 242d Street to South Ferry | 15.16 | 840 | 104 | 47 |
| Local-Express from Dyckman Street to South Ferry | 12.68 | 741 | 96 | 38 |
| Lenox Avenue Line: | | | | |
| Local from 145th Street to Brooklyn Bridge | 9.45 | 1,020 | 125 | 37 |
| Local-Express from 180th Street to Atlantic Avenue, Brooklyn | 17.52 | 1,726 | 278 | 50 |

unreasonable. At the beginning of the rush hours the trains keep up to their schedule satisfactorily, indicating that even with heavy loads the motors are sufficiently large to maintain the speed that is necessary to make the trips on time.




**Arnold Report—Loading Diagram of Southbound Express Train, Morning Rush Hour**




**Arnold Report—Loading Diagram of Northbound Express Train, Evening Rush Hour**

As soon, however, as the rush starts in the trains are held longer at the platforms, the delays begin to accumulate and a general congestion of train movement spreads along the line, particularly in that part of the system between Ninety-sixth Street and Brooklyn Bridge.

STUDY OF PASSENGER MOVEMENT OF INDIVIDUAL TRAINS

Observers were placed on different trains during various days and in the rush-hour periods to count the passengers getting on and off at the stations in order to determine

*a*—Location and extent of the standing load.

*b*—Average length of travel of passengers on the express and the local trains.

*c*—Relative carrying efficiency of the express and the local trains.

*d*—Distribution of passengers throughout the different cars of the trains.

The trains chosen for these observations were eight local trains during various days in February and March, 1908, and 10 express trains during January and February, 1908. Subsequently when the subway system was extended to 242d Street and the Brooklyn extension was opened to Atlantic Avenue, observations were made on six additional express trains in order to measure the influence of the fall traffic and the longer runs due to the two extensions upon the averages already obtained.

A study of the results of the detailed observations will show the following conclusions:

*a*—Taking an average of eight local trains, the total number of passengers carried on each trip averaged 2.58 times the maximum number carried on the trains at any one time, while with the 10 express trains first taken this ratio averaged but 1.62, and with the six express trains in October, 1908, this ratio averaged 1.64. These figures indicate that the local trains are used to much better advantage than the express trains.

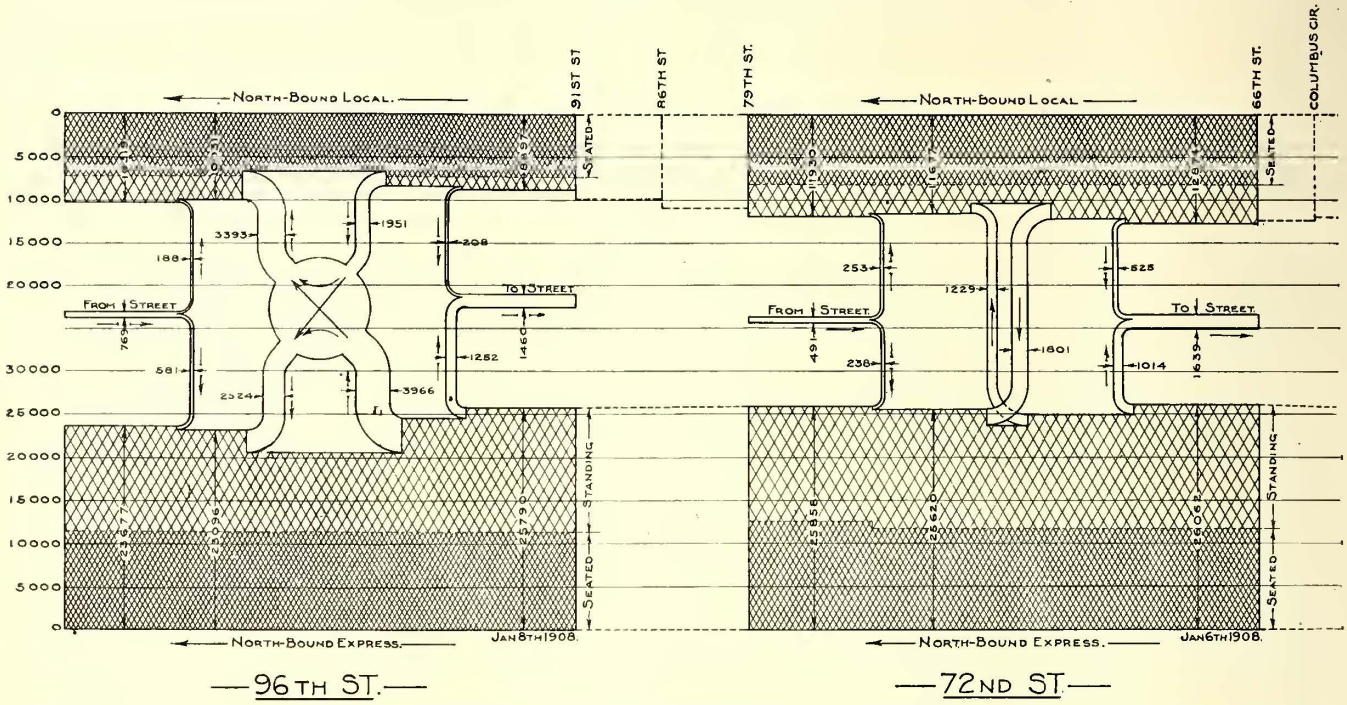
*b*—The ratio of the total number of passengers boarding the train to the number of seats in the train shows that these local trains carried 4.36 passengers for every seat, while the express trains carried 3.24 and 3.62 passengers per seat, thus showing again that the seating capacity of the locals is used more efficiently than the seating capacity of the express trains.

*c*—The ratio of the number of passengers in the train at the time of maximum load to the total number of seats provided which indicates the comparative crowding of the trains is less with the local trains (1.71) than with the express trains, which show averages of 2.17 passengers and 2.20 passengers per seat in the trains at points of heaviest loading.

*d*—The average distance traveled by passengers on local trains, taking the results of the count of eight local trains referred to, was found to be slightly more than 2 miles, and the average distance traveled by passengers on the 10 express trains studied was found to be 5.5 miles and of the later six express trains to be 5.75 miles, thus indicating the extent to which the local trains get the benefit of the short-

haul passengers and also the extent of the burden of the long-haul passengers upon the express trains.

*e*—The average length of passenger haul on the express trains is gradually increasing as the road is added to and as the outlying districts become built up. The total number of passengers entering a train is a measure of its earning power, whereas the number of car-miles traveled by the train is a measure of the expense involved in moving the passengers; therefore if the number of passengers upon any train is divided by the number of car-miles made by the train in making a trip in one direction, the result will be the average number of passengers per car-mile, and the higher this result the greater will be what might be called the earning power of the train. This ratio for the eight local trains shows 26 passengers per car-mile, whereas the result from the express trains shows 12.6 and 11.4 passengers per car-mile, thus indicating that during rush hours the locals have an earning power equal to fully twice that of the express trains.




Arnold Report—Diagrams Showing Transfer of Passengers Between Local and Express Trains at Express Stations

COMPARISON OF LOCAL WITH EXPRESS TRAINS.

| | Average of 8 local trains Feb. and March, 1908. | Average of 10 express trains Jan. and Feb., 1908. | Average of 6 express trains Oct., 1908. |
|---|---|---|---|
| Time lost between 96th Street and Brooklyn Bridge..... | 6 min. 20 sec. | 5 min. 52 sec. | 2 min. 27 sec. |
| Ratio of the total number of passengers boarding the train to the maximum number on the train at the time of heaviest load..... | 2.58 | 1.62 | 1.64 |
| Ratio of the total number of passengers boarding the train to the number of seats provided ..... | 4.36 | 3.24 | 3.62 |
| Ratio of the maximum number of passengers on the train at the time of the heaviest load to the number of seats provided..... | 1.71 | 2.17 | 2.20 |
| Average length of trip of each passenger, miles..... | 2.08 | 5.52 | 5.75 |
| Average number of passengers per car..... | 53 | 69.5 | 65.5 |
| Average number of passengers per car-mile..... | 26 | 12.6 | 11.4 |

DISTRIBUTION OF PASSENGERS THROUGHOUT THE TRAINS

It is often said that while the middle cars of the train are crowded, there is plenty of room in the end cars. In order to determine the relative location of the standing passengers in the various cars of the train diagrams were prepared to show the extent of the location of the standing load in the cars of four different trains, two of which were 137th Street locals, one north and one south bound, and the other two trains were Kingsbridge express trains, one north and one south bound.

There is a much more even distribution of passengers through the express trains than through the local trains, due, no doubt, to the fact that the passengers will take more trouble to avoid a crowded car in boarding an express train than they will in boarding a local train, as in the latter case most passengers travel but a short distance. Considerable improvement could be made in more evenly distributing the passengers throughout the length of all of the trains.

HOURLY VARIATIONS OF TRAFFIC

A large number of studies of the hourly variation in traffic have been made by the transportation bureau of the Public Service Commission from time to time. Some typical results of the information collected have been plotted in the form of graphical logs. Each curve (p. 194) shows the passenger movement through the station during the day and also the number of seats in the trains at the same time, indicating at once the number of passengers who were standing in the trains as they left that particular station.

A study of these curves reveals several characteristics, among them the following:

The peak load during which standing passengers appear for any great length of time lasts for about two hours in the morning and again for two hours in the evening. This rush-hour load rises to a sharp peak for a half hour during each period.

The seating capacity during these rush-hour periods is limited by the physical limitations of the subway.

Of the passengers traveling in one direction during the day fully 33 per cent travel during the two hours of the rush period.

As the subway is now operated there are more than enough seats passed through it each day to provide a seat for every passenger if the passenger load and the train movement could coincide, but unfortunately this condition cannot be approximated without making radical changes in its design and construction.

The train movement in future subways, however, can be made to approximately coincide with the passenger load by doubling the track facilities at stations, either by double-decking or otherwise, and providing suitable storage yards at both ends of the longer lines so as to reduce to a minimum the movement of empty cars.

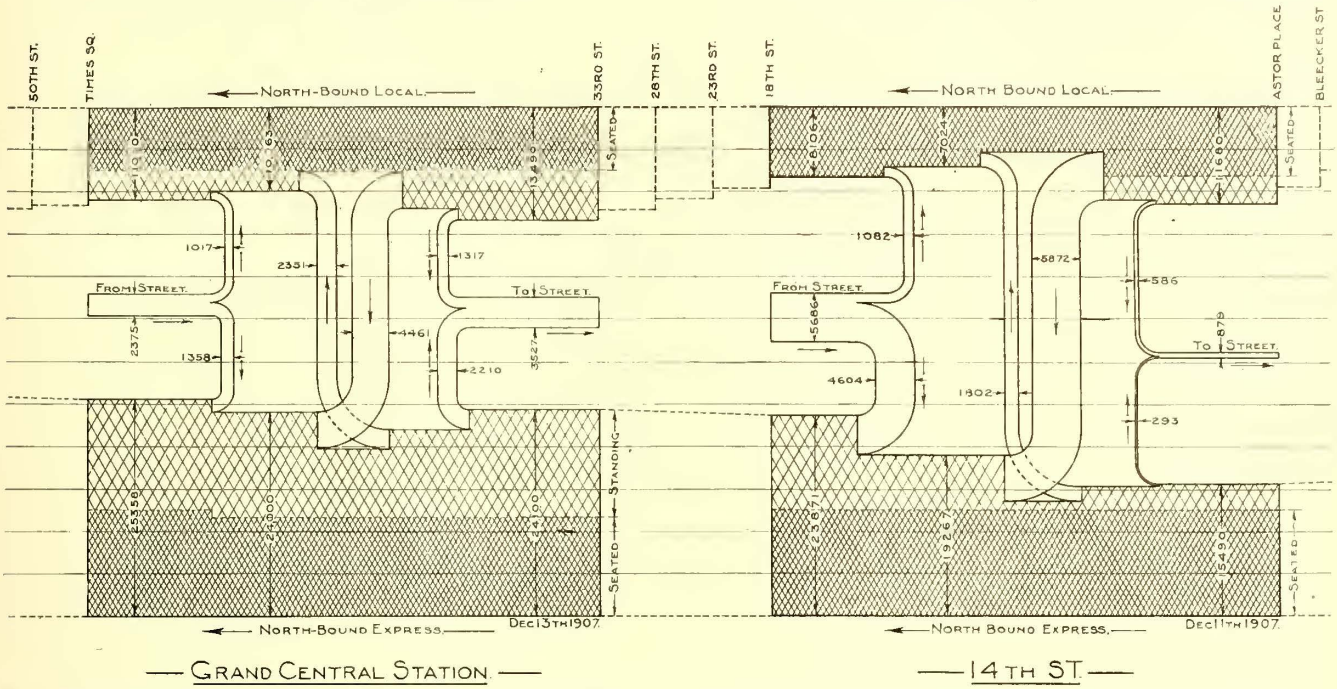
INCREASES IN CAPACITY TO BE EXPECTED

The one great difficulty in the way of supplying every passenger with a seat during the rush hours is due to the physical limitations of the subway. The peak-load capacity of the express tracks in seats per hour may be taken as shown in the table on the opposite page.

While these improvements are being made it is easy to be seen that the maximum passenger load, which last year averaged about 22,000 passengers per hour, will probably increase to 36,000 passengers per hour. The result will be that the relative crowding during the rush-hour period will not be decreased until other subways are built.

Of 1400 passengers, therefore, using a local train, 326 have come from express trains and 474 are on their way to express trains, leaving 600 passengers or 43 per cent of the total number using the local trains who are strictly local passengers riding from one local station to another.

Of the 1400 passengers who patronize a local train there




**Arnold Report—Diagrams Showing Transfer of Passengers Between Local and Express Trains at Express Stations**

These future subways should be designed with reservoir stations on the express tracks, and with this arrangement

| | Seats per Hour—Increase. | Total. |
|---|---|---|
| Capacity during fall of 1907 | .... | 12,000 |
| Improvement during year 1907 | 1,250 | 13,250 |
| Improvement anticipated due to additional doors in sides of cars near ends | 1,250 | 14,500 |
| Improvements anticipated by use of a speed-control signal system | 650 | 15,150 |
| Improvements anticipated due to changes at 96th Street | 850 | 16,000 |
| Additional capacity to be secured by running 9 cars on each express train, instead of 8 cars | 2,000 | 18,000 |

of tracks may be expected to have a maximum seat capacity of 30,000 seats per hour.

PROPOSED SYSTEM FOR REGULATION OF SUBWAY TRAFFIC

If the service in the subway is to be regulated so as to provide for the constantly increasing traffic and not be worse in the future than it has been in the past, an effort should be made to anticipate the requirements of the service and provide a schedule calling for sufficient car-miles, so that the ratio between passengers and car-miles will never exceed 5. From a study of the record of the past year it would appear to be fair to the subway company to require a ratio of 5 during the months of October to April, inclusive, 4.5 for May, 4 for June, July and August and 4.5 for September

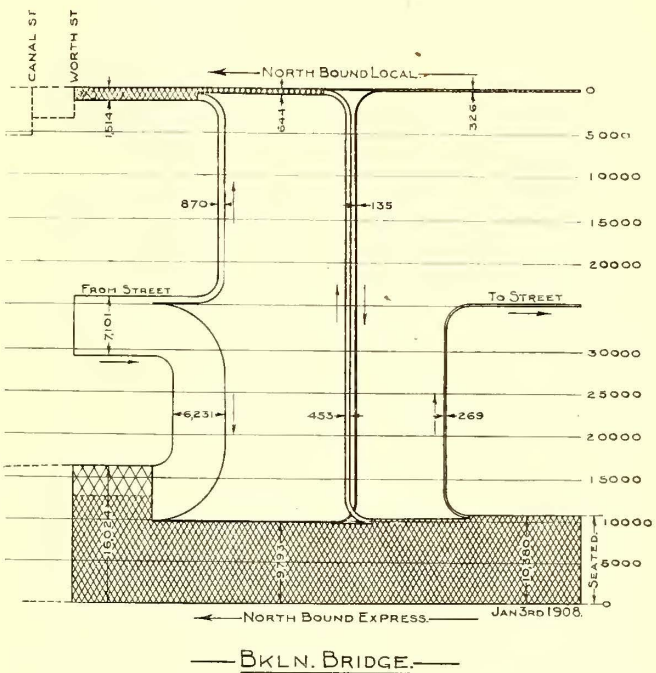
STUDY OF THE TRANSFER SYSTEM

The accompanying diagrams indicate the number of passengers traveling for one hour during the evening rush period on both the local and the express north-bound trains from Brooklyn Bridge to Ninety-sixth Street.

A study of these figures shows a number of conclusions, it being understood that all of the facts relate to the north-bound trains during the evening rush hours, as follows:

The average number of passengers entering the doors of the express trains is 1300 per train, of which an average of 326 or 25 per cent transfer to the local service—that is, the local distributing service is used by 25 per cent of the patrons of the express service.

The average number of passengers entering the doors of the local trains is 1400 per train, of which an average of 474 or 34 per cent transfer to the express service, i. e., the express trains are the destination of 34 per cent of the local train patrons.




**Arnold Report—Diagram Showing Transfer of Passengers Between Local and Express Trains at Brooklyn Bridge Station**

are 474 who transfer to the express trains. The income from this local trip may therefore be taken at (1400 — 474) × 5 cents, or $46.30, and as this train is composed of five cars and has traveled an average of 9 miles in one direction the income per car-mile for this part of the trip is equal to

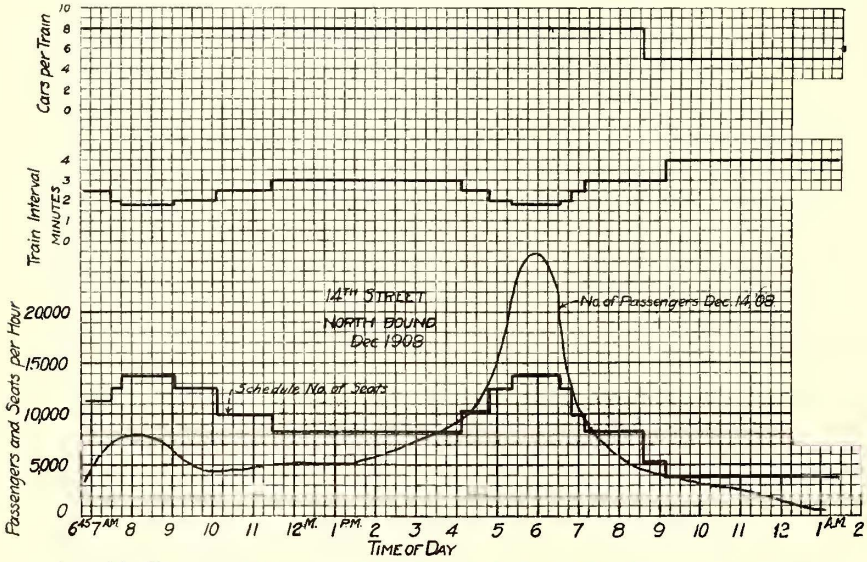
$$\frac{\$46.30}{5 \times 9}$$ or $1.03 per car-mile for rush-hour service.

In a similar way the income from an express train carrying 1300 passengers may be found by deducting the 326

passengers who transfer to the local trains, making the income for one express train north-bound trip (1300 — 326) × 5 cents, or $48.70. This express train, however, consists of eight cars and travels an average of 15.38 miles in one direction, thus reducing the income per car-mile to $\frac{\$48.70}{8 \times 15.38}$ or 39 cents.

SHORT-HAUL PASSENGERS IN SHORT-HAUL CARS

The subway system has now been in operation long enough to demonstrate that in order to make this method of transportation self-sustaining upon the present flat-fare basis the income should average at least 1 cent per passenger-mile. In other words, with a uniform fare of 5 cents the average length of ride should not exceed 5 miles.




Arnold Report—Diagram Showing Schedule Number of Seats and Number of Passengers Carried, North Bound Express Traffic, 14th Street Station, December, 1908

The analysis resulting from the study of the passenger movement on individual trains proves that the average length of travel on the express trains is now 5½ miles, or slightly above the critical average, whereas the average length of ride on the local trains is but 2 miles. It is apparent that as the subway is extended and outlying districts become more thickly populated that the average length of the long-haul rides will become greater, and that unless the fare for these longer rides is increased it will be necessary to cultivate the short-haul business and increase the profit from that source if the present 5-cent flat fare is to be retained.

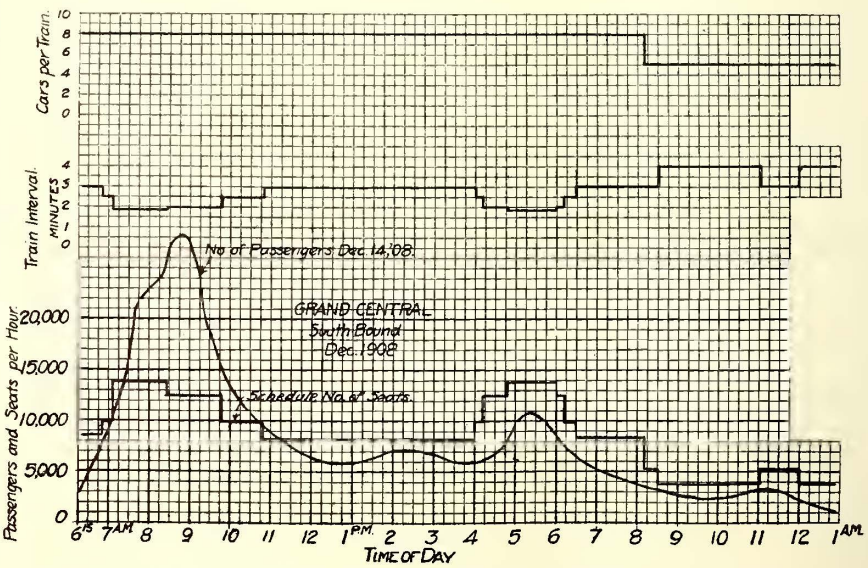
The problem of the future, therefore, if the fixed fare of 5 cents is retained, will be to find a way to handle short-haul passengers in short-haul cars and to make enough profit on this short-haul business to be able to sustain the loss due to the long-haul burden. In other words, the fact that the local trains in the present subway are proved by careful analysis to have twice the earning power of the express trains points out the solution of the problem of eventually developing a comprehensive subway system for Greater New York. The development of the short-haul business must be encouraged by furnishing a convenient, rapid, safe and comfortable service of ample capacity. It is not improbable that a commercial demonstration of the moving platform may prove that the short-haul passengers can be transported at a lower cost by means of a moving platform than by the present local-train method. Irrespective of whether the short-haul business is handled by means of moving platforms or by cars—the profit made from the short-haul rides should be so used as to offset the losses due to the long haul.

The building of subways should start at the center of the city and work out rather than start from the outlying districts and work in. Any plan for future subways which fails to make ample provision for the down-town local business, in a degree greater than is done with the present subway, will suffer from a fundamental defect which will not only cripple its usefulness from the start, but this defect will become more apparent as the outlying districts develop and as the average length of the long haul becomes greater.

CONCLUSIONS

1. The capacity of the express tracks of the present subway can be increased (from 12,500 seats per hour) to 18,000 seats per hour, and as the peak load is now over 28,000 passengers per hour, and increasing rapidly, every effort should be made to augment the maximum carrying capacity. Additional doors should be put in the sides of the cars and the speed-control signal system which has now been developed should be installed at all express stations. These improvements should be followed by the addition of one extra car on each express train and the use of an automatic coupler should receive early consideration. The installation of a shuttle-train service at Bowling Green station, in order to increase the capacity of the Brooklyn tubes, should be pushed, and eventually the cross-overs should be eliminated at Ninety-sixth Street.

2. The equitable way to control the number of cars which should be furnished to provide for the constantly increasing subway traffic is to determine upon a constant by which the number of passengers to be expected can be divided. The result will be the number of car-miles which the schedule should provide. Judging from past records this constant during the winter months may be taken as 5.




Arncld Report—Diagram Showing Schedule Number of Seats and Number of Passengers Carried, South Bound Express Traffic, Grand Central Station, December, 1908

3. A more thorough study should be made to determine where useless car-miles can be eliminated from the present schedule and where an equal number of car-miles can be introduced in such a way as to reduce the standing load to a minimum.

4. A study of the transfer system indicates that the local tracks have a greater earning power than the express tracks. If a uniform fare of 5 cents is to be maintained with the present and future subways, progress must be made along the lines of cultivating and effectively serving

the short-haul business by providing a comprehensive system of local short-haul trains. In this connection the merits of the moving platform system of transportation should be thoroughly investigated.

5. The measure of the ultimate usefulness of any subway is its peak or overload capacity. If the present subway could handle 60 trains an hour on each express track, its usefulness would be materially increased over its present service of 30 trains and beyond its ultimate capacity of 40 trains per hour. Future subways should be planned to get the full advantage of the investment in the main-line tracks by running 60 trains an hour during the morning and evening rush periods.

## FACTORS DETERMINING THE EFFICIENCY OF TROLLEY WIRE*

BY CARL F. WOODS, ARTHUR D. LITTLE LABORATORY, BOSTON, MASS.

No department of electric railroading has received less attention than the transmission line, and particularly the trolley wire. In the construction and maintenance of an electric railroad no expense is spared to obtain power-station equipment of the highest efficiency, while the trolley wire, which is just as essential for operation, is generally purchased with no restrictions on the quality of material.

Ordinary soft copper does not have sufficient strength for this service so that reliance has had to be placed upon either steel, bronze or hard-drawn copper; while steel wire has the requisite strength it is subject to severe corrosion from the weather and has vastly greater electrical resistance. The silicon, phosphorus and other bronzes of a similar nature possess great strength, but all have the serious defect of much lessened conductivity. Soft copper wire has a strength of about 34,000 lb. per square inch, while hard-drawn wire can be made having a strength of as high as 67,000 lb. per square inch. Hard-drawn wire, although possessing some serious defects, has therefore been accepted as being much better than the other materials available for the purpose.

To give efficient service under the conditions trolley wire must possess the following qualities: (1) Conductivity, to secure economical operation; (2) tensile strength, to withstand the abnormal loads; (3) flexibility, to permit stringing and enable the wire to adjust itself under strains and blows; (4) homogeneity, that the stresses may be distributed uniformly along the wire, and (5) toughness, to withstand kinking, wrenching and distortion.

Each of these qualities is essential and no one of them can be increased beyond a certain point without a proportionate reduction of one or more of the others. For example, certain wires have been made from an alloy of copper and tin which have high tensile strength, great toughness and homogeneity, but are lacking in flexibility and have a conductivity only half that of pure copper. On the other hand, by proper drawing wire can be made very homogeneous, flexible and tough, but lacking in tensile strength, the conductivity being unimpaired.

Attention naturally turns next to the methods of determining to what extent wire possesses the five essential properties mentioned. The conductivity is very readily and accurately measured with a Wheatstone bridge or one of the several appliances based upon the same principle which are especially adapted for trolley wire. Tensile strength may be determined in a testing machine of suitable capacity, but owing to the nature of copper the elastic limit cannot be determined by a drop of the beam, as the metal apparently yields quite steadily up to the breaking point. Numerous conflicting figures are in print regarding the yield point of copper, but as a stress and strain diagram shows a nearly perfect curve, the actual elastic limit can be accurately determined only by applying increased loads for a definite length of time and measuring the permanent set in each case. Such a procedure is obviously too complicated for commercial testing so that the elasticity of the wire has to be judged by other means. Under ordinary circumstances power to resist the effects of twisting is not necessary for conducting wire, but the torsional strength measures indirectly but accurately two of the most important mechanical properties that a wire can possess, namely, homogeneity and toughness. In a tensile strength test the maximum tensile load is largely a factor of the cross-sectional area and the amount of work which has been put into the hardening of the surface. This test will detect inferior drawing or inherent weakness of the copper, but it gives no idea of the power of the wire to resist distortion nor of defects such as oxide seams which run lengthwise of the wire, and do not have a cross-sectional area of sufficient size to affect the breaking strength. Under a torsional strain, however, such defects are quickly noted. If the wire contains an oxide seam, spoken of above, the twisting will open it up and at once weaken the strength of the wire. If the wire is of unequal hardness the twists will tend to bunch up in the softest portion and very noticeably show this spot. Inferior copper not only shows a very low number of turns, but splinters and slivers of metal appear on the surface which in very bad wires fall off to such an extent that a paper held beneath the sample during torsion will show a considerable collection of copper fragments. Non-homogeneous copper, due either to impure metal or uneven drawing, will show a great difference in the number of turns which different specimens will stand without breaking, while high-grade metal which has been carefully drawn, twists evenly and uniformly with no slivering and shows little difference in the number of turns on different specimens. It is, therefore, desirable to make at least three torsion tests, whereas one tensile-strength test is sufficient to obtain an accurate measure of the strength.

TABLE I.—TESTS ON COPPER WIRE

| Number | Diameter In | Torsion Turns in 10 in. (Average) | Tensile Load Lb. | Conductivity Per Cent. |
|---|---|---|---|---|
| A | 0.365 | 12 | 5650 | 98.4 |
| B | 0.364 | 11 | 5550 | 98.6 |
| C | 0.362 | 16 | 5500 | 98.2 |
| D | 0.365 | 17 | 5260 | 98.6 |
| E | 0.365 | 15 | 5270 | 98.7 |
| F | 0.364 | 14 | 5370 | 98.7 |
| G | 0.364 | 22 | 5070 | 98.9 |
| H | 0.364 | 23 | 5110 | 98.4 |
| I | 0.365 | 24 | 5210 | 98.4 |
| X | 0.364 | 28 | 5400 | 98.3 |
| Y | 0.364 | 26 | 5490 | 98.1 |
| Z | 0.364 | 26 | 5590 | 98.2 |

In Table I are given a series of tests which clearly illustrate the four general divisions into which the trolley wire of commerce may be divided by reason of difference in physical qualities. Specimens A-B-C, having tensile strengths of 5500 lb. or higher and torsion tests averaging about 13, represent wire lacking toughness, which has been given a high tensile strength by drawing. Specimens D-E-F, having tensile strengths around 5300 lb. and torsion tests of about 15, are wires lacking both toughness and surface hardness. Specimens G-H-I, having tensile strengths of about 5100 lb., but torsion tests of approximately 23, are typical of wires in which the torsion has been obtained at the expense of tensile strength, while specimens X-Y-Z, with tensile strengths over 5400 lb. together with torsion tests of 26 and even higher, represent the best wire which can be made at a reasonable price.

Of these four classes there is again a distinction in that the first two represent copper of an inferior grade which cannot be made the equal of the wires of the last two classes by any treatment in the rod mill. On the other hand, wires of the last two classes are made from excellent copper, although specimens X-Y-Z are wires greatly superior in all respects to the preceding three. It is interesting to note that all of these wires have practically the same conductivity which shows clearly the fallacy of attempting to value trolley wire by conductivity and tensile strength alone, as is so frequently done. It is therefore necessary, not only to obtain high-grade copper, but also to secure the proper balance between tensile strength and torsion, as these two properties are correlated and increase in one beyond a certain point results in a proportionate decrease of the other.

The preceding remarks have shown the conditions under which wire must work and the qualities which are necessary to successfully meet these conditions. Attention must

*Abstract of paper read before the Division of Industrial Chemists and Chemical Engineers of the American Chemical Society, Dec. 31, 1908.

now be turned to the process of manufacture to determine how these qualities may be obtained and what defects of such processes injure the finished wire.

In the refining furnace the copper, which is already at least 96 per cent pure from the blister furnace, is oxidized by air until a large part of the impurities have been removed and copper oxide is formed in considerable excess. Cuprous oxide is readily soluble in molten copper and acts as a powerful oxidizing agent by giving up its oxygen to any metallic bases present, so that an excess of oxide insures the presence of all metallic impurities in the oxide form. The excess cuprous oxide is then removed by burying a piece of green wood in the molten mass and covering the surface with charcoal. This process must be stopped within very narrow limits as over-reduction will throw the impurities back into the metallic state. On the other hand, the presence of a large amount of cuprous oxide is known to harden copper and cause it to become short or brittle.

In purchasing copper for drawing trolley wire the manufacturer insists upon conductivity, but as a rule cares little for the other physical qualities, as he can obtain sufficient tensile strength by drawing. Lake copper possesses both high conductivity and excellent mechanical qualities, but this kind of copper costs from ⅛ cent to ¾ cent per pound more than electrolytic. Why the latter should be inferior to Lake is difficult to explain, but experience shows that the general run of commercial electrolytic copper is by no means uniform in physical qualities and as a general thing is distinctly inferior to Lake for wire-drawing purposes. The cheaper price of electrolytic results in its use by many manufacturers, although they frequently understand that the wire will be inferior.

The refined copper comes to the rod mill in bars weighing about 200 lb. each, approximately 10 of which are used in the manufacture of a mile of wire. These bars frequently have ridges along the sides, due to faults in casting, and the surface is often covered with a layer of oxide. These bars are heated in a furnace until sufficiently soft for rolling and are passed through a series of rolls diminishing in size until a rod of the proper diameter is obtained. The rod is then cooled and drawn through dies, the rods being connected by brazing. The dies give the wire a dense hard exterior coating which increases its tenacity. As the strength obtainable is almost a direct factor of the work expended upon the wire, the smaller the size the greater the tensile strength per square inch, so that the strength of the trolley wire is readily varied by changing the size of the rod and the number of dies.

One of the most serious defects occurring to wire at this point is from ridged bars as above described. Ordinarily the bar will not be sufficiently heated to dissolve the copper oxide on the surface, so that as the softened bar enters the first passes of the rolls the ridges are lapped over, enclosing the oxide scale. The subsequent passes and the drawing through the dies obscure this flaw almost entirely, but it remains a serious menace to the toughness and the resistance to wear of the copper, as has been previously shown in remarks on the torsion test.

A second cause of trouble arises at the same point by overheating the copper in the furnace, in which case copper oxide is formed on the surface and quickly dissolves through the entire bar, thereby increasing the oxide content and tending toward the production of brittleness. Both of these dangers can be avoided by careful selection of the bars and by proper regulating of the temperature of the softening furnace.

As the proportion of the hard surface from drawing is at best a rather delicate operation, careless handling, uneven welding of the rods and unequal temperature of the wire while passing through the dies will all produce noticeable effects in the quality of the finished wire, so that care throughout the mill is absolutely necessary for the best results.

It therefore appears that the most efficient wire must possess not only high conductivity, but the maximum torsion and tensile strength possible in commercial copper and that to obtain this it is necessary first to use high-grade copper and to prevent an excess of cuprous oxide entering it at any stage of the manufacture, and, secondly, to select as perfect bars as possible and to observe extreme care in every treatment through which they pass. The question at once arises: Can such wire be purchased at a commercial price? The writer must admit that this high-grade wire cannot be obtained at the ordinary market price, but requires the payment of a premium of ½ cent per pound. To produce wire of this grade consistently the wire manufacturer must use the higher priced Lake copper and observe unusual care in its treatment so that he is justified in demanding a higher price. Experience in the use of this wire has shown conclusively that it is well worth the additional cost.

Table II gives the results obtained upon 13 consecutive miles of trolley wire made from selected bars of Lake copper. The tests were made upon each mile of the wire and the results show the great uniformity obtainable with proper care. It should be said in this connection that this wire was not made as an experiment, but was drawn by a certain wire company as a part of a regular contract.

The point must be kept clearly in mind, however, that even the best of wire is of little value if improperly used,

TABLE II.—TESTS ON COPPER WIRE

| Number | Diameter In. | Torsion Turns in 10 in. (Average) | Tensile Load Lb. | Conductivity Per Cent. |
|---|---|---|---|---|
| 1 | 0.363 | 23½ | 5470 | 99 |
| 2 | 0.364 | 23½ | 5490 | 98.7 |
| 3 | 0.363 | 21½ | 5400 | 97.8 |
| 4 | 0.363 | 24 | 5470 | 98.8 |
| 5 | 0.363 | 22½ | 5450 | 97.8 |
| 6 | 0.363 | 22¾ | 5500 | 98.6 |
| 7 | 0.363 | 23½ | 5420 | 97.8 |
| 8 | 0.365 | 22 | 5510 | 98.5 |
| 9 | 0.363 | 22 | 5540 | 98 |
| 10 | 0.363 | 21½ | 5470 | 98.8 |
| 11 | 0.363 | 22½ | 5490 | 98.8 |
| 12 | 0.363 | 25½ | 5500 | 98.5 |
| 13 | 0.363 | 22½ | 5450 | 98.7 |

and the consumer must realize that the same degree of care which he insists upon from the manufacturer is essential in the handling and stringing of the finished wire.

The study of copper wire and the demands made upon it show the great need of a more thorough knowledge of this material. Owing to the minute quantity of impurities which exert a marked effect upon the qualities of copper, a chemical analysis is too difficult for technical purposes. The iron and steel industry is largely controlled to-day by microchemistry, and, in the same way, there is a future for this same practice in the copper industry. Of first importance is the careful working out of the copper-cuprous oxide system with the determination of the number of phases occurring and the physical properties incident to different alloys. Doubtless much of this information is already in the hands of the copper refiners, but it remains for chemical engineers and chemists interested in industrial materials to verify and complete the work for the consumer.

## JANUARY MEETING OF THE ELECTRIC RAILWAY SHOP FOREMEN'S ASSOCIATION

At the January meeting of the Electric Railway Shop Foremen's Association, held on Jan. 18, at the Plank Road Shops of the Public Service Railway, matters of organization were taken up before the customary discussions on mechanical subjects. The association has broadened its scope to take in like classes of men from other companies, and hereafter will be known as the Electric Railway Shop Foremen's Association of America. The initiation fee for all voting members was fixed at $1 and the monthly dues at 50 cents.

F. P. Maize, traveling inspector, started the mechanical discussion by criticising the practice of some shopmen who drive a punch through the keyhole of brake-shoe heads. He said that this was unnecessary and resulted in loosening the brake shoe. One of the foremen thought that looseness was a proof that the shoe was too large. Another foreman asserted that it was necessary to punch through the keyhole to remove burrs. Mr. Maize disputed this contention, and after obtaining a head with an

old and new shoe from the shop, proved that the key could be driven in simply by light hammering. Mr. Maize also started a talk on limits of brake-shoe wear by submitting a badly worn shoe which he had discovered in service.

The talk on journal troubles brought out various theories for their occurrence. One man believed that low bearings or bearings of improper size were principally responsible; another had found that his journal troubles decreased when using new clean waste instead of old waste which had been resoaked but still contained grit; a third said that apparently only one size of journal box was furnished, although two axle diameters—3¾ in. and 4½ in.—are in use. It was suggested, also, that as the Brill No. 27-G trucks in service originally were made for feed wick lubrication, waste would not be entirely satisfactory until the box was changed by breaking out the shelf.

Mr. Feeney, representing R. E. Danforth, general manager of the Public Service Railway Company, read a number of the usual monthly statistics comparing the different divisions. One of the greatest improvements shown as the result of previous discussions was a 25 per cent reduction in journal troubles.

Gear lubrication also came up for attention. A number of foremen apparently were unfamiliar with the proper application of a new gear grease the company is trying out. Mr. Maize explained that when the gears were in the shop they were given 5 lb. of grease and that thereafter they should receive 2 lb. of grease per month, distributing it to a thickness of 1/16 in. on both faces of the teeth. As this lubricant is hard in cold weather, it must be heated before application, and the car should afterward be given a run up and down the car house. Probably a good deal of the trouble the users experienced was caused by long open-air exposure of the cars, thereby freezing the lubricant.

Mr. Feeney pointed out to the foremen the desirability of examining journal boxes, trolley wheels, trolley spindles and other parts to see that the shops are turning out exactly what is wanted. As long as they suffered in silence they could hardly expect the shop to know what troubles to correct.

Mr. Ricker called attention to the inaccurate reports turned in by crews relative to the condition of their cars, some apparently signing in "O. K." because they either could not or would not spell out the names of the parts. He suggested that every car be furnished with a record card listing various car parts for O. K., or otherwise, by the crews. Such cards should be handed to the proper official when the car is turned in and be accessible to the shop foremen whenever necessary. This would be much better than a book record, which often is incomplete. Mr. Ricker's suggestion met with the approval of most of the members. The meeting concluded with a talk on sandboxes and trolley wheels.

## TRANSFER CRUSADE IN CHICAGO

Since the article was prepared on the crusade against the illegal use of transfers in Chicago, which was printed in the ELECTRIC RAILWAY JOURNAL for Jan. 2, 1909, page 26, a large number of additional arrests have been made, bringing the total up to more than 300. Through a typographical error in the article in question the abuse of the privilege was exaggerated. One sentence was made to read, "The misuse of hundreds of thousands of transfer tickets every day then seemed to become an important item." This should have read "hundreds or thousands."

## ADDRESS OF RETIRING PRESIDENT OF THE CENTRAL ELECTRIC RAILWAY ASSOCIATION

BY F. D. CARPENTER, GENERAL MANAGER, WESTERN OHIO RAILWAY

It has been my pleasure to preside over the meetings of this association for the past year and in so doing it has been my great desire to be able to note at the close of the year some substantial progress for the future welfare of our association. The third year of the history of the Central Electric Railway Association has just passed and we are at the close of the first year's history of our adopted Central Electric Traffic Association. This traffic association came to us with nothing but a name and the work of the year has of necessity been along the lines of finance. It is with pleasure we are able to note that all of the bills of the year have been paid and we have a small balance to our credit.

Your chairman, with the assistance of the executive committee, has performed a most admirable service in practically financing the association until Dec. 31, 1909. Without doubt the small amount of mileage required to meet our additional requirements and supply a sufficient sum to meet the naturally increasing demand upon our treasury during the ensuing year will soon be subscribed.

The Central Electric mileage book has been placed on sale and is meeting with much favor and the benefits to be derived from the tariffs the association is now preparing can hardly be estimated; without doubt the use of the tariffs will be greatly appreciated and the development of our properties greatly enhanced. Our chairman has been somewhat handicapped in his work by reason of the lack of knowledge of some companies relative to details of the requirements placed upon us by the Interstate Commerce Commission and the various State railroad commissions. This, however, we will be able to overcome in time, and with the continued hearty co-operation of our members we believe we will be able to work out to a conclusion many problems that are now before the interurban railway properties.

It is to some extent unfortunate that we could not have had a little education and practice relative to requirements of the new laws that have been passed regulating our operating and accounting systems previous to the organization of our association which would have enabled us to have passed through the year much more smoothly and with less friction.

There are before us many very important problems, the solution of which this association, together with other like associations, should work harmoniously with the American Street & Interurban Railway Association, among which is the standardization of equipment. I regret very much that during the past year our standardization committee has not been able to work out to a conclusion some of the problems before it. These, however, may be submitted for your consideration during the coming season and I trust many improvements made.

Another matter of great importance is the securing of better rates to interurban railways for handling United States mail. Our committee has just entered upon this work and by co-operating with other similar committees will without doubt be able to effect changes in the laws relative to compensation to be paid that will prove to be of great benefit to many interurban railways.

When I review the work of the Central Freight Association and the Central Passenger Association of the steam railroads and note the possibilities before the similar association of the interurban railways I am more than ever impressed with the importance of the work of our association. Together we are to formulate and plan the necessary devices that will make possible the proper development of this great force that moves us. He who makes the great success of the enterprise in which he may be engaged is the man who can look beyond and spread upon an imaginary canvas a structure of his completed work, a touch here and there bringing out its fulness and beauty, and the inspiration caught from this is the power that moves him on to victory. Did it ever occur to you that even now capital and talent have been combined and the man is now spread-

ing the canvas, the background of which we to-day form an important part, upon which a structure is to be built, more grand and more beautiful than anything that man ever yet beheld; where electric trains are to flash across the continent from ocean to ocean at a rate of speed that has hitherto been unknown and where all the power that moves this vast sea of vehicles will be generated and distributed from one central point? And not only this, but all current used to move every imaginable mechanical device and to light every village and city throughout this broad universe will also flash along the same wires that move these trains. This does not more than compare with that which has transpired in the few years that have just passed, for within the natural life of a man we have witnessed the transformation of the Indian trail and village to the macadamed streets and flourishing and prosperous cities, the development of the phonograph, the telegraph, the steam engine, the telephone and many other wonderful inventions, all of which are the fruits of the fertile mind of man. We are living in an age of transportation, in an age where all the skill of man is being concentrated on one great problem. Wonderful results must follow, and I believe I am safe in predicting that we are to-day but toys as compared with that which will be developed within the next 50 years.

I thank you one and all most heartily for the support you have given me during the past year and I trust the coming year will be attended with steady onward progress.

## THE LUMINOUS ARC HEADLIGHT *

BY W. S. CULVER, ENGINEER, CINCINNATI OFFICE, GENERAL ELECTRIC COMPANY

The light from the luminous arc comes from the arc stream, and not from the tips of the electrodes, as in the older form of arc lamps, and in order to get the greatest amount of light from the arc with a given amount of energy, it has been found necessary to employ, not electrodes of carbon as in the older arc lamps, but of metals or their oxides. Stable operation, with the greatest amount of light, is secured by the use of a positive electrode of pure copper and a negative electrode composed of magnetite, titanium and chromium. The magnetite gives conductivity and color, the titanium brilliancy and color, and the chromium long life and steadiness.

One peculiarity of the luminous arc is that the arc is more luminous at the negative end, and, with the same current, the longer the arc, up to a length where the arc becomes unstable, the farther from the negative electrode the luminous portion extends. On the other hand, if the length of arc remains the same, but the current is varied, the distance of the luminous portion of the arc from the negative electrode will vary with the amount of current. It will be understood, of course, that there is a certain relation of current, length of arc and voltage that will give the most stable operation with the most light.

Another peculiarity of the luminous arc is that with the positive electrode above and the negative electrode below, the maximum intensity of illumination is in nearly a horizontal plane, which makes it ideal for headlight purposes. A further peculiarity of the luminous arc is that if the direction of current flow is reversed, making the copper electrode negative and the magnetite electrode positive, there is less light from the same amount of current. Advantage is taken of this feature, as will be later explained.

The luminous arc headlight is very similar in appearance to the carbon headlight, and consists of a galvanized sheet steel casing about 15 in. in diameter, 9 in. deep, reinforced by iron door castings, making a rigid structure. The mechanism is not of a regulating type, but is so arranged as to strike an arc of a fixed length. With the slow rate of consumption of the electrodes there are sufficient interruptions of the circuit incidental to regular operation to maintain the arc within safe voltage limits. This permits a simple and rugged construction, suitable for high-speed interurban railway service. The lamp and reflector are held in place by one wing nut on the back of the casing, and can be readily removed for inspection or repair.

To protect the arc from air which might otherwise get between the sections of the glass and the door, two separate panes, with the joints overlapped, are used. This slat construction lessens the liability of breakage from extreme temperature changes.

The luminous arc is at the focus of a highly polished metal reflector. The upper electrode is a T-shaped copper forging, and as it has a life of 2000 to 3000 hours, it may be considered as non-consuming, and as it is stationary, the arc remains in the focus of the reflector. This upper electrode is held at the bottom of the draft chimney, and the natural draft keeps the arc burning on the ends of the electrodes and carries off the fumes from the electrodes. The chimney is covered at the top by a hinged shield so designed as to protect the arc from high winds and rain and to make the tube easily accessible for cleaning with a brush furnished for the purpose. The lower electrode consists of a sheet-iron tube, ½ in. x 5 in., filled with materials which give the necessary vapor in the arc stream to produce an efficient luminous arc.

The headlight not only illuminates the track for a distance of 1200 ft. to 1800 ft. ahead of the car, but the width of the beam is very noticeable. The lighting of a considerable area each side of the track is found to be of great assistance to a motorman in approaching and taking curves. It also is an additional insurance against collision with vehicles, animals or persons approaching the track. If a narrower and farther reaching beam of light is desired the headlight can be furnished with a Mangin mirror instead of the standard type of reflector.

The luminous arc headlight is designed to operate at 75 volts and 4 amp. To take up the difference between the line potential and arc potential either a resistance or incandescent lamps for lighting the interior of the car may be employed. In this latter case one very satisfactory combination is a group of 16 32-cp, 110-volt lamps, consisting of four series of four lamps each, connected in multiple. If more incandescent lamps are desired, 32 16-cp lamps may be used, in eight series of four lamps each, connected in multiple. These incandescent lamps may be kept burning when the headlight is removed by substituting a resistance wired up to a pair of two-way snap switches, one placed at each end of the car. This arrangement permits the headlight to be turned on or off without interfering with the incandescent lamps.

To take advantage of the reduction of light with reversed current, the feature already mentioned, a reversing switch may be supplied, by means of which the light can be dimmed when required for certain sections of the route. The dimming due to the current reversal can be carried still further by a slight reduction of the current. If too great a reduction of light by this method of reversal and low current is attempted, a point of unstable operation is reached, so that where extreme reduction of light is required an incandescent lamp should be mounted in front of the reflector. The headlight may be so adjusted that satisfactory operation will be obtained with a widely varying line voltage, although there is, of course, a low limit of line voltage below which operation will be unsatisfactory. This limit is lower with the normal arc than with the arc reversed and the extra resistance in circuit. If unusually low voltage points exist, it may be necessary to carry a somewhat shorter arc than usual.

The advantages of the luminous arc headlight may be summed up as follows:

The higher efficiency of the luminous arc, giving quantity and quality of illumination.

Arc maintained at focus of reflector, insuring permanent direction of rays.

No enclosing globe used, thereby eliminating greatest expense of enclosed headlight maintenance.

Long life of electrodes, 2000 to 3000 hours for upper, 50 to 75 hours for lower, showing a further reduction in operating expense.

Available means of quickly and effectually dimming the light—either by reversal of the arc or by the substitution of an incandescent lamp.

Simple and exceedingly strong mechanism.

*Abstract of paper read at meeting of Central Electric Railway Association, Indianapolis, Jan. 28, 1909.

## REPORT OF THE BOSTON TRANSIT COMMISSION

The fourteenth annual report of the Boston Transit Commission covering the fiscal year ending June 30, 1908, has been made public. It deals with the final work which was necessary to complete the Washington Street tunnel, the advertising privileges therein, takings of real estate and settlements for it, and the prospective connection between the East Boston tunnel and the Tremont Street subway. The commission is now proceeding to make provision for this connection according to law.

The toll receipts in the East Boston tunnel amounted to $111,821 for the year, exclusive of the cost of collection at ticket offices, which came to $18,118, including wages, cost of exit tickets, cost of entrance tickets, power for lighting and heating, cost of necessary accounting, proportion of indemnity insurance premiums on bonds of collectors, toll collectors and ticket sellers. The Boston Elevated Railway paid $51,371 in rentals in the year 1907, or three-eighths of one per cent of its gross receipts for one year.

The commission outlines the plans which have been considered by it in connection with the location of the Riverbank subway in Boston, authorized by the Act of 1907. Under the terms of the act the construction of this subway does not have to be begun before a year has elapsed after the opening of the Washington Street tunnel, except by agreement between the Boston Elevated Railway and the commission. The commission feels that this work should be undertaken, but the railway company does not consider it advisable at present in view of the expenditures to which the company is already committed and the need of studying the effect of the opening of the Washington Street tunnel upon the Boylston Street traffic.

The commission has expended a total of about $16,000,000 on the Tremont Street subway, East Boston tunnel, Charlestown bridge, East Boston and Washington Street tunnels and investigations.

The report of Howard A. Carson, chief engineer, discusses the final construction work on the Washington Street tunnel, alterations of the Tremont Street subway, the effect of street irregularities on the tunnel and its approaches, the design of shelters, progress of work and studies of probable noise and vibration in buildings from the Washington Street tunnel. As a considerable portion of the Washington Street tunnel lies directly under private buildings experimental study was given to the question of preventing annoyance to the occupants by sound and other vibrations caused by the running of trains. Among the means thought of were: (*a*) Building the track on separate foundations, like piles or piers, passing through the invert or floor of the tunnel and having little or no connection with the floor; (*b*) substituting for the ordinary stone ballast some other support for the track itself, such as concrete made with Portland cement or with asphaltic material. Consultation on this general subject was had with A. Mallock, who had made a careful study of vibrations in buildings near the Central London Railway; Prof. C. R. Cross, of the Massachusetts Institute of Technology, and Prof. G. W. Pierce, of Harvard University. Mr. Mallock did not expect any benefit from either plan; in his opinion relief would be expected almost entirely from having the weight of the trains as far as practicable borne on springs. When trouble occurred on the Central London Railway the non-spring-carried load of the locomotives there used amounted to about 8 tons per wheel, while on the motor cars operated by the Boston Elevated Railway in the Washington Street tunnel the maximum non-spring-borne load is about 1.5 tons per wheel.

Among other experiments a radial truck was used with a non-spring-borne load revolved by an electric motor on a circular rail, the latter having forms of support as mentioned above. Experiments were also made with standard cars running on about 200 ft. of track. The relative effects of various experiments were measured directly with the ear and also by observing with a telescope with cross wires the movements of an image on a surface of mercury. The information secured indicated that sounds or sensible vibrations coming from the tunnel were much less likely to be noticed than vibrations caused by teams and cars on the surface of the street. It also appeared that the support of ties by ordinary stone ballast was practically as good as any form tried, and accordingly that method has been used in all parts of the tunnel. The full report of the commission on "Street Traffic," made to the Legislature of 1908, is included in the appendix.

## HEARINGS ON CAR DESTINATION SIGNS BEFORE THE PUBLIC SERVICE COMMISSION

On Jan. 14 a hearing was held before Commissioner John E. Eustis, of the Public Service Commission, on the lack of adequate signs in the New York subway trains. At present the different classes of trains are indicated only by colored lights on the front end and by destination signs in the corners of alternate cars. The complainants were the rapid transit committee of one hundred, represented by J. A. Hodge, and the New York City Federation of Women's Clubs, represented by Mrs. D. F. Cartright. Mr. Hodge suggested a high illuminated destination sign of 1-ft. letters at the front of each car, illuminated station indicators at the ends, readable from the inside of the car, and a car placard bearing a city map, with the stations indicated thereon. Mrs. Cartright made substantially the same suggestions, and added that some form of bridging should be used to cover the gaps between car and station platforms at curves. The hearing was then adjourned until Jan. 22 to give the Interborough Rapid Transit Company the opportunity to reply to these suggestions.

At this second hearing the railway company was represented by Frank Hedley, vice-president and general manager. Mr. Hedley referred to the practice of having the two principal classes of express trains stop opposite appropriate signs on the platforms for the convenience of the passengers, but admitted that it was difficult for the motorman always to make these stops accurately. Recently the company had determined that passengers would be materially aided if every car had a destination sign in diagonal corners. These signs are to be of metal, and all will be installed in about three months. The company had also considered the desirability of placing a map in every station, as well as a colored sign explaining the train light markers. At present only employees are furnished with cards explaining the markers. Mr. Hedley objected to movable station indicators because of their complexity, especially in the case of the subway. It was true that the guards did not always speak distinctly, but the company was doing its best to train the men to do better, and has an inspection system for this purpose. He thought it would be objectionable to have interior signs, as then the passengers might get into the habit of not seeking the proper sign until they were in the car.

## ANNUAL MEETING OF THE NORTHWESTERN ELECTRICAL ASSOCIATION

The seventeenth annual meeting of the Northwestern Electrical Association was held in Milwaukee on Jan. 20 and 21, 1909. The morning session of the first day was devoted to routine business. A committee report was presented which was adverse to the proposed consolidation of the Wisconsin Electric & Interurban Railway Association with the Northwestern Electrical Association.

A subject of most vital interest to the railways, lighting companies and other public utilities of Wisconsin, namely, operation under the regulation of a commission, was freely discussed by members representing companies widely scattered throughout the State and furnishing many kinds of service. The present commission and its methods of regulation and inspection were highly complimented. It was stated that the rulings of the commission had been conservative and fair and that the public utilities were in far better shape as regards finances and general stability than ever before. Rumors had been current that certain groups of politicians, wishing to make capital before election, had announced that they would foster a change in the present plan of regulation and suggest that each municipality have a local commission. The weaknesses of such a plan are apparent and it was thought obvious that such a method would find few supporters outside of the politicians of lesser caliber. The principal reason why any material change in the present plans would be very doubtful of acceptance is that the public utilities which have made a study of the existing laws creating the Wisconsin Railroad Commission are satisfied with the present method of control and regulation.

At the afternoon session of the first day the following papers were read: "Series Tungsten Lighting," by H. Schroeder, General Electric Company; "The Commercial Development of the Tungsten Lamp," by S. E. Doane, National Electric Lamp Association; "Keeping Track of Supplies and Handling the Contracting End of the Business," by Ludwig Kemper, Albert Lea, Minn.

Thursday morning, through the courtesy of the Allis-Chalmers Company, about 50 members of the association and their guests were entertained with a trip through the large works of that company at West Allis.

The afternoon session was devoted to a general discussion of the regulation of service by the commission. This subject was introduced by F. A. Vaughn, electrical engineer, lighting department, The Milwaukee Electric Railway & Light Company, who presented a paper on "The Control of the Adequacy of Electric Service." In this paper Mr. Vaughn included a detailed discussion of the Milwaukee company's methods of handling the inspection and replacement of light and power current meters. Suggestions were made as to possible improvement in the instructions issued by the commission and a complete set of the meter blanks used by the Milwaukee company formed a part of the printed papers which were distributed.

Prof. B. H. Meyer, chairman of the Wisconsin Railroad Commission, addressed the convention at length and strongly impressed upon the minds of the delegates that it was the desire and ambition of the present commission to fulfil with absolute impartiality the instructions of the law creating that commission. Professor Meyer discussed in detail the relations which existed by virtue of law between the public utilities companies and the commission. It was intimated that the time would soon come when the commission would call for a meeting of all the public utilities companies within the State for the purpose of discussing the basis for a sliding scale of rates. The scale would undertake to lower the rates in a way compatible with the increase in the efficiency of a plant, brought about by improvement in operating methods and extension of service. It was stated that the ideal condition of affairs would exist when the value placed upon a property for taxation purposes should equal the value on which rates were based. However, the present discrepancy in these values is not necessarily unjust because of the hazard in the operation of public utilities.

C. N. Duffy, comptroller of The Milwaukee Electric Railway & Light Company, made a strong plea for the acceptance of the classification of accounts as promulgated by the Wisconsin commission and explained that these accounts were of the utmost value to small properties which heretofore had not had available so close an analysis of their operating methods that they could be administered efficiently.

Following the close of the second day's session about 90 members and guests of the association banqueted at the Pfister Hotel and listened to interesting addresses by Professor Meyer, chairman of the Wisconsin Railroad Commission; John I. Beggs, president of The Milwaukee Electric Railway & Light Company; Neil Brown, president of the Wausau Street Railway, and Franklyn Hobbs, advertising specialist. C. N. Duffy presided at the banquet as toastmaster.

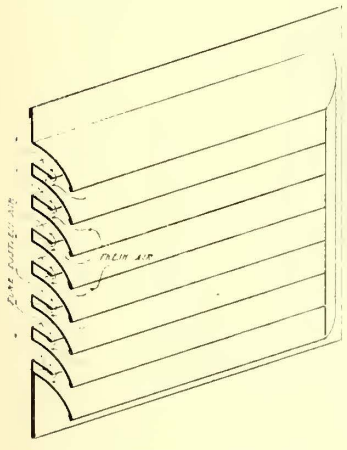
Mr. Beggs discussed in characteristic manner the relations existing by virtue of law between the public utilities companies of Wisconsin and the State commission. He asserted that the public utilities companies of the State are now in a more secure condition and are more substantial as financial undertakings than they ever have been before. The State had offered the public utilities companies an opportunity to obtain "indeterminate franchises," giving each a monopoly in its class of service within a limited district. Basing his arguments upon his broad experience and calling attention to the conditions of the indeterminate franchise Mr. Beggs strongly emphasized the necessity for laying aside surpluses that would in the future take care of the loss of value of a property by reason of the obsolescence of the parts composing that property. Under the provisions of an indeterminate franchise the municipality is permitted to take over a public-service property at its existing value, and so if the property has not laid aside a fund to balance the earlier expenditures for parts obsolete at the time of the taking over of the property there must be a loss. Only by the setting up of such surpluses could this loss by reason of obsolescence be taken care of and the interests of the investors upheld.

The following officers of the association were elected for the coming year: President, Ernest Gonzenbach, general manager, Sheboygan Light, Power & Railway Company, Sheboygan, Wis.; first vice-president, George B. Wheeler, general manager, Chippewa Valley Railway, Light & Power Company, Eau Clair, Wis.; second vice-president, Roger Kimball, general manager, Kenosha Gas & Electric Company, Kenosha, Wis.; secretary and treasurer, James G. Allen, secretary and treasurer, Equitable Electric Company, Lake Geneva, Wis.

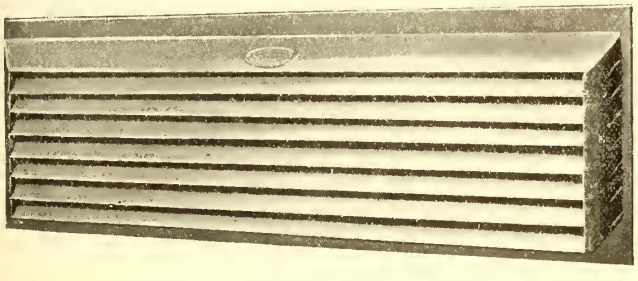
The Hungarian Minister of Commerce is said to have recently stated that during the coming year the entire railway system of Budapest will be electrified.

## AN AUTOMATIC CAR VENTILATOR

The accompanying engravings illustrate the construction and operation of the Perry ventilator. The peculiar construction of this device causes fresh air to be forced into the car at one end of the ventilator and foul air to be exhausted from the same ventilator at the other end while the car is running. As will be seen from the line engraving, the ventilator is made up of a series of curved metal slats which are bent over at their inner edges to form longitudinal deflector plates. Fresh air is entrained between the curved outer slats and passes in and over the deflector slats. All snow, rain, cinders and dirt carried in with the air is deposited under the deflector slats before the air passes into the car. Dirt collecting under the deflector slats is carried along to the end of the ventilator and ejected past the curved end plate. When the car is in motion a strong current of air passes along under the deflector slats and creates a suction over the deflector slats at the front end of the ventilator. It is claimed that the air in a car fitted with these ventilators in the monitor deck in which all passengers are smoking is kept fresh and pure enough to pass any reasonable air test. The ventilators are made to fit any space and are easily installed. They are built of heavy plate and do not require any large expenditure for maintenance or repairs. Large numbers of them have recently been applied to the cars of the Boston Elevated Railway Company, Hudson Companies and the New Orleans Railway & Light Company. They are made by the Perry Ventilator Company, New Bedford, Mass.



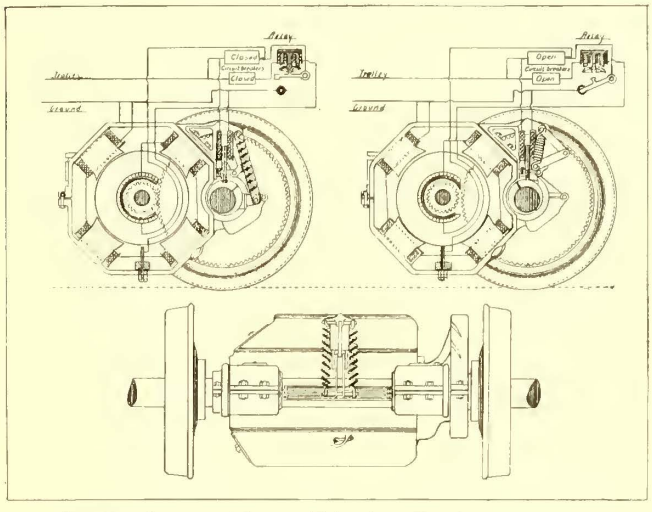
Sectional View of Ventilator



Exterior View of Ventilator

## MOTOR TRIPPING DEVICE

An automatic device for throwing the pinion of a railway motor out of mesh with the gear when there is danger of the armature rubbing on the pole piece from worn bearings has recently been placed on the market by the Herath & Hultman Manufacturing & Equipment Company, of Schenectady, N. Y., and is illustrated in the accompanying diagrams. The linings of the axle bearings of the motor are eccentric, so that when they are revolved from left to right as shown in the diagram, the distance between the axle and the armature shaft is increased sufficiently to throw the pinion and gear out of engagement. The movement is effected by a spring which is held extended by a toggle when in operation, but which can be tripped by the solenoid. The solenoid is located on the motor casing midway between the bearings, so that it can operate both pairs by a cross-bar. The solenoid is actuated by the trolley current when it is thrown into service by the automatic relay, which operates when the armature is in danger of destruction from worn bearings.



Application of Motor Tripping Device to Truck

As the depth of a standard tooth is only 9/16 in., it has been found that the maximum movement required is therefore less than an inch, so that no change is required in the gear case. It will also be noticed that there is an adjustable screw at the end of the solenoid plunger. By this plunger all lost motion caused by the wear of the pinion and gear is taken up in the eccentric bearing.

As shown in the diagram, a contact piece or brush extending the entire length of the armature shaft is carried within the lower part of the motor frame and in a vertical position so as to make contact with the band wires before the armature has an opportunity to scrape on the pole pieces. Contact of any part of the armature with this brush will open the circuit breaker and close the circuit of the relay. This trips the solenoid which is in series with the circuit breaker, opens the toggle which normally holds the axle bearing in position, and allows the axle bearing to revolve. Thus the short-circuit instantly disconnects the motor mechanically and electrically. When the motor is once tripped it is dead mechanically and electrically, and requires no further attention until it is replaced in its proper position at the car house.

The explanation given describes the action of the tripping device from worn bearings, but it will be understood that it will also act whenever the circuit breaker opens. In this way it disconnects the motor with equal promptness in case of grounding or arcing, or if any short-circuit occurs between the field and the armature, or if a band wire becomes loose or tangled.

The weight of the device is from 30 to 50 lb., and the company claims that it can be installed for from one-half to one-fourth the cost of any serious repair to the armature winding. It can be used with practically any type of motor on the market except one or two of the latest designs. With these it is only necessary to increase the diameter of the axle bearings about ⅛ in.

The company has had a motor equipped with the device in operation in Schenectady, and is planning to equip a two-motor car for demonstration purposes in other cities.

## CAR EQUIPMENT FUSE BOX

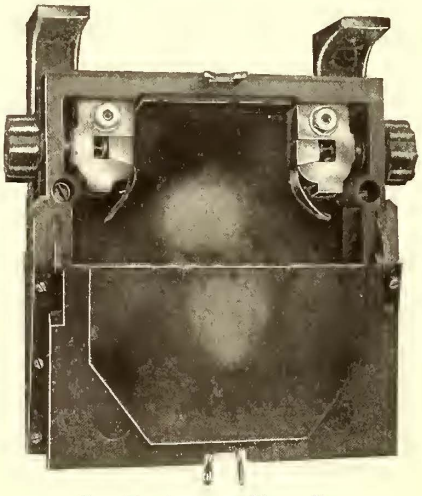
To meet the demand for a fuse box suitable for car equipments not exceeding 200 hp, the General Electric Company has developed the MA-13 magnetic blowout copper ribbon fuse box illustrated in the accompanying cut. Over 10,000 of these boxes are now in use by a large number of electric railway companies.

The sides, top and back of the box are molded in one piece of a durable insulating material composed largely of asbestos. This will not soften and lose its shape under heat. A shield at the base of the chute renders the most severe arc practically invisible. This shield is not, however essential to satisfactory operation, and if desired can be removed.

The copper ribbon fuse is clamped at the ends by wedge-shaped blocks, which are drawn into place with hand-screws to exert a powerful pressure on the fuse and insure good contact. Ready access to the fuse is obtained by dropping the hinged cover of the box, which is normally held closed by a convenient latch. Replacing a fuse, therefore, is a very simple matter, a few turns of the hand-screw, the grips of which are made large for ease in manipulation, being sufficient to free or bind it in place.

A feature of this fuse box is the peculiar form of magnetic blowout employed. Unlike the ordinary method of obtaining a magnetic field, no coil is used, the flux set up about the fuse as a conductor alone producing the field. The blowout is obtained by an arrangement of soft iron plates or poles built in the cover and the back of the box, which, being brought together at the hinges, distribute the magnetic lines to the best advantage.

For attaching the fuse box to the car two malleable iron feet, one at each end, are substantially fixed to it. Holes for ½-in. bolts or lag screws are provided for carrying it from the car beams or sills. These feet can be readily removed if desired, and the holes used for holding them to the box can be utilized for attaching the box to the car. The relative advantages of the two methods of



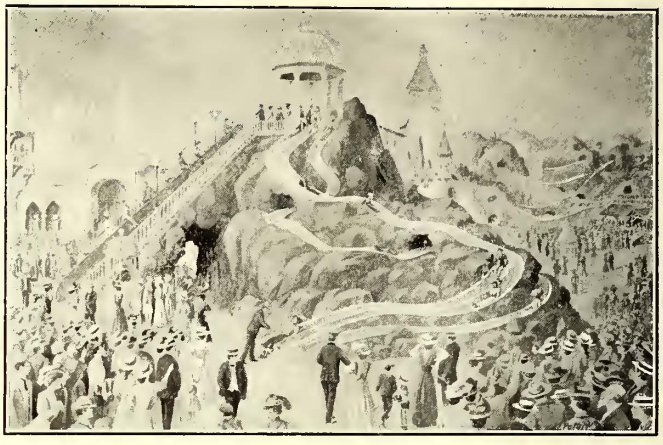
Car Equipment Fuse Box

carrying depend largely upon the place available for the installation of the fuse box. The feet admit of its being placed in a hanging position, while without them it can be clamped against a support at its back by the use of spacing cleats.

The terminal blocks are provided with tapered holes for receiving corresponding sleeves, which are to be soldered to the ends of the entering cables. The sleeves are drawn tightly into place by nuts secured by lock washers.

## THE HELTER-SKELTER

A well-constructed and artistically designed helter-skelter is an amusement device which can be relied upon to amuse both onlookers and partakers. It is perfectly safe, and can be built for so little that it is frequently a free attraction in the larger parks which charge admission at the gate. As a pay attraction it has been found very profitable at the minimum fee of 5 cents. The popularity of this form of riding device has led the L. A. Thompson



An Artistic Helter-Skelter

Scenic Railway Company, of New York, to give it the artistic treatment and variety it deserves. One possibility is shown in the accompanying cut, which illustrates a mountain effect with several tunnels. The experience of this company in building scenic railways naturally is of valuable aid in the construction of helter-skelters at reasonable cost for different-sized parks. The expense for maintenance and power is very little. In fact, a 5-hp slow-speed motor suffices to carry 1200 people an hour. The company is prepared to build these devices complete or sell the plans and operating equipment.

## PROGRESS OF THE CIRCLE SWING

The Novelty Machine Company, of New York, took over the business of the Traver Circle Swing Company more than a year ago. It has continued to build and operate these swings and improved their construction considerably in the past year. Many railways operating in cities of less than 40,000 could not afford to buy a new swing, but since several city parks recently have been cut up into city lots a few machines have been made available at lower figures. These used swings have since been re-erected and repainted in high-class operating condition. They should serve well in every particular, while costing about one-half the price of a new circle swing. As the parts are composed of steel, these plants should last for 15 or 20 years. After a circle swing has been used in one park for four or five seasons it can be disposed of to good advantage elsewhere, if desired. Instead of the expensive illuminated tower which some parks have adopted, the swing can be given a central location and serve for lighting a park better than a tower, because its electrical effects are more beautiful and possess the additional feature of lights in motion.

The export business of swings is constantly growing, and this year the first shipment will go to South America and to the Philippine Islands. The first circle swing in Spain was installed by a street railway company. Per-

haps its introduction will result in a general adoption of the amusement park idea in connection with Spanish and South American street railways.

## THE RACING DIPS

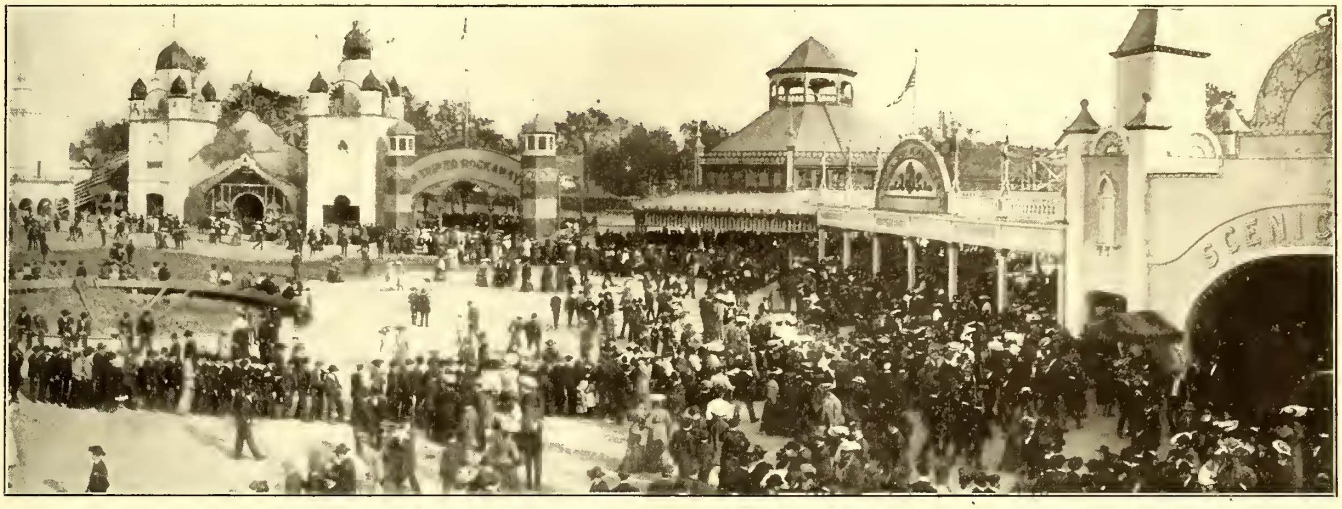
According to Frederick Ingersoll, of the Ingersoll Engineering & Constructing Company, Pittsburg, financial failure of summer parks in a majority of instances is largely due to the lack of earning capacity. The most careful investigation of the summer amusement business, not from casual observation, but from accurate daily reports and a thorough study of results, will reveal the correctness of this conclusion. If a man visits his tailor and finds the tailor busy, he returns another day. But in the amusement business each day's business has to be reckoned by itself. One dollar lost to-day is never made up and is never regained. A prospective attendant at a park show, or a prospective rider on a park device who loses that desire to ride upon a device or to attend a show is lost forever. A new desire in that same patron is "new business."

Amusement parks are subject to wholly different elements for success than any other form of amusement or entertainment. The park's receipts are acquired in nickels and dimes, while a theater, circus or other form of amusement acquires receipts in bulk. These park receipts must be acquired in driblets within a short time, placing the park management under a handicap. The longest period of business in any park of the distinctly amusement variety is three hours, and most of the parks have but two hours or two and one-half hours in which to earn the day's expenses and profits. Allowing for several inclement days each week, or each month, the receipts must be proportionately larger each day than the expenses.

It is a common sight at any park in any part of the country to witness crowds of prospective riders so closely assembled about the entrance to a riding device that they are uncomfortable, perhaps uncomfortable to a degree which prevents them ever again becoming enthusiastic enough to enter a similar crush. The accompanying illustration shows such a lack of earning capacity. In the meantime hundreds, and perhaps thousands, of other patrons who might ride on the device if it were not so uncomfortably crowded are passing the entrance and losing their desire to enjoy that same device's novelty and exhilaration.

To solve this problem, Mr. Ingersoll, assisted by his chief engineer, J. A. Miller, has devised a new attraction, called the Racing Dips, which is being put on the market by the Ingersoll Engineering & Constructing Company. With the racing dips it is possible to haul fares amounting to $500 an hour with ease and safety. Instead of the old-style coaster car, a modern three-seated car is used, and these cars are operated in trains of three cars each. This gives a seating capacity of 18 passengers to each train, and as two trains can be forwarded from the loading station every 20 seconds, it is easy to calculate the receipts for an evening.

The racing dips was installed at an Ingersoll park last summer, and proved such a success that the Ingersoll company has been awarded a host of contracts to alter old-fashioned coasters and scenic railways into racing dips. Construction was begun on a large racing dips at White City, Chicago, Jan. 1, this year, to cost $75,000, and an equally elaborate one is to be installed at Riverview Park, Chicago, this summer, while racing dips already in operation at Mt. Clemens, Mich., and Hot Springs, Ark., and other well-known resorts are demonstrating the advantage of this new device over old-style coasters with a limited earning capacity.




Crowds Waiting in Line to Patronize Riding Devices

On the racing dips two trains are started from the same platform at the same instant, and are shot forward at exciting speed in a sensational race along parallel tracks. First one car is ahead by reason of the advantage of an inside track at a curve, then the other car is ahead at the next curve. This order is reversed six times in one trip, alternately increasing the excitement in each carful of people. Few park visitors in search of diversion can resist these rides with an element of chance and a tinge of real "sport" in them. With two trains filled with merry pleasure seekers shouting gleefully to each other, holding onto the sides of the cars for dear life and fairly flying up and down hill at terrific speed, racing merrily along side by side, they have reached the pinacle of outdoor fun. When, finally, the cars dash into the loading station again, almost at the same instant, the occupants of the car are sufficiently enthused over the trip to want to remain aboard for another flying trip around the course.

Instead of antiquated light wheel and maple track, the racing dips is constructed with iron railroad tracks, and the cars are equipped with flanged wheels. The "pickup" is so good that the rider is never aware when the car is coast-

ing up a dip or being drawn over a grade by the chain, no matter whether the car is picked up at the rate of 20 m.p.h. or 1 m.p.h. The most attractive feature from an operating standpoint is the fact that the cars are controlled by brakes along the track, instead of the customary brakes upon cars. The entire system is controlled by one brakeman from one station. The whole system of trains can be stopped at once, no matter where the cars are along the tracks, or any one train can be stopped or its speed slackened at any time. By doing away with brakemen on each train that many chances of danger are eliminated, for while it is sometimes impossible to find a skilled brakeman for every train operated on any device, it is always possible to have one clever brakeman on duty to control the system.

## COURT DECLARES OWNERS NOT RESPONSIBLE FOR INJURIES TO PASSENGERS ON SCENIC RAILWAYS

Electric railway companies and others operating parks containing special riding devices such as scenic railways will be much interested in a decision on this subject handed down in New York on Jan. 22, by the Appellate Division of the Supreme Court. The ruling of the court was to the effect that any person who takes the thrilling and unusual forms of amusement of the type given by these devices does so at his or her own risk, and cannot expect to recover damages for injuries. This question came up in the suit of Mrs. Phœbe Lumden against a scenic railway company for $10,000 for injuries received when she was thrown out of a car as it plunged down an incline in the scenic route. In the lower court the plaintiff received a verdict of $3,000. The Appellate Division reversed the judgment on the appeal of the defendant and ordered a new trial. In the decision Justice Ingraham says:

"The attractiveness of these appliances depends solely on the sensation that the rapid change of speed gives to the persons using the appliances. There is necessarily a lurch or jerk as the car descends the incline, and there is nothing to show that the lurch or jerk that happened when the plaintiff fell was unusual or that it was anything more than must have been anticipated by any one using the appliance.

"It seems to me that the accident was the result of one of the dangers that the plaintiff had been warned against and the existence of which was the attraction which induced her to take the ride and was a risk she assumed in undertaking it."

## NOTES ON PARK ATTRACTIONS AND AGENCIES

A few years ago the big theatrical vaudeville agencies paid but small attention to summer park theaters. As summer parks were laid out on more elaborate scale, larger theaters constructed and consequently better talent required, these agencies began to realize that there were large possibilities in this new field. Especially was this true as the summer park theater business comes at a season of the year when most city theaters are closed. The accompanying notes on some of the plans of the park amusement companies during the coming season may be of interest.

The United Booking Offices, New York, the largest theatrical vaudeville booking agency in the United States, is anticipating an active season. Among the parks booked by these offices may be mentioned: Celeron Park, Jamestown, N. Y.; Henderson's Music Hall, Coney Island; Idora Park, Youngstown, Ohio; Sacandaga Park, Gloversville, N. Y.; Rock Springs Park, East Liverpool, Ohio; Farm Theater, Toledo, Ohio; Fairview Park, Dayton, Ohio; Cascade Park, Newcastle, Pa.; Valley Theater, Syracuse, N. Y.; Electric Park, Passaic, N. J.; Union Lake Park, Millville, N. J.; Four-Mile Creek Park, Erie, Pa.; Orange Park, Newburgh, N. Y.; Oakford Park, Greensburgh, Pa.; Olympia Park, McKeesport, Pa. This agency controls exclusively more than 2000 standard acts, costing from $50 to $200 per week each. Variety is therefore assured. During the dull summer season many of the best vaudeville actors are willing to play in summer parks at greatly reduced prices; contracts are therefore made by the performers with the United Booking Offices for the entire year. Programs are sent to the park manager at least 10 days in advance and if any change in the bill is deemed necessary it is promptly attended to. The manner of billing the show and advertising it, order of program, scene and plot are all prepared for and sent to the park managers in ample time to issue successful preparation and performance.

The Prudential Vaudeville Exchange, New York, N. Y., managed by W. S. Cleveland, reports increasing appreciation of its vaudeville offerings. In 1906 this company furnished attractions for only nine parks and six fairs; in 1907 it booked 23 parks, 12 theaters and 16 fairs; in 1908 it had the exclusive booking for 18 theaters, 39 parks and 43 fairs. For this year, 1909, the exchange will supply approximately 186 parks and fairs and 106 theaters, of which 70 per cent are booked exclusively.

Lampham's Red Hussar Band, an organization which last year had a very successful season at Ontario Beach Park, near Rochester, N. Y., is now accepting bookings for its eighth season. The band is accompanied by several soloists, including the bandmaster, who is a well-known cornetist.

Willoughbeach Park, of the Cleveland, Painesville & Eastern Railroad Company, will be improved this year by the enlargement of some of the buildings. It is expected that the capacity of the dance hall will be increased by one-third.

## STATISTICS OF OHIO INTERURBAN ROADS

The Railroad Commission of Ohio has issued the totals of statistics returned by the electric interurban railroads of the State, as shown in their annual reports. The lines show an increased business. The following general results are shown:

COMBINED OPERATING REPORT FOR TRACKAGE IN OHIO

| | 1908. | 1907. | Increase. |
|---|---|---|---|
| Passenger earnings | $11,458,511 | $10,920,913 | $537,598 |
| Freight earnings | 754,770 | 620,981 | 133,789 |
| Other earnings | 769,175 | 714,765 | 54,410 |
| Gross earnings | $12,982,456 | $12,256,659 | $725,797 |
| Operating expenses | 7,972,364 | 7,403,396 | 568,968 |
| Income from operations | $5,013,695 | $4,863,334 | $150,361 |
| Deficit from operations | 3,603 | 10,071 | *6,468 |

*Decrease

CAPITALIZATION, ENTIRE LINE

| | 1908. | 1907. | Increase. |
|---|---|---|---|
| Common stock | $108,741,523 | $98,362,678 | $10,378,845 |
| Preferred stock | 27,720,169 | 15,964,225 | 11,755,944 |
| Total stock | 136,461,692 | 114,326,903 | 22,134,789 |
| Funded debt outstanding | 89,308,100 | 82,920,000 | 6,388,100 |

GENERAL STATISTICS

| | 1908. | 1907. | Increase. |
|---|---|---|---|
| Miles of main track operated in Ohio | 2,479.71 | 2,406.12 | 73.59 |
| Total miles of track operated in Ohio | 2,794.18 | 2,646.14 | 148.04 |
| Employees in Ohio | 7,735 | 6,952 | 783 |

The 1908 year was concluded on June 30, while the previous fiscal year ended April 30.

# News of Electric Railways

## The Cleveland Traction Situation

At a called meeting of the City Council of Cleveland on Jan. 20 Mayor Tom L. Johnson said that he was willing to co-operate with Judge R. W. Tayler, of the United States District Court, in regard to a long-time franchise for the Cleveland Railway system along the lines laid down by Judge Tayler in his letters to the receivers. Mr. Johnson still favors the idea that the residents of the suburbs should pay more fare than the people living within the city limits and indicated that he might insist upon this.

Mr. Johnson further stated that he is not altogether satisfied with the financial reports that have been issued and that he does not feel that all or the greater part of the deficit resulted from operation at a 3-cent fare. He says that he cannot reach any conclusion until he has had time to analyze the reports. He promises that if he finds anything to bear out his contentions, he will present it to the receivers for correction before a conclusion is reached.

He also disagreed with the receivers as to the rate of fare that would result from the operation of the systems as they have suggested. In the case of six tickets for a quarter, he figures that the rate would be reduced when the franchises on some of the lines have expired.

With the idea of working out a franchise, the Mayor named Judge Tayler, Attorney John G. White, City Solicitor Newton D. Baker and himself as a committee to arrive at a conclusion and frame a franchise. Frederick H. Goff and Attorney D. C. Westenhaver have since been called into the consultations.

Officials of the Cleveland Railway Company are said to be willing that the returns on the investment shall be limited to 6 per cent, but they will also be careful that no action taken by the city shall result in leaving the property in the hands of the Municipal Traction Company. Although it is understood that the Mayor broached the subject of another holding company in one of the committee meetings, the results of operation under the present company make improbable a return to a holding company scheme.

Mayor Johnson expressed his willingness to take the valuation of the property found last spring as the basis of negotiations on the fare this time. Some of the councilmen suggested that the amount allowed for good-will be dropped from the considerations, but the Mayor stated that nothing had been added for the improvements made since that valuation was fixed, and that it would not be fair to insist upon such a reduction.

In order to satisfy himself that conductors are collecting all the fares, Mayor Johnson detailed employees of the waterworks department to act as spotters for a few days and report to Superintendent Bemis, who acted as expert statistician during the former negotiations.

The Chamber of Commerce had taken action toward drafting an ordinance along the lines suggested by Judge Tayler before it was decided that a special committee should take the matter up, but will content itself with suggestions until the result of the work being done is announced.

Meetings of the committee were held every day during the week ended Jan. 23, in an effort to reach a conclusion at an early date. The court promised to hold the advance in fares in abeyance for a few days in order to ascertain whether there was a possibility of reaching a settlement with the city. If it is found that negotiations will extend over too long a period, it is possible that the court will permit the receivers to increase the fares to the point allowed on the different lines, as he indicated in hearing the motion of creditors to that end last week. The report of the receivers for December follows:

| | |
|---|---|
| Gross earnings | $404,459 |
| Operating expenses | 319,061 |
| Net earnings | $82,398 |
| Miscellaneous income | 2,352 |
| Gross income less operating expenses | $84,750 |
| Taxes | *23,544 |
| Income less taxes and operating expenses | $61,206 |
| Interest | 40,293 |
| Other deductions | 891 |
| Net income | $20,022 |
| Cleveland railway rental | 73,378 |
| Deficit | $53,356 |

This brings the total deficit for the last quarter of the year up to $120,816, and for the entire time the property has been operated by the Municipal Traction Company to $163,851. This latter figure is based upon those given in the statements of the Municipal Traction Company previous to the appointment of receivers.

City Solicitor Baker has filed an intervening petition in behalf of the city of Cleveland to the motion made by creditors that the fare be advanced to the figures allowed by the franchises of the various lines. Mr. Baker states that unless the court intervenes the receivers will so interpret the regulations and restrictions contained in the grants as to operate against the interests of the people and in favor of the creditors of the Municipal Traction Company. He states that it is the intention of the receivers to treat the Woodland Avenue and West Side lines as having franchises authorizing high fares, and contends that these franchises have long since expired and only 3 cents may be charged on them. The petition asks that only such fares shall be charged as may be authorized by an interpretation of the franchise.

The Municipal Traction Company filed an answer on Jan. 20 to the bill of complaint of the Central Trust Company, New York, in which it alleges that the referendum election was illegal because of the condition of some of the voting machines and that the lease of the Cleveland Railway properties has not terminated. It denies that it is no longer entitled to control the properties. The company admitted, however, the allegations regarding the ownership of all the original lines by the Cleveland Railway Company and the bond issues for which it is liable to the Central Trust Company, but denied that the Cleveland Railway Company was at any time the owner of any of the rights or privileges of the Forest City Railway, referred to in the agreements of April 27, 1908. It also denies that the plaintiff has any rights under its bond for any amount against the property formerly owned by the Forest City Railway, but admits that the mortgage provides for covering the property then owned by the Cleveland Electric Railway Company and any that it might afterward acquire.

The answer acknowledges all the agreements made on April 27, but asserts that the Cleveland Railway Company is not entitled to become owner of the property of the Forest City Railway as a result of its performance of the contract between them.

The company says that of the authorized capital stock of $10,000, only $1,000 has been issued. It contends, however, that the conditions of the lease were understood and signed and that the consideration for the use of the property was to be an amount equal to 6 per cent on a valuation of $14,675,000.

Special Master Belford has delayed consideration of the claims against the Municipal Traction Company pending the outcome of the franchise negotiations. It is thought that if a franchise such as is desired by the court should be granted, the claims may be arranged satisfactorily. If not, Mr. Belford will proceed with the classification.

The Pay-Enter Fare Box Company has delivered the remainder of the boxes called for by the contract with the Municipal Traction Company. It has not been decided whether they will be used or not.

## History of the Twin City Rapid Transit Company

The Twin City Rapid Transit Company is publishing during the present month through the medium of full-page advertisements the history of this company from its beginning, 35 years ago, up to date. In the past two issues of the ELECTRIC RAILWAY JOURNAL abstracts have been presented of the first 11 of these advertisements. This portion of the history included the period up to the electrification in 1890 and the change from horse to electric operation. An abstract of the additional advertisements follows:

In the fall of 1892, when the Minneapolis Street Railway had been completely electrified, the company anticipated increased earnings with which to pay off the heavy indebtedness necessary for reconstruction and electrification. The financial panic of 1893 and the "bicycle craze" so greatly reduced the company's revenues that it was almost impossible to obtain money with which to keep pace with public improvements. Just at this time the city required the reconstruction of track that had been down but five years. This work had to be done, however, and it was found to be a most advantageous time to remove the feeder wires from the poles and place them under ground. The finances were available for this work only after the most rigid economies in operation had been enforced.

The 12 years from 1896 to 1908 were years of rapid and constant progress in the growth and development of the Minneapolis Street Railway. Some of the most important features of the growth during this period were as follows:

Second interurban line between Minneapolis and St. Paul completed, giving a continuous ride of 17 miles for 10 cents. Contract made for 10,000 hp in water capacity available at the site of its steam station on Third Avenue N. In 1904 a general office building 80 ft. x 160 ft. three stories high was built. In 1905 several important extensions were made including a third interurban line to St. Paul, the extension to Ft. Snelling. A 14-mile line to Excelsior on the route of the "old motor line" was built this year and the Minneapolis & St. Paul Suburban Railway operating this line also launched a fleet of nine new boats and purchased four other boats to run in connection with the electric trains to and from Minneapolis. Big Island Park in Lake Minnetonka was equipped that year. The growth of traffic began to demand larger cars and it was found necessary to rebuild practically all of the existing lines in Minneapolis. It is stated that only about 5 per cent of the track in use in 1896 is now in service.

In 1898 the company commenced the manufacture of its own cars. The repair shops and manufacturing plant were located at Nicollet Avenue and Thirty-first Street, but ultimately there was a demand for better facilities, so a tract of 60 acres was purchased in the Midway district on University Avenue and the general shops for the manufacture of cars as well as for all classes of repair work were erected. This plant has been described in these columns. The use of the 10 old horse car stations was gradually discontinued and three electric car stations were established. The construction by the company of the cars required for its service has grown from a small beginning until now all the cars in operation in the Twin Cities are manufactured in the company's shops. At the present time 500 to 550 skilled workmen are regularly employed in these shops.

The fifteenth installment of the history of the Twin City Rapid Transit Company is a tribute to Thomas Lowry.

The sixteenth full-page advertisement bears four illustrations and a clear description of the track and paving used in Minneapolis. This construction costs the company $12 per running foot of double track, or over $60,000 per mile. The illustrated description of the trackwork is followed by a story about the power houses.

## Alternative Proposition for Sale of Steinway Tunnel

In a letter addressed to the Public Service Commission of the First District of New York on Jan. 20, 1909, Theodore P. Shonts, chairman of the executive committee of the Interborough Rapid Transit Company, New York, signified that his company was willing to amend the original proposition made to the commission for the sale of the Steinway tunnel to the City of New York, mention of the rejection of which by the commission was made in the Electric Railway Journal of Jan. 16. As an alternative to the proposition that if the city bought the tunnel an agreement should be made with the New York & Queens County Railroad for operating it, Mr. Shonts new proposes that if the city buys the tunnel the New York & Queens County Railway shall apply for a franchise to operate it independent of all conditions which have heretofore been made. Mr. Shonts says:

"The proposition submitted to your honorable commission by the Interborough Rapid Transit Company in February, 1908, was the result of months of careful study of the situation and was decided upon as being the only possible plan by which the City of New York could give to the people of the Borough of Queens a 5-cent fare from every part of the borough into the heart of Manhattan.

"The Interborough Rapid Transit Company recognized the right of the people of Queens to ask of the city facilities which would put their borough in a position of fair progressive competition with the other parts of the municipality and was not willing to stand before the citizens of Queens as opposing any effort by the city to do for Queens as it has done for Brooklyn and the Bronx. The company was, therefore, willing that the Queens tunnel should become a rapid transit road, to be acquired by the city at cost, and was willing to go further and undertake operation with an agreement for a single 5-cent fare over the whole Queens County railway surface system. The idea of the operating arrangement was that the New York & Queens County Railway would share with the city during the first few years of operation any losses which the city might be put to by reason of the tunnel patronage not being sufficiently great to meet operating expenses and interest and sinking fund payments on the bonds issued for the purchase, and that after the first few years the development of Queens Borough would be so great that the city's annual share of the profits from the railroad and tunnel traffic would be considerable for all time to come.

"If, however, the provision to make an operating agreement with the New York & Queens County Railway, which was intended as an advantage to the city in case of purchase by it, is regarded as a drawback, the owners of the tunnel are willing to sell it to the city at actual cost, as outlined in our previous offer under date of Feb. 27, 1908, free from any condition, or they are prepared to follow the suggestion contained in your memorandum of opinion and apply under the provisions of the city charter for a franchise. This latter course, however, will involve an independent operation of the tunnel for an additional 5-cent fare. It was to avoid the contingency of this 5-cent fare that our original offer was made."

## New Associate Members of the A. S. & I. R. A.

Secretary Swenson, of the American Street & Interurban Railway Association, reports that between Jan. 12 and Jan. 25, 121 applications for associate membership in the association were received at his office. Of these new members, 81 were secured by H. H. Adams and J. S. Doyle, of New York. The total number of associate members of the association on Jan. 25 was 245. A list of the names of those applying for membership between Jan. 1 and Jan. 12 was published on page 113 of the issue of the Electric Railway Journal for Jan. 16. Those applying between Jan. 12 and Jan. 25 follow:

Baltimore, Md.—H. A. Leonhouser.
Boston, Mass.—F. M. Nellis, Frank J. Stone, L. R. Speare.
Brightwood, Mass.—Henry Pearson.
Brooklyn, N. Y.—T. W. Budden, J. G. Buehler, W. G. Clayton.
Buffalo, N. Y.—F. B. H. Paine.
Camden, N. J.—John Hanf.
Charleston, S. C.—Chas. J. Bendt, Louis Y. Dawson.
Cheyenne, Wyo.—A. T. Young.
Chicago, Ill.—W. S. Bartholomew, A. H. Sisson, Forsyth Brothers.
Columbus, Ohio.—J. L. Bone.
Corning, N. Y.—Fred C. Cameron.
Dayton, Ohio.—D. L. Paulis.
Detroit, Mich.—T. J. Lawlor.
Elizabeth, N. J.—T. S. Adams, F. H. Gordon, L. A. Kling.
Jersey City, N. J.—P. A. Clerkin.
Kennebunk, Maine.—E. B. Kirk.
Mahwah, N. J.—F. W. Sargent.
Milwaukee, Wis.—C. L. Jones.
Montreal, Can.—A. Douglas Gourd.
Newark, N. J.—H. V. Brown, Edw. J. Dunne, J. R. Case, H. J. Kuhn, James G. Mowry, Wm. R. Ricker, John L. Kane, John J. Murphy, C. Remelius, L. A. Shepard.
New York, N. Y.—A. T. Oesterreich, H. E. Cozzens, Azel Ames, G. G. MacCracken, J. S. McWhirter, H. P. Clarke, E. H. Chapin, S. A. Megeath, F. H. Shepard, Wesley Meeteer, H. W. Sheldon, Harry B. Logan, Frank Samuelson, Jr., C. B. Beckwith, E. H. Dewson, F. F. Mullaney, H. G. Grier, A. V. Porter, O. C. Gayley, H. W. Brown, P. W. Robertson, Joseph Maycock, E. H. Stearns, F. G. Robinson, E. A. Simmons, Ray Morris, J. L. Single, Carl Schwartz, E. B. Katte, Percy M. Brotherhood, F. A. Elmquist, Harry E. Baer, W. F. Reeves, C. H. Dorland, C. H. Cole, A. F. Old, L. T. Carter, F. W. Gardiner, C. B. Keyes, E. G. Davis, H. C. Johnstone, O. C. Reinecke, Thomas Farmer, Jr., S. D. Smith, G. Thyberg, D. E. Lenehan, J. K. Hearn, L. Rasmusson, E. B. Blandy, Geo. E. Austin, James O'Shea, Jr., H. G. Stott, R. C. Green.
Philadelphia, Pa.—E. L. Langworthy.
Pittsburg, Pa.—J. M. Flannery, A. S. King, W. V. Turner, E. A. Craig, N. B. Trist, C. G. Bacon, Chas. N. Bennett,
Providence, R. I.—A. E. Potter.
Reading, Pa.—W. B. Sullivan.
St. Louis, Mo.—E. L. Adreon.
St. Marys, Pa.—J. S. Speer.
Salt Lake City, Utah.—E. A. Johnston.
Schenectady, N. Y.—Geo. L. Radcliffe, W. H. Wright, T. W. Williams, G. H. Hill, E. D. Priest, J. G. Barry.
Seattle, Wash.—F. Dabney.
Seneca Falls, N. Y.—W. C. Gray.
Spartanburg, S. C.—F. H. Knox.
Trenton, N. J.—S. B. Keys.
Washington, D. C.—Clarence F. Norment, Ward Theron, Charles J. Bell, M. E. Ailes, George Truesdell.
West Lynn, Mass.—J. M. Darke.
Worcester, Mass.—John E. Bradley.

**Funds Authorized for Public Service Commission.**—The Board of Estimate of New York, has authorized the issue of $300,000 of special revenue bonds as a part of the $987,500 asked by the Public Service Commission of the First District of New York for its expenses for the current year.

**Meeting of New York Association.**—At a meeting of the executive committee of the Street Railway Association of the State of New York on Jan. 19, 1909, it was decided to

hold the next quarterly meeting of the association in Schenectady on March 24, at which time the committees will report. The subjects of transfers and claims will also be discussed.

**Accident Fakir Sentenced.**—Through the efforts of W. A. Rice, general claim agent of the Boston & Northern Street Railway, Boston, Mass., Bert Winslow, alias F. Gordon Wilson, alias Jack McIntyre, was convicted at Brockton, Mass., on Jan. 21, of obtaining money under false pretences by accident faking and was sentenced to one year. It is thought that this man served a term in Pennsylvania under the name of Hart, and that he was also arrested in New Jersey under the name of McIntyre several years ago.

**Missouri & Kansas Interurban Railway Operating into Kansas City.**—The Missouri & Kansas Interurban Railway has begun operating its cars over the Seventh Street Loop of the Metropolitan Street Railway in down-town, Kansas City. The Missouri & Kansas Interurban Railway formerly operated gasoline-electric cars, but it has recently changed its motive power to electricity. Traffic is reported to have increased appreciably since cars have been in operation into Kansas City proper.

**Museum of Safety and Sanitation.**—Announcement has just been made of the acceptance of the treasurership of the Museum of Safety and Sanitation by Frank A. Vanderlip, and the opening of an office at the United Engineering Societies Building, 29 West Thirty-ninth Street. The chairman of the committee on plan and scope is Prof. F. R. Hutton. Charles Kirchhoff, editor of *The Iron Age*, is the chairman of the committee of direction; T. C. Martin, editor of the *Electrical World*, is vice-chairman, and Dr. William H. Tolman, director.

**Wisconsin Electric & Interurban Railway Association.**—An executive session of the Wisconsin Electric & Interurban Railway Association was held in Milwaukee on Jan. 20 at which 15 companies were represented. Clement C. Smith, president, announced that meetings would be held jointly with the Fox River Valley Gas & Electric Association at Sheboygan, Wis., on April 12 and 13, for the purpose of discussing operating methods. Other meetings throughout the year will be held at Waupaca, Eau Claire and Janesville, the dates to be decided and announced by the executive committee.

**Park Tax Declared to Be a Franchise Tax in Baltimore.**—Judge Niles, in the Baltimore City Court, has decided that the park tax is a franchise tax and not an easement tax, and that it is legal for the Appeal Tax Court to assess the United Railways & Electric Company, Baltimore, with an easement tax. He also decided that the assessment made for the easements by the Appeal Tax Court was excessive and reduced the same from more than $11,000,000 to less than $3,000,000. The United Railways & Electric Company appealed from an assessment made by the Appeal Tax Court of $11,214,460 on what are known as easements. The company contended that as it paid a park tax of 9 per cent on its gross receipts such tax constituted a tax on the easements, and that the amount assessed by the Appeal Tax Court was excessive and not computed upon equitable valuations. As the Court of Appeals of Maryland had already declared that an easement tax upon public utility corporations was legal, the question before the court was the application of the tax. The distinction drawn between a franchise tax and an easement tax is that the former is a consideration for the right to use the streets and the latter is a direct consideration for the use of the streets. It is stated that the United Railways & Electric Company will appeal the case upon its contention that, having paid a tax of 9 per cent on its gross receipts, the city has not the legal right to impose a further tax for easements upon the company.

## LEGISLATION AFFECTING ELECTRIC RAILWAYS

**Kansas.**—The recommendation of Governor Stubbs regarding the passage by the Kansas Legislature of a public utilities law embodying the principal features of the New York and Wisconsin public utility laws, as noted in the recommendations of the Governors published on page 152 of the ELECTRIC RAILWAY JOURNAL of Jan. 23, 1909, has not been without effect, for a bill has been introduced by Senator Hamilton to create a public service commission to be composed at first of the three present railroad commissioners and two persons to be appointed by the Governor and confirmed by the Senate, all the members to serve for two years. Subsequent boards are to be selected by the Governor, and are to be non-partisan, not more than three members to be selected from any one political party. The proposed law includes under its provisions electric railway, electric light, telephone and other public utility corporations. Its most striking feature is the provision that all companies shall enjoy an indeterminate right to operate, subject to the regulation of the commission and the right of the municipality to purchase the property according to the valuation of the commission. It is provided that companies now operating with a fixed franchise limit may surrender their grants for the indeterminate rights under the new law.

**Massachusetts.**—The Public Transit Improvement Association will ask for legislation to restore the elevated train service in the old Tremont Street Subway. A bill has been introduced to require street railway companies to equip their cars with lifting jacks. The Railroad Commission has lately gone on record against the use of jacks by inexperienced persons on electric cars. A bill has been introduced to provide for the use of fenders on all cars operated within the State. Another resolution requests the New York, New Haven & Hartford Railroad to inform the House if it was directly or indirectly concerned in the securities of any street railway organized under the laws of Massachusetts, or in any holding corporation directly or indirectly in the stock of the Boston & Maine Railroad, and what disposition has been made of street railway securities which it was directed to dispose of by the Supreme Court last May. A petition has also been introduced for legislation providing that any officer of any railway or street railway company operating in Massachusetts who violates the law in respect to the combination of properties shall be guilty of a criminal offense and punished by fine or imprisonment. A bill has been introduced providing for the construction of a tunnel from the vicinity of Park Street by the Boston Transit Commission. The tunnel is to be leased to the Boston Elevated Railway, according to the bill, at a rental of 4.5 per cent of its net cost of construction. A referendum is attached. According to another measure, the Railroad Commission is to investigate the issue of passes by railroads and electric railways. The Railroad Commission in conclusions presented to the Legislature opposes special legislation to permit the New York, New Haven & Hartford Railroad to continue to hold and operate the Berkshire Street Railway.

**New York.**—The constitutional amendment which is designed to put the city of New York in a position to finance the construction of subways, or other public improvements which will be self-sustaining, has already been introduced. It was passed by last year's Legislature. An amendment must pass two Legislatures and then be submitted to the people at a general election. The present amendment must be passed by this year's Senate and Assembly before it can go to the people. If it is in any way altered, it becomes a new proposition entirely and must pass not only this year, but next year, before it can be voted on. The amendment has received the indorsement of the Public Service Commission of the First District, is in accord with the views of Governor Hughes and has, in the past, been urged by the city authorities.

**Ohio.**—It is stated that several bills, which were introduced into the Legislature last winter providing for the placing of telephone and telegraph companies of the State under the jurisdiction of the State Railroad Commission and which were not reached, will be revived in the present extra session, and the outcome of the controversy over the reappointment of J. C. Morris as a member of the Railroad Commission by former Governor Harris will probably influence the passage of such a bill. Before he retired on Jan 11, ex-Governor Harris reappointed Mr. Morris and had the appointment confirmed by the Legislature, although the new member will not enter upon his term until February. Governor Harmon has sent to the Senate the name of John Sullivan as successor to Mr. Morris as Railroad Commissioner, and it has been referred to the committee on railways and telegraphy. A bill has been passed by the Senate which proposes to give to interurban electric railways the same rights of eminent domain that are enjoyed by steam railroads in Ohio. A bill introduced in the House provides for heating all steam, electric and city cars used for the transportation of passengers to a temperature of 70 deg. F. It has been referred to the committee on cities.

**Vermont.**—In accordance with the recommendation of Governor Prouty in his inaugural address that the name of the Railroad Commission of Vermont be changed to that of the Public Service Commission with power of supervision over all public service corporations, Representative Barber, of Brattleboro, has secured passage by the House of the public utility bill of which he was the author. The bill, however, was not put through as originally drawn up by Mr. Barber, but was amended and recommitted in amended form and then reported upon favorably. The bill as passed by the House changed the name of the Railroad Commission to the Public Service Commission of Vermont, and gives the Public Service Commission authority over railroad, telegraph, telephone, gas and power companies with the right to fix rates and regulate the conditions of service.

# Financial and Corporate

## New York Stock and Money Market

Jan. 26, 1909.

Although there was a good deal of financial news of interest in Wall Street to-day the trading was very light and was generally professional in character. The publication of the report of the Consolidated Gas Company furnished the basis for a bear raid on the stock. At the opening of the exchange a strong selling movement developed which carried the price in the first hour from 126½ down to 117⅛. At that point some support developed, but the stock was never strong. There were other influences, however, which tended to strengthen the market. The announcement that Edwin Hawley and his associates had purchased control of the Chesapeake & Ohio Railroad and would possibly take over a portion of the Cincinnati, Hamilton & Dayton road, had little direct influence on prices, but was a bracing feature. The announcement of this change of control gives an insight into a possible combination effecting a large system from smaller properties.

Local traction stocks have not been nearly so active during the last week as earlier in the month. There have been some losses in prices. Whatever the influence may have been that stimulated Interborough-Metropolitan and Metropolitan Street Railway a few weeks ago, it seems to have disappeared for the present. Brooklyn Rapid Transit has lost its activity since the rumors of possible dividends have ceased to receive attention.

The money market continues favorable to speculation and to investment. The same bountiful supply of cash that has been in evidence for so many months is still in the banks. Although funds are offered to borrowers at rates that seem peculiarly tempting, money is not in great demand. Neither the heavy withdrawals of the Treasury Department nor the liberal bond takings seem to have the effect of reducing the surplus. Rates to-day were 1½ to 1¾ per cent for call loans and 2½ to 2¾ per cent for 90-day funds.

## Other Markets

The sales of traction securities in the Boston market were only moderate in amount during the last week and the transactions were mostly in broken lots. Massachusetts Electric common and the preferred have been sold to some extent, the former around 13 and the latter at 63; Boston Elevated has sold at 128, and West End at about 92½.

In the Chicago market little was done in the traction issues. The various series of the Chicago Railways, which have been active recently, were practically out of the market. A few shares of Chicago City Railway changed hands at 184½ to 185.

In the Philadelphia market, Rapid Transit stock continued to be the most active issue. During the week prices advanced steadily and the close to-day was at 28¼, an advance of two points in the week. Union Traction sold at stronger prices. Few transactions in bonds have been recorded.

In Baltimore, as usual, the trading in tractions was confined largely to United Railways bonds. These were not nearly so active as a few months ago. The 4s sold for 84⅜ and the 5s at 78⅜.

Quotations of various traction securities as compared with last week follow:

| | Jan. 19. | Jan. 26. |
|---|---|---|
| American Railways Company, Philadelphia | 45 | 45 |
| Boston Elevated Railway | 128¾ | 128 |
| Brooklyn Rapid Transit Company | 71¼ | 70⅞ |
| Chicago City Railway | *180 | 185 |
| Cleveland Railway | — | — |
| Consolidated Traction Company of New Jersey | a75 | *a75 |
| Consolidated Traction Company of New Jersey, 5 per cent bonds | a105½ | *105½ |
| Detroit United Railway | *55 | *56 |
| Interborough-Metropolitan Company | 15¾ | 15½ |
| Interborough-Metropolitan Company (preferred) | 44½ | 43½ |
| Manhattan Railway | 153 | 151½ |
| Massachusetts Electric Companies (common) | 12¼ | 12¾ |
| Massachusetts Electric Companies (preferred) | 59¼ | 63 |
| Metropolitan West Side Elevated Railway, Chicago (common) | 16 | 16 |
| Metropolitan West Side Elevated Railway, Chicago (preferred) | 46 | 48 |
| Metropolitan Street Railway | *42 | *42 |
| North American Company | 73⅞ | 82½ |
| Philadelphia Company, Pittsburg (common) | *42¼ | 42 |
| Philadelphia Company, Pittsburg (preferred) | *44 | 44 |
| Philadelphia Rapid Transit Company | 26 | 28¼ |
| Philadelphia Traction Company | 91 | 93 |
| Public Service Corporation, 5 per cent collateral notes | a99½ | *99½ |
| Public Service Corporation certificates | a76½ | *76½ |
| Twin City Rapid Transit Company, Minneapolis (common) | *99½ | 99½ |
| Union Traction Company, Philadelphia | 52¼ | 54¼ |

a Asked.
*Last sale.

## Final Argument Heard in New York Foreclosure Proceedings

Judge Lacombe in the United States Circuit Court heard final argument on Jan. 21 on the motion of the Guaranty Trust Company, New York, to foreclose the mortgage for $12,500,000 on the property of the Metropolitan Street Railway. The motion was made on the ground that the company had failed to pay taxes and had defaulted on interest on April 1, 1908, and Oct. 1, 1908, and also on the principal of the bonds.

Julien P. Davies, who represented the Guaranty Trust Company, claimed that all property in the hands of the receivers, except cash and bonded real estate, should be sold at foreclosure and the proceeds turned over to the mortgagor. Bronson Winthrop, representing the Morton Trust Company, said that the Thirty-Fourth Street Crosstown Railroad and Twenty-Eighth & Twenty-Ninth Street Crosstown Railroad and the Fulton Street Crosstown Railroad should not be included in this application for the reason that they were not parts of the Metropolitan Street Railway. Judge Lacombe said at this point that he was inclined to agree with Mr. Winthrop, but would hear Mr. Davies in opposition. The latter said that these three crosstown roads were operated by the Metropolitan Street Railway under a contract for trackage service, and that parts of these three roads were owned by the Metropolitan Street Railway. Judge Lacombe reserved decision.

On Jan. 25 Judge Ward, of the United States Circuit Court, handed down his findings in a suit brought by Adrian H. Joline and Douglas Robinson, receivers of the New York City Railway, against the Metropolitan Securities Company, in connection with the settlement of accounts between the two companies. The court allows the receivers $4,964,000, with interest at 6 per cent on $1,345,754 from Oct. 18, 1907, and on $3,718,245 from March 8, 1908, together with the costs of the action. The findings are supplementary to a decision rendered by Judge Ward in November, 1908.

In his finding Judge Ward tells of the lease made by the Metropolitan Street Railway in 1902 of all its lines to the New York City Railway. Under this the lessor paid to the lessee $23,000,000, which was expended up to May, 1907, by the New York City Railway for purposes mentioned in the lease. Moreover, the New York City Railway advanced $2,834,484 for the same objects and had a floating indebtedness of $1,550,774, and contemplated further capital expenditures of at least $4,000,000. The Metropolitan Street Railway on May 22, 1907, proposed to issue improvement notes to the amount of $8,000,000, and these, by agreement between the Metropolitan Street Railway, the Metropolitan Securities Company and the New York City Railway, were placed with the Metropolitan Securities Company.

The court finds that the Metropolitan Securities Company has used these notes as collateral for loans made by it. On June 4, 1907, the Metropolitan Street Railway approved a plan of construction which would cost, it was estimated, $4,000,000, and the New York City Railway and its receivers have paid and incurred the sum of $8,000,000 on behalf of the improvements of the Metropolitan Street Railway. For this they have received no consideration, except the agreement of the Metropolitan Securities Company to pay $8,000,000 to the New York City Railway. Of this $8,000,000 the New York City Railway paid $2,834,483 up to April 30, 1907, and on account of its agreement the Metropolitan Securities Company paid to the New York City Railway $3,036,000, for which no acknowledgment was received. The receivers, on Oct. 10, 1907, asked that the Metropolitan Securities Company pay them a further sum of $1,245,754. The securities company refused to do so on the ground that both the New York City Railway and the Metropolitan Street Railway were insolvent.

Between May 1, 1907, and Sept. 24, 1907, the New York City Railway paid to the Metropolitan Street Railway further sums to the extent of $1,922,629, which brought its payments on the original agreement up to $4,757,113.

At the time of the trial, says Judge Ward, there also existed necessary capital expenditures to the extent of $1,733,325. Further immediate construction needs of the Metropolitan Street Railway under the lease brought the amount up to $3,326,797, which, with the payments on account of the contract on April 30, 1906, of $5,675,481, make a total of $9,002,278. The court also considered the fund of $814,921 deposited by the Metropolitan Street Railway in the Morton Trust Company as a special construction fund in connection with the Central Crosstown Railroad. Of this $500,000 was loaned to the Metropolitan Securities Company, which, when it was repaid, was treated by the Metropolitan Street Railway as money borrowed by itself on the note of the Central Crosstown Railroad. When Messrs. Joline and Robinson were appointed receivers of the New York City

Railway the securities company paid $800,000 to the Metropolitan Street Railway to make good this special construction fund of the Central Crosstown Railroad, and $503,833 of the amount so deposited forms part of the $1,550,774 floating indebtedness of the Metropolitan Street Railway. Judge Ward finds that this payment on the part of the Metropolitan Securities Company was without the knowledge or consent of the New York City Railway or its receivers.

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**Carbondale (Pa.) Railway.**—Governor Stuart, of Pennsylvania, has approved a bill providing for the consolidation of the Blakeley & Dickson Traction Company, capital, $36,000, and the Carbondale Railway, capital, $450,000, as the Carbondale Railway with a capital of $486,000 and these officers: J. J. Sullivan, president; H. J. Crowley, vice-president; C. L. S. Tingley, secretary and treasurer; W. W. Perkins, assistant secretary and treasurer. J. J. Sullivan, W. F. Harrity, W. H. Shelmerdine, E. C. Miller, C. L. S. Tingley, H. J. Crowley and W. W. Perkins, directors. The line of the Blakeley & Dickson Traction Company, which connects Blakeley and Dickson City, has been operated under lease by the Scranton & Carbondale Traction Company, while the Scranton Railway has leased the Carbondale Railway.

**Chicago & Milwaukee Electric Railroad, Chicago, Ill.**—It cost $176,258.61 to complete the Chicago & Milwaukee Electric Railroad inside the city limits of Milwaukee, according to the report of the receivers for 1908, which came before Judge Tarrant at Milwaukee on Jan. 21 on a motion for approval. The report covers the period dating from the appointment of the receivers, in May, 1908, until Dec. 30, 1908. The question of the compensation of the receivers will come before the court later for adjustment.

**Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.**—At the annual meeting of the Cleveland, Southwestern & Columbus Railway, F. T. Pomeroy retired as president because of sickness and F. E. Myers, Ashland, Ohio, was chosen to succeed him. A. E. Akins was elected first vice-president. P. A. Myers, a brother of F. E. Myers, and L. J. Wolfe, president of the Aurora, Elgin & Chicago Railroad, were elected directors to succeed George N. Chandler and J. F. Harper. Mr. Wolfe was also made second vice-president of the company.

**Danbury & Harlem Traction Company, Danbury, Conn.**—J. Hector McNeal, New York, representing the bondholders, purchased the property of the Danbury & Harlem Traction Company at foreclosure on Jan. 23 for $22,000. The company owns an electric railway partly constructed between Harlem, N. Y., and Danbury, Conn.

**Detroit (Mich.) United Railways.**—The Detroit United Railways is reported to be negotiating with Coates & Company, London, England, for the sale of part of the $2,500,000 of consolidated mortgage 5 per cent bonds still in the treasury of the company. On March 1, $1,000,000 of 3-year 5 per cent notes of the Detroit United Railways mature and it is said that if a satisfactory price cannot be obtained for the treasury bonds, they will be used as collateral for a bank loan to provide for retiring the notes.

**Interstate Railways Company, Philadelphia, Pa.**—E. B. Smith & Company, Philadelphia, bankers, have engaged the Stone & Webster Engineering Corporation, with the approval of the directors of the Interstate Railways Company, to report on the physical and operating conditions of each of the underlying properties of the Interstate Railways Company, and to make recommendations for improvements. The Interstate Railways Company controls through The United Power & Transportation Company the electric railway properties entering Philadelphia, and others in Reading, Wilkesbarre, Trenton, Chester, Wilmington and several smaller cities. There are in this group 15 railway companies which operate approximately 800 cars over 525 miles of track. In addition to this there are four electric lighting companies.

**Lehigh Valley Transit Company, Allentown, Pa.**—At the annual meeting of the stockholders of the Lehigh Valley Transit Company on Jan. 11, R. P. Stevens was re-elected president; John C. Dawson, Philadelphia, vice-president, and Charles N. Wagner, Allentown, secretary and treasurer. The annual report of the company for the year ended Nov. 30, 1908, showed gross earnings of $910,574.20, a loss over 1907 of $16,225.05, which was attributed to the business depression.

**Massachusetts Electric Companies, Boston, Mass.**—The Massachusetts Electric Companies has sold $1,096,000 of 6 per cent preferred stock of the Boston & Northern Street Railway and the Old Colony Street Railway to Hayden, Stone & Company, Curtis & Sanger and Parkinson & Burr.

**Mexico (Mex.) Tramways.**—At the meetings of the stockholders of the Mexico Tramways and the Mexico Light & Power Company, held in London on Jan. 16, an agreement was ratified by which the stock of the Mexico Light & Power Company will be exchanged for the stock of the Mexico Tramways on the basis of 14 shares of stock of the Mexico Light & Power Company for 8 shares of the stock of the Mexico Tramways Company. The Mexico Light & Power Company has outstanding $13,600,000 of common stock, $2,400,000 of preferred stock and $12,000,000 of bonds. The Mexico Tramways has $6,000,000 of stock and $7,000,000 of bonds outstanding. Its authorized capital stock is $15,000,000 and it has authorized $15,000,000 of bonds.

**Northern Ohio Traction & Light Company, Akron, Ohio.**—At the annual meeting of the stockholders of the Northern Ohio Traction & Light Company, Fred S. Borton, Cleveland, was chosen to succeed Chauncey Eldridge, Boston, as a director. P. L. Saltonstall is the only representative of the Boston interests on the board now. C. J. McCuaiy represents the Canadian interests. The board organized by re-electing the officers.

**Philadelphia (Pa.) Rapid Transit Company.**—Charging that Mayor Reyburn, Clarence Wolf and William H. Carpenter are unlawfully acting as directors of the Philadelphia Rapid Transit Company as representatives of the city, Roy Franklin Brode, a stockholder, has filed a petition for a writ of quo warranto in Common Pleas Court to have them removed from the office. Messrs. Reyburn, Wolf and Carpenter entered the directorate of the company in accordance with the terms of the agreement entered into recently between the city and the company.

**Port Jervis Electric Light, Power, Gas & Railroad Company, Port Jervis, N. Y.**—The bondholders of the Port Jervis Electric Light, Power, Gas & Railroad Company have ratified the action of the bondholders' protective committee and authorized the committee to bid for the property at the foreclosure sale to be held at Port Jervis on Jan. 27.

**Rhode Island Company, Providence, R. I.**—The Rhode Island Company has been added as a defendant to the suit brought by United States District Attorney French on behalf of the Government in which he cites the New York, New Haven & Hartford Railroad, the Boston & Maine Railroad, the Providence Securities Company and the Consolidated Railway of Connecticut as defendants, and charges them with violation of the Sherman anti-trust law in the merging of railroad and railway interests. The Rhode Island Company was not mentioned at first, but the amendment alleges that this company, which operates and owns practically all the urban and interurban railways in Rhode Island, in June, 1907, transferred to the Providence Securities Company all its holdings in the Providence & Burrillville Street Railway, Columbian Street Railway, and the Woonsocket Street Railway. The Providence Securities Company transferred control of these properties to the New York, New Haven & Hartford Railroad on Jan. 31, 1908, it is alleged by Mr. French.

**Rochester (N. Y.) Railway.**—The stockholders of the Rochester Railway, the Rochester & Sodus Bay Railway and the Rochester & Eastern Rapid Railway have voted in favor of the proposed merger of the three companies into the New York State Railways, which is designed to take over as a holding corporation all the electric railways in New York State controlled by the Central Railway Syndicate, as announced on page 45 of the ELECTRIC RAILWAY JOURNAL of Jan. 2, 1909.

**Toledo Railways & Light Company, Toledo, Ohio.**—At the annual meeting of the Toledo Railways & Light Company, at Toledo, on Jan. 21, the following directors were elected: Spencer D. Carr, Jay K. Secor, W. J. Walding, Irving B. Hiett, John J. Barker, Albion E. Lang and L. E. Beilstein, all of Toledo; W. E. Hutton, Cincinnati; Dr. J. F. Demers, Quebec; Barton Smith, Toledo; E. W. Moore, Cleveland, and R. B. Van Courtland, New York, retired. The directors organized by re-electing the old officers, as follows: Albion E. Lang, president; L. E. Beilstein, vice-president and general manager; H. S. Swift, secretary; Spencer D. Carr, treasurer. The directors authorized the issuance of universal transfers on the payment of a cash fare of 5 cents. Heretofore transfers have not been exchanged between the old Toledo Traction lines and the Robison lines. A contract between the Toledo Railways & Light Company and the Toledo, Fostoria & Findlay Railway was ratified, by which the Toledo, Fostoria & Findlay Railway secures entrance into the business section of the city. The subsidiary companies of the Toledo Railways & Light Company were almost self-sustaining last year, notwithstanding the financial stringency and business depression.

# Traffic and Transportation

## Hearing by Massachusetts Railroad Commission on 6-Cent Fares in Northampton

On Jan. 22 the Massachusetts Railroad Commission heard the petition of the Mayor and City Solicitor of Northampton protesting against a 6-cent fare on the Northampton Street Railway. Briefs were presented by J. C. Hammond, president, and N. D. Winter, treasurer of the company. An abstract of each brief follows:

President Hammond reviewed the history of the company as printed in the Electric Railway Journal of Jan. 23, page 162, pointing out that for the past 16½ years the average rate of dividend has been slightly more than 7.5 per cent, or an average of 5.5 per cent since the road has been in operation. The only question now being considered is whether a 6-cent unit of fare is reasonable or excessive. President Hammond said he was prepared to maintain that the unit of fare at 5 cents has always been too low for street railways situated like the Northampton; almost all the travel is suburban. He added:

"This fact has not been fully recognized by myself because the extent to which depreciation goes on and the rise in the expense of everything incident to operation has not until recently been realized. Probably the convenience of using the nickel had much to do with the establishment of this fare. Since this fare was established in general practice the laws of the State have required railways to do more for the comfort of passengers. Cars must now be heated and lighted by electricity. Again, the use of double-truck cars increases beyond proportion the expense of operation. These are samples only of the many other ways by which the cost of operation has increased. A greater investment in money is now requisite for a given mileage of street railway than was counted upon 10 or 15 years ago. Since 1901, with no further addition to the trackage, the investment has increased about $56,500. On this sum interest must be paid. Thereby almost $1 on each share of stock is devoted to paying interest.

"Unless this street railway can have much more net income its power to pay dividends is at an end. It is not desirable to secure this end by diminished service; nor is it practical. The public constantly protests against any reduction in service. We feel sure that good service and 6 cents as the fare are acceptable to patrons who understand the situation. Increase in the cost of everything incident to the expense of operation has far outrun any increase of business. The popular statement of this same thing is that 6 cents has not the purchasing power that 5 cents had 8 or 10 years ago. These things are all so well known to this board that I hesitate to note or suggest the items, except in the briefest way. Wages, coal and supplies cost the company a third more than 10 years ago.

"For the year ended Sept. 30, 1901, the car miles run were 773,782, with a power-house cost of $13,350. For the year ended Sept. 30, 1908, the car mileage was 803,369, and the power plant operating cost was $21,775, an increase of $7,424, with a very slight increase in traffic.

"The time has arrived when it must be an established policy to charge annually a reasonable sum for depreciation, especially on tracks, rolling stock and power-house machinery. A comparison of these accounts as they stand on the books with the recent appraisal of E. K. Turner, consulting engineer for the Railroad Commission, is as follows:

| | Books. | Mr. Turner's estimate. |
|---|---|---|
| Tracks | $214,501.31 | $168,843.00 |
| Rolling stock | 178,159.99 | 91,415.00 |
| Power plant | 104,114.00 | 76,005.00 |

"The boilers in the power house have to be run year by year with a diminished pressure to comply with wise State laws, and during 1909, or at least in 1910, they will have to be replaced by new ones, and the book value of these will have to be charged off as a loss. It is probable that within the next five years the wooden car sheds will have to be torn down—charged off as a loss—and replaced by brick sheds in the interest of safety. This charging off to profit and loss ought to be so apportioned over a number of years as to permit year by year the payment of a reasonable dividend. If dividends are passed the company cannot get its stockholders to take up the remaining 750 shares of stock authorized to be issued. The present stockholders hold only a little more than half the issue of 1000 shares, completed Jan. 1. If dividends were to be passed an insurmountable barrier to the placing of the stock would be encountered. A non-dividend paying road is not entitled to borrow money from savings banks. Where shall we borrow the money?"

Regarding the suggestion of the petitioners that a book of tickets without transfers might be sold at a reduced rate, and the company still derive adequate revenue, it was stated that the limitation without transfer would not affect 90 per cent and more of the traffic, because the transfers constitute only 8 per cent of the fares paid. The experience of the company just before the 6-cent fare went into operation showed that all who could availed themselves of the opportunity to buy tickets; in fact, patrons bought books at the rate of $1,000 per day until the supply was exhausted. Patrons who, from lack of foresight or money, did not purchase a book of tickets felt that they had been discriminated against. President Hammond concluded with the request that the commission permit the company to continue to operate at a 6-cent fare during 1909.

N. D. Winter, treasurer of the company, presented tables showing the earnings, expenses, fixed charges, capitalization, traffic, car mileage and unit costs for the 14-year period from 1895 to 1908 inclusive, to prove that the company's operating expenses are reasonable; that the increase in expense is normal and incidental to the increase in the age of the road; that the cost of operation has increased much faster than has the income, and that the service required cannot be maintained in the future without a 6-cent fare. Car-mile results and costs per passenger follow:

| | Gross receipts. | Operating expenses. | Taxes and interest. | Cost per pass. div. excluded. |
|---|---|---|---|---|
| 1895..... | $0.2108 | $0.1167 | $0.0148 | $0.0302 |
| 1896..... | .1909 | .1163 | .0123 | .0345 |
| 1897..... | .2041 | .1229 | ..... | .0384 |
| 1898..... | .1894 | .1182 | .0198 | .0376 |
| 1899..... | .2012 | .1209 | .0186 | .0358 |
| 1900..... | .18388 | .11594 | .02318 | .0441 |
| 1901..... | .17244 | .11385 | .02348 | .0408 |
| 1902..... | .18877 | .12709 | .03495 | .0441 |
| 1903..... | .19212 | .12777 | .03814 | .0444 |
| 1904..... | .18906 | .13937 | .03840 | .0485 |
| 1905..... | .19390 | .13312 | .03600 | .0449 |
| 1906..... | .20702 | .13942 | .03606 | .0436 |
| 1907..... | .21593 | .16143 | .03920 | .0476 |
| 1908..... | .21340 | .14993 | .04133 | .0459 |
| Per cent of increase. | Less than | | | |
| 1895 to 1908. | ½% | 28% | 178% | 50% |

In 1895 the company had $300.000 capital and $60,000 debt, making an investment of $360,000. Everything being new, and the demand of the public not so insistent as at present, the operating expense was 11.67 cents per car mile, with a total expense of 13.15 cents exclusive of dividends. The operating expenses have since increased steadily to a maximum of 16.1 cents in 1907. The 1908 figure is 28 per cent higher than in 1895. The total expenses, exclusive of dividends, increased 45 per cent, or to 19.12 cents per car mile in 1908. In 1895 the company paid 7.5 per cent dividends and carried to surplus $9,000, or practically 2.5 per cent on the investment, which, on a 40 years' basis, cannot be considered too much to cover depreciation. Mr. Winter said:

"We know better now; but it seemed enough at that time. Fares were established on the false premise that the profit on the increase of traffic would care for the increased costs and requirements. Time has proved that the company was much mistaken, and the present unfortunate condition of the street railway business in Massachusetts suggests that nearly all the other companies made the same mistake, and the situation has been made worse in Northampton on account of the fact that the fares have had to be reduced twice since that time. It was emphasized that the company now knows that not only does the operating expense of a street railway increase at a rapid rate after the first five years, but that no company can keep its equipment and service up to the proper standards without adding to its investment every year that it operates. In each of the 14 years recorded the company has invested more money in order to serve the public. During this period the investment has increased from $360,000 to $750,000, and while the stockholders have put this $400,000 into equipment for the public's use (the public being charged with the interest only) the amount received from the stockholders has steadily decreased from $30,000 to $18,000, and the company is now on a $15,000 basis. With a reasonable charge for depreciation the company would have shown considerably less than nothing. During the 14 years of steady increase in cost the company has borrowed about $450,000, or 1½ times its capital.

"This borrowing would strain any credit, and therefore the commission granted us the right to issue 1750 shares of stock at $110 a share. We waited until the money market was easy and asked for subscriptions for 1000 shares. Our stockholders subscribed for only 550 shares. We then canvassed Northampton to secure subscribers for the balance, but were unable to place a share. Finally, however, we succeeded in placing the stock through the personal influence of the officers of the company. I refer to this to show that our stockholders very naturally refuse to invest the money that is necessary yearly for the proper maintenance of a road unless they may expect a fair return

upon their present investment. The question at this time is: Can the company maintain safe and satisfactory service in the future on a 5-cent fare?"

In reply to the objection that the company paid out too much money in dividends, Mr. Winter referred to the total investment necessary, and the relation of the dividends paid to this. To the objection that the expenses are high because of accidents, he reiterated that the cost per car mile is only 15 cents, and the average expense for accidents in the past 10 years has been 3 per cent of the gross receipts, the maximum being 9.5 per cent, and the minimum 0.4 per cent. In answer to the possible criticism that the total investment has been expended injudiciously, the recent inventory by the engineer of the commission showed that there has been no serious mistake, especially since the company discarded a horse railway at the beginning.

Regarding the claim that the increase is due to the recent panic, Mr. Winter stated that the gain in receipts in 1906 and 1907 was very unusual, being double that of almost any other year, and in 1908 the receipts were within 2 per cent of 1907, the company's most prosperous year. The company operates through a wealthy community that rides a great deal, and is not subject to the vicissitudes of manufacturing cities. The main trouble has been that the expense has grown faster than the income. The question is, whether a road 15 years old, whose total receipts are 21.34 cents per car-mile, and whose average cost, not including anything for dividends and depreciation, is 19.12 cents, can keep up, through a term of years, the standard of service and improvement that will be satisfactory to the community and the commission. Mr. Winter said, in the course of his remarks:

"Can we expect our stockholders to furnish the money necessary for improvements if they cannot receive as much interest on their present stock as they can get in many safer investments? Am I right in stating it, as a business truth, that in the broad view it is absolutely necessary to the best interests of a community that the stockholders of a street railway receive a reasonable interest in order to maintain proper safety and service? It will be impossible for the Northampton Street Railway to maintain such service and safety as you would have it for the next 5 or 10 years on a 5-cent fare, and only by the closest attention and strictest economy can the company do so on a 6-cent fare. Personally, I think that within a few years it will be necessary for suburban companies to receive a fare equal to 1.5 or 2 cents per mile.

"If we were required to sell 5-cent books the increase would not be sufficient to relieve the situation much. In fact, with a straight 6-cent fare it is doubtful if the company will be able to pay any dividend for a year or two. We estimate that a 6-cent fare will increase our income about $10,000 per year."

The following table of daily average car receipts for the first 15 days of January, 1908 and 1909, with the 5 and 6-cent fares in force, respectively, was then presented by Mr. Winter:

| | 1908 | | 1909 | |
|---|---|---|---|---|
| | Passengers. | Car receipts. | Passengers. | Car receipts. |
| Bay State line.... | 1,173 | $58.42 | 834 | $50.85 |
| Williamsburg line. | 2,275 | 105.54 | 2,336 | 120.43 |
| Easthampton line. | 2,258 | 112.51 | 2,022 | 120.23 |
| Holyoke line..... | 2,165 | 107.00 | 1,928 | 112.96 |
| Total..... | 7,871 | $383.47 | 7,120 | $404.57 |

Decrease in passengers, 751, or 10 per cent.
Increase in receipts, $21.10.

Concluding, Mr. Winter said: "Our case differs here from most companies. We serve a public where a greater proportion are in a position to buy tickets than any other community in Massachusetts, perhaps, save one. To illustrate, on the last three days of December we sold 4000 books, or one to every voter in the city, in anticipation of the increased fare. The parties suggesting that we sell 5-cent books recognize that in our city such a policy would not result in sufficient increase in our receipts to relieve the situation, and therefore suggest that we take the transfer privilege from such tickets.

"In 1908 we registered 3,711,726 fares. The transfers on the whole road were 311,268, practically 8 per cent. Taking transfer privileges from these tickets, in our opinion, would work a loss both to the public and the company. Transfers are the best legitimate and successful method of inducing traffic; besides, there is a clause in our location that requires the giving of transfers. While the members of the city government have felt, perhaps properly, that it was advisable to have the commission pass upon the matter, the public we serve are generally convinced that a flat 6-cent fare is just and necessary to maintain the service desired."

Press clippings were cited in which it was stated that there was a local sentiment that the company is giving more than it can afford; that no one wants a street railway which is not prosperous; and that fair dividends should be received by all corporations which serve the public as well as the Northampton Street Railway. It was then pointed out that the company is not on any line able to pick up two loads at one trip, and should therefore not be required to carry for the same fare as in densely populated cities. In the last five years the population of Northampton has increased 1.5 per cent per year. In its final summary the brief of Mr. Winter contended that the company is giving good service to the public; that it has operated economically and with reasonably good judgment; that the increased cost of operation is normal and proper, sure to continue, and has now reached a point where the future welfare of the community, as well as the company, and the exercise of sound business judgment, necessitate an increased fare. The community, on its part, does not desire action that will impair service or curtail the yearly improvements that are necessary for convenience and safety.

In taking the question under advisement the commission stated, through Chairman Hall, that this case presents some features that distinguish it from other fare problems that have come before the board, the principal point of interest being the fact that the company has paid 6 per cent dividends, or better, for a series of years. Chairman Hall said that without prejudice to the commission's investigation and subsequent decision, the question of proper financing is one of great importance in this case, and will be given the closest consideration by the commission.

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**Buffet Service Discontinued by Ft. Wayne & Wabash Valley Traction Company.**—The Ft. Wayne & Wabash Valley Traction Company, Ft. Wayne, Ind., has discontinued the buffet service on its Indianapolis-Ft. Wayne limited cars and will establish lunch stands in the depots of all the principal towns along the lines.

**Petition for Reduced Fare in Massachusetts.**—The Mayor and the City Solicitor of Marlboro, Mass., have petitioned the Railroad Commission of Massachusetts for a reduction in fare from 6 cents to 5 cents over the Hudson, Southboro and crosstown lines of the Boston & Worcester Street Railway. The main line is not affected by the petition.

**Offices of Toledo Urban & Interurban Railway at Findlay.**—The general freight offices of the Toledo Urban & Interurban Railway were moved from Bowling Green to Findlay on Jan. 20, thus centering all the department offices. H. A. Stevenson, who will become traffic manager of the company on Feb. 1, will also make his headquarters at Findlay.

**St. Louis Sues for Passenger Tax.**—The city of St. Louis has begun suit against the United Railways Company and the St. Louis Transit Company to recover a claim against the companies based upon the tax of one mill per passenger, imposed upon them recently. The injunction secured by the companies to prevent the city from collecting the tax was dissolved recently.

**Bumps to Deter Fast Automobiling at Crossings.**—The Long Island Railroad has had plans prepared for a series of "bumps" 5½ in. high, rising and falling within 8 ft., to be installed as an experiment at several grade crossings on the Long Island Railroad on Eastern Long Island, to determine their efficiency in deterring automobilists from driving recklessly at crossings.

**Report to be Made of Traffic Conditions in Pittsburg.**—Stone & Webster, Boston, Mass., have been retained by the Pennsylvania Railroad Commission to examine and report on the street railway service in Pittsburg. The Commission has asked for an investigation of the situation from an engineering and an operating standpoint, with due regard to various factors of economy, safety and practicability.

**Service from Brooklyn Over the Williamsburg Bridge.**—The Public Service Commission of the First District of New York has ordered a hearing for Jan. 29 to inquire into the compliance by the Brooklyn Rapid Transit Company with the terms of Final Order 706 in regard to service on the Williamsburg Bridge local cars. The order has been complied with from 5:30 p. m. to 7 p. m., but is said not to be up to the requirements of the commission at other hours.

**More Pay-Within Cars in Philadelphia.**—The Philadelphia (Pa.) Rapid Transit Company has placed pay-within cars in service on its South Seventeenth Street-South Eighteenth Street line. In the interest of the public small illustrated folders showing the proper way to board and leave the cars and emphasizing the importance of having the exact fare ready have been hung in each car for general distribution. Pay-within cars are now being operated by the company on the Twelfth Street-Sixteenth Street line, the South Nineteenth-South Twentieth Street line and the South Seventeenth-South Eighteenth Street line.

# Personal Mention

**Mr. C. W. Ricker,** electrical engineer of the Cleveland Construction Company, Cleveland, Ohio, has been appointed engineering assistant to the receivers of the Municipal Traction Company, Cleveland, Ohio. The heads of the motor power, distribution and return, and mechanical departments will all report to Mr. Ricker.

**Mr. H. A. Robbins,** formerly assistant electrical engineer of the Brooklyn (N. Y.) Rapid Transit Company, has been appointed superintendent of power of the company to succeed Mr. S. A. Spaulding, resigned. Mr. Robbins has been connected with the Brooklyn Rapid Transit Company since graduating from the Pennsylvania State College in 1901.

**Mr. S. A. Spaulding,** for the last two years superintendent of power of the Brooklyn (N. Y.) Rapid Transit Company, has resigned to become connected with the electrical department of the Pennsylvania Railroad at New York. Mr. Spaulding will be succeeded as superintendent of power of the Brooklyn Rapid Transit Company by Mr. H. A. Robbins, formerly assistant electrical engineer of the Brooklyn Rapid Transit Company.

**Mr. R. M. Searle,** who has been general manager of the Rochester Railway & Light Company, Rochester, N. Y., has been elected vice-president of the company. Mr. Searle was formerly general manager of the Westchester Lighting, Power & Gas Company, New York, and at one time was connected with the Georgia Railway & Electric Company. Mr. Searle's election in no way affects the organization of the Rochester Railway, the stock of which is owned by the Rochester Railway & Light Company.

**Mr. J. T. Hutchings,** assistant general manager of the Rochester Railway & Light Company, Rochester, N. Y., has been appointed general manager of the company, to succeed Mr. R. M. Searle, who has been elected vice-president. Mr. Hutchings was graduated from the Massachusetts Agricultural College at Amherst in 1889. Shortly thereafter he became connected with the Thomson-Houston Company, for which he did considerable construction work. Subsequently he became assistant superintendent of the West End Electric Company, Philadelphia. Later he was appointed superintendent of the company, and remained in that position until the Philadelphia Electric Company was organized in 1897, when he was appointed electrical engineer of the company. In 1904 Mr. Hutchings was appointed superintendent of the electrical department of the Rochester Railway & Light Company and was appointed assistant general manager in 1906.

**Mr. E. T. Munger,** who recently resigned as superintendent of motive power and equipment of the Metropolitan West Side Elevated Railway, Chicago, Ill., was given a testimonial dinner at the Hoffman House, New York, on Jan. 22 on the occasion of his becoming general superintendent of the Hudson & Manhattan Railroad, New York. The party was composed of leading railroad men and manufacturers' representatives in and about New York and was the occasion for much praise for the Chicago railroad men who had gone East to assume important duties. Among the guests were Mr. Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company; Mr. J. S. Doyle, superintendent of car equipment of the Interborough Rapid Transit Company; Mr. L. B. Stillwell, electrical director of the Interborough Rapid Transit Company; Mr. W. S. Menden, assistant general manager and chief engineer of the Brooklyn Rapid Transit Company; Mr. W. G. Gove, superintendent of equipment of the Brooklyn Rapid Transit Company; Mr. Chas. Remelius, superintendent of rolling equipment of the Public Service Railway, and Mr. W. O. Wood, general manager of the New York & Queens County Railway.

**Mr. Charles H. Smith** has resigned as secretary of the Lebanon Valley Railway, Lebanon, Pa. Mr. Smith began his railroad career on Feb. 3, 1873, when he entered the employ of the Reading Railroad, at Harrisburg, Pa., as telegrapher. On Dec. 8, 1879, he was transferred to Philadelphia and served in the same capacity in the office of the general traffic manager and later in the office of the general superintendent of the New York Division. On Aug. 1, 1881, Mr. Smith accepted a position in the office of the general manager of the company and in July, 1887, was appointed general agent at Camden, N. J. From April, 1888, until May, 1893, Mr. Smith served as clerk for the Reading Railroad, having charge of the Pennsylvania Avenue, Willow Street and Washington Avenue stations of the company in Philadelphia. In May, 1893, he became superintendent of the Lebanon & Annville Street Railway. After a few months of hard work, Mr. Smith reduced the expenses of the company about $1,200 per month, and so managed the property that it was soon placed on a dividend paying basis. During 1899, the United Power & Transportation Company took over the local street railway lines at Lebanon and made several extensions and improvements. Mr. Smith is secretary of the Pennsylvania Street Railway Association. Mr. Smith has not yet made his plans for the future, but expects to remain in the electric railway field.

**Mr. L. B. Stillwell** has been nominated as president of the American Institute of Electrical Engineers, by a number of members of that association. In a circular, with 30 signatures, issued Jan. 22, the qualifications of Mr. Stillwell are given as follows: "As the time is approaching when the members of the American Institute of Electrical Engineers must cast their nomination ballots for the various offices to be filled, we, the undersigned, deem it an appropriate time to suggest that Mr. Lewis B. Stillwell, of New York, is eminently qualified for the office of president of the institute. As is well known, Mr. Stillwell's reputation as a consulting electrical engineer is of the highest type. He is responsible for much of the most important and progressive work done in this country in electric traction, steam and hydro-electric power generation in large plants, the standardization of practice and the industrial use of electric power on a large scale. Mr. Stillwell has been intimately associated with the Institute work, not only as a notable contributor of papers and discussions, but as manager, vice-president, member of the board of examiners, member of the committee on standardization, the committee of code of ethics, the international electrochemical commission and an active member of the building fund committee. At the solicitation of many of his friends Mr. Stillwell has consented to become a candidate for the presidency. We trust that you will be able to vote for his nomination and election and further will use your good offices with others with whom you come in contact."

**Mr. Ernest Gonzenbach,** vice-president and general manager of the Sheboygan Light, Power & Railway Company, Sheboygan, Wis., was elected president of the Northwestern Electrical Association at the annual convention of that body, held at the Hotel Pfister, Milwaukee, Wis., on Jan. 20 and 21, 1909. Although Mr. Gonzenbach's reputation has been largely made in the electric railway field, he has demonstrated since taking hold of the Sheboygan Light, Power & Railway Company, his ability also to handle electric lighting problems in a broad way, and is one of the few managers who combine well the ability and willingness to give attention to details of both railway and lighting work. Mr. Gonzenbach is Swiss by birth and education, but came to this country immediately after leaving school. After an electrical experience in power-house work in Chicago he completed the Thomson-Houston expert course at Lynn, Mass. In 1895, as electrical engineer in St. Johnsbury, Vt., he constructed several electric light and transmission plants in that vicinity. In 1898 he entered the employ of the Westinghouse Electric & Manufacturing Company, and in 1900 became electrical engineer of the Albany & Hudson Railroad, one of the early third-rail roads. Subsequently he accepted a similar position with the Aurora, Elgin & Chicago Railroad, then under construction. He has been at Sheboygan as general manager since Jan. 1, 1905. Mr. Gonzenbach has always taken an active interest in the affairs of the American Street Railway Association and its successor, the American Street & Interurban Railway Association, and at the meeting of the American Street & Interurban Railway Transportation & Traffic Association last October presented a paper entitled "How Can the Small Road Best Promote Traffic and Increase its Revenue?"

E. Gonzenbach

## OBITUARY

**Lucius T. Gibbs,** electrical engineer of the Baltimore & Ohio Railroad, Baltimore, Md., died on Jan. 22 at his home in Green Spring Valley, Pa., of pneumonia. Mr. Gibbs was born in New York in 1869. He served as an apprentice in the machine shop of the Otis Elevator Company and was assistant to the mechanical engineer of the Chicago, Milwaukee & St. Paul Railway. He was graduated at Cornell University in 1891, and afterward made electrical engineer of the Milwaukee Electric Railway & Light Company. He was also vice-president and chief engineer of the Gibbs Electric Company, Milwaukee.

# Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

## RECENT INCORPORATIONS

***Montana Rapid Transit Company, Wilmington, Del.**—This company has been incorporated in Delaware to construct and operate electric railways. Capital stock, $5,000,000.

**Waukegan, Rockford & Elgin Traction Company, Waukegan, Ill.**—Incorporated in Illinois to construct an electric railway from Waukegan to Woodstock, Marengo, Rockford, Belvidere, Elgin, Antioch and Milburn. Principal office, Waukegan. Capital stock, $1,500,000. Incorporators: Robert D. Wynn, Clair C. Edwards, John D. Pope, Fred Bairstow and Dr. John C. Foley, all of Waukegan. [E. R. J., Jan. 16, '09.]

***Missouri & Cameron Railway, Kansas City, Mo.**—This company has been chartered in Missouri to construct a road from the Missouri River in Platte County through Kirksville and Smithville to Lathrop, a distance of 35 miles. Capital stock, $350,000. Incorporators: William W. Lewis, Charles O. French, William A. Medill, Fred. M. Titus and N. S. G. Peabody, all of Kansas City.

***Traction Development Company, Elizabeth, N. J.**—This company has been incorporated in New Jersey for the purpose of securing franchises, rights of way and engineering plans for the Elizabeth & Amboy Traction Company, which proposes to operate an electric railway between Elizabeth and Perth Amboy. Capital stock, $100,000. Incorporators: Richard F. Pettigrew, Richard M. Montgomery, Dr. H. B. Hoagland, W. J. Lansley, C. A. Trimble and P. A. Peterson. Percival E. Jones, 27 Pine Street, New York, N. Y., general counsel.

***Cobourg, Port Hope & Havelock Electric Railway, Cobourg, Ont.**—Application has been made to the Ontario Legislature by G. H. A. Ward for a charter for this company to build a road connecting Port Hope and Cobourg, extending across the country to Warkworth and Campbellford, and on to Havelock, thus connecting the lake front towns with the Canadian Pacific Railway. A branch line will also be built from Cobourg to Gore's Landing.

## FRANCHISES

***Globe, Ariz.**—A petition has been presented to the Globe City Council asking that a franchise be granted to N. L. Amster for the building of a street railway in Globe.

**Wallace, Idaho.**—W. J. Hall, representing the Spokane-Wallace Electric Railway, has asked the City Council to re-enact the franchise granted the company two years ago and which was forfeited in January, 1908. The company plans to build an electric railway radiating from Wallace to Burke, Mulla, Kellogg and eventually to Spokane.

**Bloomington, Ill.**—The Bloomington & Normal Railway & Light Company has petitioned the City Council for a franchise to build a number of new lines in Bloomington. The Bloomington & Normal Company is owned and operated by the Illinois Traction System.

**Cedar Rapids, Ia.**—The Cedar Rapids & Marion City Railway has presented three ordinances to the City Council which will provide for the construction of a number of new lines in Cedar Rapids. The first ordinance presented gives the company the right to build a double track commencing at its present terminal at O Avenue and Seventh Street West, thence along Eighth Street West, through the Ellis addition as now platted to Ellis Park. There is a provision for a 15-minute service between the dates of May 15 and Oct. 15. The second ordinance gives the company authority to build a double track from the intersection of Second Street and Third Avenue West, along Third Avenue to a point 200 ft. west of the West line of North Fifteenth Street West, with a "Y" extending north into said North Fifteenth Street for a distance not to exceed 200 ft. The third ordinance gives the company authority to make several extensions and improvements of its existing lines.

**Cherokee, Kan.**—The Joplin & Pittsburg Electric Railway has been granted a franchise by the City Council of Cherokee for the construction of its line into that town. The franchise calls for the completion of the road from Weir Junction into Cherokee, a distance of 5 miles, inside of six months.

**Bangor, Maine.**—An offer has been made to the City Council whereby the Bangor Railway & Electric Company, in exchange for a 50-years' extension of franchise, agrees to build two steel spans in the Bangor-Brewer bridge and to put the piers and abutments in proper condition, also to transport free all gravel and other material used on the city streets.

**St. Louis, Mo.**—The St. Louis, Creve Cœur & Western Railway, Clayton, Mo., has been granted a 50-year franchise by the County Court. The road will run from the city limits at Etzel Avenue to Creve Cœur Lake. It will run over a private right-of-way to Studt's Park. The stockholders of the St. Louis, Fern Ridge & Western Railway, which obtained a franchise over the same route three years ago, filed a statement waiving all further right to the franchise. [E. R. J., Jan. 23, '09.]

**Springfield, Mo.**—A bill has been introduced in the City Council granting the Springfield Traction Company a franchise to extend its line to the State Normal school.

**Great Falls, Mont.**—The City Council has adopted the proposed franchise to G. Calvin Bower and associates for the construction and operation of an electric railway into and through the city of Great Falls and has called a special election for Feb. 15 at which time it will be submitted to the freeholders of the city. [E. R. J., Aug. 29, '08.]

**Camden, N. J.**—An ordinance will be introduced in the Camden City Council on Jan. 28, granting the Camden & Delaware Tunnel Company a franchise for the construction of its tunnel under the Delaware River, extending from Philadelphia to Camden.

**Morristown, N. J.**—The Morris County Traction Company has been granted an extension of time of one year in which to complete the new line between Milburn and Maplewood. The company has cars in operation on a single track between the two towns.

**Brooklyn, N. Y.**—The Board of Estimate & Apportionment has granted the Brooklyn Heights Railroad a franchise to build a street railway on Livonia Avenue.

**Elmira, N. Y.**—The Ashland Town Board and the Wellsburg Valley Board have granted the Elmira, Corning & Waverly Traction Company a 60-year franchise for the construction of its line through these towns. In return for the franchises the company agrees to rebuild and maintain the Narrows highway east of Wellsburg. The village and town concede the 25-cent fare for round trip from Wellsburg to Elmira, with one transfer on the round-trip ticket or two transfers if the 15-cent one-way fare is paid by the passenger. It is also agreed that the road shall be completed and in operation not later than Dec. 1, 1909. The company has only about 3½ miles of track to lay in order to open the road to traffic.

**Forestville, N. Y.**—The Buffalo & Lake Erie Traction Company has applied to the Town Council for a franchise to build a street railway in Forestville. It is stated that the company is formulating plans for the construction of an extension between Silver Creek and Forestville.

**Salisbury, N. C.**—The Rowan County Commissioners have granted the Piedmont-Carolina Railway a franchise for the building of an electric railway from Salisbury to China Grove and Landis, 9 miles south of Salisbury, and to Spencer, also to the Yadkin Valley fair grounds, 2 miles north. Work has already been begun on the road. [E. R. J., Aug. 29, '08.]

***Eugene, Ore.**—Application has been made to the County Court by George M. Miller, J. W. Zimmerman, Charles H. Fisher and Fred Fisk, all of Eugene, for a franchise to construct and operate an electric railway between Eugene and Florence.

**Waynesburg, Pa.**—F. P. Marr, representing the West Penn Railways, has applied to the City Council for a franchise for the company to construct a line over certain streets of the borough.

***Temple, Tex.**—Max Elser, New York, N. Y., has filed an application with the City Council for a franchise to construct and operate a street railway in Temple. The franchise is to extend for a period of 30 years.

**Bellingham, Wash.**—The City Council has granted A. J. Craven and J. W. Welch, representing the Nooksack Valley Traction Company, a 30-year franchise for the construction and operation of an electric railway in Bellingham. [E. R. J., Nov. 21, '08.]

**Cle Elum, Wash.**—The City Council of Cle Elum has granted Frank S. Farquhar, Tacoma, a franchise for a period of 30 years to operate an electric railroad within the limits of Cle Elum. The name of the company that will operate the line is the Cle Elum-Roslyn Electric Railway & Power Company. The electric road is proposed to connect with the Milwaukee Railroad at South Cle Elum, and will enter Cle Elum on Oakes Avenue; a steel bridge will be erected at that point across the Yakima River and connect South Cle Elum and Cle Elum. The road will cover the principal streets of Cle Elum and leave the city

from First Street and follow the county road to Roslyn and operate on the streets of Roslyn and leaving the city on the north, following the county road to Ronald, and Jonesville, and then on up to the head of Cle Elum Lake, a distance of 10 miles from Roslyn. [E. R. J., Dec. 26, '08.]

## TRACK AND ROADWAY

**Sheffield (Ala.) Company.**—Announcement is made that this company has a plan under consideration for the extension of its railway system to the Florence University, in East Florence, a distance of about 2 miles north of Florence.

***Yellville, Ark.**—It is stated that the Commercial Club of Yellville is interested in the construction of a street railway from the city square to the depot. A committee consisting of W. E. Layton, S. W. Woods and A. W. Estes has been appointed to draft an ordinance to be presented to the City Council for passage.

**Carlyle & St. Louis Electric Railroad, Carlyle, Ill.**—Announcement is made that the directors of this company have decided to start at once the work of obtaining the right-of-way for the electric railway which is to extend from Carlyle to Lebanon and through the cities of Beckemeyer, Breese, Aviston, Trenton and Summerfield. Surveys have already been made and the franchises secured in all the towns through which the road will pass. [S. R. J., Oct. 19, '07.]

**Du Page Railroad, Naperville, Ill.**—It is stated that this company expects to build during this year an electric railway from Wheaton to Naperville and Plainfield. Capital stock, $25,000. Officers: Asa M. Royce, president; Alvin Scott, vice-president; W. F. Keeney, secretary and treasurer, all of Naperville.

**Murphysboro (Ill.) Street Railway.**—This company announces that it will award contracts during the next two months for the construction of three-quarters of a mile of new track.

**Woodstock & Sycamore Traction Company, Woodstock, Ill.**—This company which is building an electric railway between the cities named in the title, has filed a trust deed in favor of the Metropolitan Trust & Savings Bank, Chicago, in compliance with a resolution adopted at a recent meeting authorizing a loan of $700,000 with which to complete the road. Charles A. Spenny, 1210 Tacoma Building, Chicago, secretary. [S. R. J., April 25, '08.]

**Evansville, Suburban & Newburg Railway, Evansville, Ind.**—At a meeting of people interested in the extension of this company's lines from Boonville through Lynnville to Oakland City, a committee was appointed to consult with the company. It is stated that Hart Township will vote a subsidy in order to have the line extended to that territory.

**Burlington-Bonaparte Interurban Railway, Burlington, Ia.**—E. E. Egan writes that plans are under way for the financing of this proposed interurban railway. It will connect Burlington, Augusta, Denmark and Ft. Madison. J. A. Johnson, Bonaparte, president; J. Bland, Burlington, vice-president; E. E. Egan, Burlington, secretary and treasurer. [S. R. J., June 29, '07.]

**Des Moines, Winterset & Creston Electric Railway, Des Moines, Ia.**—L. H. Hixson writes that this company will commence work during this year on its proposed electric road, which is to extend from Des Moines to Winterset, Macksburg and Creston, Ia. It will be 60 miles in length. The company expects to furnish power for lighting. Headquarters, Iowa Loan & Trust Building, Des Moines. Officers: W. D. Skinner, Des Moines, president; E. B. Steere, Des Moines, vice-president; Milo Ward, Des Moines, secretary; S. D. Alexander, Winterset, treasurer; L. H. Hixson, Des Moines, general manager.

**Kentucky Central Traction Railroad, Louisville, Ky.**—G. J. Lampton, Louisville, president and general manager of this company, writes that it has not yet been decided when contracts will be let for the construction of this 40-mile electric road, which is to connect West Point, Elizabethtown, Howard, Vine Grove and Hogdonville. Capital stock authorized, $500,000.

**New Orleans Railway & Light Company, New Orleans, La.**—This company has begun the construction of a new line to be known as the Orleans railway extension. It will consist of 1½ miles of double track on Broad Street from Laherpe Avenue to St. Bernard Avenue, and on St. Bernard Avenue from Broad Street to Villere Street, laid with 80-lb. T-rail. The Orleans Railroad, one of the subsidiary companies of the New Orleans Railway & Light Company, is the owner of the franchise, and the work will be done by the New Orleans Railway & Light Company.

**Twin City General Electric Company, Ironwood, Mich.**—This company will shortly place contracts for material to be used in the construction of a 7-mile extension from Ironwood to Bessemer, Mich.

**Gulfport & Mississippi Coast Traction Company, Gulfport, Miss.**—This company expects to place contracts during the next three weeks for the construction of 5.7 miles of track and for the necessary overhead material.

**Kansas City & Olathe Electric Railway, Kansas City, Mo.**—This company which operates an interurban line from Rosedale to Merriam and Shawnee, has begun the work of grading on another mile of the road west of Shawnee.

**Kansas City & Southeastern Traction Company, Kansas City, Mo.**—This company is reported to have completed the final survey for the proposed electric road between Kansas City and Lone Jack. It is one of the several divisions to be built which will result in a through line from Kansas City to Jefferson City, with two or three branch lines. The main line will pass through Kansas City through Leeds, Raytown, Little Blue, Lee's Summit, Lone Jack, Warrensburg and Sedalia to Jefferson City, 125 miles. There will be a branch line 15 miles long from Lee's Summit to Greenwood, Pleasant Hill and Harrisonville. Another branch will run from Pittsville through Holden, 24 miles to Clinton. The proposed system has been divided. The first division includes the line from Kansas City to Lone Jack, 30 miles. This is to be built first. In this division are the branch lines from Lee's Summit to Harrisonville, and the one from Pittsville to Clinton. The second division includes that part of the line from Lone Jack to Warrensburg, 24 miles. The third division is from Warrensburg to Sedalia, 30 miles, and the fourth division from Sedalia to Jefferson City, 60 miles. It is said that the project has been financed. Officers: Charles A. Sims, president; C. G. Minturn, secretary; B. F. Shouse, treasurer; J. C. Herring, chief engineer. [E. R. J., Oct. 3, '08.]

**Mexico, Santa Fe & Perry Traction Company, Mexico, Mo.**—This company, which plans to construct a 25-mile electric railway to connect Mexico and Perry, is understood to be desirous of arranging with an engineering and contracting firm for the completion of its project. R. E. Race, auditor.

**Missoula & Bitter Root Traction Company, Hamilton, Mont.**—E. O. Lewis advises that construction will be started this summer on the electric railway projected by this company between Missoula, Florence, Stevensville, Corvallis and Hamilton, a distance of 42 miles. Capital stock authorized, $20,000; issued, $10,000. Officers: J. L. Humble, Corvallis, president; D. R. Beck, Missoula, vice-president; E. O. Lewis, Stevensville, secretary and treasurer. [S. R. J., Jan. 4, '08.]

**Hornell, Bath & Lake Keuka Railway, Hornell, N. Y.**—The Court of Appeals has handed down a decision permitting this company to have a rehearing before the Public Service Commission, of the Second District, on its application for authority to construct an electric railway from Hornell to Bath, a distance of 46 miles.

**Syracuse (N. Y.) Rapid Transit Railway.**—It is reported that this company will build a new line through Green Street and Robinson Street and Shuart Avenue. It is said that the company has set aside the sum of $160,000 for this improvement.

**Swananoa Valley Company, Asheville, N. C.**—J. M. Chiles writes that arrangements have been made whereby this company will shortly place a proposition before some capitalists for the financing of an electric road which is to be constructed between Biltmore and Montreat. It is expected that construction will be started this spring. Officers: F. T. Merriwether, president; W. R. Whitson, vice-president; J. M. Chiles, secretary and treasurer, all of Asheville, N. C. [S. R. J., Dec. 5, '08.]

**Oberlin & Lorain Railway, Oberlin, Ohio.**—The Electric Railway Journal is advised that it is the plan of this company to begin the costruction this year of a gasoline motor operated line between Oberlin, North Amherst, South Amherst and Lorain. Office, 7 South Main Street, Oberlin. Officers: W. F. Stanley, Conneaut, Ohio, president; C. R. Summers, Oberlin, secretary; George C. W. Westervelt, Oberlin, treasurer.

**Wooster & Mansfield Electric Railway, Mansfield, Ohio.**—David Collier writes that this company contemplates the construction of an electric road, 41.5 miles in length, connecting Wooster, Shreve, Big Prairie, Lakeville, Londonville, Perrysville, Lucas and Mansfield. Catenary construction will be used. The power plant will be erected at Londonville. The company expects to furnish power for lighting. Odell's Lake, an amusement resort, will be reached by the road. Capital stock authorized, $30,000; issued, $10,000. Bonds authorized, $1,000,000. Officers: B. L. Chase, Mansfield, president; David Collier, Plimpton,

vice-president and general manager; D. M. Graven, Londonville, secretary; Charles Brumfield, Mansfield, treasurer.

**Central Crawford Traction Company, Blooming Valley, Pa.**—Announcement is made that this company is planning to begin the construction of its proposed electric road this spring. It will be about 28 miles in length, connecting Meadville and Titusville. Officers: Dennis Smith, Guy Mills, Pa., president; Henry Dewey, Blooming Valley, Pa., vice-president; J. W. Heard, Blooming Valley, secretary and treasurer. [S. R. J., Jan. 25, '08.]

**Easton & South Bethlehem Transit Company, Easton, Pa.**—Gov. Stuart has approved of the extension of this road from Lower Saucon Township to Northumberland Heights, part of the new line being over the tracks of the Lehigh Valley Transit Company on Fourth Street, Northampton Heights from Bessemer Street to Anthracite Street. The new line will be 6493 ft. long. The Lehigh Valley Transit Company has consented to the use of this portion of its system, subject to all reservations in agreement made Dec. 12, 1908.

**New Castle & Beaver Falls Street Railway, Beaver Falls, Pa.**—Jordan Johnston, one of the promoters of this proposed electric railway, states that construction will be started this spring. Nearly all of the right of way has been secured. The road will be 22 miles in length, extending from Beaver Falls to Kopple, Wampum, West Pittsburg and New Castle. It will also reach Rock Point, Cascade and Morado Parks. C. Strohecker, Zelienople, general manager. Headquarters, Suite 410, Magee Building, Pittsburg, Pa. [E. R. J., Dec. 5, '08.]

**Philadelphia & Garrettford Street Railway, Philadelphia, Pa.**—This company, which is a subsidiary company of the Philadelphia & West Chester Traction Company, has filed an extension of its chartered route, with the Secretary of State, connecting the borough of Lansdowne with the present tracks leading to the Sixty-ninth Street terminal station and the Market Street elevated line of the Philadelphia Rapid Transit Company.

**Bryan, Tex.**—Hon. W. C. Davis, Brazos, has introduced a measure in the Texas legislature to provide for the construction of an electric railway by the State between Bryan and the State College near that city. [E. R. J., Sept. 26, '08.]

**Rutland Railway, Light & Power Company, Rutland, Vt.**—This company is in the market for 5000 6-in. x 6-in. 8-ft. oak ties.

**Milwaukee Electric Railway & Light Company, Milwaukee, Wis.**—The Wisconsin Railroad Commission has given this company a certificate of necessity and convenience, authorizing the proposed north extension of the line from Wauwatosa to Oconomowoc, via Elm Grove and the northern shores of the Oconomowoc lakes. It is stated that the construction of the line will be commenced next summer. The road will pass through Elm Grove, Brookfield, Duplainville, Pewaukee, Hartland, Nashotah, Nagowicka, Giffords and thence to the city of Oconomowoc.

### SHOPS AND BUILDINGS

**Terre Haute, Indianapolis Eastern Traction Company, Richmond, Ind.**—This company announces that it has selected a site in the north part of Richmond and plans are being made for the construction of a modern freight depot.

**Gulfport & Mississippi Coast Traction Company, Gulfport, Miss.**—This company will soon award contracts for the erection of a small car house, in which will also be located an office and transformer station. The company will also build a new battery house.

**Rutland Railway, Light & Power Company, Rutland, Vt.**—This company announces that it will purchase woodworking machinery within the next few weeks.

### POWER HOUSES AND SUBSTATIONS

**Twin City Electric Company, Ironwood, Mich.**—Announcement is made that this company will repair its transmission line and install new machinery in its power plant. A contract will be placed during the next 30 days for one 150-kw, 2300-600 volt, three-phase generator, also one 200-hp, 500-volt a.c. to d.c. motor generator.

**Warren (Pa.) Street Railway.**—This company has recently awarded a contract for one 730-hp horizontal, double-acting Westinghouse gas engine, direct connected to a 500-kw a.c. Westinghouse generator.

**Parkersburg, Marietta & Interurban Railway, Parkersburg, W. Va.**—Announcement is made that this company will build a small power plant between Parkersburg and Marietta on the Ohio side of the Ohio River to take care of increasing business.

# Manufactures & Supplies

### ROLLING STOCK

**Cheyenne (Wyo.) Street Railway** has purchased one double-truck car from Arthur S. Partridge, St. Louis, Mo.

**Galveston Electric Company, Galveston, Tex.**, may be in the market for new equipment in 1909, although no definite plans have been formulated as yet.

**Albany & Hudson Railroad Company, Hudson, N. Y.**, is in the market for nine interurban cars. Specifications will be furnished by R. H. Smith, general manager.

**Edmonton Radial Railway, Edmonton, Alberta, Can.**, has ordered one double-truck snow sweeper from the McGuire-Cummings Manufacturing Company, Chicago.

**Southwestern Wisconsin Railway, Madison, Wis.**, will soon order one sample car for early delivery, and will later purchase several additional cars built on the specifications made for the sample car.

**Ohio & Michigan Southern Railroad, Chicago, Ill.**, is planning to purchase electric cars early in the spring. Curtis W. Steudel, Chicago, Ill., is superintendent of construction of this new road.

**Illinois Traction System** will purchase 20 or 25 cars for operation on its line entering the St. Louis terminal and on the bridge which is being built by the company over the Mississippi River at St. Louis.

**Stone & Webster Engineering Corporation, Boston, Mass.**, is drawing specifications for 50 new cars to be used on the various traction lines which the corporation controls. These cars will be of various types, suited to the needs of the different lines.

**Geneva, Waterloo, Seneca Falls & Cayuga Lake Traction Company, Seneca Falls, N. Y.**, is drawing specifications for four double-truck and four single-truck cars. Bids will be asked for these within a few weeks. The general manager of the line is W. C. Gray, Seneca Falls, N. Y.

**Omaha & Council Bluffs Street Railway, Omaha, Neb.**, is preparing specifications for 25 large cars, which will be constructed in the company's shops. This is following out the announced policy, referred to in the ELECTRIC RAILWAY JOURNAL of Nov. 21, 1908, of building 25 cars annually.

**Aurora, Elgin & Chicago Railway, Chicago, Ill.**, will receive early in February 25 trucks built by the Pullman Company. This order was noted in the ELECTRIC RAILWAY JOURNAL Sept. 19, 1908. The center plates for these trucks will be the T. H. Symington Company ball-bearing type.

**Buffalo, Lockport & Rochester Railway, Buffalo, N. Y.**, which was referred to in the ELECTRIC RAILWAY JOURNAL as being in the market for cars, has ordered 15 cars from the Cincinnati Car Company for interurban service. The cars will be equipped with Baldwin trucks and Westinghouse air brakes.

**Buffalo Southern Railway Company, Gardensville, N. Y.**, a line that reaches Erie County Fair Grounds and Lein's Park, Buffalo, will soon be in the market for eight open cars of large size. It is said that the specifications for these cars have been prepared, but the company has not yet asked for bids.

**Rochester (N. Y.) Railway** will close within a few days the contract for the four interurban cars which were referred to in the ELECTRIC RAILWAY JOURNAL of Jan. 16, 1909, and also a contract for 25 city cars, specifications for which were issued last week. The city cars will be built with the pay-as-you-enter platforms.

**Illinois Traction System, Champaign, Ill.**, is rebuilding all of its drop platform through service cars by extending the car floors and sills and raising their platforms so that the vertical plane type of couplers may be used. The bumpers of the cars will be built out to a radius of 4 ft. 10 in. to accommodate the installation of radial draw bars. End doors will be provided on all of the passenger cars to facilitate train operation. The cars that are being rebuilt include 10 passenger, 10 motor express and 6 trail express cars.

**Chicago Railways Company, Chicago, Ill.**, has received from the Pullman Company 250 of the original order of 600 cars. The work of building the remaining 350 cars is progressing rapidly, and delivery will be made as fast as possible. It is reported that the railway company's engineers are working out the details of specifications under which an additional 550 cars will be built, though, it is said, the order for these equipments will not be placed until the 50 steel cars, which are being built by the Pressed Steel Car Company, are received and tried out.

## TRADE NOTES

**G. A. Dentzell, Philadelphia, Pa.,** a pioneer manufacturer of carousels and other amusement devices, died at his home in Philadelphia on Jan. 21.

**Col. Giles S. Allison, New York, N. Y.,** has recently secured the sales agency for Dossert & Company, New York, who manufacture the well-known Dossert cable joints, taps and specialties.

**Henry F. Kellogg,** who for many years was connected with the railway department of the Frank Ridlon Company, Boston, Mass., died on Jan. 16. Mr. Kellogg was well known among the railway and supply men in the East.

**Bureau of Manufactures, Washington, D. C.,** has received an inquiry from a Latin-American city concerning the electrification of its horse-car lines. Information concerning this application will be furnished on application to the bureau.

**Buda Foundry & Manufacturing Company, Chicago, Ill.,** announces that F. E. Place, formerly general superintendent of the company, has been appointed general manager, and will have charge of the selling and manufacturing departments.

**American Bridge Company, New York, N. Y.,** announces the removal of its New Orleans office from the Hennen Building to the Maison Blanche Building on Feb. 1. The general offices of the company in New York are in the Hudson Terminal Building, 30 Church Street.

**American Specialty Company, Chicago, Ill.**—A paragraph in the Electric Railway Journal for Jan. 16 erroneously announced that Warren Webster & Company, of Camden, N. J., had taken over the business of the American Supply Company, Chicago. The company taken over was the American Engineering Specialty Company.

**Dossert & Company, New York City,** report the receipt of orders from the Chicago City Railway Company for 200 solderless connectors for 1,000,000 circ. mil feeder cable, also cable taps for the Winona Railway & Light Company, Winona, Minn., and Dossert feed-in taps for overhead trolley lines from the City Railway Company of Jackson, Miss.

**Cherry River Boom & Lumber Company, Richwood, W. Va.,** advises that it furnished 4000 Cherry River poles to the Pittsburg, Harmony, Butler & New Castle Railway. A description of this road was given in the Electric Railway Journal of Jan. 16. Some of these poles are shown in the illustrations published in connection with the article referred to.

**Mathias Klein & Sons, Chicago, Ill.,** have shown at the Chicago Electrical Show during the past two weeks a full line of Klein products for electric transmission line and railway construction and maintenance work, as well as tools of general utility for the use of electric light and electric railway men. This company claims to be the pioneer manufacturer of this class of tools.

**United States Brake Shoe Company, Corry, Pa.,** has applied for a charter in Pennsylvania. The new company has a capital of $100,000 and will manufacture brake shoes for steam and electric railway cars. The officers are Louis Strueber, Erie, Pa., president; J. F. Austin, Corry, Pa., secretary and treasurer; J. J. Ressler, Corry, Pa., general manager. The company's plant will be erected either in Corry or Erie, Pa.

**Dearborn Drug & Chemical Company, Chicago, Ill.,** announces that Edward C. Brown, manager of its Hawaiian office, 42 Queen Street, Honolulu, is making an extensive Oriental trip of three or four months, during which he will visit Japan, the important sea coast cities of China, Australia, the Philippines, Java and other important islands in the Pacific Ocean. Mr. Brown has successfully handled the Dearborn company's business in the Hawaiian Islands since that department was opened, some 10 years ago.

**Sherwin-Williams Company, Cleveland, Ohio.**—At a recent meeting of the directors of this company William H. Cottingham was elected president, succeeding H. A. Sherwin, who remains with the company in the capacity of chairman of the board of directors. Mr. Cottingham has been actively associated with the Sherwin-Williams Company for 20 years. For a time he had charge of the Canadian branch, but for the past 10 years he has been general manager, with headquarters at Cleveland. Mr. Cottingham is the author of a well-known book for the information and instruction of salesmen. At present he is in Europe on business for the company.

**Wagner Electric Manufacturing Company, St. Louis, Mo.,** has opened a sales office in the Trust Building, Charlotte, N. C., to assist in caring for its rapidly growing Southern business. The Wagner Company's other office in the South is in Atlanta, Ga. The factory and main office, as is well known, are in St. Louis. E. W. Goldschmidt, New York manager of the company, and formerly of Chicago, sailed from Antwerp on Jan. 16 for the United States, after a four months' vacation. Mr. Goldschmidt, after spending about two months in Southern Italy, toured the Continent by automobile. Fortunately, he left Italy before the recent earthquake.

**Massachusetts Chemical Company, Walpole, Mass.,** announces that Frederick J. Gleason, vice-president and general superintendent of the company, which owns and operates the Walpole Rubber Works, has made an important invention in the rubber goods line. Patent No. 910,307, issued Jan. 19 to Mr. Gleason, reveals this process, which is the forming of hollow rubber goods having a fixed mechanical strength over a core which fuses at the temperature at which rubber vulcanizes. By Mr. Gleason's method, automobile tires, hot-water bottles, etc., may now be formed to any desired thickness and strength over a solid core, and subjected to any pressure, and after vulcanizing the core is removed in the form of liquid metal.

**H. A. Goode,** secretary, Hudson & Bowring Company, Ltd., Manchester, England, who is on another visit to this country, reports that notwithstanding the business depression, and the fact that the output of cars was quite small in all the car building works in England, his company had the best year in its history. A large number of foreign orders were filled, indicating that there is a demand for the H-B wheel guard all over the world. While in this country, Mr. Goode will make his headquarters at the offices of Wonham & Magor, 29 Broadway, New York City, who have the American rights for the manufacture and sale of the H-B wheel guard. A description of the wheel guard appeared in the Electric Railway Journal of Dec. 26, 1908.

## ADVERTISING LITERATURE

**Railway Equipment Company, Portland, Oregon.**—This company is sending a large business calendar to the trade.

**The Deming Company, Salem, Ohio.**—A new catalog of spray pumps and appliances made by this company is ready for distribution.

**Blake Signal & Manufacturing Company, 246 Summer Street, Boston, Mass.**—This company has just issued a new folder devoted to soldering flux, and quoting a new scale of prices which went into effect Jan. 15, 1909.

**Pacific Electric Heating Company, Ontario, Cal.**—The January number of this company's monthly bulletin *Hot Points,* explains the advantages of electric flatirons at home and in the tailoring shop.

**The Nichols-Lintern Company, Cleveland, Ohio.**—The company has issued a catalog which describes its pneumatic sanding devices and gives instructions for using them. An insert describes the Jewett anti-telescoping cast steel drawhead and bumper plate.

**National Tube Company, Pittsburg, Pa.**—A new illustrated catalog of this company describes the processes of making Shelby hot- and cold-drawn seamless steel tubes. A feature of this catalog is a list of over 700 uses to which the product described has been put in manufactures.

**Crane Company, Chicago, Ill.**—*Valve World* for December, which is issued by this company, contains a number of articles on modern foundry processes. The concluding article by R. Crane, on "Some Fallacies of Education," is devoted to a discussion of agricultural colleges and experimental stations.

**Keystone Lubricating Company, Philadelphia, Pa.**—"Grease Versus Oil" is the title of a booklet by this company containing instructive comparisons of the efficiency of two types of lubricants, with particular reference to Keystone grease. An account is given of some tests made of this product by William Cramp & Sons, Philadelphia.

**The Pettingell-Andrews Company, Boston, Mass.**—The February issue of this company's house organ, *Juice,* describes the new D. & W. service switches and boxes, boulevard and parkway lighting fixtures, Wheeler tungsten lamp fixtures, the tungstometer for measuring the output of tungsten lamps, the "O. K." ground clamp and Sprague steel outlet boxes.

**The J. G. Brill Company, Philadelphia, Pa.**—*Brill's Magazine* for January contains the first of a series of articles on conditions governing the type of car for city service, Philadelphia being the first city chosen. Other articles in this issue describe cars of the East St. Louis & Suburban Railway; several variations of the company's semi-convertible window system as applied on cars for the New York City Interborough Railway Company and for the Gulfport & Mississippi Coast Traction Company; interurban cars for the Houghton County Traction Company, and steam cars of several types for the Eastern British Columbia Railway.