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Changes of advertising copy should reach this office by 10 a. m. Monday preceding the date of publication, except the first issue of the month, for which changes of copy should be received two weeks prior to publication date. New advertisements for any issue will be accepted up to noon of Tuesday for the paper dated the following Saturday.

Of this issue of the Street Railway Journal 8000 copies are printed. Total circulation for 1905, to date, 82,950 copies—an average of 8295 copies per week.

The Strike on the New York Elevated and Subway

As this paper goes to press the trains on the New York Elevated Railway are passing regularly by this office, and while the service on both the elevated and subway has not yet reached its regular proportions, the Interborough Rapid Transit Company has amply demonstrated its ability to handle both divisions with absolutely no assistance from its striking employees. The strike, which began at 4 a. m. on March 7, will go down in the history of other miserable affairs of its kind as one of the most absurd and unreasonably which has ever been called. The motormen were receiving wages very much larger than those paid on any other electric railway system in the world, while the conditions of operation, both on the elevated and in the subway, owing to the perfectly clear track on which the cars run, are much easier than on the average surface railway.

Moreover, the men were under a signed contract with the management which bound them not to strike before September, 1906. During the first day of the strike the New York traveling public was put to some inconvenience, but as soon as the strike was announced the offices of the company were besieged with applicants for positions, and before it was twelve hours old the nominal presidents of the unions involved were busy explaining that they had not been consulted about the strike and that it had been instituted, against their advice, by some local leaders. We consider that the managers of the Interborough Rapid Transit Company have performed a great service, both to the city of New York and to the electric railway industry as a whole, in refusing to put the control of their road into the hands of their ex-employees and in denying their absurd demands. That the correctness of their position in this matter is recognized by the public at large is indicated by the hearty support which they are receiving from the daily press.

Street Railway Parks and Amusements for Them

It is at this time of the year, while the snow is still on the ground, that most street railway companies take up the subject of parks. The park season begins in earnest in the Northern latitudes about the middle of June, and three months are by no means too long a time to make preparations for it. It was not many years ago that the American Street Railway Association was gravely debating whether street railway parks paid. Hesitation about engaging in this class of business has largely disappeared, and it is the exception now to find a street railway company which does not own at least one pleasure resort on its line.

No set rule can be laid down as to the most desirable way of conducting a street railway park; in some instances, where the parks are naturally attractive, little is needed in the way of artificial stimulants to travel during the heated season. But such instances are the exception and not the rule, especially where the patronage to the park must come principally from persons who are employed during the day time. While it is usually desirable to retain many of the rustic features of a naturally attractive pleasure resort, dense woods are not suitable for evening entertainments, and most companies agree that artificial forms of amusements are not only more popular but more profitable. For this reason we devote considerable space in this issue to describing a number of the attractions—many of them new this year—which are suitable for street railway parks. A great deal of ingenuity has been devoted to the subject of attractions during the past four or five years, and there has been almost as complete a revolution in the art of providing people with cheap amusements and in attracting their money as was involved in the change from animal to electric power in street railway transportation. It is true that many of the old-time attractions are as popular now as ever. The carousel, or "merry-go-round," with the small number of attendants required and the large number of patrons which it can accom-

moderate, is as good a money earner as when the readers of this paper rode upon the horses, although modern improvements have greatly changed its outward appearance. But other forms of amusement to win the nimble nickel or dime have come into general use and offer strong competition to the earlier forms which were popular twenty or more years ago. To certain companies a summer theater will appeal with special emphasis, and some very profitable entertainments of this kind have been provided. As a rule, however, these theaters are possible only in the neighborhood of large cities, as the expense of providing the entertainments is considerable, while the minor attractions, to which the greater part of the park article in this issue is devoted, are possible in either large or small resorts.

Passes to Power Plants

The practice of street railways in issuing passes to visitors wishing to inspect power plants or other company property varies widely in different localities. In some cases no official permission is required, while in many others the matter of giving a pass is simply a meaningless form. Large city roads are generally more particular as to the responsibility of visitors upon their premises, while the smaller systems are seldom as strict when it comes to the point of denying an unauthorized person admission to the power house or the sub-station. While local conditions must ultimately determine the amount of latitude a company can reasonably allow, there is little doubt that the safest course from the standpoints of possible damage claims in case of accident and the possibility of harm being done to the equipment by evilly disposed persons is to require each person admitted to a plant to sign a printed statement agreeing to abstain from interfering with the apparatus and to absolve the company from all blame in case anything happens to injure him. In the case of a party, the printed slip should require but a single signature covering all the visitors present.

Probably the simplest and best method of issuing passes is to supply them from a pad or book, leaving a numbered stub as each pass is torn out. Such a book saves a great deal of time and trouble, compared with the plan of keeping numbered tickets in various places, or issuing specially dictated letters as the need arises. As soon as the official concerned—manager, superintendent, engineer or chief clerk—has decided that the would-be visitor may be given the freedom of the premises, it ought to be a simple matter to supply him with the proper credentials. The pass question would scarcely be an important one, as far as the delivery of the permit is concerned, if it were not for the loss of time incurred in the dictation, typewriting and copying of letter passes—a proceeding which costs money if repeated many times during the year. Sometimes it takes ten or fifteen minutes to prepare such a document, when, if a numbered series were used, a couple of minutes at the outside would suffice. Passes should be signed or countersigned in ink by the official responsible, in order that the whole transaction may be carried out on a business basis.

In very small towns where everybody knows everybody else, it may seem like going to needless trouble to require visitors to present passes at plants, but in case of trouble at the stations a signed statement freeing the company from responsibility is a first-class asset to hold. Since it is really a favor on the part of a company to allow visitors on its premises, there can be no reasonable objection on the part of such persons to assuming the responsibility of personal safety during the time they are upon the company's precincts. When the rules of the company

require the use of passes, the permits should always be taken up or "lifted," as the saying is in Pullman circles, and returned to the office at once. Otherwise the whole scheme becomes a farce.

How to Secure Good Foremen

A great deal has been said and written on the subject of the relations between the street railway manager and the men, but in an address made by Mr. Vreeland last week at an open meeting in Boston of the welfare department of the National Civic Federation, a point was emphasized which is very often overlooked in questions of this kind. On a small system, the street railway manager knows all of his men individually, they work largely under his direction and his personality enters largely into his relations with the men. On a large system, however, a different condition of affairs prevails. A great deal of the supervision and discipline must necessarily be left in the hands of foremen of the different divisions, who, as Mr. Vreeland points out, are usually selected for their ability to show good financial results from operation rather than that of handling men. No matter how fair-minded the presiding officer of a company may be, his influence may be entirely counteracted, without his knowledge, through lack of judgment on the part of one or all of the division superintendents. It is a characteristic of some men who have been given a little brief authority, to exercise it to as great an extent as possible, and these men, by domineering conduct or rules which do no real good, are often responsible for a great deal of mischief. The causes are often too small to create attention at the main office until there is such great dissatisfaction as to result in open revolt. When matters have gone so far, the complaints by the men usually take a shape entirely foreign to the real cause of the trouble. There can be no doubt that in a great many cases the principal causes of strikes are not those on which emphasis is finally laid, but that they are the result of a series of small matters, with a feeling on the part of the men that there is no means of redress available.

Mr. Vreeland has demonstrated his great ability in the handling of men, and as chairman of the welfare department of the National Civic Federation his discussion on the subject of foremen is of the greatest interest. Although addressed primarily to manufacturers and employers of labor in industrial establishments, his remarks have a peculiar bearing upon railway work and, coupled with the description, which is also published in this issue, of his method of requiring reports from all foremen of divisions as to changes in the operating force during the previous month, will prove of the greatest value.

The present century is essentially one of large aggregations of capital in transportation and other enterprises. Each has its army of thousands and, in some cases, of tens of thousands of employees, including men representing every phase of intellectual and physical energy, and often of every class of scientific and technical knowledge. The problem of how to direct the energies of the operating force in any one of our large industrial or railway organizations so as to secure the maximum degree of benefit to the company and insure justice and fair treatment to the employee, is one which demands the highest degree of executive skill. The men employed on one large railway system often exceed in number those in many an army, but the task of directing their energies is much greater than in a military force, because the freedom of the individual must be retained, and because there is no ability to compel action. It is to aid in the solution of this problem that

the National Civic Federation was formed, and Mr. Vreeland's address discusses a topic which affects the question in a most vital way.

Some Continental Tests

The first practical data from a road using single-phase commutating motors have recently been given respecting the Stubai Valley road running up into the mountains from Innsbruck, and described in the *STREET RAILWAY JOURNAL* for Nov. 26, 1904. This line has been in operation, apparently with good success, since the first of last August. It is a light mountain road, a dozen miles long, with an average grade for half its length of more than 200 ft. to the mile. It is equipped with Winter-Eichberg motors, four of 40-hp each on each motor car, taking 2500-volt current at 42 cycles from a trolley wire, which is in turn fed by a 10,000-volt transmission line. Each motor car usually draws two trailers, and the average speed is about 15 m.p.h. The energy required, on the basis of four months of wattmeter readings, was 70 watt-hours per ton per kilometer at the car, while the actual power required at the wheels was computed from various experiments as 48 watt-hours per ton-kilometer, giving thus an efficiency for the car equipment of about 68 per cent. This certainly does not compare badly with the results obtained from direct-current operation as regards the gross power required, and ought to be encouraging to friends of alternating-current traction in this country. We have no means of knowing what troubles were encountered on the Stubai Valley line, but it certainly does not appear to have been in any sense a failure.

Another interesting report of experiments comes along from the Valtellina line. This, as our readers will doubtless remember, is a three-phase line with 3000 volts between the trolley wires, worked by induction motors. From an operative standpoint, it has done excellent work. The motors are worked in parallel at full speed and in cascade at reduced speeds. The power factor in these connections is a matter of special interest. In the motors at full speed it rises to about .9, which is certainly a most creditable figure for railway motors wound for high voltage, and ought to be a lesson to those who condemn induction motors on account of alleged low power factor. At reduced speed, however, when the motors are in cascade, there is a very different state of things. The power factor drops to .5 on the level and rises only to .75 under the stimulus of the output required on grades. Obviously, the cascade connection is not all that it should be for reduced speeds, and we question indeed whether upon the whole rheostatic control would not give better operative results, considering the relatively small number of stations. In this connection it is worth noting that in two new locomotives ordered for this road a radical change in control has been made. The motors are connected so as to use either 16 poles or 8 poles, the former giving a normal speed of 20.5 m.p.h., the latter 41 m.p.h. In starting, the 16-pole system is delta-connected. If the design of the motors has been properly worked out this arrangement ought to give considerably better average results than the arrangement now used. These locomotives are big affairs, weighing 62 tons, and rated at 900 hp, the normal tractive force rising to 13,000 lbs. and the maximum to very nearly 20,000 lbs. Numerous experiments on the energy required in hauling trains gave for the average of many runs a value of 40 watt-hours per ton-kilometer for the motor car running alone, while the normal train of motor car and four or five trailers gave about

31 watt-hours per ton-kilometer. On a level track at 36 m.p.h., the energy required for a train was about 13 watt-hours per ton-kilometer.

The total copper iron and rheostat losses on the line as worked showed that the aggregate of these was only about 20 per cent of the total energy, so that the losses in starting and in control were of very minor magnitude. This is natural in a line with few stops, and the conditions might be quite otherwise in work more nearly approximating tramway conditions. Another interesting point in the experiments was a measure of the energy returnable to the line. The saving thus made possible with certain kinds of equipment has often been considered, but there have been thus far very few experimental values obtained. On this Valtellina line it was found that on a down grade exceeding 0.417 per cent with a 110-ton train, the motors would work as generators. On a grade thus favorable to returning energy it was found that 54 per cent of the potential energy of the train could be returned to the line. How far this operation would prove practicable in everyday working of the line does not appear. It seems probable that on certain lines a very material gain might be made, but we are rather inclined to the belief that such cases are rather exceptional on lines outside the range of heavy railroading. It certainly must be acknowledged that the Valtellina line, in spite of various obstacles, has made a very good showing. The engineers who made the tests not only say that the three-phase system has proved completely satisfactory, but that in efficiency it is rather superior to a direct-current system with third rail. In our own country the objection to two trolley wires seems well-nigh unconquerable, but with a single-phase distribution up to the motors this objection disappears. The case is now up to the exponents of single-phase traction, and may we soon hear equally good reports from them. The foreign work with alternating currents is certainly encouraging, and it is high time for more work to be undertaken here. The opportunity and the rewards are great.

Automatic Acceleration

Automatic acceleration appears now to have come to stay, so far as heavy cars, operated by heavy train-control system, are concerned; and its equivalent on hand controlled cars, namely, an automatic restriction on the controller handle, is being looked upon with increased favor. On the two train-control systems which are now on the market, the rate of acceleration is regulated by the amount of current flowing in the armature circuit of one of the motors. As soon as the current in this circuit falls below the predetermined amount for which the limiting device is set, another step of the resistance is cut out automatically. The effect of this is to produce as nearly a uniform starting torque in the motors as it is possible to secure with a step by step resistance. Where the resistance is subdivided into small sections, as it is in the modern systems of train control, the acceleration is very smooth and pleasant, and from a passenger's standpoint in striking contrast to the acceleration given a car or train by a careless motorman, or on cars where the resistance steps are not properly proportioned. Where, as in the case of a device adapted for use on ordinary controllers, the rate of controller advancement is determined by time rather than by current flowing, the action is not theoretically as perfect as if it were determined by current, but practically, if the resistance points are properly proportioned, the results will be much the same.

INTERESTING POWER PLANT AT OLYMPIA, WASHINGTON

Olympia, the capital of the State of Washington, is a city of 4300 population, and is fortunately situated at the head of Puget Sound. The lighting, power and railway business of the city is in the hands of the Olympia Light & Power Company, which for several years has received its power from a hydro-electric station on the Des Chutes River at Tumwater, an historic village about 4 miles from the city. The demands for current had grown beyond the capacity and equipment of the old station, and this fact necessitated an additional installation, which has taken the form of a new, larger and thoroughly modern water-power plant, built recently on a site a short distance down stream from the older one.

Water is taken from the Des Chutes River by means of a concrete intake at one end of a concrete and masonry dam, about 120 ft. long and 20 ft. high. A portion of this dam was built of rubble masonry, and another portion was constructed

cheap. The flume carried about 100 ft. of water per second, and gave a head, at the old plant, of 48 ft.

The supply line for the new plant begins at the lower end of the wooden flume, and consists of about 700 ft. of steel pipe, 9 ft. in diameter, varying in thickness from 3-16 in. at the upper end to $\frac{3}{8}$ in. at the power house. The round seams are single-riveted and the longitudinal seams double-riveted. Near the lower end of the line the pipe is carried across the river on a steel truss bridge of 84-ft. span, and from the lower end of the truss to the power house, a distance of 120 ft., it is supported on steel I-beam trestles, resting on concrete piers. On all the bridge and trestle work the pipe rests in wooden saddles, made of 12-in. x 12-in. timbers, and spaced 5-ft. 4-in. centers, which is the same as the width of each pipe course. At the power house the pipe line terminates in a 9-ft. diameter vertical standpipe, which connects with a receiver, of the same diameter, in the rear of the station. The standpipe has a vertical steel overflow, 7 ft. in diameter, which rises slightly higher than the



VIEW AT THE CORNER OF FOURTH AND MAIN STREETS, OLYMPIA, WASH.

of concrete with large stones embedded in it. For this work forms were first erected, and the concrete was mixed very wet, dumped inside of the forms, and large stones, weighing as much as 300 lbs. to 500 lbs., which had first been washed clean, were dropped into the concrete, great care being taken to insure that the stones were completely embedded in the concrete and that no voids were left through which leakage might occur. After the forms were removed and the water was allowed to rise to the height of the top of the dam, it was found that no leakage whatever occurred.

From the intake to the old power house, a distance of about 700 ft., the water is carried in a square enclosed wooden flume, built about five years ago for the first plant. The construction of this flume is unique, for it is built of 3-in. x 10-in. fir planks, spiked face to face in such a manner as to give a closed conduit 10 ft. square inside dimensions, the walls being the thickness of the width of the planks, viz., 10 ins. The flume is naturally very solid and substantial. It rests upon four 10-in. x 14-in. stringers, which rest upon mud sills embedded in the banks of the stream. This construction could hardly be possible except in places like Washington, where lumber is comparatively

level of the water above the dam. When the load on the plant is suddenly thrown off and the Lombard governors close the water-wheel gates, the water rises in the overflow pipe and flows over its top without causing any appreciable water ram at the wheels.

The power house, which is illustrated in the accompanying views, is located on tide water, at the foot of Tumwater Falls. It is built of Tenino sandstone, quarried in the vicinity, and has ground dimensions of 74 ft. x 30 ft. The building sets out over the water and rests upon foundation walls of concrete, which are carried down to bed rock. The floor is formed of concrete arches, sprung between 10-in. I-beams, and has a top surfacing of $\frac{1}{2}$ -in. thickness of cement mortar. The roof trusses are of steel, and the roof itself consists of tongued and grooved planking, covered with tarred felt and galvanized iron tiling. A 10-ton hand traveling crane spans the entire width of the building, and is carried upon an I-beam track, running the length of the building and supported by I-beam posts.

The hydraulic equipment consists of two pair of Stilwell-Bierce & Smith-Vaile inward-discharge turbines, mounted on horizontal shafts and enclosed in $\frac{3}{8}$ -in. steel cases. Each pair

of turbines has a capacity of 800 hp when operating under a head of 80 ft. Each turbine set is connected to the receiver by a feeder pipe, 54 ins. in diameter, passing through the rear wall of the power house. In each one of the feeder pipes a 54-in. single-face Ludlow gate valve is placed so that the water can be shut off from the wheel cases entirely when it is desired to make any necessary examination or repairs.

The average head under which the wheels operate is about 86 ft., it being 80 ft. at mean high tide and 92 ft. at mean low water, advantage being taken of the rise and fall of the tide by means of draft tubes. The difference in head between high and low water is very noticeable when a vacuum gate is attached to either of the draft tubes.

Each turbine set is regulated by a type D oil-actuated Lombard governor, the oil pumps and governor heads being driven by belts run from the water-wheel shafts. The water-wheel gates are actuated by wire rope transmission between the gate gearings and the gearing on the governors. One of the turbine sets is direct connected to a 500-kw, 550-volt, two-bearing type Westinghouse direct-current generator for furnishing the railway power. The other set is direct connected to a 500-kw, 2300-volt, revolving-field, two-bearing type Westinghouse two-phase alternator for the lighting service. Between the two generator units is a 200-kw Westinghouse rotary converter, wound for 550 volts on the direct-current side and 385 volts on the a. c. side. This converter is used to equalize the load on the generators feeding onto the railway circuit or the two-phase alternating-current system, according to which is the more heavily loaded. It is generally brought into service when the demand on one of the generators is excessive and when the other ma-

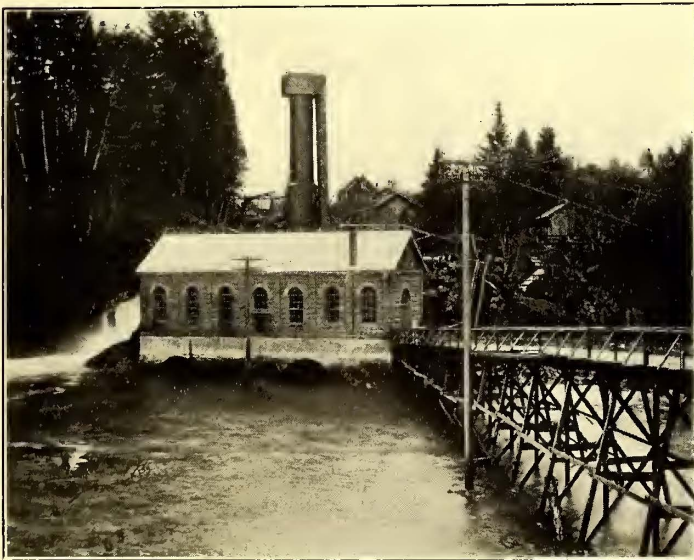
chine is carrying a comparatively light load. Two 125-kw, 2300-385-volt, oil-insulated transformers are used in connection with the alternating side of the rotary.

one synchroscope and two 3000-volt voltmeters, one for each phase; one feeder panel, carrying one 200-amp. automatic oil-break switch and two 300-amp. ammeters; one transformer panel, carrying one 60-amp. automatic oil-break switch, voltmeter, plug switch and two 80-amp. ammeters; one a. c. panel for rotary, carrying a Westinghouse polyphase regulator, 400-amp., 4-pole, double-throw, quick-break switch, synchroscope plug switch, 100-amp. field switch, synchronizing lamp

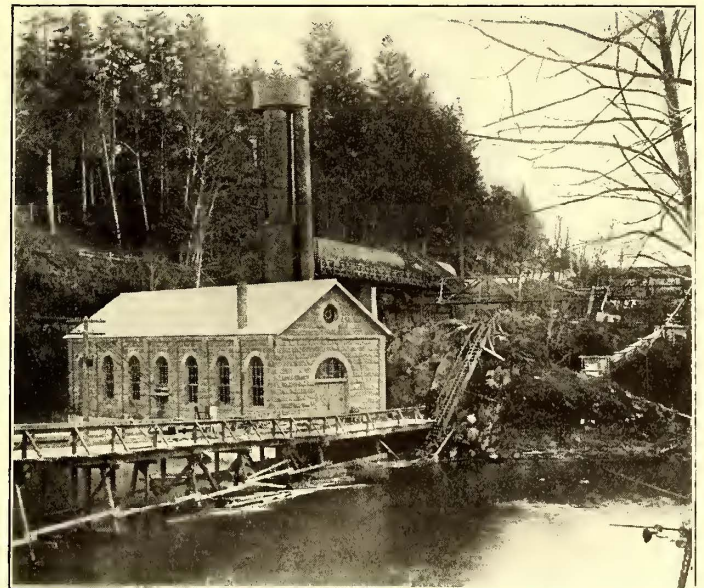


DAM, INTAKE AND SQUARE WOODEN FLUME OF OLYMPIA PLANT

and two 500-amp. ammeters; one d. c. panel for rotary, carrying a starting rheostat, 400-amp. positive and negative single-pole, single-throw switches for d. c. terminals, combination rheostat, 600-volt differential voltmeter, 600-amp. double-reading ammeter and automatic circuit breaker with equalizer con-



POWER HOUSE AND TUMWATER FALLS



POWER HOUSE, STANDPIPE AND PIPE LINE

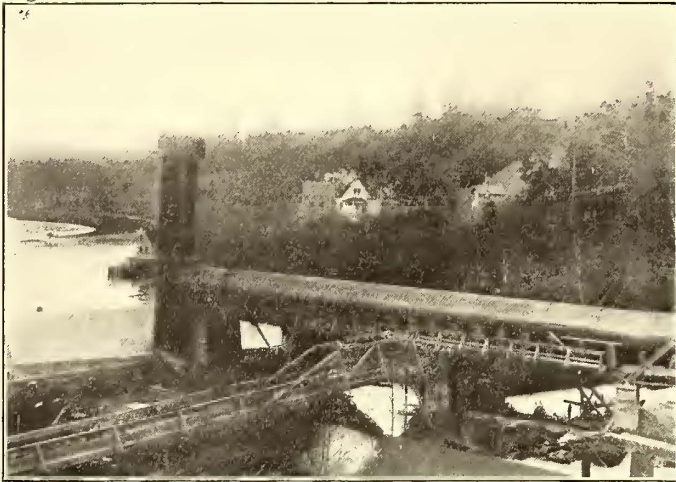
chine is carrying a comparatively light load. Two 125-kw, 2300-385-volt, oil-insulated transformers are used in connection with the alternating side of the rotary.

For distributing current and controlling the different machines there is installed a gray Vermont marble switchboard of eight panels, made up as follows: One a. c. generator panel, upon which are mounted a non-automatic oil-break switch, combination rheostat, field switch, voltmeter and synchroscope plugs, indicating wattmeter, two 200-amp. ammeters and one 75-amp. ammeter, and, supported by brackets attached thereto,

tact; one d. c. generator panel, carrying a starting rheostat, voltmeter plug switch, 1000-amp., single-pole, single-throw switches for positive and negative terminals, one 1500-amp. ammeter and one automatic circuit breaker; one d. c. power feeder panel, carrying one 1000-amp., single-pole, single-throw switch, one 1500 amp. ammeter and one 1000-amp. automatic circuit breaker, and attached to a swinging bracket one 600-volt voltmeter. An equalizer switch is mounted on a pedestal at the d. c. end of the switchboard. The switchboard and fixtures were furnished by the Westinghouse Electric Manufac-

turing Company. All of the indicating instruments are of the new round-dial type.

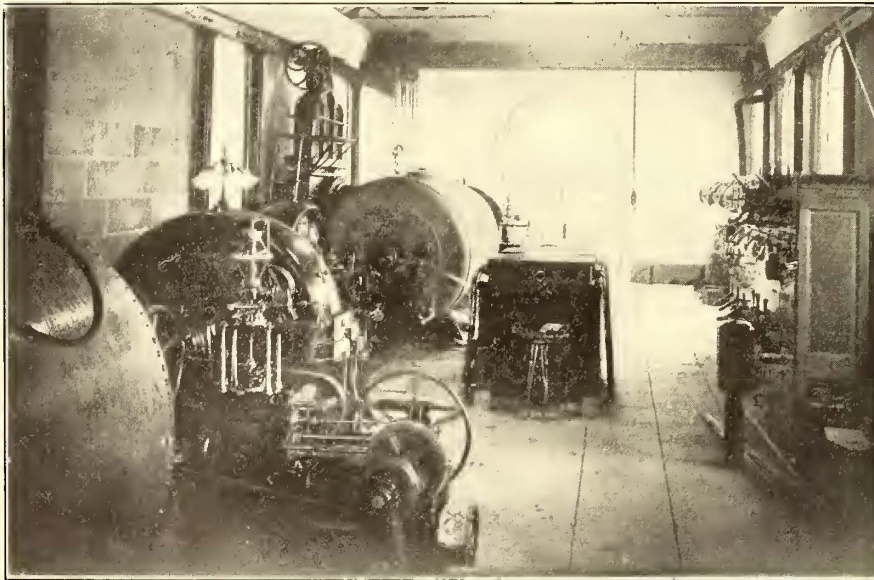
A series arc-lighting service in the city is operated from a fifty-light General Electric Company's series arc transformer, located in the power house. The lighting load on the station consists of 2200-volt, two-phase, 60-cycle primaries, distributing as 104-volt, single-phase secondaries, and also the series arc-



PIPE LINE AND STANDPIPE AT POWER HOUSE

lighting system. The power load is practically all on the 550-volt, direct-current railway system, and is made up of motors operating a large brewery at Tumwater, pumping the city water supply for Olympia, and driving printing presses and saw and planing mills.

The railway system comprises a little over 4 miles of standard gage track, laid through the principal streets of Olympia and extending to Tumwater. The rails are 40 lbs. and 60 lbs.



INTERIOR OF POWER HOUSE OF THE OLYMPIA LIGHT & POWER COMPANY

For the overhead work, side-pole construction is used in the city and brackets in the country. The company has eight single-truck cars, and gives a fifteen-minute service, which is a very good schedule, considering the size of the city. Considerable freight business is also handled.

In the way of future development the company plans, when the capacity of the present installation is reached, to double the equipment and draw the additional water necessary from a storage lake, which can be easily created to store the flood waters of the river, by means of a dam at a point about 27 miles above the present plant.

The new power plant was designed by E. W. Cummings,

consulting engineer of Seattle, Wash., and was installed under his supervision. The Pacific Bridge Company, of Portland, Ore., was the contractor for the construction. The latter's superintendent, in charge of the installation of the hydraulic and electrical machinery, was F. N. Averill, now superintendent of the Baker City Electric Power Company, at Baker City, Ore. The officers of the Olympia Light & Power Company include the following-named gentlemen: President, Hazard Stevens; vice-president, N. W. Jordan; secretary, John F. Souther; all residing in Boston, Mass.; manager and treasurer, L. B. Faulkner; superintendent and chief electrician, H. C. Ranft; chief engineer, F. M. Cooper; the last three gentlemen all residing in Olympia, Wash.

A NEW TYPE OF CONVERTIBLE CAR FOR THE BROOKLYN RAPID TRANSIT COMPANY

Something of an innovation will be inaugurated by the Brooklyn Rapid Transit Company in the use of a new type of convertible car for operation upon its surface lines during the coming summer. In the selection of the type of car for a large order of new surface cars recently placed by the company, a careful study was made of the problem of electric railway rolling stock, which has resulted in the adoption of a type of car radically different from usual types of convertible surface cars. A novel type of convertible car had been used with great success for the past two summers upon the elevated lines leading to Coney Island and the other ocean resorts, the introduction of which was due to the extremely heavy and trying character of the summer service of this company on account of the through service from New York and all parts of Brooklyn directly to the various ocean resorts. An open type of car seemed very desirable for use upon the through elevated trains, while the usual side entrance type of open car would, of course, have been entirely inapplicable to elevated service; this type of convertible car, however, proved to entirely meet the requirements and has been so successful in service that it was decided to adapt this type of construction to the new open cars.

As will be remembered from an article presented in the Dec. 20, 1902, issue of this journal, descriptive of the new type of convertible elevated car, this car was built with removable side panels, which are taken out in the summer and replaced in the winter, thus making a very comfortable and desirable car for summer traffic, particularly as the interior of the car is arranged on the cross-seat plan. Of these cars, 120 were placed in service, particularly to care for the summer traffic, for which they have been found to be very popular with the public. They proved to be very comfortable to ride in, not only on account of the cross seating, but also of the open feature; they are practically as completely an open type of car, when the side panels are removed, as are the usual style of open surface cars, inasmuch as the panels extend to within 14 ins. of the floor. Furthermore, when closed for winter service they are also very comfortable and convenient.

The new style of surface car adopted follows the lines of construction of this elevated convertible car very closely, as may be noted from the accompanying photographs; the side panels are here also removable to within about 12 ins. of the floor line, so that the resulting summer car will be as strictly an open type of car as those of the usual side entrance open type now so commonly used. The usual style of cross seating is made use of, and the aisle is unusually wide, so that ample standing room will be provided without restricting the conductor from easy

passing through in collecting fares. Very heavy curtains of pantasote material will be used, so that under summer conditions, when the side panels are removed, the curtains may be drawn in case of rain and serve as an effective protection to passengers. The pinch-handle fixtures of the Curtain Supply Company will be used, but with important improvements which will prevent the lower part of the curtain from being accidentally pulled out of the groove. As may be noted from the interior view, straps will be provided only at the ends near the doors, three being provided on each side at each end.

This car, which was built by the John Stephenson Company to serve as a sample from which the final design for an order of 200 was to be settled, is 41 ft. in length and has a seating capacity of forty-eight persons. This particular car is equipped with Westinghouse air brakes and four Westinghouse 68 motors, while the trucks are an improved design of the type 45 truck built by the Peckham Manufacturing Company for heavy surface traffic. Many other improvements will be used upon these cars, including electric headlights, a new style of universal destination sign and other interesting features.

The selection of this type of convertible car to supplant the usual type of open summer car with side running board is one of more than usual importance. The use of a convertible type of car, which is thus available for both summer and winter service, has many attractions and has been carefully studied by the mechanical officials of the Brooklyn Rapid Transit Com-

pany, obviously, secure immunity from these troubles, and at the same time retain the attractive features of the ordinary open



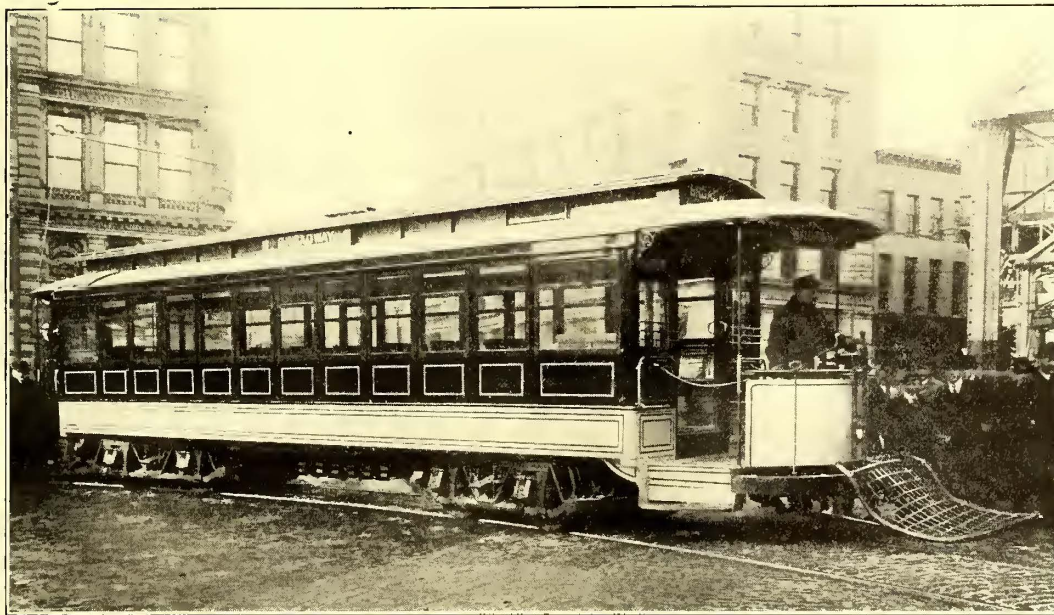
INTERIOR VIEW OF THE SAMPLE CONVERTIBLE CAR FOR BROOKLYN

pany. It offers very many desirable features, particularly for the conditions met in Brooklyn, and will, it is thought, do much to relieve some of the trying difficulties of their very large summer traffic.

As stated in the STREET RAILWAY JOURNAL of Feb. 25, the J. G. Brill Company has received an order for 175 and the Jewett Car Company for 25 of these cars. The motors will be the Westinghouse type No. 101, controlled by the new Westinghouse No. 28-A hand controller. The trucks are of a special design of short wheel base for surface operation, but which will conform to the M. C. B. standards for heavy service; they were designed by the Brooklyn Heights Railroad Company, will be furnished by the Peckham Manufacturing

Company and will be known as the "No. 25 Brooklyn Heights Special." The brakes for the surface cars will involve, besides the National Brake Company's "Peacock" hand brakes, a complete equipment of air brakes, which, including compressors and brake equipment, will be supplied by the Westinghouse Traction Brake Company. The heaters will be supplied by the Consolidated Car Heating Company. The seats, 5200 in number, will be supplied by the Heywood Bros. & Wakefield Company. They are of the Wheeler type and are upholstered in rattan. The length over all is 34 ins., leaving a 24-in. aisle. The backs of the seats being made offset at both ends, gives ample clearness for reversing the back at the wall end and increases the aisle width above the seat line by about 3 ins. The wall end casting is made with an offset which allows the pinch curtain fixtures to operate beneath the line of the top of the casting. The seats measure 19 ins. from floor to top of cushion, and are made with a single foot rail.

A more complete description of this car, together with its details of construction, will be presented in a later issue.



THE NEW TYPE OF CROSS-SEAT CONVERTIBLE SURFACE CAR, TO BE USED BY THE BROOKLYN RAPID TRANSIT COMPANY

pany. It is, of course, practically impossible to abandon the use of the open car for the very heavy and profitable summer traffic above referred to, particularly as the comfortable side seating features and cooling breeze available in the open car are as great an attraction to the public in the hot summer weather as are the attractions at the ocean resorts reached by these lines. On the other hand, the shortcomings of the usual side entrance open car have long been fully realized, particularly under the operating conditions met by the Brooklyn company, upon which long runs from the suburbs to the beach resorts are made at comparatively high speeds. Under these conditions it is found very difficult for the conductors to properly collect fares, especially as with crowds hanging on the running boards, their movements are badly obstructed and are, in fact, made with considerable danger to themselves; there have, in fact, been a large number of serious accidents from this cause in particular, as many as a dozen conductors having lost their lives in this way during the last summer season.

The new type of convertible car with the middle aisle will,

CAR WHEELS—A STUDY OF THEIR COSTS

BY D. F. CARVER

The traction industry has advanced beyond the purely experimental stage in the development of its technical component parts, and many things are rapidly approaching a standard, in fact would be so considered, except that the indorsement of the properly constituted association has not been given. This applies to car wheels for the three varieties of traction service—city, interurban, and the combination of the two. This article will deal particularly with those for city service, as it is here that there is the greatest necessity for a consideration of the most practical way to reduce the cost.

The demands made by the patrons of street railway companies for a continuously improving service often entail an additional expense to an account already heavily burdened. The revenues per passenger per mile must decrease because of the growth of our communities and the extensions of the single fare limits. These conditions combined make it necessary for the mechanical men employed on street railway properties to give close attention to the costs per unit of material used. This includes the initial cost, and also the cost of wear and tear of service.

The recently published annual report of the New York Board of Railroad Commissioners for the year ending June 30, 1904, indicates that the amount of money available from earnings for the operation and maintenance of street railway properties is now limited. Judging from experience gained in the development of other leading industries which are now older in years than the electric traction industry, it is reasonable to assume that the city railway companies will be called upon to do in the future a continuously increasing volume of business at a diminishing margin of profit per passenger carried. This condition calls for an analysis, by the engineer, of the costs of wear and tear as well as the initial costs, to find if possible a more economical combination of first cost and rate of destruction; or a combination of first cost, cost of wear and tear, and finally, the selling value of that which is left as "scrap"; or a more economical combination of cost of labor plus cost of material; or other combinations which arise always as special features to special cases. It must be that these analyses have at times something of general interest to those interested in the industry, and hence this article.

Car wheels for city railway use—cast-iron, steel-tired and rolled-steel—are highly developed mechanically, but restricting conditions, which require narrow treads, thin and shallow flanges, prevent improvements which are obviously proper but impossible with the grooved rail now so common. The very short-lived part of the city railway wheel is the flange, and until the restrictions imposed by the full grooved rail are removed, the city railway wheel will always cost more in wear and tear than suburban and steam wheels. This cost when reduced must be done without any reduction in reliability of operation or in factors of safety. The full grooved rail has advantages to those who ride in something else than the trolley, but that it is imposing a heavy burden on the trolley companies in the maintenance of wheels can be shown by comparison with the costs of car-mile or wheel-mile service to steam railroads who do not have these restrictions to contend with and who can make their wheels run economically.

Quoting from notes copied some four or five years ago from figures of cost given by one of the leading steam trunk lines running out of Chicago, these companies in certain test cases have run 33-in. cast-iron wheels till worn to safe limits at a cost of 2.81 cents per 1000 wheel-miles' run. If this were at all possible on city traction systems, it might mean to some of them the saving to them of the interest on \$100,000 at 5 per

cent. This is rather an unusual run, but it is interesting to one studying costs of wear and tear.

Cast-iron car wheels in hard city service wear away at about 1 lb. in weight of wheel per 1000 wheel-miles' run, and although the metal worn away costs only a little more than 1½ cents per pound in the new wheel, the scrap value of the remaining part of the used up wheel is approximately 65-100 cent per pound. This difference in value between new metal and scrap metal, plus the first cost of that which has been worn away, shows that for all practical purposes to the railway company, the part of the rim which has been destroyed has cost 14.95 cents per pound (including labor at shops and material), or \$5.23 per wheel, made up of

Depreciation	\$3.74
First cost of that worn away.....	.54
Labor95
Total	\$5.23

That is to say, the depreciation in value to the railway company of its unconsumed worn out cast-iron wheel is seven times more than the actual first cost of the part that has been destroyed.

An analysis made of several cases in years past shows that where phenomenally low costs per 1000 wheel-miles were obtained, it has been done largely by creating some special condition which reduced this proportion of 1 to 7. The first instance quoted, where the cost was 2.81 cents per 1000 miles, was largely due to the reduction of the proportion, but by a method not applicable to city trolley service.

In a consideration of wheel costs, some basis of comparison must be used, and for comparison only it has been assumed that the wheels will average (for 33-in. cast-iron, chilled, spoked type) 450 lbs. in weight when new; that the new wheel costs 1.55 cents per pound; that its scrap value, f. o. b. car shops, is 65-100 cent per pound, and that the average life of such a wheel at this cost should be 35,000 miles.

In the diagram, Fig. 1, the axis of *x*, or abscissas, represents 1000 miles' run per wheel. The *y* ordinates represent on the left \$1 for each horizontal line, and on the right 10 cents for each horizontal line. The line *A* then shows the value of the wheel at the successive mileages of its life, or its weight for the time being, at 1.55 cents per pound. The line *B* represents the value of the wheel at the successive mileages of its life, or its weight for the time being, at its scrap value of 65-100 cent per pound—both referred to the left-hand ordinates.

The line *C* represents the cost per 1000 wheel-miles of the wheel, both labor and material, at the successive stages of its wear, and the line *D* represents the cost per 1000 wheel-miles of the wheel only, f. o. b. company's shop, at the successive stages of its wear. The values of the ordinates of both of these curves are those at the right of the diagram.

Suppose that a wheel breaks after running 20,000 miles and is, of course, practically useless. A reference to line *D* at the 20,000-mile vertical shows that for the time the wheel in question was in actual service its cost rate to the company—wheel only—for the time it could be used was 20.8 cents per 1000 wheel-miles, and a reference to line *C* on the same vertical shows that the total cost of labor and material has been at the rate of 25.6 cents per 1000 wheel-miles. It also appears that for a 35,000 miles' run, which is the assumed life of the average wheel, the rate per 1000 miles for labor and material has been 14.96 cents per 1000 miles, and that the cost per 1000 miles of wheel only has been 12.25 cents.

This line *C* shows a number of things. It shows that if the track is bad at special work and is breaking flanges, every wheel that is broken at 6000 miles' run, for instance, has cost the company 84 cents per 1000 miles. It also shows why it is economy to spend some money to grind up a comparatively new

wheel, but rather doubtful economy to spend very much on a wheel that has done 28,000 miles or 30,000 miles.

If the line *A* were a horizontal one, that is to say, if there was no loss in weight of the wheel as it wore out, then the line *C*, describing the cost per 1000' miles' run, would be a rectangular hyperbola, with the formula

$$xy = 501,000$$

and the cost in cents per 1000 miles—*y*—for any value of *x*, in miles, would be

$$y = \frac{501,000}{x}$$

But the diminishing weight must obviously be provided for in an equation of this kind. It is covered by the cost of the metal worn away per 1000 miles' run, at its scrap value, in this case, 1 lb. of metal at 65-100 cent per pound. Therefore, to the above must be added $.65 \times x$ (in miles)

and the equation becomes

$$y = \frac{501,000 + (.65 \times x)}{x}$$

For the line *D* the rectangular hyperbola is

$$xy = 406,000$$

and the cost of the wheel only (no labor) per 1000 miles—*y*—for any value of *x*, in miles, would be

$$y = \frac{406,000}{x}$$

plus $.65 \times x =$

$$y = \frac{406,000 + (.65 \times x)}{x}$$

It is therefore evident that the cost of the wear and tear on car wheels is governed by a very simple natural law, and that an equation can be derived for any conditions, anywhere, which will instantly and accurately show the cost of wear and tear, or of destruction by "flats" or broken flanges.

The line *E*, Fig. 1, shows the value of a wheel at different mileages run, computed on the assumption that standard wheels at a first cost of \$6.98 per wheel (1.55 cents per pound) should run 35,000 miles. If one bought with such a contract, he would want to know how much a wheel that had only run, say, 32,000 miles, was worth to him. To determine this point, follow the 32,000 vertical line to its intersection with line *E*, and this point, on the left-hand ordinates, will be found to be \$6.63. Conversely, if it ran over its guarantee, or, say, 40,000 miles, the intersection of line *E* with 40,000 will be found at \$7.60, the equitable value of the wheel. Of course, line *E* is straight, and it is interesting to note that its origin at *x* = 0, is at *y* = \$2.92, equal to the scrap value of the wheel, for it is obvious that if the wheel could not be run, its value was only scrap.

It will be noted from this line that, in establishing a base rate of price per 1000 miles' run, it is well to establish the standard of price at some point close to the limit of wear of the average wheel, because if taken at 28,000 miles, for instance, the amounts payable for wheels showing long life would be quite considerable. That is to say, the base price for wheels on a mileage basis should be computed at an average, which is as near, as may be judged, to the cost price per wheel per 1000 miles' run, when scrapped.

It will also be noted that in relation to the line *E*, for any value of *x* in 1000 miles

$$y \text{ (in cents per wheel)} = x \times .0116 + 292$$

where the mileage cost per wheel is on a 35,000-mile basis. So much for the cast-iron wheel.

TABLE SHOWING PROGRESSIVE COSTS OF OBTAINING 175,000 MILES FROM CAST-IRON WHEELS

First cost cast-iron 450-lb. wheel, \$6.98; scrap value, \$2.70; cost of pressing wheel on or off axle, \$0.48.

Cost New Wheel	Cost Labor Pressing on and off, etc.	Scrap Value at 35,000 miles	Net Cost at End of	Total Cost
\$6.98	\$0.48	\$2.70	35,000 miles.	\$4.76
4.76 6.98	0.95	2.70	70,000 "	9.99
\$11.74 9.99 6.98	0.95	2.70	105,000 "	15.22
\$16.97 15.22 6.98	0.95	2.70	140,000 "	20.45
\$20.20 20.45 6.98	0.95	2.70	175,000 "	25.68
\$27.43	0.48	26.16

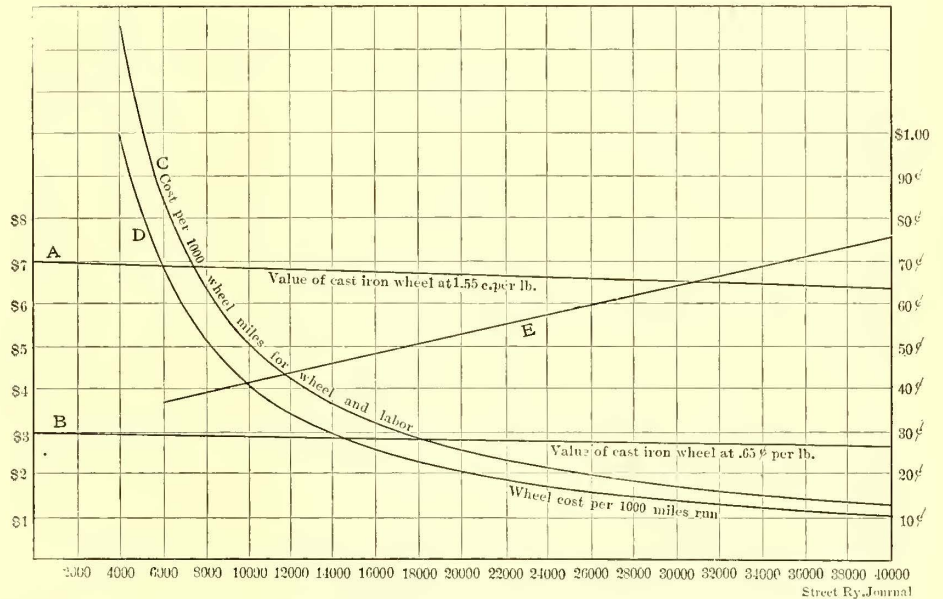


FIG. 1.—DIAGRAM FOR DETERMINING SERVICE AND SCRAP VALUE OF NEW AND WORN CAST-IRON WHEELS

The steel-tired and rolled-steel wheels are coming into common use, and a comparison of their costs with cast iron has some interesting features. As the life of a single steel wheel is equal to several cast-iron ones, it is necessary in making comparisons to accumulate the costs against several cast-iron wheel, as shown in the foregoing table.

That is to say, wheel No. 1 has run 35,000 miles at a net cost of \$4.76; wheels Nos. 1 and 2 have together run 70,000 miles at a net cost of \$9.99; wheels Nos. 1, 2 and 3 have together run 105,000 miles at a net cost of \$15.22; wheels Nos. 1, 2, 3 and 4 have together run 140,000 miles at a net cost of \$20.45; wheels Nos. 1, 2, 3, 4 and 5 have together run 175,000 miles, and wheel No. 5 has been pressed of and scrapped at a net cost of \$26.16, and

$$\frac{26.16}{175} = 14.95 \text{ cents per 1000 miles.}$$

This progression is shown graphically by line *F* in Fig. 2.

The cost of a new rolled-steel wheel may be assumed at \$20, and it will cost 47 cents to press it on and handle necessary material in connection therewith. At the end of 50,000 miles' run its net cost to the company, if it has run, as is perfectly fair to assume it will, is \$20.47. Now, if it is taken out of service, turned down and trued at a cost, say, of \$1.50, which is reason-

able, and it runs for an additional 40,000 miles, so that its net cost to the company at the end of 90,000 miles' run is \$21.97, when it is again trued up at an additional cost of \$1.50, its net cost to the company when it is worn out at 127,000 miles will be \$23.47; but it costs another 48 cents to get it off and the

flange; another to improve the metal in the flange of present shape is to make its mileage greater between turnings, and the third is to increase the value to the railway company of the wheel center, which does not wear out with the rim. Thanks to the efforts of the wheel makers, many economies have already been given to the railway company by improvements in the latter items.

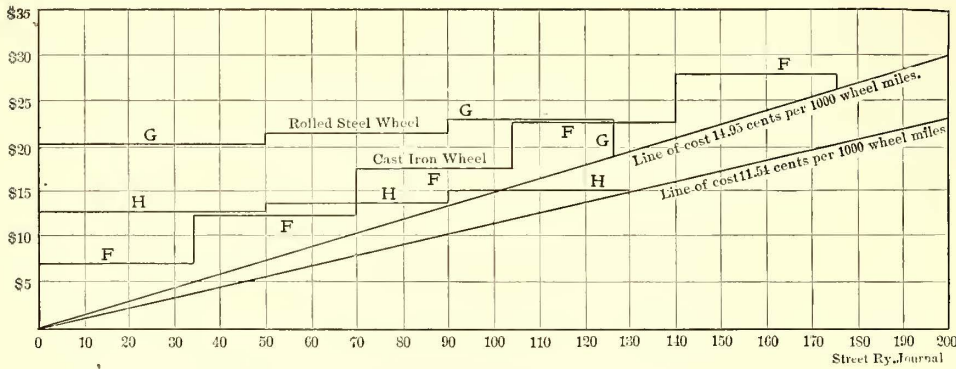


FIG. 2.—DIAGRAM FOR COMPARING COST OF IRON AND STEEL WHEELS AND STEEL TIRES

scrap value approximates \$5, so by the time it is scrapped it has cost a total net of \$18.94.

$$18.94$$

$$\frac{\quad}{127} = 14.91 \text{ cents per 1000 miles' run,}$$

$$127$$

approximately the cost to run cast-iron wheels. This is a hypothetical case, but it is well within the range of immediate possibilities, and shows what may be expected.

This progression is shown by line G in Fig. 2. On the face of it and from superficial consideration only, a 33-in. steel-tired wheel, at a first cost of \$36, with an ultimate scrap value of \$6, would have to run more than 200,000 miles to give a service at equal cost with cast iron. But methods have already been devised by which it is not necessary to part with \$24 worth of wheel center and some rim value, at a depreciated market value of approximately 80 per cent. There are many cases of a combined city service and suburban service in which it is dangerous to use cast-iron wheels. In fact, it is probable that the steel-tired wheel may yet enter into strong competition with cast iron on the basis of cost of wear and tear alone.

Line H, Fig. 2, shows the progression of costs of a rim for a steel-tired wheel at an initial cost per rim of \$12 and a net cost to the company after running 130,000 miles of \$15, or 11.54 cents per 1000 wheel-miles.

As will be noticed in Fig. 2, the diagonal or final cost lines per 1000 miles, start from $x = 0$ and $y = 0$, showing that it is ultimately immaterial whether the investment is made as first cost, as in steel wheels, or whether it is a slowly accumulating cost, as in cast iron. For this reason, if the steel wheel line terminates on the line 14.95 cents, as shown, independent of the value of x , the cost of steel wheels must be equal to that of cast iron—with this additional risk, that breakages in new steel wheels are much the most costly.

It is also apparent from this diagram that a steel tire will have to run 100,500 miles to become equal in cost to cast iron, and further, that but for the scrap value of rolled wheels they would have to run 157,000 miles with two turnings to bring them down to a cost equal to cast iron in wear and tear. As a matter of fact, the economies which the changeable steel tire is able to show are due to its ability to run long mileages at slowly accumulating expense, for the scrap value of the rim is small. For the purposes of comparison, a price of 95 cents per wheel has been used as the cost of taking off the old wheel and putting on the new. This is the price averaged in shops with ordinary facilities for doing the work.

There are three lines along which to work to reduce the cost per 1000 miles, or the wear and tear on car wheels in city service: One is to increase the latitude of the restriction upon the

specific results obtained. However, there is some proportion governing the relation of one to the rest, and the method of reasoning by which these conclusions have been derived, if applied by anyone to his actual conditions, will give him the results he may know will follow from any line of action as an economic proposition.

CREATING TRAFFIC—I. THE TRAFFIC AGENT

BY E. P. HULSE

Traffic creating is beginning to receive more of the attention to which it is entitled from both city and suburban electric railway managements. They now feel that there is more to the business than striving to operate cars satisfactorily, however desirable that difficult end may be; additional means must be taken to keep the benches full and prevent red figures from showing on the statement of earnings and operating expenses. This work is traffic creating—originating new reasons why the public should use the lines and part with its nickels, and stimulating the desire to travel and directing the impulse by means of implanting the proper suggestion.

As electric railway operation takes on more and more of the character of steam railway operation, the methods that experience has found profitable for the latter in drawing the dollar to their lines are being adopted. Many electric systems that now rival in equipment and service the longer established steam roads have found that they must learn some of these methods if they would maintain their growing advantage in the tug-of-war for passengers and freight. For it is a recognized competition, and one that is growing stronger every day as the little street railway units that formerly centered their interests in a single city are stretching out and speeding their electric shuttles from one population center to another in ever-increasing distances and combining in systems that think nothing of 100-mile runs.

The passenger agent of a steam road that crosses several States excitedly exclaimed recently, when discussing the point that electric lines increased traffic over his road by acting as feeders from new territory: "Yes, but they draw more travel away from us. You have no idea of the number of business men that now use the electric lines for long distances."

Some of these modern long-distance electric railway lines, that are to be found particularly in the Middle West, are the cause of much wonderment to those who view them for the first time and who have not kept in touch with the speedy development in this branch of public service. Running over a roadbed laid out for the most part on private right of way, perfectly graded and heavily ballasted, and banked at the neces-

sary curves with the most scientific engineering skill, on rails as heavy as those used by the steam roads, such a line is enabled to claim a right to compete for traffic with the steam roads. On many of them the rolling stock is the most modern and expensive that is built, the best and latest in every way. Their cars are large, double-truck ones, easy riding, handsome and comfortable, each equipped with four high-power motors; air brakes, supplemented with hand brakes; arc headlights which illuminate the track far ahead; warning signals, both gong and whistle; and all the appliances that long experience and due regard for safety could suggest. Some have double track; but the single-track lines are protected by a complete equipment of block signals of the most reliable make and type, showing red when a car is on the block and white for a "clear line," as well as a private telephone system, and these are supplemented by the most painstaking routine of despatch sheets or of verbal checks, exchange of "key of the road" and other right-of-way signals between motormen and conductors of passing cars, with experienced starters on guard at all junction points and a despatcher, perhaps with the assistance of a "pin-board," in charge over all.

But it is one thing to build a roadbed, and quite another to build up the traffic, and to increase to its greatest proportions the travel that might go over it. I have several lines in mind the country over that connect large cities, but where such apparently jealous care has been taken in guarding this fact that all that the citizens in each terminal place know of the road is that it runs along a certain street and then disappears into the country. The road's managers know where the cars go to and how often they run, but they forget that this has never been brought to the attention of the public—frequently, insistently, convincingly, as it should be. The "exploring" bent is strong in only a small percentage of the population; they must be directed and have all made plain by maps and descriptions.

Road managers become so interested in the details of operation that they are too prone to concentrate all their attention on what might be termed the mere "mechanism" of public service, and they neglect all effort to increase passenger and freight business. They would rather have the praise of another electric railway official to the effect that they are operating a fine road than to know what the public thinks about it. They necessarily get a bias in this particular direction. To be sure, the best advertisement a road can have is convenient schedules, closely maintained; roadbed in fine condition, and comfortable cars in good repair; a safe system of operation, and alert and courteous men; line kept open in all conditions of weather, and few shut-downs of the power. A line cannot enter strongly into competitive bidding for traffic unless it can deserve praise on its operation. But having all these, it is possible to draw far more travel than would naturally voluntarily offer itself.

Mankind is subject to influence by the proper suggestion. Psychology probably never will be included in the course of training that fits an electric road manager to operate his line, but he must remember that all his travel comes from a "suggestion" in one form or other. How best to present this suggestion to the greatest number of possible riders with the utmost economy is the important point. Printer's ink will engulf dollars beyond all hope of return if printing is injudiciously done. While steam roads make the dollar their unit, the electric road manager must keep in mind that he is getting his by the nickel; therefore the steam road methods must be modified with this in view. An elaborate publication that a steam road could afford to give to a prospective passenger who might return forty or more dollars would be out of all proportion in bidding for the nickel passenger, even though his patronage might be constant thereafter. There are classes that it pays to go after, however—the exploring tourist and the student of history, the lover of nature and city sightseer, the pleasure seeker, the picnicker, the enthusiastic "trolleyer"—that devotee

of the most enjoyable and inexpensive of sports and one with a thousand fascinations. The electric road that has no amusement resort or historic spot on its line is handicapped, for the pleasure travel should form a large part of its receipts, and it is this class that is the most susceptible to suggestion and direction, although much business travel may be proselyted from the steam roads where there is competition. The suggestions that follow, however, apply equally well to the traffic that can be influenced independently, or where no competition exists.

I would advise any road to give the business of traffic creating into the hands of a special man, at least during the spring and summer months. If he exerts himself in all the directions that are possible, and is backed up by a sufficient appropriation, he cannot fail to make his position a remunerative one to the company. Give up the idea at the start that your road or park or beach resort or picnic ground will advertise itself. It will not. This has been thrashed out already in analogous lines that are as necessary as transportation. Note how such staples as sugar, coffee, flour, biscuit, etc., are now being advertised, where the suggestion that it would be profitable to do so would have been laughed at ten years ago.

Your traffic man should have some qualifications outside of a knowledge of the electric railway business. He should know the preferences of the public in matters of amusements, sports, holidays. He ought to be familiar with the show business, the best booking agencies, the best acts, what their accustomed prices are, etc. Not that he should book direct for his theater or circuit of theaters necessarily—unless he wishes everyone connected with the management to contract heart failure—but that he should be able to know when the road is getting value received for the amount that it is putting out for amusements. Knowledge here will sometimes save a road many dollars. Your traffic man should be aware of the respective value of the newspapers in his territory as advertising mediums. He should know paper, ink and type; for instance, he should know when an s. and s.c. (sized and super-calendered) paper will do as well for his printed matter as a more expensive coated stock, etc.; know what qualities of red ink will stand the sunlight on his displayed posters without fading entirely in three days, etc.; know what printing offices in his territory are equipped for different classes of trade and be aware of the ones that have wood type, especially of 7½-in. and 10-in. sizes; know what printing concerns have cylinder presses capable of handling a dasher sign or a one-sheet poster; know what places will make a night or Sunday run, or where he can get his matter out the quickest, for traffic creating is sometimes a mushroom matter, and public attention must be nailed immediately when an opportunity presents itself. He must be able to "fight fractions" in keeping down the cost, for nowhere can he "swap" an old dollar for a new one so easily as in eating up traffic profits by the printing expense that brought it. These may be details for the purchasing agent, but it would be better if the traffic man knew his business along these lines. So much the better if he knows photography and the requirements in photographs taken for half-tone cuts. And better yet, if he have imagination and the creative faculty (which will enable him to get up excursions, carnivals, field days and to originate other big features) and the ability to write. So equipped, there are many things that he can do.

I will treat of his mediums of publicity next week and will then describe the events that he can advertise through them.

After March 15 all street cars in the city of Baltimore will stop on the far side of cross streets, and not the near side, as now.

A special cable from Berlin says the Bavarian Government is planning the introduction of electric traction on several trunk line railroads like the Munich & Lindau, which is 136 miles in length.

HOW TO MAKE A GOOD FOREMAN

A very interesting address, with this subject as a title, was delivered by H. H. Vreeland, president of the New York City Railway Company, at an open meeting of the welfare department of the National Civic Federation at Young's Hotel, Boston, on Feb. 27. The invitation was extended to Mr. Vreeland, as chairman of this department of the Civic Federation, by a large number of prominent manufacturers and other employers of labor on an extensive scale. Although the address was intended to cover all industrial enterprises, many of Mr. Vreeland's remarks have an especially interesting bearing upon railway work, and in connection with the highly successful methods employed on the New York City Railway Company in handling the labor problem, are of the greatest value.

Mr. Vreeland first referred to the great gulf which separates the independent employer of the middle ages, and even of the middle of the last century, with his two or three apprentices, and the head of a great industrial or railway enterprise of the modern day, with its thousands of employees, and in which the directing heads rarely come into direct contact with the men who carry out the details by physical labor. The theory that labor is but a commodity to be purchased in the market as any other at what is its market price, has largely disappeared. The vast majority of the larger employers, and those concerned in the financial management of the great corporate systems, recognize that supply and demand are not the only factors in the determination of the amount of wages they shall pay, and that the American workman is entitled to be treated as a social being, having the right to rear a family, educate them according to American conditions and fit them to enjoy the advantages which he sees so abundantly distributed around them. Continuing, Mr. Vreeland said:

"The question of wages is not the only dominating factor in the solution of the labor question. There is another factor which I deem of almost equal if not greater importance, and that is the relations between the directing mind or immediate superior of the employers and the employees.

"We want no labor controversies if they can be avoided, and in this, as in all other cases, an ounce of prevention is worth a pound of cure. As long as human nature remains unchanged—and, in its essential qualities, it has undergone but very little variance, as history teaches—there always will be differences between employer and employee, and these will be sometimes too acute for immediate amicable settlement, and, during this period of heated controversy, strikes and lockouts may occur. But we can minimize these differences instead of accentuating them, and we may foster and engender relations of good will so close and intimate between employer and employee that when unavoidable differences do part them for a time their disputes may be adjusted with as little acrimony and delay as possible. In inspiring and creating this good will no single factor is of such consequence as the careful and judicious selection of those who are put over and have the immediate direction of the employees, from the most subordinate grade of authority to the highest. For but little reflection will disclose that nearly every crime arises from a wound to someone's vanity, and that once men are insulted or offended it is virtually impossible to bring them to reason, no matter how just our claims upon their obedience may be; but if we have their respect and good will, causes of contention are readily compromised.

"The selection of properly trained men for promotion to the position of foreman in charge of employees is, or should be, one of the most important factors in organizations. Every consideration is given to the qualifications of a man for the position of foreman in the interest of the corporation when the closest scrutiny is made of his ability to so organize forces as to secure the greatest output. Very seldom is consideration given to the

question, 'What are his qualifications for handling men?' After his appointment, the most careful scrutiny is made of the results of the work under his charge in dollars and cents; little or no consideration is given to the equally important question of methods of discipline and consideration for those who are under his charge.

"We gain our experience from association and intimate relations with men. A man trained under an incompetent foreman, incompetent so far as relates to his ability to handle men, knows no other course and uses the same methods when he gets the opportunity. In a large organization, how can this be known? Either by close supervision on the part of the general manager or, what is better, the appointment of a well-equipped man to the position of head of the labor department. In the present day of large corporate enterprises, employing thousands of men, many important questions come up every day to tax the time and physical strength of the general manager and do not admit of his giving the necessary time for consideration of the question at issue, and what he does is done in a perfunctory way, and his decisions can only be made on reports of interested parties. A well-equipped man at the head of a labor department has ample time not only to study the system of workings of the organization as a whole, but to study the traits and characteristics not only of foremen but of individual employees. He is in a position to detect any irregularities in the system, as well as to discover what the feeling of employees is, what complaints are in the minds of subordinate employees if not openly expressed, to study causes for same, to suggest remedies, and in cases where matters are brought to an issue with the management to be able to advise with a full understanding of all details from both the corporate side and the side of the employees; also to suggest where improvements can be made in the interest of improved sanitary or working conditions to the benefit of both the employer and the employee. In a word, to care for the welfare department of the organization.

"I have made a very careful study of this subject and have followed the principles I have enunciated in connection with the working of the property of which I have charge. We employ a very large number of men and have to do with all the conditions that appertain to manufacturing and industrial establishments as well as operating a railroad, as we have large shops in which are employed men of different trades. We have no head of a labor department of the character I have described, but we have an organized bureau for the appointment of men in which every effort is made to secure a uniformity of character and experience. As I desired to make a personal study of the value of such work to the organization, I have taken direct charge of what might be termed the labor department, and thus have been able to put into effect my ideas and to follow their workings and see the result. One of the features of this department was the organizing of a system of reports in which the capacity and qualifications for handling of men and proper methods of discipline is shown by a system of records which checks one department or branch of the service against another, not only in like work, but also the total number of employees under one department head against that of another. I started with the theory that where all employees were appointed through references and qualifications examined into by one man and these employees distributed through the organization by a system of requisitions on the appointment bureau, secured a uniform standard of employees throughout the system, subject to the orders of subordinate department heads, and under them the foremen. I believed that there was no reason why foreman 'A,' having 500 men subject to his orders, under one well-defined system or management, with one set of rules and regulations, should find it necessary to suspend or discharge more men in a month, or covering any period of time, than foreman 'B,' with a like number of men working under like conditions. This is worked out on a table of percentages,

so that at a glance the manager can tell what each foreman is doing in this direction, and gives him just as safe a method for calling attention to defects in this line as easily as a study of output and financial results of any particular branch or department of the organization.

"This system incites heads of departments and all subordinate managers to greater consideration for their men, and at the same time fosters the desire in them to learn the art of managing men. It also enables the company to develop a system of civil service by which, as their fitness for greater responsibilities is shown on the part of foremen, they may become superintendents, heads of division, and subsequently departmental managers; for it is indisputable that as the modern industrial system requires the co-operation of large bodies of men in common undertakings, if it is to be operated without unnecessary friction, hope of advancements must be held out to aspiring, ambitious and capable minds as a reward for their fidelity and devotion.

"The American workman is the most intelligent of all men of his class, and if his hearty co-operation is given to the development of any enterprise it is certain of success. Having his hearty sympathy and his good will, the settlement of all differences with him can readily be reached. No one can measure or estimate the vast amount of financial loss to both employers and men without reference to the great hardships inflicted upon the men and their families, inflicted by the great strikes and lockouts; and any system which will foster feelings of good will and friendship between employer and employee and minimize these losses and hardships is to be welcomed, and is worthy of the earnest effort and thought of every man who loves his fellow men and is desirous of seeing this great Republic progress and maintain that position of pre-eminence in the civilized world as the Home of Freedom and the Land of Plenty and Prosperity which it to-day holds, and, we trust, will always maintain."

REPORTS ON EMPLOYEES IN NEW YORK CITY

In connection with the address on "How to Make a Good Foreman," by Mr. Vreeland, printed above, a brief description of the methods of reporting the number and character of the discharges on the New York City Railway system will be of interest. The object of this series of reports, as described in the address mentioned, is to gage the efficiency of the heads of all the different departments in handling their men. Each department is obliged to file with the president a monthly report of all men who have resigned or have been discharged during the preceding month, with causes for discharge, and in all cases where the men have been in the service of the company for one year or more, the name of the man and a short history of his case. For example, in the transportation department, which is, of course, the largest employer of labor, the report takes the following form:

(Sheet No. 1.)
NEW YORK 190..
CONDUCTORS, MOTORMEN AND DRIVERS.

The following men were discharged from the different divisions during the month of 190.... for causes given below:

Table with columns for CONDUCTORS, MOTORMEN, and DRIVERS, and rows for Intoxication.

(NOTE.—This statement covers the total number of men in each capacity discharged on the entire system for violations of the vari-

ous rules governing them. In effect it is a summary of the statement next attached.)

(Sheet No. 2.)

Table with columns for Division, Conductors, and Motormen, and rows for Cause for dismissal.

NOTE.—This statement shows the number of men in each capacity discharged on each division, with the cause of their discharge. In this statement resignations are also included. There are separate reports for each division. At the foot there is a recapitulation of the total number of men discharged for the various offenses, as follows):

Table with rows for Failing to register fares and Intoxication, etc., etc.

(Sheet No. 3.)

The following named men were in service of company one year or more, and have been dismissed during month of 190.., for causes as specified.

(NOTE.—This report is made out for each division and gives the name of the man discharged, his date of appointment, and cause for his discharge, with any comments which may be necessary. At the foot of the report is a summary showing the total number of men discharged on each division, capacity of employment, and a further summary of the total men discharged in each capacity. The company is much more interested in having a record of those men who are discharged and have been in its employ for a year or more, than for those who have been in its service a shorter time. Hence, this report.)

(Sheet No. 4.)

Statement of motormen, conductors and drivers, both regular and extra, working during the month of 190..

(NOTE.—This statement shows the number of regular and extra men employed in each capacity on each division of the system, with a total at the bottom of the number of men employed in each capacity and a grand total of the number of men employed.)

(Sheet No. 5.)

Percentage of conductors, motormen and drivers discharged from each division during month of 190..

(NOTE.—This statement shows the percentage of discharges of the men in each capacity on each division of the system.)

From these statements as a basis, the president can take up the question of discharges with the foreman of any department which may show too strict, or possibly too lax, a discipline.

COLUMBUS-DAYTON THROUGH SERVICE PLANNED

Manager Theodore Stebbins, of the Appleyard system, is preparing a schedule for limited cars between Columbus and Dayton, and expects to inaugurate the through service in the near future. There will be four cars a day each way, making the 77 miles in less than three hours. The schedule will be arranged so that the cars will connect with the limited cars of the Dayton & Western Traction Company at Dayton and with the Columbus, Newark & Zanesville Traction Company at Columbus, making possible a continuous trip with limited car service from Indianapolis to Zanesville, 250 miles.

The first recognition on the part of the Lake Shore & Michigan Southern Railway (steam) of the existence of parallel electric lines, comes in the shape of a reduction of fares between Cleveland and Norwalk. The round-trip rate has been reduced from \$2.80 to \$2, which is about equal to that of the electric line. The limited cars on the Lake Shore Electric have unquestionably caused a tremendous loss of business to the steam road.

THE QUESTION BOX

The answers in the mechanical department of the Question Box this week relate to best ways of securing regulation of electric heaters in cars, best methods of moving armatures around the shops and keeping records of motormen's outfits. In the track department are published numerous answers to questions I 6 to I 8, inclusive, which refer to ballast; a suggestion is also given for an inexpensive derrick car for handling pieces of special work and other bulky material. The remainder of the Question Box is devoted to the subject of express and freight.

E—MASTER MECHANIC'S DEPARTMENT

E 19a.—Where electric heaters are used what is the best way of insuring that employees have the proper degree of heat turned on in all cars?

It is the practice on several roads to hang out at some central point a sign bearing a number, 1, 2, or 3, indicating to conductors of passing cars just what point of the heater switch should be used, whether first, second or third. This arrangement places the responsibility for proper heat regulation on some one official who is competent to decide, and does not leave the matter to the caprice of individual conductors.

We enclose the electric heater switches in a box fitted with a special lock. The inspectors have keys to this box, and as each car passes a central point the inspector on duty opens the box and regulates the current supply to heaters in accordance with the temperature. The box is then locked and the car crews do not have access to the heater switches. This insures that the heaters in all cars will be regulated uniformly in relation to the weather.

Schenectady Ry. Co.

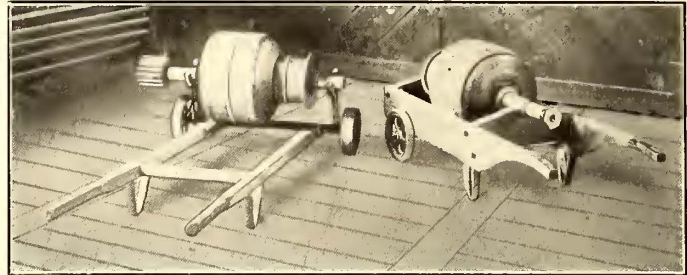
E 127a.—What are good methods of moving armatures around the shops quickly and without damaging the windings?

For handling armatures in parts of the shop not served by the overhead runways, we use a small, solidly built truck mounted on

carried at a sufficient height above the floor to prevent accidental damage to them. Instead of leaving armatures indiscriminately around on the floor where they are subject constantly to injury, we stack them in racks, as indicated in the illustration. These racks are served by the overhead trolley runway in combination with claim drop and fall, and armatures can be brought from various parts of the shop and deposited in the racks, or removed therefrom, with maximum dispatch and convenience.

Detroit United Ry. Co.

The accompanying engraving shows two forms of armature trucks that have been used for handling armatures in the shops.



TWO FORMS OF ARMATURE TRUCKS

The truck at the right is a box arrangement that affords protection to the armature from possible jams and knocks while it is being moved. The truck at the left has the advantage that with it the armature can be picked up direct from the floor, whereas with the other form the armature has to be lifted into the box.

ANONYMOUS.

E 110a.—What is the best method of keeping track of motormen's outfits?

Schenectady Railway Co.

TOOL RECEIPT.

Date _____ 19____

Time _____

Headlights No. _____

Markers No. _____

Lanterns No. _____

Tool Boxes No. _____

Switch Bars _____

Controller Handles _____

Reverse Handles _____

Air Brake Handles _____

Broom _____

Conductor No. _____

Motorman No. _____

RECEIPT FOR TOOLS

When a motorman takes his outfit he signs a receipt (shown herewith), which receipts are kept in the lamp room, and trainmen are instructed to see that their receipt is destroyed when the articles are returned, as they are charged with articles lost through negligence. If any article received for is not returned within 24 hours, notice to this effect is sent to the superintendent's office and the cost of the article is deducted from the man's wages. Articles damaged by accident must be returned to the lamp room with a proper report in order to secure credit there-

WEEKLY REPORT OF LAMP ROOM

Week ending _____

ARTICLES	Total on hand last report	Number now in lamp room	Number now out on receipts	Number missing since last report	REMARKS
Headlights					
Markers					
Lanterns					
Tool Boxes					
Switch Bars					
Controller Handles					
Air Brake Handles					
Brooms					

REPORT OF LAMP ROOM, SCHENECTADY RAILWAY COMPANY

for. Trainmen are cautioned to keep with them extra copies of the blank receipts, so that in case they are relieved before returning to the car house they can take a receipt from the one to whom the articles are turned over. This receipt properly executed is accepted at the car house in lieu of the articles themselves. The keeper of the lamp room accounts weekly for stock in his charge on a report blank prepared for that purpose (reproduced herewith).

Schenectady Ry. Co.



ARMATURE TRUCKS AND RACKS USED AT DETROIT

four castors, as will be seen in the reproduction from the photograph, which shows one corner of our armature-testing room. The trucks are pushed about by hand, and the armatures are

I—TRACK DEPARTMENT

I 6.—What are the determining factors in selecting ballast for a new suburban or interurban electric road?

The determining factors are accessibility and cost. In my estimation, however, the question of cost (within reasonable limits) should not prevent the securing of a good ballast, as the best is none too good. Broken stone I regard as the best ballast in use to-day. However, a road with fine gravel pits on its right of way would hardly be warranted in using broken stone if the stone must be hauled 500 or 1000 miles.

W. H. GLENN, Supt. Roadways,
Georgia (Atlanta) Ry. & Elec. Co.

Cost of the material generally determines the matter.

M. J. FRENCH, JR., Roadmaster,
Syracuse Rapid Transit Ry. Co.

The expense of obtaining and handling it and the material of which the roadbed is built.

Columbus, Buckeye Lake & Newark Tract, Co., and
Columbus, Newark & Zanesville Elec. Ry. Co.

It depends upon the policy of the company and the cost of available material. If the road is built for speculative purposes the cheapest ballast that shows up well temporarily should be used.

Asst. Eng. Ry. Dept.

I 7.—What is the best material for ballast on a suburban or interurban electric road?

Broken stone varying from 1/2 in. to 2 1/2 ins.

W. H. GLENN, Supt. Roadways,
Georgia (Atlanta) Ry. & Elec. Co.

Giving economy and results equal consideration, clean gravel is not excelled by broken stone, and it is more easily tamped. The ideally ballasted track would have a 12-in. layer of 2-in. broken stone with about 3 ins. of 1/4 in. to 3/4 in. stone or screened gravel for tamping. Cinders and earth should be used only as a last resort.

M. J. FRENCH, JR., Roadmaster,
Syracuse Rapid Transit Ry. Co.

Depends on location and the kind of ballast that is obtainable. In Birmingham, Ala., and surrounding sections, slag is used because it is the refuse from the furnaces that manufacture pig iron, and can be obtained at low cost. It makes a satisfactory ballast.

GEO. H. HARRIS, Supt. Ry. Dept.,
Birmingham (Ala.) Ry. Lt. & Power Co.

Screened gravel.

Columbus, Buckeye Lake & Newark Tract, Co., and
Columbus, Newark & Zanesville Elect. Ry. Co.

Broken stone.

Asst. Eng. Ry. Dept.

Crushed stone or cinders.

H. A. TIEMANN, New York City.

I 8.—Please give comparative costs of ballasting track with different materials.

Perhaps the best way to answer this question is to give the cost per cubic yard of the material used, and the expense of putting in this same amount. It would be manifestly unfair to figure the cost per foot of track, as some engineers may use 6 ins. of ballast under the ties, while others may use 12 ins. Here again the question of proximity of material comes in, so in order to get some idea of the cost it is best to eliminate the item of freight and consider the materials in their original locality. In this section, broken stone costs 50 cents per cubic yard at the crusher, cinders 10 cents at power houses, slag 20 cents at furnaces, and gravel 25 cents at pits. These prices assume that the materials must be bought. Many com-

panies make enough cinders for their own use, and others have their own gravel pits. Some are located near furnaces where the furnace owners are anxious to be rid of the slag, and consequently give it away in many cases. The cost of labor in putting cinders and gravel in place under track is 12 1/2 cents per cubic yard, while that of broken stone is 18 to 20 cents per cubic yard. With broken stone ballast the cost of renewals of ties is much greater than in other forms of ballast, and the wear and tear on the ties is greater. Grass and weeds are very hard to clean from this ballast, but it presents a fine bearing surface for the ties, is not affected by water, and is not dusty like cinders and gravel. It also holds the track in line better than other ballasts, and makes an excellent roadbed when properly laid.

W. H. GLENN, Supt. Roadways,
Georgia (Atlanta) Ry. & Elec. Co.

Broken stone ballast costs 60 per cent more, and the cost of tamping stone is about 30 per cent more than gravel.

M. J. FRENCH, JR., Roadmaster,
Syracuse Rapid Transit Ry. Co.

In Birmingham, Ala., and surrounding sections, slag can be delivered for ballast at 25 cents per cubic yard on the works. Could not say about other kinds of ballast.

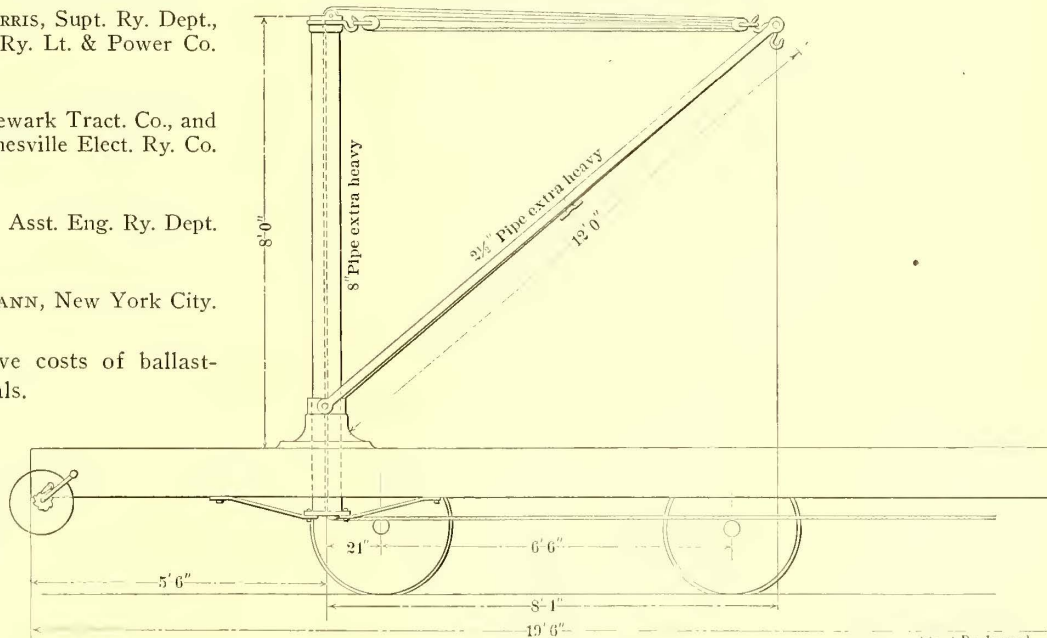
GEO. H. HARRIS, Supt. Ry. Dept.,
Birmingham (Ala.) Ry., Lt. & Power Co.

Broken stone in this city costs, for limestone, \$1.10 per yard, and for granite, \$1.50 per yard, crushed to a size to pass through a 2-in. ring. Gravel is not available, except by long haul on carts, and costs about 80 cents per cu. yd., delivered.

Asst. Eng. Ry. Dept.

I 9.—What means, machines, devices, special rigged cars, etc., do you know of for expediting or cheapening the work of ballasting and laying track? Please give sketch or photograph and detailed description, including cost.

A convenient home-made derrick car for handling special work and other bulky material can be rigged up at almost any shop for small cost, and will greatly reduce the cost of handling and transporting rails, special work and track material in general. The sketch gives a suggestion for a derrick car for this purpose. The



DERRICK CAR FOR HANDLING SPECIAL WORK

mast is made of 8-in. extra-heavy iron pipe; the boom is 2 1/2-in. extra-heavy pipe. The lower end of the boom is pivoted to an iron ring, which is free to revolve around the base of the mast. The derrick can be operated either by a hand-wheel or by a motor-driven windlass, as desired. Almost any old flat car can be utilized for the body.

ANONYMOUS.

D.—THE EXPRESS AND FREIGHT QUESTION.

D 1.—What general advice and suggestions would you give to the manager of an interurban road who is thinking of starting an express and freight business—particularly on the subject of rates and classification?

To the management of an electric railway who contemplates the inauguration of an express service I would say, investigate the matter very thoroughly before starting. A great deal of expense can be incurred and the management discouraged in the express and freight business by getting the wrong start. It is not always advisable to follow the rules adopted by other companies, as it has been proven beyond a doubt that rates and arrangements successfully adopted by one company cannot be successfully used by another. It depends entirely upon the competition, and the kind and volume of business to be handled in arriving at a decision on this point. The handling of freight and express by an electric railway is different than by steam railroads and old-line express companies, whose territory and possibilities are not so limited. With the electric railway the territory and traffic are usually limited to the local business only, on account of being cut off from the general interchange and long haul traffic. I would not advise the adoption of the steam railway freight rate and official classification unless investigation shows this to be the only arrangement that can be made. An electric railway cannot handle freight and express as cheaply as the steam road, and the adoption of such rates are usually unsuccessful from a revenue standpoint. The service given by an electric railway is much better than the steam railway freight, and usually is equal to the regular express service, but the regular express rates cannot be adopted from the fact that the volume of business handled between local points on which a regular express rate can be charged is usually so small that it would not pay an electric line to handle this business only. It is, therefore, necessary to study the situation and adopt such rates as will enable the shippers to make use of the service, and will at the same time create a business of its own.

A. EASTMAN.

Be sure that there is express and freight to handle in quantities that will warrant your undertaking the business on the basis of making both ends meet, and remember that such a business calls for intelligent organization and facilities necessary to conduct the business.

GEO. W. PARKER, G. E. & P. A., Detroit United Ry.

First study the conditions at terminals and intermediate points. Find out the amount of freight business being done between your terminals by steam railroads. If it is necessary to meet steam rates to get the business, meet them. It costs almost as much to operate a 30,000-lb. capacity car carrying 10,000 lbs. as it does to carry 30,000 lbs. Some classes of freight should not be accepted. Use the "official classification," same as steam railroads. If steam rates are not used, make your own freight tariffs, in connection with the official classification. Maintain a regular train schedule.

J. R. HARRIGAN, Gen. Mgr.,
Columbus, Buckeye Lake & Newark Tract. Co.

My general advice to a manager of an interurban line who is thinking of starting an express and freight business would be, first, to ascertain the volume and class of business which his road might be called upon to handle, and then establish his rates and classification to meet the requirements of the situation. The conditions in different localities vary, and I think this is a matter which is purely a question of good judgment.

E. J. RYON, Supt. Schenectady Ry. Co.

The manager must first become familiar with the territory to be served by his road, both in the matter of competition and the different classes of freight and express he would be likely to handle. The next step would be the installation of an express and freight classification. Rates should be too high rather than too low, as a rate can be lowered or a special rate adopted much more easily than a rate, once introduced, can be raised.

GEORGE DUNFORD, Gen. Ex. Agt.,
Utica & Mohawk Valley Ry. Co.

Provide terminal facilities for loading directly into cars. Adopt steam railroad "official classification" for all shipments and meet steam railroad rates where conditions are equal. Adopt express rates covering shipments under 50 lbs.

H. J. CLARK, Interurban Elec. Exp. Co., Auburn & Syracuse.

In my opinion no electric railway company can carry on an exclusively express business with profit to itself. In other words,

it must carry a certain amount of freight to help out. The point is just this: Granted, that there is a given amount of express business that can be secured at the terminal station; now, if enough express cars are run out of that station to give a service sufficiently quick and frequent to attract the bulk of the possible business, some of the cars are bound to run a great many trips only partially loaded, and those trips will be made at a loss. The company must have enough freight business, in addition, to send the cars out full, or nearly so. (In further answer to this question, see the writer's answer under D-5.)

J. W. GIBNEY, Supt. Ex. Dept.,
United Tract. Co., Albany.

In establishing rates and classification, use as guide the tariffs of the steam roads and express companies as applied in the particular locality, and follow their methods.

SOUTHERN SUPERINTENDENT.

Would recommend using the "official classification," and making equal rates to points competitive with steam lines.

C. C. COLLINS, Gen. Supt. Exp.
The Appleyard Lines in Ohio.

D 2.—To what extent does an express or freight business assist the development of the passenger business?

When the territory reached has to depend entirely on the electric railway to transport merchandise and supplies, the express service will tend to develop the country, and this will be followed by an increase in the passenger business. Increased facilities for receiving and shipping goods always have a tendency to stimulate other branches of business.

A. EASTMAN.

Problematical. Probably does not affect the passenger business at all.

GEO. W. PARKER, G. E. & P. A., Detroit United Ry.

Difficult to determine to what extent. If a merchant living at one terminal buys goods at another, and his goods are shipped by trolley, he probably will travel by trolley, if passenger train service is quick and reliable, though he may be a steam road traveler. Usually freight car service on trolley roads is better than freight car service on steam roads.

J. R. HARRIGAN, Gen. Mgr.,
Columbus, Buckeye Lake & Newark Tract. Co.

I do not believe that express or freight business have very much to do with the development of passenger business.

E. J. RYON, Supt. Schenectady Ry. Co.

Only in the carrying of trunks and baggage.

H. J. CLARK, Interurban Elec. Exp. Co., Auburn & Syracuse.

The carrying of express matter assists the development of the passenger business to the extent that people will go more frequently to the shopping centers to buy goods if they know their purchases will be delivered to them promptly and cheaply by electric express. The express department is also an important factor in building up and developing communities, as it contributes one more convenience to the residents, and constitutes an additional inducement for people to settle in the district served by the company's lines. More population means more passenger business.

J. W. GIBNEY, Supt. Ex. Dept.,
United Tract. Co., Albany.

It encourages people to locate on the line, as it furnishes means for them to secure their supplies without inconvenience, and facilitates reaching markets with farm products without delay and at small cost.

SOUTHERN SUPERINTENDENT.

D 3.—As far as the electric railway business is concerned, what is the difference between "express" and "freight" matter?—in other words, define each term. How do you classify various material?

Express matter can be defined as such shipments as are given express service, rapid transit, careful handling and wagon service at points of shipment and destination. Freight can be defined, as such shipments as are transported from point of shipment to destination with wagon service eliminated. With the exception of carload business, it is difficult to give a freight service on an electric line, as the service is usually an express service, but sometimes handled at freight rates.

A. EASTMAN.

In theory, express matter is that character of goods ordinarily transported by old line express companies. Freight matter is that character of goods ordinarily transported by railroads at their convenience. The classifications of the old line companies apply. In practice, express matter is any old thing that the shipper wants to forward, and the rates applying are generally in competition with the rates in effect on the competing railroad.

GEO. W. PARKER, G. E. & P. A., Detroit United Ry.

Ordinarily, express and freight matter on interurban roads are the same kind of goods, the difference generally being that express matter is called for and delivered, and freight is not; express rates should be higher than freight rates.

J. R. HARRIGAN, Gen. Mgr.,
Columbus, Buckeye Lake & Newark Tract. Co.

The distinction between freight and express matter ordinarily is determined by whether or not the goods are handled on passenger or freight cars. Inasmuch as both freight and express are handled in the same cars on the lines of the Schenectady Railway Company, the distinction which we make is merely a matter of wagon service. All business which is handled by our wagons at both terminals is considered as express matter, and goods which are brought to us and called for at destination are classified as freight.

E. J. RYON, Supt. Schenectady Ry. Co.

"Express" matter is given the preference in the matter of time, and is called for and delivered at the end of the route by the wagons of the express company. "Freight" matter is delivered to the warehouse by the shipper and called for at destination by the consignee.

GEORGE DUNFORD, Gen. Ex. Agt.,
Utica & Mohawk Valley Ry. Co.

Consignments are all billed according to weight and for convenience only; we classify 1 lb. to 10 lbs., 11 lbs. to 50 lbs., and 51 lbs. to 100 lbs. as express, the rates for 51 lbs. to 100 lbs. being the minimum one for freight. All shipments are classified according to the "official classification."

H. J. CLARK, Interurban Elec. Exp. Co., Auburn & Syracuse.

In our express and freight business we have three classifications: Class A, which is a distinctly express service, including collection and delivery at both ends; class B, including cartage at only one end; and class C, which is purely freight, and does not include cartage at either end. The bulk of our business comes under class A. Class B represents a small portion of the total business, less than 10 per cent, and consists largely of beer, which is delivered to us at our terminal in Albany, and which we distribute throughout Troy, Watervliet, Cohoes and Waterford. Class C is a small, although very important part of the business, on which we make a low rate, but for which we act merely as carriers between our terminal depots.

J. W. GIBNEY, Supt. Ex. Dept.,
United Tract. Co., Albany.

Think express and freight matter should be handled and treated in the same way by electric, as by steam lines, as far as possible. Express should be handled on passenger trains, and quick delivery made, and rates should be made on profitable basis for this service. Freight matter should be handled on slow trains, or at night when it interferes least with other traffic; it should be accepted subject to delays, and rates should be made on lower basis than express. We follow the practice of steam lines and express companies in the matter of classification.

SOUTHERN SUPERINTENDENT.

With us the term "express matter" covers shipments handled by our delivery wagons at one or both ends. The term "freight" represents shipments received and delivered at our freight houses.

C. C. COLLINS, Gen. Supt. Exp.
The Appleyard Lines in Ohio.

D 4.—Do you recommend the adoption of regular official classification class rates, or special rates to meet circumstances?

I would not recommend the adoption of the regular official classification class rates. I think special rates to meet circumstances are preferable.

A. EASTMAN.

I recommend the present official classification with rates established so as to bring second-class matter into first-class, third-class matter into second-class, fourth-class matter into third-class,

fifth and sixth-class matter into fourth-class, and such special rates as will meet the situation with a minimum rate sufficient to warrant the handling of the goods. I recommend that rates be established so as to prohibit the forwarding on electric cars of certain classes of goods.

GEO. W. PARKER, G. E. & P. A., Detroit United Ry.

Use official classification. At times it is advisable to make some special rates for special commodity. This is only practical locally. Should not be done if you interchange with foreign roads, unless an agreement is made.

J. R. HARRIGAN, Gen. Mgr.,
Columbus, Buckeye Lake & Newark Tract. Co.

I do not recommend the adoption of regular official classification rates for electric service, but prefer to make a flat rate, which is easy for the patrons to understand, and much more popular than classification. Special rates can then be issued covering low-class business where it is necessary to compete with steam roads.

E. J. RYON, Supt. Schenectady Ry. Co.

Both regular official classification class rates and special rates to meet circumstances should be adopted.

GEORGE DUNFORD, Gen. Ex. Agt.,
Utica & Mohawk Valley Ry. Co.

"Official classification" has nothing to do with the rate. Make your rates for each class, according to local conditions.

H. J. CLARK, Interurban Elec. Exp. Co., Auburn & Syracuse.

A company doing such a miscellaneous business as ours, where the bulk of the goods handled comes under the term "express," cannot adopt class rates, and must have a special classification. For instance, a grocer in Albany will send in a diversified shipment consisting of pickles, matches, soap, barrels of sugar, etc. These goods must be accepted at a uniform rate, because it would cost too much to separate them into classes.

J. W. GIBNEY, Supt. Ex. Dept.,
United Tract. Co., Albany.

See the writer's answer to D 1.

SOUTHERN SUPERINTENDENT.

As a large part of interurban freight business is secured in competition with steam lines, would recommend the adoption of class rates as provided in the "official classification." While flat rates may save work in educating agents, they are not revenue gainers.

C. C. COLLINS, Gen. Supt. Exp.
The Appleyard Lines in Ohio.

D 5.—Is it advisable for an electric railway to compete with a steam railroad in carrying freight at or below the rate made by the steam road?

No.

A. EASTMAN.

No.

GEO. W. PARKER, G. E. & P. A., Detroit United Ry.

Make same rate, if necessary. If merchants are satisfied to receive their goods by steam road, say two days after they order, they will not pay a higher rate to a trolley road for a quicker delivery.

J. R. HARRIGAN, Gen. Mgr.,
Columbus, Buckeye Lake & Newark Tract. Co.

It is quite necessary for electric railroads to compete with steam roads where there is competition, but we do not advise offering rates below those of the steam road. My opinion is that the proper flat rate to be adopted by the electric road is the first-class rate of the steam road. Business taken lower than first-class rate by the steam road may be handled either by a special rate or by fixing a flat rate covering such business, which can be arrived at by taking the average of, say, the first four classes of the steam road rates.

E. J. RYON, Supt. Schenectady Ry. Co.

Electric roads should adopt a freight rate to compete with steam roads, but not a lower rate, as the electric road has the advantage in being able to transport the freight much more quickly than the steam road.

GEORGE DUNFORD, Gen. Ex. Agt.,
Utica & Mohawk Valley Ry. Co.

Make your rates no lower than the steam railroads.

H. J. CLARK, Interurban Elec. Exp. Co., Auburn & Syracuse.

Yes, a small road is forced to compete for freight in order to fill out. For instance, we run seven express cars into Troy, and if we did not have considerable freight matter the cars on some trips would run nearly empty. We aim to fill our cars on each trip, and, as a matter of fact, such freight business as we obtain is largely clear gain, because the cars otherwise would run partly empty, and the express department is charged with the cost of power on the express car mileage, whether the cars are full or not.

J. W. GIBNEY, Supt. Ex. Dept.,
United Tract. Co., Albany.

It is necessary to meet rates made by steam lines in order to secure business; but I do not think it advisable or profitable to cut under established rates.

SOUTHERN SUPERINTENDENT.

While the steam lines in many cases have better facilities, we find that our time enables us to compete at equal rates.

C. C. COLLINS, Gen. Supt. Exp.
The Appleyard Lines in Ohio.

D 6.—Is it advisable to compete with a regular express company in carrying express matter at or below the rate made by such express company?

Yes.

A. EASTMAN.

Modified rates, so as to equalize the call and delivery charges, capitalizing the greater convenience offered by the electric companies.

GEO. W. PARKER, G. E. & P. A., Detroit United Ry.

Necessary to make at least same rate and usually lower. Express service on steam roads is as quick and often quicker than on trolley roads.

J. R. HARRIGAN, Gen. Mgr.,
Columbus, Buckeye Lake & Newark Tract. Co.

I think it is very advisable to compete with regular express companies in the carrying of express matter, but do not believe in cutting the rate below that of the regular express companies provided the same service is given, unless there is very good reason for making a reduction.

E. J. RYON, Supt. Schenectady Ry. Co.

Where the old line express companies have a frequent service and are well established it is necessary to establish a rate lower than the rate charged by these companies.

GEORGE DUNFORD, Gen. Ex. Agt.,
Utica & Mohawk Valley Ry. Co.

Make no lower rate than the express companies, providing you give the same service.

H. J. CLARK, Interurban Elec. Exp. Co., Auburn & Syracuse.

We make a slightly lower rate in order to get the business.

J. W. GIBNEY, Supt. Ex. Dept.,
United Tract. Co., Albany.

The old express companies' rates are generally very high to local points. I believe electric companies can handle at less cost, and it pays to make rates low enough to increase tonnage.

SOUTHERN SUPERINTENDENT.

D 7.—Do the steam railroads and regular express companies interchange traffic with you? If not, why not? What can be done to bring about interchange relations between electric railway companies and steam railroads and old line express companies?

It is not profitable to the electric companies to do so. They are not equipped to handle the current business of the steam railroad, and there is no reason why they should divide their rates with the express companies.

GEO. W. PARKER, G. E. & P. A., Detroit United Ry.

No. No occasion for interchange with steam roads on our lines.

J. R. HARRIGAN, Gen. Mgr.,
Columbus, Buckeye Lake & Newark Tract. Co.

This company interchanges business with steam railroads to a

very small extent, and with the regular express companies only when the charges are prepaid by our company. It is the practice of the large express companies to refuse to interchange business on any pro rata basis with competing lines, and also to do everything within their power to prevent competing companies from securing business in competition with the old line companies.

E. J. RYON, Supt. Schenectady Ry. Co.

We have no trouble with the railroad company in exchanging freight, but the old line express companies will not advance any charges to us.

GEORGE DUNFORD, Gen. Ex. Agt.,
Utica & Mohawk Valley Ry. Co.

We have no exchange of traffic with foreign companies, having no track connections with the steam railroads, and our territory is covered also by the old line express companies.

H. J. CLARK, Interurban Elec. Exp. Co., Auburn & Syracuse.

ADDITIONAL QUESTIONS

The following questions have been received from correspondents during the past month. Replies to these from any reader of the paper who can supply the information requested will be heartily appreciated. Address answers to Question Box Department, STREET RAILWAY JOURNAL:

A 5a.—Who are entitled to free tickets from street railway companies?

A 35a.—Can a fifteen-minute service be successfully given upon a single-track interurban road? What conditions are necessary to make this possible?

A 36a.—Based upon experience, what is a proper rate per mile for interurban passenger business, and to what extent should these rates be reduced by the sale of commutation tickets, monthly tickets, coupon books, etc.?

A 48.—Information is requested regarding the sprinkling of streets by street railway companies, and particularly the proportion of street usually sprinkled, and the amount paid by the cities and municipalities for this service. Does your company sprinkle streets? If so, on what terms?

A 49.—Information is requested relative to best ways of despatching cars on interurban roads.

(a) What is the proper method of numbering trains?

(b) Should odd and even numbers be used for opposing trains?

(c) How are train numbers changed at the end of the run?

A 50.—Please describe a simple board for dispatcher's use, showing location of all trains at all times.

B 26.—Should each company keep records of employees and answer all questions about a man who has left its employment?

B 27.—What do you consider the best system for keeping records of conductors and motormen?

B 28.—Do most large companies keep the employees' records on the card system or in a book?

B 29.—Do you think all misses, quarrels and accidents should count in the employees' record?

E 82a.—What is the best remedy for preventing sleet and ice from forming on car windows, particularly on the vestibule windows?

I 28.—What is a good method of testing rail-bonds?

I 29.—What is the best method of keeping records of individual rail-bond tests?

I 30.—What has been the experience with soldered bonds?

I 31.—In using bond tester on special work in which each joint is bonded in addition to long bonding, what is the method of procedure in case the tie-rods span two or more joints?

I 32.—What is the best form of portable rheostat to use in connection with bond-testing instrument.

I 33.—Has the conductivity of the zinc joint held up?

I 34.—What is the best method of preventing switches from "kicking"?

I 35.—How many renewals of hard centers can be made on modern special work before the abutting rails are worn out?

REPORT ON ILLINOIS STREET RAILWAYS

The annual report of the Railroad and Warehouse Commission of Illinois for the year ending June 30, 1904, shows that the total length of main line and branches of the electric railways in the State for the year mentioned was 586.42 miles, which is an increase for the year of 221.1 miles. The total mileage of second, third and additional main track was 160.28, making an increase of 12.86 miles over the previous year. The total mileage of all kinds of tracks is 794.06 miles, which is an increase of 240.72 miles.

The capital stock and funded debt for the year ending June 30, 1904, was \$135,013,961, which is an increase of \$12,528,101 over that reported in 1903. The total capitalization of surface and elevated electric railways is \$222,615 per mile of road, and is divided as follows: For surface roads, \$82,964 per mile, and for elevated roads, \$1,981,148 per mile.

The total income from the operation of the surface and elevated electric railways was \$9,722,176, which is an increase over the previous year of \$1,766,952. The income account was as follows:

	1903	1904
Gross earnings from operation.....	\$7,955,224	\$9,722,176
Operating expenses	4,217,120	5,162,293
Income from operation	3,738,104	4,559,883
Income from property and other sources	12,420	9,201
Total income	3,750,524	4,569,084
Expenses assignable to fixed charges.....	2,971,787	3,291,875
Net income	778,737	1,277,209

The total dividends paid were \$497,952, which is a decrease from the previous year of \$214,419.

The total assets and liabilities were: Assets, \$145,270,381, an increase of \$17,050,874 for the year, and liabilities, \$143,415,293, an increase over the previous year of \$15,714,406, showing a net surplus of \$1,855,088 and a net increase of \$1,336,468 from the previous year.

The total amount of income from passenger service was \$8,379,481, which was an increase of \$1,324,296 over the previous year. The total amount received from freight service was \$334,816, which was an increase of \$232,350 over the previous year. The total earnings and income for this class of roads from all sources for the year ending June 30, 1904, was \$9,663,573, which was an increase for the year of \$1,735,725.

The total expenditures for maintenance of way and structures was \$429,187; maintenance of equipment, \$569,128; operation of power plant, \$1,132,922; conducting transportation, \$1,728,792, and general and unclassified expenses, \$1,255,954, which with fixed charges of \$3,276,826 amount to a total of \$8,393,810, which is an increase over the previous year of \$1,243,125.

The number of revenue passengers carried was 151,308,786, which was an increase over the previous year of 16,145,416. The transfer passengers carried were 3,846,586. The number of tons of freight hauled was 660,530 tons, which was an increase over the previous year of 310,611 tons.

The number of officers and employees on the surface and elevated electric railways was 4126, an increase of 646 over the previous year. There was paid in salaries to these employees the sum of \$2,787,594.69, which was an increase over the previous year of \$464,023.57. The compensation ranged from a general average of \$7.69 per day for general officers to an average of \$1.57 a day for station agents. The total average for all classes of employees increased from \$2.07 per day in 1903 to \$2.85 in 1904.

Under description of equipment, the commission states that there are 10 locomotives in service, 824 motor cars and 1449 all other cars, making a total of 2283, and a total increase of 431. Of these, there are 207 fitted with fenders, 204 fitted with vestibules and 1721 fitted with train brakes. This is an increase of 14 fitted with fenders and 178 fitted with train brakes.

During the year, 2808 tons of steel rails were laid and 88,662 new ties laid. There are 18.5 miles of road equipped with block signals. The number of highways crossed at grade was 683, an increase for the year of 351. The number of under highway crossings was 394, an increase of 20 for the year. The number of overhead highway crossings was 8, an increase for the year of 4.

The number of electric railways crossed at grade was 30, an increase for the year of 1, and the number of steam railroads crossed at grade was 98, an increase for the year of 5. The number of under railway crossings was 17, an increase for the year of 3.

There are 78.24 miles of stone ballast, 198.49 miles of gravel ballast, 86.16 miles of cinder ballast, 135.70 miles of earth, 45.79 miles of pavement and 41.79 miles of superstructure. There are 7 bridges of masonry, 56 of steel, 5 of wood and 4 of combination structure, with an aggregate length in feet of 6551.

The total number of passengers killed by the surface and elevated electric railways for the year ending June 30, 1904, was 8; number of employees, 2; number of others, 27, making a total of 37, being an increase for the year of 9. The total number of passengers injured was 279; employees, 139; other persons, 72, making a total number injured of 490, being an increase for the year of 49.

The amount of taxes paid by these corporations for the year ending June 30, 1904, was \$586,853.82, making an increase of \$145,044.03.

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IMPROVEMENTS IN OHIO INTERURBAN ELECTRIC RAILWAY SERVICE

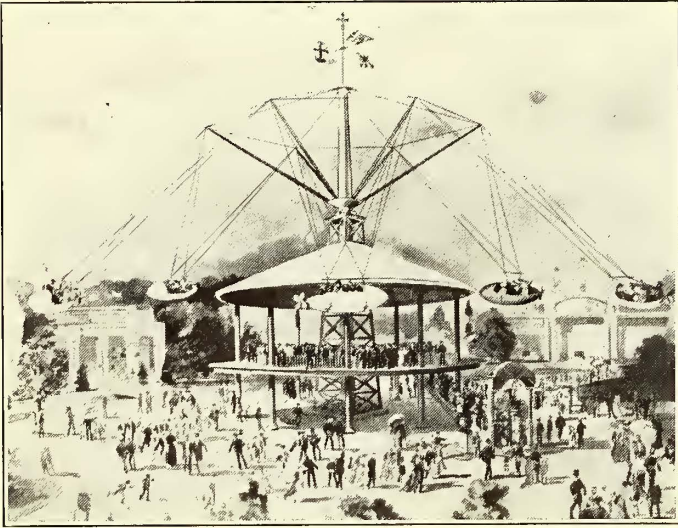
The Dayton & Troy Electric Railway and the Western Ohio Railway, whose combination limited service has been referred to in these columns, have announced some improvements to the service. The magnificent chair car "Harriet," heretofore used in the "Clover Leaf Special" run from Dayton to Delphos, giving connection for Toledo, will be used in regular limited service, leaving Dayton at 5:25 a. m., 11:18 a. m. and 5:18 p. m., running through to Delphos on the last run. Excess fare will be charged on these runs. The plan gives an early morning limited and does away with an extra run in the evening. Another chair car will be installed in the near future, when excess fare will be charged on all limited runs. It is also the intention to put on a morning run to Delphos, giving another connection for Toledo.

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Robert H. Derrah, general passenger agent of the Massachusetts Electric Companies, delivered a lecture before the Salem Board of Trade recently on "Transportation Systems, Old and New." He discussed more particularly the relations between the public and the companies, and pointed out the tendency now in electric railway work to follow in the paths blazed by the publicity and advertising departments of the steam railroads. Mr. Derrah entered the street railway field in Boston some sixteen years ago, and while he discussed the subject generally, still he recited a number of happenings during the pioneer days of electric railroading in New England that were especially interesting. His account of some of his experiences on the trip that he made from Boston to Detroit and other Western cities proved a revelation to his hearers. More than 200 views were thrown upon the screen by the stereopticon during the lecture. As a finale were shown portraits of Henry M. Whitney, General Bancroft, president of the Boston Elevated Railway, and P. F. Sullivan, general manager of the Massachusetts Electric Companies, all of whom have been largely responsible for the development of street railways in Massachusetts.

AMUSEMENTS FOR PARK RESORTS

The growth of pleasure traffic through the stimulating medium of cheap electric railway transportation has caused the introduction side by side with this development of a wide variety of amusement devices for various types of parks. It has been the custom of the *STREET RAILWAY JOURNAL* for a number of years past to publish in one issue descriptions of some of the latest of these forms of amusement, as well as some of those which have proved most popular in past years.

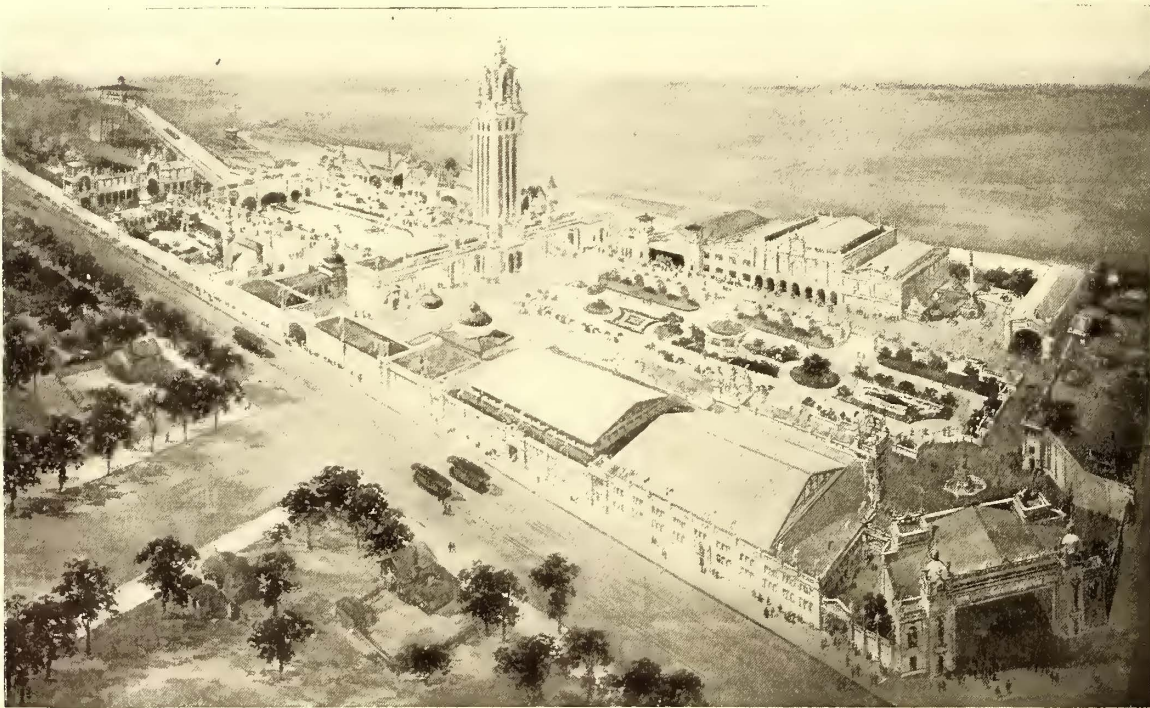


SIR HIRAM MAXIM CAPTIVE FLYING MACHINE

cently another "White City," a 13-acre pleasure ground, to be opened to the people of Chicago on June 1. One of the principal features of this vast entertainment ground will be the electric tower 300 ft. high, which appears in the accompanying view. Of course, pleasure grounds designed to cater to millions of visitors offer many forms of entertainment too expensive for small cities, but this very consideration proves the wisdom of having work of this kind carried out by a specialist.

SIR HIRAM MAXIM CAPTIVE FLYING MACHINE

The American public, ever seeking for novelties, should find the captive flying machine recently invented by Sir Hiram Maxim a very interesting device. The first of these machines was erected at Earl's Court, London, in May, 1904. It attracted wide attention, not only by reason of its inventor's fame, but also because of its novel character as an amusement enterprise. So pronounced was its success that another was soon installed at the Crystal Palace, London. Quick to discern the possibilities of this remarkable contrivance, Thomas J. Ryan, the well-known amusement purveyor of Philadelphia, acquired the American rights and arranged to have the first installation in the United States in "Dreamland," Coney Island. Contracts, however, will be taken for other resorts throughout the country. The machine consists of a central structure 100 ft. high, with ten extending arms, from each of which an "airship" is suspended by cables. When the huge arms begin to revolve, the ships move off in widening circles, reaching very high speeds, and the momentum acquired carries the ships high into the air at the ends of the steel cables. Naturally the utmost care has been taken to design these machines with a high safety factor to prevent all possibility of accident to those who will patronize them.



THE WHITE CITY, CHICAGO

Since the opening of another park season is so close at hand, the accompanying descriptions will prove of benefit for railway companies looking for paying attractions.

THE CONSTRUCTION OF PLEASURE GROUNDS

Among the leaders in the design and execution of those pleasure resorts, the attractiveness of which is due more to the mechanical ingenuity of man rather than the work of nature, may be mentioned Edward C. Boyce, of New York. The ideas of Mr. Boyce in this field have borne fruit in the construction of such magnificent resorts as "Dreamland," at Coney Island, N. Y.; "The White City," at New Haven, Conn., and more re-

THE CIRCLE SWING

Among the new devices which have sprung rapidly into public popularity is the Travers circle swing, of which a description was published in the *STREET RAILWAY JOURNAL* of Oct. 1, 1904. It is made by the Travers Circle Swing Company, of New York. This swing has proved very popular on account of its revolving, expanding and contracting motion. It consists, briefly, of a central steel shaft, to the hub of which are attached projecting arms. From these arms, cables are suspended for carrying small cars. The whole structure is revolved by an electric motor within the tower, the

acceleration being so rapid that in less than a minute the passengers enjoy the exhilarating sensation of sailing through the air at 30 m.p.h. without jar or shock of any kind. At night, illuminated by hundreds of incandescent lamps, the circle swing is even more interesting, especially when revolving, as it then



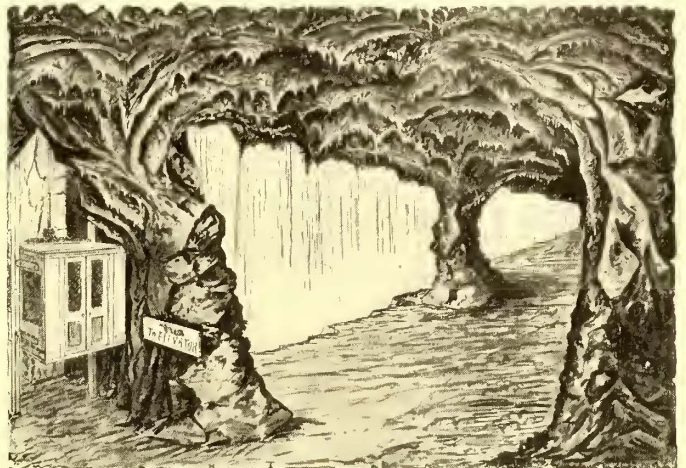
THE CIRCLE SWING AND CAPT. BALDWIN'S AIRSHIP AT LOS ANGELES

looks like a huge shimmering umbrella. The view presented shows the circle swing installed at "Chutes Park," Los Angeles, and is remarkable also for its representation of a successful flight of Captain Baldwin's airship.

A TRIP UNDER NIAGARA FALLS

What promises to be one of the most remarkable attractions during the coming season has been perfected recently by Joseph Turner, of New York, who has made arrangements to produce at Steeplechase Park, Coney Island, a spectacle unequalled for realistic effects. It will be a representation of a trip under Niagara Falls, combining therewith a series of dissolving views which will accompany the guide's version of the Maid of the Mist legend. The front of the building in which this production is to be housed will appear as a great golden frame, show-

become moist and chilly, and on stepping out at the bottom the visitors will find themselves in a cavern hewed out apparently from the solid rock. Following the guide through tortuous slippery passages, they will reach the back of the Falls at the base of a seething whirlpool, amid the dripping waters and deafening thunders of the giant cataract. Here the guide will relate the famous legend of the Maid of the Mist, whose spirit is said to haunt the environs of the Falls. As the guide continues his relation, the cavern becomes darker and darker, ominous flashes of lightning play to and fro, accompanied by roars of thunder, and, to crown all, the beholders are

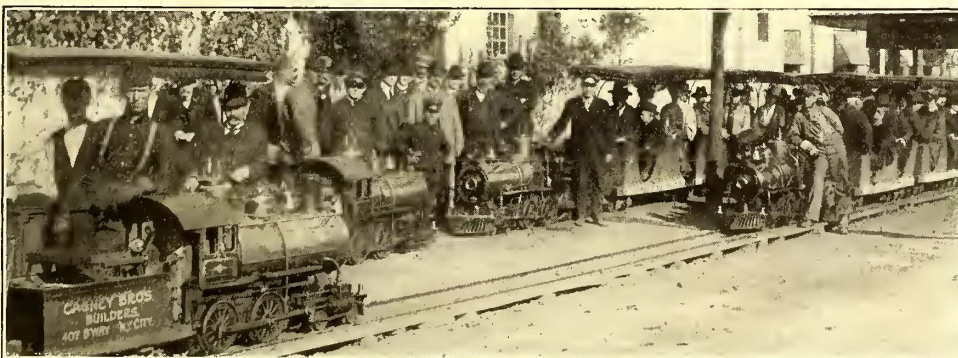


VIEW OF GROTTO IN "A TRIP UNDER NIAGARA FALLS"

startled to see the form of a beautiful Indian maiden slowly rising through the falling water and apparently murmuring some chant of her people. This vision is but the first of a series of dissolving views intended to illustrate the chief incidents of the legend, and culminating in a grand panorama symbolizing the entrance of the Maid to the happy hunting grounds. Following this remarkable exhibition, the Falls resume their former appearance and the visitors retrace their steps, regretting their departure from this grotto of wonders to the prosaic upper world.

MINIATURE RAILWAYS

A diversion which appears to be as pleasing to old folks as to young ones is riding on miniature railways. The Miniature Railroad Company (Cagney Brothers), of New York, holds a prominent place in the development of this class of apparatus. The manufactures of this company are not mere toys, but well constructed locomotives and cars, capable of being operated on any length of straight or curved track, the locomotives having a drawing capacity varying from 10,000 lbs. to 20,000 lbs., and attaining a speed of about 10 m.p.h. When the railway operates in a conspicuous locality, the money received simply for advertising privileges upon the sides of the cars and locomotives will often pay for the entire outlay. The miniature



ASSEMBLY OF MINIATURE LOCOMOTIVES AND CARS IN ACTIVE SERVICE

ing the Falls as seen from the cliffs of the Victoria Park Hotel on the Canadian side. Elevators will be installed, which will descend to the base of the cliffs, while the realism of the scene will be enhanced by the shouts of the "ballyhoos," inviting the onlookers to purchase tickets and step into one of the elevators. As the door of the elevator is closed, the occupants will enjoy the sensation of descending a great depth, the air will gradually

railway is especially well patronized when it is used in a large resort as a connecting link between the various attraction when it runs through tunnels, over bridges, etc. This co had a large number of its trains in regular passenger transportation service at the St. Louis Exposition, and was a grand prize and gold medal by the jury of awards the St. Louis convention of the American Street Rail-

ciation, the Miniature Railroad Company extended the courtesy of its service to the delegates and their families. The electric railway men did not fail to take advantage of this opportunity to study the miniature railway at first hand, and afterward showed their appreciation by passing a resolution of thanks to Cagney Brothers.

Another miniature railway which has made great progress in pleasure resorts is the type manufactured by the Armitage-Herschell Company, of North Tonawanda, N. Y., of which a most interesting feature is the use of air brakes. The No. 1 train, which draws sixty people, is equipped with them throughout, including both the locomotive and cars; while the No. 2 train, which is lighter, has air brakes only on the locomotive. These brakes are thoroughly practical, being capable of stopping the loaded train at full speed (about 15 m.p.h.) in less than its own length. It is apparent that this arrangement secures great safety, besides lengthening the life of the equipment. The locomotives usually employed for trains Nos. 1 and 2 develop 7.5 hp, but a heavier type, developing 18 hp at 15 m.p.h., is made for train No. 3, which is also completely equipped with air brakes.

ROLLER COASTERS AND LAUGHING GALLERIES

Those who seek pleasures of the thrilling sort have found



FIGURE 8 ROLLER COASTER AT NEW CASTLE, PA.

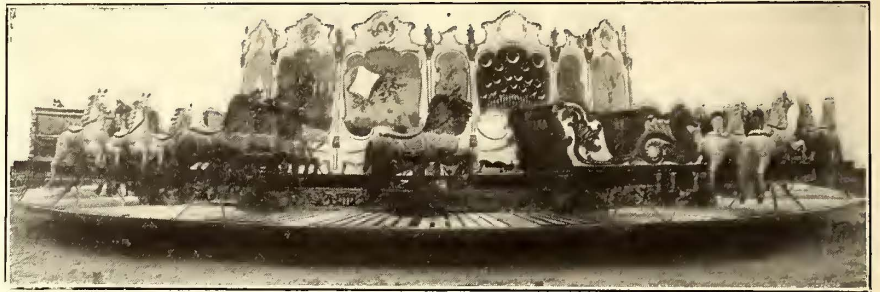
that the figure 8 roller coaster meets their demands fully without endangering life and limb. This popular amusement is a specialty of the Ingersoll Construction Company, of Pittsburg, Pa., which has built and installed a large number throughout the country. The Ingersoll roller coaster is now so well known that it is scarcely necessary to describe its construction, but the following covers the essential features: The ground required for the structure is 85 ft. wide x 225 ft. long. Ten massive, handsomely decorated cars are carried up a 70-ft. incline by a heavy chain. On either side of the cars, three in number, are safety arms which drop back behind them, preventing all danger by making it impossible for the car to run backward in case the chain breaks. The cars run on a hard maple track, while the structural lumber is long-leaf heart Georgia pine. In connection with the roller coaster there is built also a handsome entrance pavilion. These coasters, as well as other of its amusement devices, are generally erected on the grounds by the Ingersoll Construction Company, the usual arrangement being to give a stipulated percentage of the receipts to the company controlling the park.

Another feature of this company's money makers is its laughing galleries, which consist of glass mirrors arranged to give the most grotesque and grotesque distortions. Twenty-six different effects are made, producing nearly 100 effects. Each mirror is

40 ft. x 70 ft. in size, and ten to fifteen are enough to make a good laughing gallery.

RIDING GALLERIES

Despite the large number of new amusement devices, the makers of "merry-go-rounds" find that their apparatus is more popular than ever, particularly where children constitute a large percentage of the park visitors. The galleries are made



VIEW OF A MODERN RIDING GALLERY, SHOWING THE FINELY CARVED HORSES AND CARS, ORGAN, ETC.

in a great variety of forms at costs ranging from a few hundreds to thousands of dollars, the more expensive styles having their attractiveness increased by elaborate carvings, fine organs and other accessories.

The illustration above shows a view of a handsome "merry-go-round" made by the Armitage-Herschell Company, of North Tonawanda, N. Y., whose products in this line are too well known to require any extended description. It may be stated, however, that while the company's models for 1905 follow along time-approved lines, some important changes have been made in the mechanical details. Chief among these is the use of ball bearings for the main bearings of the machine, thereby permitting a much easier running.

Among others who have been largely instrumental in developing this branch of the amusement business to its present extent is E. Joy Morris, of Philadelphia. To demonstrate the popularity of this manufacturer's designs of riding galleries, it is only necessary to refer to the prominent parks where they have proved profitable attractions. Among these are: Exposition Park, Pittsburg, Pa.; Chutes Park, Chicago, Ill.; Woodland Beach Park, Ashtabula, Ohio; East Lake Park, Birmingham, Ala., and Willow Grove Park, Philadelphia, Pa.



A TYPICAL FIGURE 8 TOBOGGAN INSTALLATION AT WASHINGTON PARK, N. J.

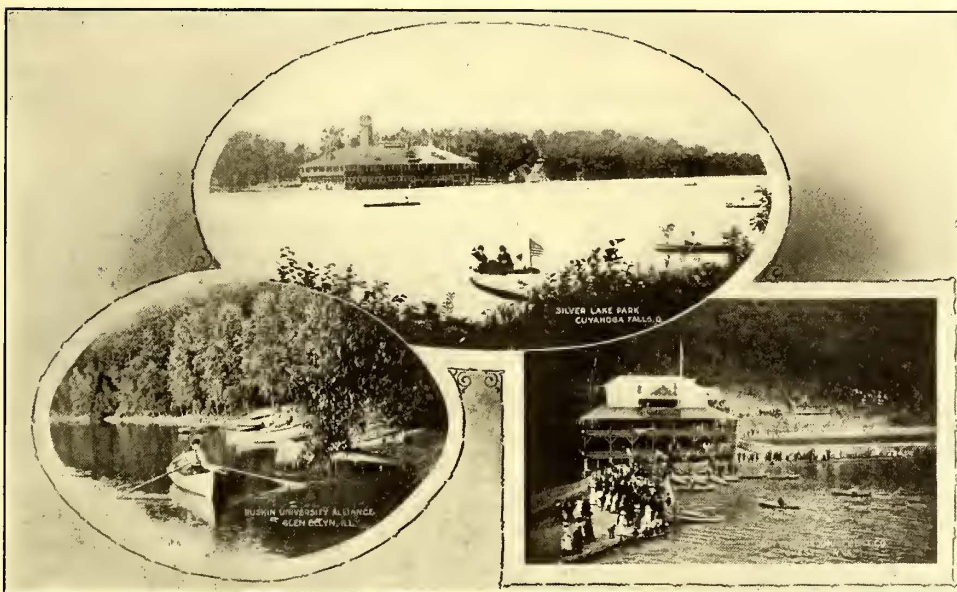
Mr. Morris also builds figure 8 toboggans, of which he has installed quite a number. The lowest illustration on page 482 shows some of his work at Washington Park, N. J.

Herschell-Spillman & Company, of North Tonawanda, N. Y., have found that the improvements brought out on their "merry-go-rounds" and ocean wave galleries last season have proved even more satisfactory than they expected. They confidently believe that their long experience in this field enables them to produce a most attractive and durable outfit. Owing to the large increase in their business it has been found necessary to add a great deal of space to the storage department. The old office has been taken for this purpose and a building having 7000 sq. ft. of storage room erected. A new and larger office has been built, new machinery acquired and extra help employed to handle all orders with facility.

Modern high-class riding galleries are also made by Wm. F. Mangels & Company, of Coney Island, N. Y. In addition, this company builds electric targets, automatic shooting galleries and safety rifle ranges. At the present time it is constructing an immense riding gallery for Feltman Brothers, of Coney Island, which fact is an additional proof that this form of entertainment is still very popular, even in a place which has become world famous for the immense scope of its amusement projects.

THE CORDILLERO SLIDE

The Cordillero slide, which promises to be one of the real novelties of the coming season, is being promoted by Clark Ball, of New York. It consists of two pyramidal towers set 400 ft. apart, one tower being 300 ft. and the other 200 ft. high.



THREE SUMMERING PLACES WHERE STEEL BOATS ARE USED

Cables will be slung between the towers and from them cars suspended for transporting passengers. These cars will descend by gravity and return by electric power. The interior of the towers may be used for some other amusement purpose, and the cables themselves may be suspended over a lake, river or other interesting area. The details of this new device will be perfected within a few weeks, at which time a more extended description will appear in this journal.

HOUSE OF TROUBLE AND METAL LAUGHING GALLERY MIRRORS

Among the new things of the coming season will be a "house of trouble," designed by the J. M. Naughton Amusement Construction Company, of Columbus, Ohio. This is an improvement on the wooden maze that has mystified so many at the leading amusement resorts. It will contain in addition to the maze, a haunted chamber. The building is designed with a very attractive front, is suitable for both small

and large parks and can be built at little cost in accordance with plans and specifications furnished by the Naughton Company.

This company also designs metal mirrors for laughing galleries, and furnishes them in sizes 3 ft. wide x 6 ft. high. They are made of a composition with a reflecting surface that is said to compare favorably with the finest glass. The curves of the mirror surfaces embody the results of long experience, and the qualities of the metal are such as to permit a wide variety. As the metal can be polished on both sides, one mirror may be made to serve for two.

THE GAME OF BOX BALL

The ingenious modification of bowling, known as "box ball," was placed on the market by the American Box Ball Company, of Indianapolis, less than three years ago, yet over 2000 alleys



PLAYERS INDULGING IN THE GAME OF BOX BALL

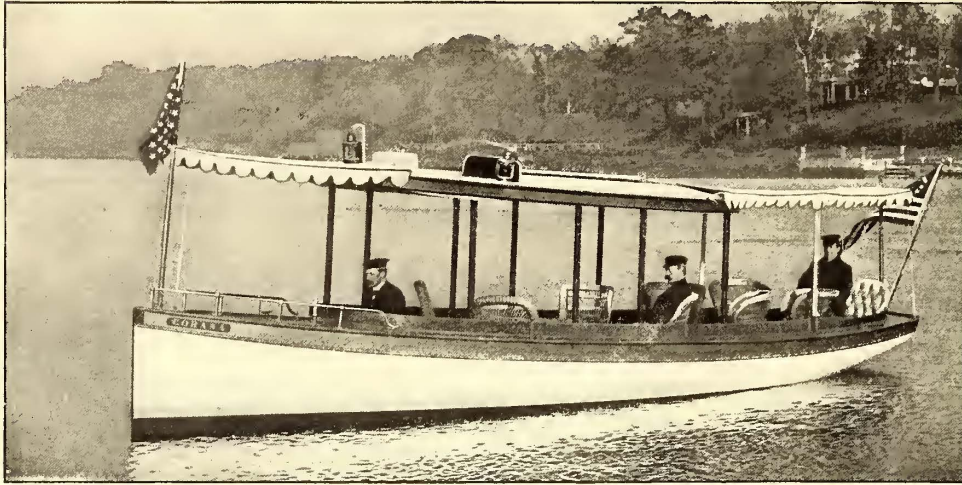
are in use at the present time in picnic parks, hotels, club rooms and private residences. Although a bowling game, it is quite distinct from ten pins. The alley, which is usually from 24 ft. to 30 ft. long, can be installed at about one-half the cost of a first-class regulation bowling alley. The balls return by gravity of their own account, and the players can set up the pins by the slight jerk of a lever, so that no attendant is required, nor are there any annoying delays. The five pins used are placed side by side, and as one pin is not depended upon to knock down another, the game itself is purely one of skill. The alley bed is covered with a composition of ground cork, which greatly eliminates noise and causes the balls to roll more evenly than on an ordinary wooden surface. They are built completely in the company's shops, shipped in strong crates and can be placed in operation by an ordinary workman within three hours after reaching their destination. The ease with which they can be removed from place to place makes it possible to use them at different seasons of the year wherever they will give the most profit. This game does not require the exertion of ordinary bowling, and may therefore be played by ladies and children with as much benefit as vigorous men derive from the regular game.

STEEL BOATS AND LAUNCHES

Wherever the operators of a pleasure ground are fortunate enough to have a body of water therein or along its borders, every effort should be exerted to make boating as safe and pleasing as possible. Few pleasures are more agreeable than those incident to gliding over lake or river, but as long as the danger of drowning is present many people will hesitate to accept for themselves and their children the risks and unpleasantness incident to using leaky wooden boats. The recognition of this fact is bringing non-sinkable steel boats into great favor for use in parks, hunting and fishing parties and the like. The pioneer advocate of this type of boat construction, the W. H. Mullins Company, of Salem, Ohio, has furnished thousands of stamped steel boats for both sporting and commercial purposes.

The accompanying group of illustrations shows Mullins boats in use in three noted outing places. Besides rowboats and canoes, the company also builds various styles of steel motor boats, all of which have air-tight compartments.

For park service the electric launches made by the Electric



ELECTRIC LAUNCH WITH METALLIC AIR TANKS BELOW DECK TO PREVENT SINKING

Launch Company, of Bayonne, N. J., have become deservedly popular on account of their safety, speed, cleanliness, noiselessness and simplicity of operation. Sinking is practically impossible, owing to the installation of metallic air tanks below deck, and in the larger boats the placing of the motor and batteries beneath the floor gives considerable extra space. There are no stiff, uncomfortable side seats, but instead easy chairs, which can be moved about to suit one's personal convenience, cosy settees, table, book racks, etc. One of this company's most popular styles is its 30-ft. electric charter launch seating twelve to twenty-two passengers. The length over all is 30 ft.; beam, 6 ft. 4 ins.; freeboard, 24 ins., and draft, 24 ins. The stem is made of hackmatack or oak, the upper stroke and plank-sheer of oak and quartered oak coaming. The decks are of oak



RIDING GALLERY AND TOBOGGAN COASTER INSTALLED AT A PROMINENT PLEASURE RESORT IN MILWAUKEE, WIS.

or mahogany laid in narrow strips. The interior is finished in oak or mahogany. The standing roof is of light wood construction, covered with waterproof canvas and fitted with storm curtains. The motive apparatus consists of a special type battery, with motor, speed controller, voltmeters, etc. Its radius of action varies from 35 miles at the medium speed of 6½ m.p.h. to 60 miles with the largest battery equipment used for this size.

A large line of rowboats, canoes, sailing yachts and motor boats is made by the Racine Boat Manufacturing Company, of Muskegon, Mich., whose long experience in this line has enabled it to perfect some graceful types which are widely used. A specialty of this company is its 15-ft. to 40-ft. motor boats, which are well adapted for park service.

PARK MUSIC

Those who have observed the large crowds that attend the fine band concerts given during the summer months in the public resorts of large cities like New York, Philadelphia and Chicago, where good music can be heard almost any time

throughout the year, must admit that a good military band should prove an exceptional attraction in less favored communities. To furnish this kind of entertainment Henry Morin, the conductor of the New York Franco-American military band, has arranged to take this well-known organization on a tour throughout the country, making engagements to play for several days or weeks at popular picnic grounds. During the coming summer Mr. Morin's band will give concerts at the Louisville Jockey Club Park, Cincinnati Zoological Garden, Winona Lake Assembly and similar resorts. The extended experience that Mr. Morin has had among different classes of people has enabled him to master the difficult art of arranging

programmes to please the lovers of both light and serious music. Mr. Morin was formerly a member of the Garde Republicaine Band of Paris, and has associated with him a number of prominent soloists.

FOREST COASTERS, TOBOGGAN SLIDES AND RIDING GALLERY INSTALLATIONS

The work accomplished by the Philadelphia Toboggan Company, of Philadelphia, Pa., may be cited as an example of the broad field of operation of modern amusement outfitters. This

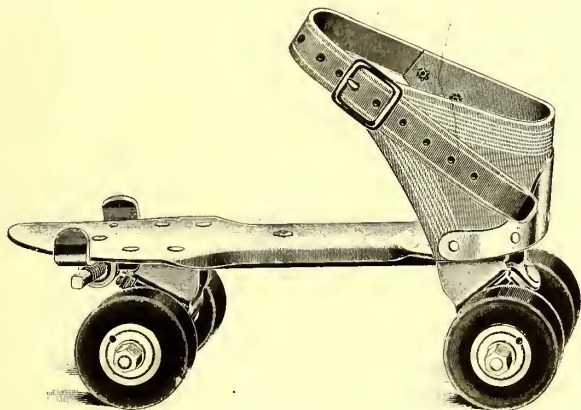


company has successfully installed modern apparatus of its own design in such widely-separated cities as Denver, Topeka, Milwaukee, New Orleans, Norfolk, Columbus and Philadelphia. One of the accompanying illustrations shows a toboggan coaster installed by this company at Milwaukee, and the other a riding gallery in the same park. The latter is certainly a remarkably fine specimen of what can be accomplished in this line. The horses are artistically carved and arranged in various life-like attitudes, the center above the ornate grand organ is covered with handsome paintings, and at night the illumination of the whole must appear like a scene from Fairyland. The toboggan coaster, which is shown in the other view, is apparently very popular, judging from the number of people in its vicinity.

ROLLER SKATING

Judging from the experience of the Northampton Traction Company, of Easton, Pa., with roller skating at Bushkill Park, this excellent combination of pleasure and exercise is renewing its former hold on public favor. Some time ago, W. O. Hay, the secretary and purchasing agent of the company, conceived the idea that the time had arrived for a roller skating revival, and the park dancing pavilion accordingly was adapted for use as a roller skating rink. The success of this experiment was so remarkable that it was soon necessary to enlarge the rink, which now comprises some 1,400 sq. ft.—this despite the fact that Bushkill Park is 3 miles out in the country. At present 375 pairs of skates, made by the Samuel Winslow Skate Manufacturing Company, of New York, are in use, but the number will shortly be increased to 600. The traction company charges 10 cents for the use of a pair of skates, either afternoon or evening, and during the winter months no special attraction is offered other than band music. The crowd is noticeably larger when there is no ice skating, and no doubt the spring season will make roller skating more popular than ever. The success of this revival is of particular interest, as it opens up a profitable source of income demanding a comparatively small investment.

Since the days of its early popularity, the roller skate has undergone many improvements. This fact is especially exemplified in the automobile cycle skate made by the Cycle Skate & Sporting Goods Company, of New York, which is furnished with either 4-in. or 5-in. solid cushion rubber tires. The constituent parts are formed in dies from sheet steel, and Seamless tubing is employed. An important feature of the new skate is



A STANDARD SKATE OF THE UNION TYPE

the positive fastening of the telescoping tubes, which are adjustable from 10 ins. to 12 ins., inclusive. The tires are rigidly held in position by substantial inner lugs, which are a part of the tire itself, screws with nut fastenings passing through the lugs and clamping the steel spokes and tires in one solid wheel, which runs on steel ball bearings. The center of gravity lies below the center of the axle so that the skates are not top heavy. All metal parts are polished and nicked. This type is designed particularly for high-speed work, but the company also builds an extensive line of regular roller skates for rink use.

A model of the line of these goods manufactured by the Union Hardware Company, Torrington, Conn., is reproduced in the above illustration. This company has been making roller skates ever since they were first designed, and was among the larger producers during the last skate craze of twenty years ago. These skates are made of the very best material, and are thoroughly high-grade goods in every detail. They are made in either plain or ball-bearing models, as desired. The ball-bearing skates, however, have been preferred

for rink use, because of the ease with which they run. They are also made in styles for men and women, the men's skate being of two patterns, an all clamp model and a half-strap model.

SOUVENIR POST CARD SLOT MACHINES

During the last three years the souvenir post card business has assumed immense proportions, the cards proving especially popular where they picture local places of note. To facilitate the sale of these cards at the least cost, the Rogers Manufacturing Company, of New York, has placed on the market three styles of souvenir postal card slot machines. The machines are made



AUTOMOBILE CYCLE SKATE, WITH RUBBER TIRES

from quartered-sawed oak, highly polished and carved. As many as 3000 cards have been sold in one week through one machine.

This company also builds an extensive line of other slot devices, like scales and punching machines, as well as disc talking machines.

STRENGTH-TESTING AND OTHER COIN-OPERATING MACHINES

To please the instincts of those who like to show their physical prowess and are willing to pay for that privilege, the Caille Brothers Company, Inc., of Detroit, Mich., has developed a large number of lung-testing, combined lung and grip-testing, punching, lifting machines, etc. One of its latest contrivances in this line is the "Mickey Finn" combined tug-of-war and grip machine, which, since its introduction last season, has met with great success. The dial of the last-named device indicates up to 1000 lbs., but at 750 lbs. a devil's head shows at the top. The machine is made entirely of enameled metal, is mounted on a heavy oak platform, weighs boxed, 125 lbs., and is 5 ft. 10 ins. high. The "Ajax" puncher illustrated is the result of many requests for a large machine. It is about 7 ft. high, has a 22-in. dial and registers 2000 lbs. A large electric bell rings at 1000 lbs.

In addition to apparatus of the above-named styles, this company builds quite an array of card, cigar, roulette and other chance machines which are intended to appeal to the sporting fraternity. Another of this company's mechanical novelties is an automatic singing bird machine, which consists of two skilfully mounted canaries perched in a brass cage among small shrubbery. When operated, the birds whistle some popular air, the head and tail of each bird moving in a life-like manner.

One of the latest novelties introduced by this company is a coin operating machine, known as the "Log Cabin." It is loaded with 500 marbles, and when a coin is dropped into the slot one of these marbles is delivered automatically to a throwing device operated by the player. The marbles fall into one drawer and the coins into another, allowing the owner to check up receipts.

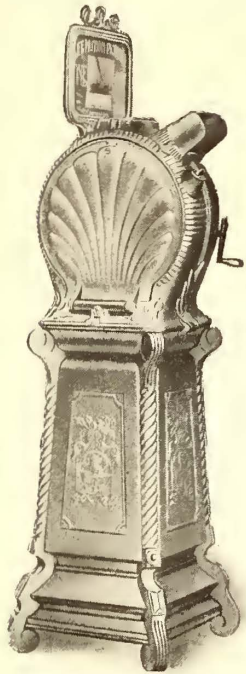


PUNCHING MACHINE

THE MUTOSCOPE

The mutoscope, made by the American Mutoscope & Biograph Company, of New York, is one of those novelties which appeal equally to all classes. The mutoscope is a handsome silver gilt cast-iron cabinet, provided with a coin slot and a crank. When a coin is dropped in the slot the beholder views some interesting scene, embracing the use of over 700 moving pictures, greatly magnified and brilliantly illuminated by electric light. When one subject has lost its earning power, another can be substituted in a few minutes. The mutoscope does not use films, the pictures being bromide photographs mounted on reels. The mechanism of this device is extremely simple. The parts are few and are all interchangeable, so that repairs can be made readily.

The weight of the boxed machine is 325 lbs.; the height to the eye piece is 4 ft. 6 ins., and the floor space needed is 2 ft. square.



THE MUTOSCOPE

"PUSS IN BOOTS" SLOT MACHINE

Roovers Brothers, of Brooklyn, N. Y., whose aluminum name plate machine has proved a most profitable slot device, have placed on the market an amusing and ingenious vending or fortune-telling apparatus known as "Puss in Boots." This machine is mounted on handsomely carved legs, which, however, are not shown in the accompanying illustration. By placing a coin in the slide recess, drawing down the handle on the right-hand side of the machine and then letting it return, the cat is caused to greet the customer with a bow, then to move its left

paw, which holds a pan, to the chute containing the article to be delivered, the head moving in unison with the pan so as to see that the latter is in the correct position to receive the article from the chute delivery opening; next the cat moves its head toward the right paw, which holds a nickel-plated rod, with which it carefully opens the lid of a basket in front, the paw holding the pan containing the article having taken a position over the lid. On lowering the pan, the article drops on the lid, then the pan is raised again to allow the lid of the basket to be closed a second time. The



PUSS IN BOOTS SLOT MACHINE

cat follows these movements with its head, and ends with a bow of thanks. The article falls through the basket into a receptacle in front of the machine. The figure is dressed in satin, and the seat and floor are covered with velvet. The net weight of the complete machine is 136 lbs., and the weight crated, 190 lbs. The size of the case is 32 ins. high x 14½ ins. square. The stand is 30 ins. high x 16 ins. square. The full height with sign is 6 ft. 2 ins.

CIGAR AND CANDY VENDING MACHINES

The "Doremus" cigar selling machine, made by the New York Vending Company, of New York, is an inexpensive, efficient salesman, especially useful where it is not convenient or profitable to carry a large stock. The machine is 8½ ins. long, 7 ins. wide x 13 ins. high, and is handsomely finished in oxidized copper or heavy nickel plate. The cigars are visible through bevel-plate glass, are delivered without damaging the wrapper and are sold directly from the original box by simply inserting the requisite coin. A valuable feature of this machine is the combination cigar cutter and match box. The machine handles cigars of different sizes, and can be constructed to deliver two or more cigars for one coin. A simple arrangement is provided for locking the machine to any convenient stand or shelf.

A modification of the above-mentioned machine is made for selling sticks of candy, chewing gum, etc., which, owing to its cleanliness and attractive appearance, has become a popular standby in many public places.



SLOT MACHINE FOR SELLING CIGARS

FOLDING STEEL LAWN SWING

The swing is a pleasure-giving device which will always find a place on outing grounds. The old wooden swing, however, is being replaced rapidly by steel swings, which are more economical in the long run, owing to their greater safety and longer life. One of the illustrations herewith shows the "Eagle" steel lawn swing, built by A. Buch's Sons & Company, of Elizabethtown, Pa. It is constructed entirely of high carbon steel, with the exception of the slats in the seats and platform, and can be set up or taken down in five minutes and folded very compactly. The chairs or seats can be placed at any angle in a moment so that the occupants can sit erect or lie down as they desire. This swing is built extra heavy for public use and can be furnished in all cases with table or steel head rests.

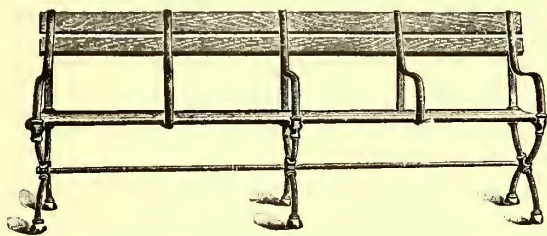


FOLDING STEEL LAWN SWING

OUT-OF-DOOR BENCHES, TABLES, ETC.

In a survey of park attractions the question of park furniture should not be overlooked. Benches, tables and the like should be not only of substantial build, but designed in harmony with the surroundings. One of the largest manufacturers in this line is the Bethlehem Foundry & Machine Company, of South Bethlehem, Pa. The Central Park settee, which is one of the company's most popular types, has been officially adopted as standard for use in the New York public parks. It is strongly built, attractive in appearance and withstands weather and

hard usage remarkably well. The length of this bench is 7 ft.; height of seat, 17½ ins.; height of back, 32 ins.; extreme width,



CENTRAL PARK SETTEE

23 ins., and width of seat, 14 ins. The company also builds folding seat benches pavilion benches, etc., as well as café, picnic tables and folding chairs.

THE KINETOGRAPH

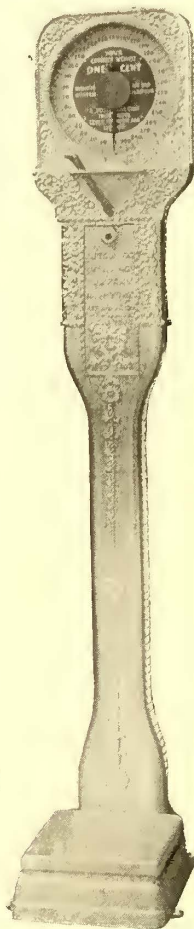
Electric railway companies that are operating theaters and vaudeville attractions in connection with their parks are apt to overlook the great money-making possibilities of moving pictures. The number of companies using moving pictures as park attractions is, however, constantly growing, and the increased profits secured by their employment has been very gratifying to the companies that have given the matter a trial. The Kinetograph Company, of New York, which acts as sales agent for the Edison stereo-projecting kinoscope and films, either leases the moving picture machine with an operator and a weekly change of films, or sells the machine outright, contracting to furnish new films as often as may be desired. The working of the machine is very simple and does not require a skilled operator. The Kinetograph Company does not manufacture slot machines of any kind, but makes a specialty of the large projecting machines, and has been furnishing films for these during the past season to about forty parks throughout the United States and Canada. Some of the largest vaudeville houses of New York City, including Proctor's theaters and the Hurtig & Seamon's houses, are using the Kinetograph service. Of special interest to electric railway companies are the reports received from roads which have been

hotels, theater lobbies and other places. These machines are leased by the Automatic Vending Company to agents and must be forfeited by said agent if any other confections except those furnished by the company are offered or sold through them. These machines are free to all who wish them, the only obligation being to purchase and keep them filled with the confections specified by the vending company. The accompanying illustration represents the company's weighing scale, which is a light, attractive machine, giving correct weight up to 300 lbs.

The compactness of these machines and their reliability in spite of the vibration caused by passing trains has prompted the extensive use of both of these machines on the stations of the elevated lines of New York, Brooklyn, Boston and Chicago.

OTHER AMUSEMENT APPARATUS

While the devices described in the foregoing pages embrace a wide scope, it is hardly possible to do justice to this important topic in the limits of one article. Arrangements are being made, therefore, to describe in an early issue a number of other attractions suitable for pleasure resorts.

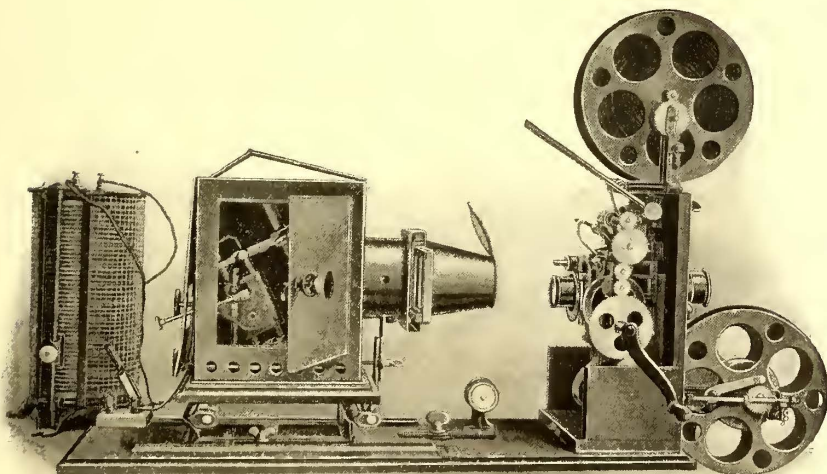


AUTOMATIC WEIGHING MACHINE

STEAM RAILROAD ASSOCIATION TO CONSIDER EXCHANGE OF FREIGHT TRAFFIC WITH ELECTRIC LINES

Announcement is made that Chairman Tucker, of the Central Freight Association, has called a meeting of the interested lines to be held at Chicago next Wednesday to consider the exchange of tariffs between the steam and electric lines at Toledo. The call is significant as showing that the question which has been agitating the Central Passenger Association for some time past has at last reached the freight association. The difference is this: More than a dozen lines of the Central Passenger Association are known to have more or less dealings with the interurbans, while not more than two or three lines of the Central Freight Association are known to be exchanging freight with the trolleys. The Wabash makes no secret that it is exchanging tariffs with the Toledo & Western (traction line) via Adrian, and it is said that the Detroit Southern has been exchanging freight with the trolley lines for some time. The Wabash has established a class rate tariff with the Toledo & Western via Adrian, where there is a track connection between the two roads, and announces that it will pro rate the same as with steam line connections. Adrian is the only point where the Wabash has a track connection with the Toledo & Western.

The freight business of the Toledo & Western is assuming large proportions, and it is said the management is now considering the advisability of purchasing a steam locomotive with a view of handling large freight trains during the hours of the night when passenger traffic is suspended. With such motive power the company would be enabled to get the bulk of its freight out of the way, and practically give a clear track for the trolley passenger cars during the day time and the first half of the night.



OPERATING DETAILS OF THE KINETOGRAPH

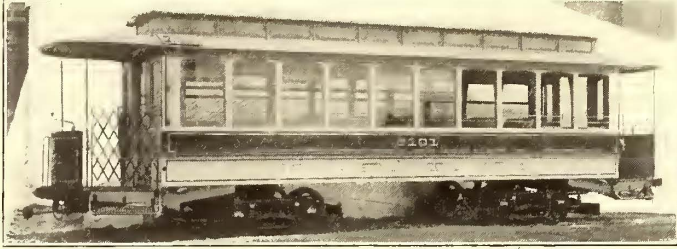
using moving pictures in their park theaters, one representative road having reported an increase in receipts for park traffic of 65 per cent, which is attributed to the use of the Kinetograph service.

AUTOMATIC WEIGHING MACHINE

The blue enamel confection and silvered weighing machines, made by the Automatic Vending Company, of New York, have established themselves firmly in parks, railway stations, stores,

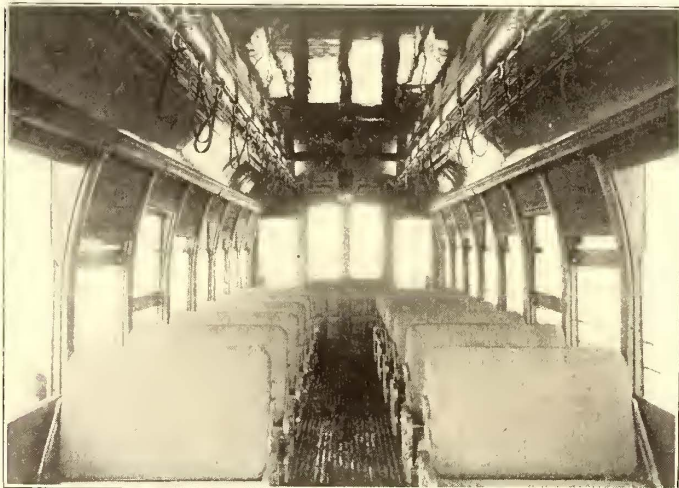
SEMI-CONVERTIBLE CARS FOR PHILADELPHIA RAPID TRANSIT COMPANY

The Philadelphia Rapid Transit Company is receiving several cars daily on its order for eighty-one Brill semi-convertible cars. The order was first for sixty cars, but was supplemented recently by another for twenty-one. The cars are all mounted on the trucks of the builder's No. 27-G type. The cars are of



DOUBLE-TRUCK CAR FOR THE PHILADELPHIA RAPID TRANSIT COMPANY

unusual interest on account of being the first built with the improved window system. The builder has worked out an arrangement whereby the metal runways, formerly used and the sash trunnions which moved in them are dispensed with. The general plan of a large lower sash carrying the upper upon it into a roof pocket remains the same, the difference being a simplified method of sliding the sashes into the pocket and doing away with grooves in the posts. There are two guides of flat steel about $\frac{3}{4}$ in. wide, spaced about 14 ins. apart, secured at the lower end to the letterboard and at the upper end to the ventilator rail. These guides are bow-shaped and are close under the roof. Two small castings attached to the top of the upper sash are slotted and have roller bearings on either side of the slots, and these slide upon the guides. The lower



INTERIOR OF PHILADELPHIA CAR

sash is attached to the upper by a sliding connection, consisting of a tongue on either side of the upper sash, which moves in a groove on either side of the lower sash. The upper sash is held in its lower position by a lock, which is automatically released when the top of the lower sash reaches the height of the top of the upper sash. When the upper sash is drawn down, metal pieces with inclined faces at the lower corners of the frame bear against other inclined metal pieces upon the posts, which wedges this sash closely against the lower, making the connection weatherproof.

The grooveless posts are, of course, the unique feature of the new arrangement, and to one who knows nothing about the guides in the pockets, it is exceedingly mystifying to see a pair of sashes under perfect control, but which apparently slide upon nothing. The sashes can be held at any desired height by lock

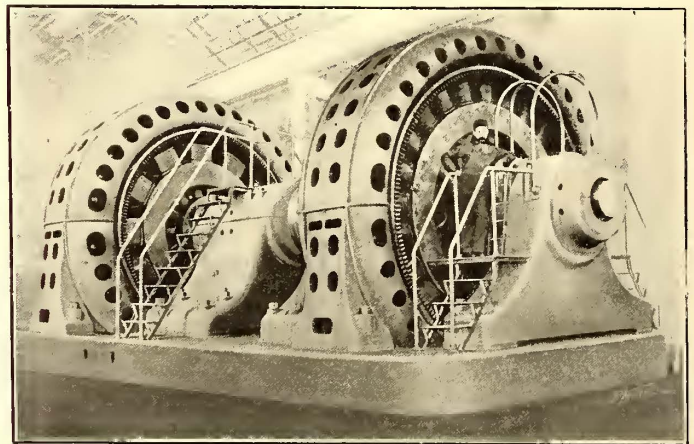
stops, as formerly. These stops are of metal set into the posts, and other than the small chiseling for the lock stops the posts are not cut into, and have all the strength of their full thickness. The arrangement has been in actual service for several months and the efficiency of every part thoroughly tested. A further description with diagrams and illustrations will be given in an early issue.

The length of the cars over end panels is 28 ft., and over the crown pieces, 37 ft. The length of the platforms is 4 ft. 6 ins.; width over the sills, 7 ft. 8½ ins.; width over the posts at the belt, 8 ft. 3 ins.; sweep of the posts, 3¼ ins.; height of the car from the rail over the trolley board, 11 ft. 6 ins.; distance between the centers of the posts, 2 ft. 8 ins.; size of the side sills, 4¾ ins. x 7¾ ins.; end sills, 4¾ ins. x 5⅞ ins.; sill plates, 12 ins. x ⅜ in.; thickness of the corner posts, 3⅝ ins., and side posts, ¾ ins. Metal sash stiles are used. The interiors are finished in ash, with ceilings of decorated birch.

LARGE MOTOR GENERATOR SET FOR A CANADIAN POWER COMPANY

The largest electric motor ever built is now being installed at the plant of the Shawinigan Water & Power Company, Shawinigan Falls, Quebec. This was recently constructed by the Allis-Chalmers Company at its electrical works in Cincinnati, and embodies in its design the characteristics of the Bullock alternators, which have proven singularly successful in their application. It is a synchronous motor of 8000 hp. The rating of the generator operated by this motor, on standard specifications, is 5750 kw at 300 r. p. m. The combined machines, in addition to their enormous capacity, are remarkable for concentrating in an exceedingly small floor space a volume of 12,000 kw.

The illustration of the machines which is shown herewith was taken while they were being tested at the shops by the



MOTOR GENERATOR SET FOR SHAWINIGAN FALLS

Behrend system, under full load conditions corresponding to 7200 kw on the generator, with the expenditure of no more than 300 kw, in order to produce the same losses in the machine which exist under full load conditions.

The working of the generator and motor forming the frequency changer at Shawinigan Falls will be carefully noted by electrical engineers in all parts of the world, and if it is as successful as the builders confidently anticipate, the result will be a valuable addition to existing data on the subject of alternating-current machinery.

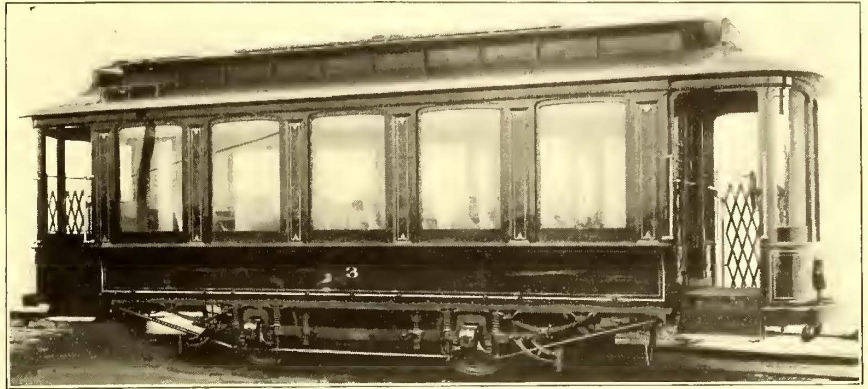
The Indianapolis & Cincinnati Traction Company has appointed a physician at each of the towns and cities through which the line runs, with instructions to attend the injured in case of accident upon the line.

INTERESTING CAR FOR JACKSON, MISS.

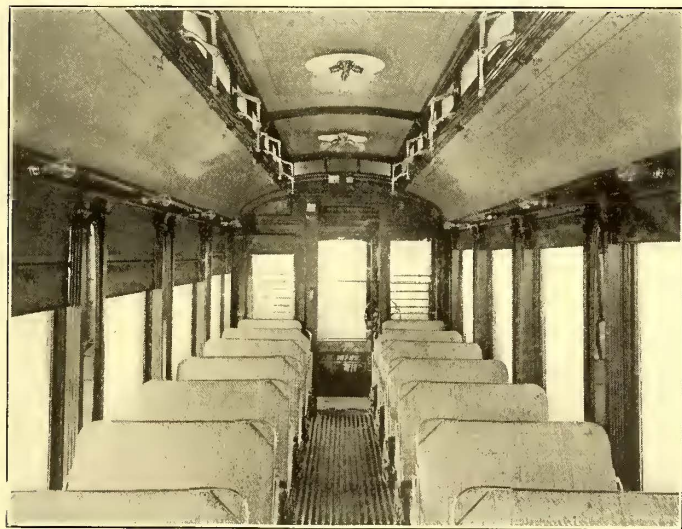
The American Car Company, of St. Louis, has recently delivered the handsome car shown in the illustration to the Electric Railway, Light & Power Company, of Jackson, Miss. The Jackson system operates chiefly within the city and has an extension to an amusement park. The city is one of the important cotton shipping points in the South, and a number of main steam lines converge here. It is the capital of the State, and is located near its center.

As one may imagine from its appearance, the car was originally intended for special service, but the company which ordered desired a double-truck car, and the builders completed the shorter car fitted up for regular service. The Jackson Railway has therefore obtained an exceptionally attractive appearing car. The interior is richly finished in mahogany, handsomely carved, and the ceilings are tinted light green and decorated with gold. Four elongated beveled mirrors are on each side of the car, and the windows are fitted with 1/4-in. polished French plate glass. Wire screens are placed behind the low curved glass windows in the vestibules to protect them against breakage.

The seats are 31 ins. long, and the aisle, 17 1/2 ins. wide. The length over the end panels is 20 ft. 11 3/4 ins., and over vestibules, 28 ft. 5 3/4 ins. The platforms are 3 ft. 9 ins. long; width over the sills, including the panels, 6 ft. 10 3/4 ins., and over the posts at the belt, 7 ft. 5 5/8 ins. The sweep of the posts is 3 1/2 ins.; distance between the centers of the posts, 2 ft. 11 3/8 ins. The side sills are 4 ins. x 7 1/2 ins., and the end sills, 4 1/2 ins. x 7 1/2 ins.; thickness of corner posts, 4 ins., and side posts, 2 1/2 ins. The car is mounted on a Brill No. 21-E truck, with 8-ft. wheel base



A REMARKABLE CAR FOR THE JACKSON (MISS.) STREET RAILWAY SYSTEM



SEATING ARRANGEMENT OF JACKSON CAR

and 33-in. wheels. Among the furnishings are angle-iron bumpers, sand boxes and gates of Brill manufacture, gongs and steps of the American Car Company's types.

In addition to many theater parties by trolley to attend the recent opening performance in Indianapolis of "The Gentleman from Indiana," was one from Dayton, Ohio, in a special car in charge of Valentine Winter, president of the Dayton & Western Traction Company, which carried society people and newspaper men. The car left Dayton at 2 p. m., arriving in Indianapolis at 6 p. m. It was the first interstate trolley theater party.

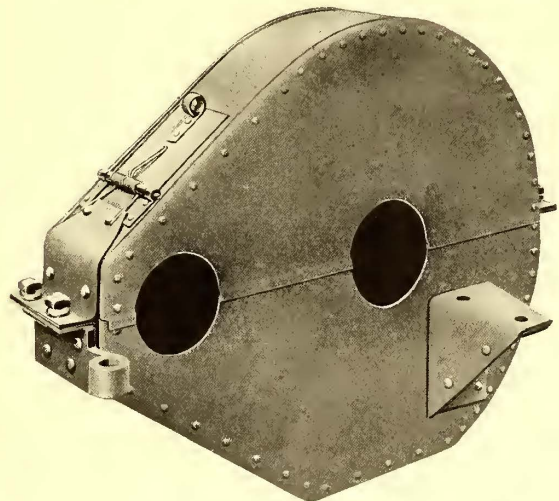
INSULATING TYPE

The Morgan & Wright bicycle tire has long been recognized as a standard, but it is not so generally known that this enter-

prising Chicago firm also manufactures a tape which is said to be peculiarly adapted for electrical work. The good qualities claimed for Morgan & Wright insulating tape are: Exceptional adhesiveness; does not dry out easily; unrolls smoothly; uniform and high insulation resistance; capable of withstanding extreme heat, and an uncommonly high percentage of insulation composition. These statements, the company says, are borne out by the increasing popularity this product is finding in electrical work.

SHEET STEEL GEAR CASE FOR STREET RAILWAY SERVICE

The all important subject of gear cases for street railway motors is very effectively met by the sheet steel gear case of the Lyon Metallic Manufacturing Company, of Chicago. This



SHEET STEEL GEAR CASE

case, while incomparably stronger than one of wood construction, is from 75 lbs. to 100 lbs. lighter than one of cast steel. It is made entirely of sheet steel, each section riveted and seamed so as to give strength where needed. At both ends it is reinforced by heavy plates both inside and out. The brackets are triple reinforced, and vibration will not cause them to work loose. Should the case become bent in an accident it can readily be hammered back into shape.

The company carries in stock cases for practically all the standard makes of motors, and has so much faith in them that it offers to ship one to any traction company for tests. If the tests should not prove satisfactory, the case may be returned at the Lyon Company's expense.

FINANCIAL INTELLIGENCE

WALL STREET, March 8, 1905.

The Money Market

Extreme dullness prevailed in all branches of the money market this week, and despite the further heavy loss in bank reserves, rates for all maturities have displayed a declining tendency. This was due in part to the extremely light demand from stock commission houses, notwithstanding the recent activity and strength in the securities market, and partly to the heavy offerings of funds from out-of-town institutions and from international banking houses against exchange transactions. In the early part of the week demand money was in fair demand at rates ranging from $2\frac{1}{2}$ and 3 per cent, but later on heavy offerings by local banks and trust companies the rate declined to below 2 per cent, but subsequently recovered to $2\frac{1}{2}$ per cent. In the time loan department business was practically at a standstill, and rates were for the most part nominal. There was a fair inquiry for contracts, both for the short and long maturities at 3 and $3\frac{1}{4}$ per cent, respectively, but there was no disposition on the part of the local institutions to place their funds, except at $3\frac{1}{4}$ and $3\frac{1}{2}$ per cent. As a result, borrowers generally continued to draw their immediate wants from the call money department at the prevailing low rates, rather than to pay the interest charges asked by the local institutions. At the close the market was in favor of borrowers, and they seem confident that the banks and other lenders would be compelled to meet their views. It is pointed out that while the banks will soon be called upon to meet the usual spring demand for funds from the interior points, and also to provide the necessary funds for various bond issues, the receipts from other sources will be more than sufficient to offset these requirements. On March 15 the national banks will be called upon to pay into the National Treasury about \$15,000,000 of government funds, but it is likely that circulation will be taken out against the government bonds thus released, which will add greatly to the already large supply of lendable funds. The statement of the associated banks, published last Saturday, was decidedly unfavorable. Loans increased \$13,143,000, due largely to syndicate operation. The loss in cash amounted to \$3,720,100. Deposits increased \$10,155,100. The reserve required increased \$2,536,275, which, added to the loss in cash, shows a loss in surplus of \$6,256,375. The surplus was \$8,389,750, as against \$29,943,350 in 1904, \$666,975 in 1903, \$3,958,425 in 1902, \$10,717,272 in 1901, and \$5,676,375 in 1900. At the principal European centers the situation remained easy, without any material change in discount rates.

The Stock Market

There was a considerable falling off in the dealings on the Stock Exchange this week, and although prices displayed more or less irregularity, the undertone was firm. The opening was fairly active and strong, but shortly afterward the reported collapse of the Southern Iron deal, which was subsequently confirmed, led to greater or less reactions from the previous high level of prices, particularly in the stocks of the Tennessee Coal & Iron, and the Sloss-Sheffield companies. Doubts as to what President Roosevelt might have to say in his inaugural address, and fear that the poor showing made by the bank statement also prompted caution and induced more or less profit-taking. The principal feature of the week, however, was the decision of the United States Supreme Court in the Northern Securities case reaffirming the judgment of the Circuit Court of Appeals, and permitting the distribution of the assets on the pro-rata plan. While the action of the stock market in response to the decision was somewhat disappointing, inasmuch as it did not immediately advance, there was no doubt that it served to strengthen bullish sentiment, as it has removed one of the unsettling features in the situation. Unfavorable reports of gross railroad earnings for the month of February, reflecting the decidedly adverse weather conditions during that period, also induced more or less profit-taking, and checked to a great extent the buying on the part of the outside public. There was, however, no serious set back to prices, but, on the contrary, some issues exhibited decided strength and touched the highest figures of the season. The settlement of the railway rate war, and the fact that the President's inaugural address was more conservative than expected, together with a decidedly easier tendency in money, and the highly satisfactory conditions of affairs in all the leading industries, notably the iron

and steel trade, prevented any liquidation, as did also the prospect of an early declaration of peace between Russia and Japan. The bond market was less active than in the preceding week, and prices reflected to a great extent the irregularity in the stock market. The tone, however, was generally firm. The features were Union Pacific convertible 4s, Atchison general 4s, Chicago, Burlington & Quincy 4s, and American Tobacco 4s.

The local traction issues were generally strong, especially Metropolitan Securities and Metropolitan Street Railway, which rose $3\frac{5}{8}$ and $1\frac{5}{8}$, respectively, on reports of increased earnings. Brooklyn Rapid Transit was also strong on an extremely gratifying increase in gross earnings for the month of February, despite the adverse weather conditions. Manhattan Railway was steady, despite the strike on the Interborough lines.

Philadelphia

There was a fairly active market for the local traction stocks this week, but the dealings were accompanied by more or less irregularity in prices. The opening was generally firm, but in the subsequent dealings there was considerable selling to realize profits which resulted in sharp recession. Philadelphia Rapid Transit was the leader in point of activity, but the stock was under pressure nearly all of the week. Initial transactions were made at $31\frac{5}{8}$, and on reports that another assessment of \$5 per share would be levied on the stock in June, the price declined nearly 2 points to $29\frac{5}{8}$. It was stated on good authority that no assessment would be called on the stock until the latter part of the year, if then, but this statement failed to have any influence on the price of the stock. The closing was at $29\frac{3}{4}$, or $\frac{1}{8}$ of a point above the lowest. Upward of 20,000 shares were dealt in. United Gas & Improvement common was comparatively quiet, but strong, about 8000 shares changing hands at from 114 to $116\frac{3}{8}$, an advance of $1\frac{3}{8}$ points. Philadelphia Electric displayed moderate activity, but the price fluctuations were extremely narrow, about 23,000 selling at $10\frac{1}{2}$ and $10\frac{7}{8}$. Philadelphia Company common sold to the extent of about 6000 shares at from $44\frac{3}{8}$ to $43\frac{3}{8}$, the final transaction taking place at $44\frac{7}{8}$. The preferred stock sold at $47\frac{1}{2}$ and $47\frac{3}{4}$. Philadelphia Traction ruled strong. Early transactions were made at $100\frac{7}{8}$ to 101, but later in the week the stock sold at $99\frac{1}{4}$ ex-dividend, from which it rallied to $99\frac{3}{4}$ at the close. Other transactions included Consolidated Traction of New Jersey at 82 to $82\frac{1}{2}$, United Railways Investment preferred at $78\frac{3}{8}$, Union Traction at $58\frac{3}{4}$ to $58\frac{7}{8}$, American Railways at from $52\frac{1}{4}$ to 53, Fairmount Transportation at from 20 to 23, and Railways General at 4.

Chicago

There was no material change in the city railway situation this week, and none is expected until after the April election, when the people will vote upon the extension ordinance. The ordinance was submitted to the Council at its meeting this week, and was ordered deferred and published.

It is said that a large number of stockholders of the Metropolitan West Side Elevated Railway Company have already sent their proxies to the independent committee to be voted at the annual meeting to be held on April 4, and that from present indications it is believed that enough stock will be obtained to control the annual meeting. In a circular issued to the stockholders, the committee declares for a general change in policy, and that four new directors be elected whose efforts will be to make it the most satisfactory elevated road in the country for its patrons and its stockholders. The proxies accompanying the circular names three directors for election: F. A. Delaus, Charles A. Requa and Charles C. Adset. It is said that the opposition element was largely instrumental in forcing the resignation of President McAllister, and a hard fight to name his successor is expected.

Trading in the local street railway issues was extremely light, but prices generally held strong. The feature was the sharp advance in Metropolitan Elevated from $21\frac{1}{2}$ to 23 on the exchange of about 600 shares, while the preferred advanced from 61 to 63 on limited transactions. South Side "L" was also strong, the price advancing a point to 96. Northwest "L" sold at $24\frac{1}{2}$ for 100 shares. A small lot of West Chicago brought 63, and odd amounts of North Chicago and Chicago Union Traction brought 99 and 11, respectively. In the bond department the transactions included \$9,000 Lake Street "L" 5s at $97\frac{1}{2}$, \$11,000 Metropolitan "L" extension 5s at 95, \$3,000 Northwestern "L" 4s, at 95 to $95\frac{1}{8}$, and a few odd North Chicago 4 per cent consols at 88.

Other Traction Securities

By far the overshadowing feature of the Baltimore market was the enormous dealings in United Railway income bonds, trading in them being stimulated by the efforts making by holders to compel the company to pay the coupon now in arrears, and for the practical establishment of the income bonds on a regular interest basis. A committee of seven, representing about \$4,000,000 of the incomes, has issued a call for deposits of additional bonds before March 15. Over \$1,000,000 of the income bonds were traded in at from 68¾ at the opening, down to 65, but at the close there was a recovery to 67½. The stock and the first 4s were also active, the first named advancing from 13¾ to 16¾, on the exchange of about 25,000 shares, while upward of \$200,000 of the 4 per cents changed hands at prices ranging from 97½ to 94¾. Trading in the other issues was comparatively small and included \$40,000 Norfolk Railway & Light 5s at 95 to 94¾, \$10,000 Indianapolis Northern Traction 5s at 96¾, \$6,000 Macon Railway & Light 5s at 99, and North Baltimore Railway 5s at 120¾ to 120½. The feature of the Boston market was the strength in Massachusetts Electric common and preferred stocks, on reports of substantial increase in earnings. It is said that for January and February last the gross earnings have increased at the rate of \$1,000 a day, or about \$70,000. The common stock advanced from 14½ to 17, but at the close there was a slight reaction. The preferred advanced from 58 to 62½ and closed at 62. Boston Elevated was weak, the price declining a point in the early dealings to 155, but subsequently there was a partial recovery. West End common and preferred ruled about unchanged at 98 and 115½, respectively.

In the New York curb market Interborough Rapid Transit continued to fluctuate widely on a comparatively small volume of business. From 207 at the opening, the stock ran off to 203½, but later there was a sharp advance to 212. In the subsequent dealing the stock developed weakness, and on the declaration of the strike on the company's lines, the price dropped back to 203¼. This was followed, however, by a sharp recovery to 210, on the report that a number of the company's employees had returned to work, which was taken as an indication of an early settlement of the questions at issue on the company's own terms. About 12,000 shares were traded in. Other transactions on the curb included \$10,000 International Traction of Buffalo 4s at 81½, \$65,000 Public Service Corporation certificates at 72½, \$110,000 Public Service Corporation 5 per cent notes at 98 and interest, \$17,000 United Electric at 77¾, \$35,000 Jersey City, Hoboken & Paterson 4s at 79¾, and \$30,000 North Hudson extension 4s at 108.

Security Quotations

The following table shows the present bid quotations for the leading traction stocks, and the active bonds, as compared with last week:

	March 1	March 8
American Railways	52¼	52½
Boston Elevated	155	155
Brooklyn Rapid Transit	65½	66
Chicago City	188	198
Chicago Union Traction (common).....	11½	11¾
Chicago Union Traction (preferred).....	49	48¾
Cleveland Electric	82½	82½
Consolidated Traction of New Jersey.....	81½	81
Consolidated Traction of New Jersey 5s.....	110¼	110¼
Detroit United	77½	80
Interborough Rapid Transit	205½	209
International Traction of Buffalo.....	—	25
International Traction of Buffalo (preferred).....	—	70
International Traction of Buffalo 4s.....	77	81
Manhattan Railway	171	171½
Massachusetts Electric Cos. (common).....	16¾	17½
Massachusetts Electric Cos. (preferred).....	64	62
Metropolitan Elevated, Chicago (common).....	21	22½
Metropolitan Elevated, Chicago (preferred).....	63¾	64½
Metropolitan Street	121½	122¾
Metropolitan Securities	81	84½
New Orleans Railways (common).....	4¼	3½
New Orleans Railways (preferred).....	15	14
New Orleans Railways, 4½s.....	81½	81
North American	101¾	102
North Jersey Street Railway.....	23½	23
Philadelphia Company (common)	43½	43½
Philadelphia Rapid Transit	30¼	29¾
Philadelphia Traction	101	100
Public Service Corporation 5 per cent notes.....	—	97¾
Public Service Corporation certificates.....	—	72½
Public Service Corporation 50 per cent notes.....	—	97¾
South Side Elevated (Chicago)	94	94

	March 1	March 8
Third Avenue	132	131½
Twin City, Minneapolis (common).....	107½	109
Union Traction (Philadelphia).....	58¾	58½
West End (common).....	98	97½
West End (preferred).....	115½	115¼

Iron and Steel

The "Iron Age" says that the monthly blast furnace returns reveal a continuance of the strong statistical position of the pig iron industry. The February production covering, as it did, only four weeks, was only 1,597,000 tons, as compared with 1,780,000 tons in January. It fell below the normal, because a considerable number of plants were affected by troubles incident to the handling of materials in winter weather. Roughly, this amounts to about 25,000 to 30,000 tons, and it is a curious fact that the stocks in the hands of merchant furnaces declined about 25,000 tons. In other words, consumption apparently during February was proceeding at a rate which would have taken care of the normal output of the furnaces in blast. Productive capacity on March 1 was very close to that of February 1, so that for the present it is stationary.

While in the Eastern markets the feature is still the buying, for prompt delivery, in moderate quantities by the general foundry trade, the Western distributing markets report a larger movement among some of the leading melters, the jobbing foundries, however, participating also. For steel making, the volume of pig has not been large. It is understood that the Steel Corporation may need 10,000 tons more for March, and there were indications of requirements aggregating 40,000 tons for April.

There has been a further movement in steel rails. It is understood that the Atchison, Topeka & Santa Fe Railroad has bought 25,000 tons, and that negotiations with the St. Paul and other Northwestern and Southwestern roads are pending which will involve about 100,000 tons.

In the structural trade an interesting new feature is the appearance of a considerable number of inquiries for steel buildings for manufacturing purposes.

A NEW LINE OUT OF SCRANTON, PA.

The Scranton, Factoryville & Tunkhannock Railway Company, which is now perfecting plans for building an electric railway from Scranton to Tunkhannock, Pa., will be an important system. The line will run from the center of Scranton to Notch, thence to Chinchilla, to Clark's Green, Clark's Summit, Glenburn, Waverly, Dalton, La Plume, Factoryville, East Mountain, Lithia Springs, Bedel's Glenn, Lake Winola, Dixon's and Tunkhannock. The main power house will be on the outskirts of Scranton. Sub-stations will be built at points along the line, to be decided upon in the future. In construction the road will embody all that is standard in recent practice. In order that high speed may be attained, construction will be for the most part over private right of way. Of the Scrantonians connected with the enterprise may be mentioned James P. Dickson, J. Selden Swisher, Lewis B. Carter, C. W. Seeley and Frederick E. Scott. These gentlemen have been closely identified with the project from the start. It is understood the full board of directors will be announced in the course of a few days. The president of the company is J. Selden Swisher, and the secretary, Charles Seely. The attorney is Lewis B. Carter, of Scranton.

NORTH AMERICAN COMPANY SECURES CONTROL OF UNITED RAILWAYS OF ST. LOUIS

A definite statement is made of the plan of the North American Company to enter United Railways, of St. Louis. The agreement is the result of negotiations extending over several months, and referred to from time to time in the STREET RAILWAY JOURNAL. It is a controlling interest in the United Railways that the North American Company has secured. The details as to the consummation of the deal are withheld, however. North American stock will be exchanged for holdings of the United Company, where it is possible to do so, and cash will be given when an exchange cannot be satisfactorily arranged. When this transaction is completed the North American Company will have a controlling interest in the public utility corporations of St. Louis and Milwaukee, beside having an interest in the Detroit Edison Company, and the Cincinnati, Newport & Covington Light & Traction and other similar concerns. What the effect will be of this move on the management of the company is not known.

STRIKE ON THE ELEVATED AND THE SUBWAY LINES IN NEW YORK—STRIKE DECLARED OFF

The presses on which the *STREET RAILWAY JOURNAL* is printed were held to record here that at 5 o'clock p. m. on Thursday the announcement was made in the daily press that the leaders of the several national associations, in conference in New York, had called upon the local labor leaders in the city to call off the strike of the motormen, guards, ticket sellers, ticket choppers and porters of the Interborough Rapid Transit Company, operating the elevated and the subway lines in New York. In deference to this order, the Brotherhood of Locomotive Engineers at once ordered the men to return to work. The other bodies are expected to follow this lead at once. The lateness of this news precludes more than this bald mention of the facts.

The trouble between the company and its employees was precipitated at 4 a. m. on Tuesday, March 7, when in compliance with instructions from their respective unions all the men quit work. Those operating trains ran them to the end of the line, where they were abandoned.

The men and the company have been at loggerheads for some time. In fact, the indifference of the men in doing their work became so noticeable a few months ago that public notice was directed to the performance of men in service. Shortly thereafter a conference was held between committees of the motormen and the management of the company, at which the questions of their relations was discussed. To be exact, this was on Jan. 19. At this conference the men said that the promise of the company to give them a relay of 15 minutes at the northern terminal was not being fulfilled. The whole question was thrashed out, however, to the satisfaction of the motormen, and it was agreed at the time that conductors and guards be given one-half straight runs, instead of swing runs. Things went well for a time. Then the stories of dissensions were renewed. Finally there came the consummation. This was on March 3, when the employees aired their grievances publicly, and made demands of General Manager Hedley, of the company, for the readjustment of the agreement between the men and the company.

The demands made of the company can best be given by quoting them as they are embodied in the official statement issued by the joint committee of the Amalgamated Association of Street Railway Employees of America and the Locomotive Engineers. This statement follows:

1. That the present physical examination now in force against motormen and other employees shall be eliminated and a practical road test substituted, instead, above to take effect Jan. 1, 1905.
2. A day's work for motormen and other trainmen to be nine hours or less, motormen's mileage not to exceed 100 miles a day.
3. Relay for motormen, when headway is less than six minutes, should be allowed at southern terminals, loop or no loop.
4. All road work on trains, with or without passengers, shall be done by qualified motormen.
5. For all employees, excepting tower switchmen, nine hours shall constitute a day's work, with time and a half for overtime.
6. Tower switchmen, eight hours or less to constitute a day's work, with one day off duty a month with pay; time and a half for overtime.
7. Ten per cent increase in pay for all employees excepting motormen.

Following is a table of the wages paid to the subway and elevated employees of all grades:

Motormen, \$3 a day for the first six months, \$3.25 for the second six months, and thereafter \$3.50.

Conductors, \$2.10 a day for the first year, \$2.25 for the second year, and thereafter \$2.40.

Guards, \$1.55 a day for the first year, \$1.70 for the second year, \$1.85 for the third year, and thereafter \$1.95.

Ticket agents, \$1.75 a day for the first year, \$2 for the second year, and thereafter \$2.25.

Switchmen, \$2 a day for the first year, and thereafter \$2.55.

Towermen, \$2.45 for the first year, and thereafter \$2.50.

Ticket chopper, \$1.40 for the first year, and thereafter \$1.55.

Porters, \$1.40, with an increase for length of service.

The company's reply to these demands was transmitted to the men at 10:30 o'clock on Monday. It is understood to have been a flat refusal of the concessions asked, although General Manager Hedley has not made the text of the letter public. At any rate, the reply was taken as being the final word from the company, and at 11 o'clock a. m., the men began to vote as to whether or not they should strike as a body, in order to force the company to meet their demands. Their decision was to go out, and, as previously stated, they quit their posts at 4 a. m. on Tuesday.

But the company was not to be caught napping. It hurriedly manned its subway trains with skilled operators who had been engaged for the emergency, and when the morning rush came a fair

service was given in the tunnel. Except for an occasional train, service was entirely abandoned on the elevated lines. The difficulty came in securing men to man the stations. This, however, was partially overcome with the opening early on Tuesday morning of general employment bureaus. Applications were received by the score, and by noon the service on all lines was fair. The evening rush on Tuesday saw the east and the west side elevated lines operating intermittently, and a service in the subway that was all that could be expected, in view of the peculiar conditions that prevail there. Unfortunately there came at 5 p. m., the height of the rush, a collision in the subway, between trains at Twenty-Third Street that caused traffic to be suspended for some time.

One local ran into another from the rear. The last car of the first train and the first car of the second train were of steel, and neither was damaged to any extent. The force of the impact was so great, however, that the second car from the rear of the first train, which was of wood, was telescoped by the steel car behind it. Twenty-nine persons are known to have been injured, two of them perhaps seriously. In the confusion that followed, the motorman of the second train, thoroughly appalled at the terrible disaster, made good his escape.

Wednesday morning saw conditions considerably improved. The headway on nearly all lines had been cut down appreciably, and on the West Side but little difficulty was experienced in making the trip down-town from Harlem. According to an official statement of the Interborough Company, the Sixth and the Ninth Avenue lines were operated on a six-minute schedule, while on the several subway divisions the longest headway was not more than 7 minutes. The East Side elevated lines, it must be confessed, fared badly. On Wednesday morning little improvement was to be noticed over the day before on these lines, but conditions were considerably improved throughout the day. It all takes time to get things running smoothly, but the results already obtained with the new men dismayed the strikers. Express trains were run in the subway on Wednesday afternoon for the first time since the strike was declared.

Wednesday afternoon the strikers seemed to realize that they had failed most dismally to paralyze the entire system. Moreover, they were conscious that slowly the thing must peter out, as the company was fully prepared to cope with the situation. An overture from the Mayor in the interest of the public to settle the strike by arbitration was readily accepted by the men. The company, however, firmly but courteously refused the offer, reviewing briefly in its reply to the Mayor its relations with its employees since it took over under lease the system of the Manhattan Elevated Railroad. In this letter was mentioned the pact entered into on Sept. 7, 1904, by the company and the Brotherhood of Locomotive Engineers and Brotherhood of Locomotive Firemen in respect to hours of labor, pay and other matters, which agreement, by its terms, was to continue at least until Sept. 8, 1906.

The motormen secured by the company to take the place of the strikers are all men experienced in railroading, and were carefully examined by the company before being put to work. They are being cared for at the company's expense. Some of them are quartered temporarily at the car houses at One Hundred and Forty-Ninth Street and the Harlem River. Others are quartered on the steamer "Northam," lying moored close by the car houses. The other men who have taken the places of the strikers are also being cared for by the company. The car houses might easily be mistaken for the commissary department of an army about to decamp for the scene of a battle. The wages to the new men are the same as those in effect before the strike, as follows:

Motormen, \$3 to \$3.50 per day, according to length of service; conductors, \$2.10 to \$2.40; guards, \$1.55 to \$1.90; agents, \$1.75 to \$2.40; switchmen, \$2 to \$2.35; trackmen, \$2 to \$2.50; porters \$1.40.

A volume might be written about improvised rapid transit. Naturally the surface lines, operated by the New York City Railway Company, were soon taxed beyond their capacity. Recourse was had to cabs by those who could afford them. Fortunately, owners of hacks, wagons, buses and other vehicles pressed them into service, and many who found it impossible to get on the surface cars rode down town in one of these vehicles. It seemed to matter not to the business man what the means was, as long as he got to his destination. This condition prevailed only for the first day. The street cars were crowded as they never were before. It was not unusual to see six or more persons riding on the bumper of a car. As for the rule against standing on the front platform, that was disregarded entirely. Quite frequently venturesome ones scrambled to the roofs of the cars and rode while perched there. In the face of existing conditions conductors were powerless. The rain of Tuesday and Wednesday prevented President Vreeland from operating open cars. As a fact, the headway was so reduced on some of the lines that it is a matter for speculation how more cars could have been crowded onto the streets.

THE CHANGE IN BUFFALO

The change in control of the International Traction Company, which was briefly mentioned in the last issue of this paper, was consummated at a meeting held at the office of J. P. Morgan & Company, of New York, on March 2. At that meeting the following were elected officers of the International Traction Company: H. J. Pierce, president; Daniel S. Lamont, vice-president, and Frank L. Slocum, secretary and treasurer. Mr. Lamont is also vice-president of the Northern Pacific Railroad.

The following board of directors was elected: Henry J. Pierce, Pendennis White, Robert L. Fryer, Henry M. Watson and Thomas E. Mitten, of Buffalo; Daniel O'Day, formerly of Buffalo, but now of New York; G. L. Boissevain, Thomas Dewitt Cuyler, of Philadelphia; Arthur Robinson, of New York; T. G. Blackstock and E. B. Osler, of Toronto.

These officers retired from the company: W. Caryl Ely, president; Van Horn Ely, assistant to the president; R. F. Rankine, secretary and treasurer; Edward McDonnell, assistant to the general manager, and H. M. Pease, auditor. Mr. Mitten, who resigned his position as general manager of the company recently, to accept



HENRY J. PIERCE



W. CARYL ELY

the position of vice-president of the Chicago City Railway Company, is succeeded by Thomas W. Wilson, who was chief engineer of the International Railway Company. A portrait and biographical sketch of Mr. Wilson appear elsewhere in this issue. As will be seen from the directorate, Mr. Mitten remains a director of the company.

These officers were elected for the Crosstown Street Railway Company, one of the principal sub companies of the International Traction Company; president, H. J. Pierce; vice-president, Daniel S. Lamont; secretary and treasurer, J. F. Slocum. Directors, H. J. Pierce, W. B. Rankine, G. L. Boissevain, Robert M. Fryer, W. H. Cuyler, D. S. Lamont.

These officers were elected for the International Railway Company, which is the operating company for all the lines owned or controlled by the International Traction Company: President, H. J. Pierce; vice-president, Daniel S. Lamont; secretary and treasurer, J. F. Slocum. Directors, H. J. Pierce, G. L. Boissevain, Pendennis White, Arthur Robinson, T. E. Mitten, T. Dewitt Cuyler, Daniel S. Lamont, Archibald M. Robinson, Charles Steele, Boyd Osler, T. G. Blackstock, Robert M. Fryer, Henry M. Watson, Daniel O'Day, E. T. Stotesbury.

Nearly all the new directors, who are from Buffalo, are known as Marine Bank men. Mr. Fryer is the only exception. He is from the Manufacturers & Traders Bank. Mr. Ely was requested to take a place on the board of directors, but declined, owing to his desire to give his attention to other business. Mr. Ely stated in an interview, however, that he expected to retain his large holdings in the company, on account of his faith in its future. The capital stock of the company is \$10,000,000 common and \$5,000,000 preferred. The common stock has recently risen from 15 to 31, and the preferred from 45 to 65. The present purchasers are said to have secured their stock in the open market, and to be in no way associated with the New York Central or other outside transportation interests.

As mentioned in the last issue, Mr. Pierce, the new president, is a prominent capitalist and financier in Buffalo, and is president of the Wood Products Company, which manufactures most of the wood alcohol produced in this country. He was born in Bath, Me., Aug. 29, 1857. While very young his parents moved to New York, where his father was for many years president of Rutgers Female College. Mr. Pierce moved to Buffalo at the age of seventeen, and in 1880 helped to organize the Wood Products Company. His other business connections were mentioned last week.

Mr. Ely has been one of the most prominent members of the American Street Railway Association, and as its president this year has had charge of the reorganization of that body. His ability,

high character and unfailing courtesy have made him one of the best known, as well as one of the most popular members of that body. The high regard in which he is also held in Buffalo is evinced by the editorials in all the papers which chronicle his retirement from the management of the transportation system of that city. While it is impossible to quote in extenso from them, the following extract from the "Express" is characteristic of them all, as indicating the high regard felt for Mr. Ely in Buffalo: "No large body of workers ever were more loyal to their chief than the street railroad men of this community have always been to Caryl Ely, and no head ever better deserved such loyalty. He has not only been a good, and, best of all, a just employer, but he has treated the motorman like a man every time, and like a man whom he liked. His courtesy and open-handed sympathy have not been kept by this big man for display to his social intimates. If there were nothing else to say about Mr. Ely, a wealth of encomium could be piled upon him as an employer and a manager of employees. Such encomium would be of vital interest to the public, for the men who know how to treat those who are working under them as men should be treated are the public benefactors who are giving the real help in solving the labor question. He goes out of an exacting office with a record of fairness and friendliness to all three parties to whom he owed a duty—to the men who worked under him, to the shareholders for whom he worked, and to the public whom he served. It is a fine record that he takes with him. It is a splendid heritage that he leaves to his successors. Characteristically, he shows his faith in the property he has built up by retaining his stock holdings, while retiring from the active management."

EQUIPMENT OF THE NEW ELEVATED CARS FOR BROOKLYN

In the Feb. 25 issue of the STREET RAILWAY JOURNAL a reference was made to the large contract for surface and elevated cars which has recently been placed by the Brooklyn Rapid Transit Company. The contract, which includes 100 elevated cars, fifty surface freight cars and 200 convertible surface cars, is considered to be one of the largest orders for cars that has ever been placed at one time by a single railway company.

The equipment for the surface passenger cars is given in detail on pages 467 and 468 of this issue, in connection with the description of the specimen car built for the company. The elevated cars will be equipped with Westinghouse type 50-L motors, according to the company's present standard arrangement of elevated motive power equipment, which embodies the use of two motors per motor car, both mounted upon the same truck. The motor control to be used will be the new Westinghouse unit-switch-group system of multiple-unit control, which system has been previously referred to in these columns, and which will make 249 motor cars equipped with this type of control owned by this company. The trucks will be of the type 40 Peckham M. C. B. trucks, known as the Brooklyn Heights Standard, which are standard for all elevated cars upon this system. Of these forty are to be purchased new, while 160 are in use in another service by the company, and are to be transferred to the new cars when delivered. The brakes are to involve the usual equipment of "New York" motormen's valves and brake cylinders, but the compressors and governors will be furnished by the Westinghouse Traction Brake Company. The heaters for the elevated cars will be supplied by the Consolidated Car Heating Company, and will be of the company's standard for cross-seat cars on the elevated division, i. e., type 192, single coil heaters, twenty-four to a set.

The seats are of the Wheeler type and are to be furnished by Heywood Bros. & Wakefield. These will number 2000, and will be similar to those supplied by this company for the new surface car. The curtains are to be made of Pantasote of the company's regular standard patterns, but the fixtures, which will be supplied by the Curtain Supply Company, of Chicago, will be a departure from the usual type, being of a special automatic style which is standard upon the closed cars, but made to serve as storm curtains. The curtains will be stiffened with battens, and posts will be arranged so that the fixtures cannot be removed from the grooves by passengers.

The fifty new freight cars are to be built by the Laconia Car Works, Laconia, N. H., 38 ft. long 7 ft. 6 ins. wide, for a capacity of 25 tons. The trucks are to be diamond frame M. C. B. type, modified to carry the motor equipment, which is to be of 4 Westinghouse No. 68 motors per car. The controllers will be of the Westinghouse No. 28-A type. The braking equipment will consist of Westinghouse motor compressors, together with the Peacock hand brake made by the National Brake Company, Inc., Buffalo, N. Y. All of the other heavy freight cars already owned by the company, 106 in number, are to be standardized and equipped as above.

CHICAGO TRACTION SITUATION

At the meeting of the Chicago City Council on Tuesday, March 7, the report of the committee on local transportation containing the proposed ordinance for an extension of the Chicago City Railway Company's franchises was presented. The report was ordered to be published. Mayor Harrison in a communication to the council, which was referred to the committee on local transportation, called attention to the need of requiring in a settlement of the franchise question with the Chicago Union Traction Company a guarantee that the company has a right to dispose of the rights of its underlying properties.

MASSACHUSETTS LAW UPHELD—WORCESTER COMPANY'S VICTORY OVER CITY

In the *STREET RAILWAY JOURNAL* of March 4 brief mention was made of the decision handed down by the Supreme Court of the United States in the cases of the city of Worcester vs. the Worcester Consolidated Street Railway Company. Below will be found an extract giving the gist of this decision, the text of which has just appeared. In explanation it may be said that the city of Worcester sought to compel the Worcester Consolidated Street Railway Company to carry out certain provisions in its franchises subsequent to the passage of the street railway law of 1898 by the Massachusetts Legislature. The cases were taken to court on the ground that there existed between the company and the city a contract which the Legislature could not annul without the consent of the parties to the agreement. The decision of the court is in favor of the company, thus sustaining the general law governing street railways in the State. The court holds, in the main, as follows:

Enough cases have been cited to show the nature of a municipal corporation as stated by this court. In general, it may be conceded that it can own private property, not of a public or governmental nature, and that such property may be entitled, as is said, "to constitutional protection."

Property which is ruled by these corporations upon conditions or terms contained in a grant and for a special use, may not be divested by the Legislature.

This is asserted in *Commissioners, etc., vs. Lucas*, treasurer (93 U. S., 115), and in *Mount Hope Cemetery vs. Boston* (158 Mass., 509), the Supreme Court of Massachusetts ruled that cities might have a private ownership of property which could not be wholly controlled by the State Government.

It seems, however, plain to us that the asserted right to demand the continuance of the obligation to pave and repair the streets, as contained in the orders or decrees of the Board of Aldermen, granting to the defendant the right to extend the locations of its tracks on the conditions named, does not amount to property held by the corporation, which the Legislature is unable to touch, either by way of limitation or extinguishment. If these restrictions or conditions are to be regarded as a contract, we think the Legislature would have the same right to terminate it, with the consent of the railroad company, that the city itself would have.

These restrictions and conditions were of a public nature, imposed as a means of collecting from the railroad company part or possibly the whole of the expenses of paving or repaving the streets in which the tracks were laid, and that method of collection did not become an absolute property right in favor of the city, as against the right of the Legislature to allow or abolish it, or substitute some other method with the consent of the company, even though as to the company itself there might be a contract not alterable, except with its consent.

If this contention of the city were ruled valid it would very largely diminish the right of the Legislature to deal with its creature in public matters in a manner which the Legislature might regard as for the public welfare.

In *City of Springfield vs. Springfield Street Railway* (182, Mass., 41), this question was before the Supreme Judicial Court of Massachusetts, and in the contention of the city, to the same effect as the plaintiff in error contends in this case, was overruled.

It was therein ruled that the city acted in behalf of the public in regard to these extensions of locations, and that the Legislature had the right to modify or abrogate the conditions on which the locations in the streets and public ways had been granted, after such conditions had been originally imposed by it.

The case at bar was decided at the same time as the *Springfield* case (182 Mass., 49), and the proposition that the Legislature had the power to free the company from obligations imposed upon it by the conditions in the grant of the extended locations was adhered to, and the *Springfield* case cited as authority for the same. We concur in that view.

There is no force in the contention that the city of Worcester has a proprietary right in the property of the defendant in error, reserved to it under the original statute incorporating the Worcester Horse Railroad Company (chapter 148, Mass. laws of 1861). These sections simply give the city of Worcester the right during the continuance of the charter of the corporation and after the expiration of ten years from the opening of any part of said road for use, to purchase all its franchise, property rights, etc.

That right is not affected by the legislation in question, even assuming (which we do not for a moment intimate) that the act of 1898 affected the right of the city to make the purchase under the sections above cited.

We see no reason to doubt the validity of the act of 1898, and the judgments of the Supreme Judicial Court and the Supreme Court of Massachusetts are, respectively, affirmed.

SYRACUSE & SOUTH BAY EQUIPMENT

The Syracuse & South Bay Railway Company, to operate between Syracuse and Oneida Lake, a distance of 11 miles, has placed orders with the J. G. Brill Company for 10 car bodies, the trucks to be supplied by the Peckham Manufacturing Company. The orders are for June 15 delivery. The motor and other equipment will be bought soon. The cars will be 49½ ft. long, 8¼ ft. wide, 9½ ft. high; their weight will be 35 tons; seating capacity, 56 persons; and schedule speed, 45 miles an hour, every car being equipped with four 70-hp motors. The balance of the rolling stock to be purchased soon, includes 10 trailers, 5 flat and 5 box freight cars, and two electric locomotives. The rail order is also to be placed early. In addition to the summer resort business at Oneida Lake, the company is planning to do a large freight business, with a new line of steamers on the lake opening up a territory in the country north of the lake, which hitherto has not been well served in this regard as far as Syracuse is concerned. The name of the company is to be changed to the Syracuse Northern Traction Company as soon as the State Board of Railroad Commissioners grants the pending application for an amended route. Lieutenant Governor W. M. Brown, of Pennsylvania, is largely interested in the project. W. R. Kimball is the general manager, and George C. Towle the engineer.

THE CENTRAL PASSENGER ASSOCIATION AND THE ELECTRIC ROADS

Opinion seems to differ as to what the action will be at the next meeting of the Central Passenger Association regarding the relations between the steam roads and the electric railways. As is well known, the affiliation of steam roads with traction lines is forbidden by the rules of the association. Despite this embargo operating agreements have been entered into by several members of the passenger association in open defiance of that body. Foremost among the steam roads to make alliances with the electric railway was the Clover Leaf, mention of whose operations has frequently been made in the *STREET RAILWAY JOURNAL*. This company and several others have found the interlining of business most satisfactory. In fact, these companies are in no position to abrogate the agreements they have entered into with the electric. Thus does the situation confront the association of holding these companies strictly to account for the infringement of the rules of the association, or of letting the matter slide in oblivion without any radical action. It is admitted that outright recognition of the electric companies is impossible without effecting a change in the whole rate situation.

IMPORTANT PURCHASE IN THE INTEREST OF THE LAKE SHORE

A syndicate represented by Warren M. Bicknell and E. V. Hale, of the Lake Shore Electric Railway, and composed of the larger stockholders of that company, has purchased the Lorain Street Railway Company, which operates 12 miles of street railway in Lorain, Ohio, with an interurban line to Elyria. The property will be acquired by the Lake Shore Electric, within two years, this being agreed to, as the Lake Shore is not willing to increase its indebtedness at this time. After their absorption by the Lake Shore, the Lorain lines will be operated as a part of the former system. The syndicate will furnish money to build a five-mile line from Avon Beach Park, on the Lake Shore Electric, to South Lorain. The opening of immense tube works at South Lorain will make of that place an important center, and the new line will give the town direct connection with Cleveland. At the same time the business between Elyria, South Lorain and Lorain City will be controlled by the line which has been purchased.

The present power station of the Lorain company will be turned into a sub-station, and power will be furnished by the Lake Shore Electric. The new cut-off to Beach Park will reduce the distance from South Lorain to Cleveland by about five miles. It will also place the Lake Shore Electric in a position to compete with the Cleveland & Southwestern Railway for Elyria business if it desires. The new line will be built at once, and it will necessitate the erection of a large steel bridge over Black River at South Lorain.

The Lorain Street Railway has a capital stock of \$750,000, and a bond issue of \$550,000, of which \$200,000 is issued and draws interest at 6 per cent. The road was owned largely by Mayor Tom L. Johnson, of Cleveland, and was operated on an alleged 3-cent fare basis; three cents was charged in either Elyria or Lorain, and three cents between towns, or nine cents from center to center. The earnings for the year ending April 30, 1904, were about \$96,000.

TENNESSEE-GEORGIA ELECTRIC RAILWAY INCORPORATES

The incorporation a few days ago of the Tennessee-Georgia Interurban Electric Railway Company insures the construction at an early date of the proposed electric railway from Chattanooga, Tenn., to Ducktown, via Ringgold and Catoosa Springs, Ga. The preliminary capital of the company is \$300,000. Already plans are well under way for building, and it is hoped soon to begin active construction work. Interested in the company are several men well known to the electric railway industry. Foremost among them, perhaps, is S. W. Divine, Chattanooga, formerly vice-president of the Rapid Transit Company of Chattanooga. Others interested in the company are: J. H. Walker, Jr., J. C. Bryan, J. R. Jones, W. E. Biggen, J. M. Robinson, W. E. Bryan and J. W. Clark.

THE LATEST SUBWAY PROPOSALS FOR NEW YORK LOOP TO CONNECT BRIDGES

As the STREET RAILWAY JOURNAL for March 4 was on the press when the recommendations were made to the New York Rapid Transit Commission by the committee on plans of that body for additional subway lines in Manhattan, Bronx, Richmond and Brooklyn Boroughs, it is proposed here briefly to review the routes so as to supplement the information already given. In all, more than a dozen new lines are proposed, with a number of alternate proposals. All of these are so planned that they may be operated independently of or in conjunction with existing lines. The estimated cost of building is \$250,000,000. No less than four cross-town lines are proposed. These are to extend across the city from river to river under Grand Street, Fourteenth Street, Fifty-Ninth Street and Thirty-Fourth Street. The last of these it is proposed to operate as a moving platform line. The most pretentious of the recommendations is for a line from Pelham Bay Parkway, in the Bronx, to the Grand Central Station, at Forty-Second Street, thence to the Battery and back to Forty-Second Street. An alternative to this route is proposed, but is not of sufficient importance to justify its presentation here. A recommendation that is of especial interest to Brooklyn provides for a line beginning at the Manhattan terminal of the Williamsburg Bridge, west in Delancy Street, to Centre Street, to Brooklyn Bridge; to William Street, to Old Slip; crossing under East River by a double two-track tube; in Montague Street, to Fulton Street, to Willoughby Street; to Manhattan Bridge; to Fulton Street, to Lafayette Avenue, to Bedford Avenue, to Brooklyn terminal of Williamsburg Bridge. An alternative to this has been recommended. Another route for Brooklyn provides for a line in Fulton Street, to Willoughby Street, to the Manhattan Bridge, to Fulton Street, to Lafayette Avenue, to Bedford Avenue, in Bedford Avenue to the Brooklyn terminal of the Williamsburg Bridge. There is also an alternative to this. Other recommendations provide for routes as follows:

A route from the East River tunnel and Montague Street, in Court Street to Atlantic Avenue, to Fourth Avenue to Fort Hamilton.

A route beginning at the Brooklyn terminal of the Williamsburg Bridge, through Broadway, to East New York loop, and through Pitkin Avenue, in Brownsville, to Eastern Parkway. This is proposed for a four-track route throughout.

A route beginning at East Fourteenth Street and the river, Manhattan, under the East River, to North Seventh Street, through North Seventh Street to Union Avenue, to Broadway, Brooklyn.

A route in the Bronx as an extension of the present subway, beginning at the Harlem River and running north in Broadway to Kingsbridge. An elevated structure for the greater part of the way.

A route beginning at Eighth Avenue and 155th Street, across the Harlem River, to Jerome Avenue, to Woodlawn. The Woodlawn section to be an elevated structure.

A route (as an alternative to the route in the Bronx extending the present subway) beginning at the Bronx terminal of the Interborough road, north by the Boston Road and Morris Avenue, to White Plains Road, to Wakefield.

The commission, after an exhaustive discussion of the pressing need of relieving traffic congestion at the Manhattan end of the Brooklyn Bridge, has decided to build an elevated loop by cutting a new short street through from the present terminal site to Baxter Street, which is just east of Centre Street, and continuing it in Baxter Street to Delancey Street, thence to a connection with the Williamsburg Bridge, thus completing a loop between the bridges. It is understood that President Winter and the directors of the Brooklyn Rapid Transit Company are willing to rent this elevated loop.

MEMPHIS SYSTEM SOLD

Confirmation could not be secured in New York of the statement coming from Memphis, Tenn., to the effect that a deal has just been closed in that city, whereby the entire capital stock of the Memphis Street Railway Company has passed to the control of Isidore Newman & Sons and Ford, Bacon & Davis, of New York. Attempts at verification elicited the information that parties to the deal were all in Memphis, but that knowledge of the consummation of the sale had not yet come to hand. From unofficial sources THE STREET RAILWAY JOURNAL learns that the sale has been made, and that Geo. H. Davis, of the purchasers, has been elected president of the company to succeed C. K. G. Billings, of Chicago, who was the principal owner of the system. There are some 90 miles of standard gage track in the city. The rolling stock comprises 180 cars. The vice-president and general manager of the company is F. G. Jones.

LECTURE BY C. F. SCOTT BEFORE THE BROOKLYN RAPID TRANSIT EMPLOYEES' BENEFIT ASSOCIATION

The course in electricity which has been offered by the Brooklyn Rapid Transit Company during the past winter to its employees was terminated Monday evening, Feb. 27, by an interesting lecture upon "Single-Phase Railway Apparatus," by C. F. Scott, consulting engineer of the Westinghouse Electric & Manufacturing Company. An unusual opportunity was afforded to the employees of the company to familiarize themselves with the remarkable developments that have been made in this rapidly developing branch of the field of electric traction, and it was greatly enjoyed and appreciated. The lecture was held in the large auditorium of the Railroad Men's Building, at the Eastern Division shops of the company, at East New York, the attendance being over 360.

Although dealing with the technical side of electric railway work, the lecture was not confined to the interest of the engineering staff only, but was made to appeal to all employees of the company, particularly the motormen and employees in the electrical departments. Mr. Scott discussed the application of the alternating-current motor to railway work, first from an elementary standpoint, pointing out the particular requirements of present systems of electric traction, which make the use of alternating-current power desirable, and later, from a more technical standpoint, describing the apparatus that has been designed for the new system and enumerating the advantages to be obtained by its use. While nothing was touched upon in his talk which he had not included in previous lectures or papers upon the same subject, still Mr. Scott brought out many of the points in a new light and rendered them in a very lucid manner. His discussion of the advantages of the alternating-current system for heavy traction was especially interesting and instructive. The lecture was profusely illustrated by stereopticon views, showing all features of car and line equipments that have been designed by the Westinghouse Company for the new system of traction.

Prof. Edward Taylor, engineer of experimental work and testing of the Brooklyn Rapid Transit Company, who has had charge of the employees' school of electrical instruction given by the company, states that the results have been very satisfactory. The course commenced Oct. 10, 1904, and ended with Mr. Scott's lecture, Monday evening, Feb. 25. Nearly 200 pupils were enrolled, and the average attendance was over 80, exclusive of the last evening, when an audience of about 360 turned out. The early part of the course consisted of lectures and demonstrations by Mr. Taylor, including a large number of experiments with electrical apparatus and instruments, in which the pupils themselves were encouraged to take part, acting as assistants. Although the lectures dealt chiefly with applied electricity, the instruction went more fully into the laws and theory of physics and mechanics than is usually done in classes of this sort, and excellent results were secured.

After the thorough groundwork in the elements of electricity, the class was better prepared to appreciate the latter part of the course, consisting of lectures by a number of prominent educators and engineers, on various phases of electrical work, and which were largely attended. The course as a whole has, it is felt, been most beneficial, both to the employees themselves and to the company, and the interest and enthusiasm aroused this year should insure an even larger attendance and success in the next season's class.

CINCINNATI FRANCHISES

The Supreme Court of Ohio has handed down a decision sustaining the validity of the franchises under which the Cincinnati Street Railway Company, of Cincinnati, is operating. This brings to an end, in favor of the railway company, the long litigation over franchises pushed by Theodore Horstman. The franchises rest upon the so-called Rogers fifty-year franchise act, passed eight years ago and repealed by the next legislature. The court in its decision reversed the decision of the lower courts and dismissed the petition. There was no dissenting vote on the decision. The Rogers law was passed in April, 1896, and was a clause of an act regulating the granting of franchises to street railroad companies and the operation of street railroads in Ohio municipalities. The clause empowered municipal councils of Ohio cities or the equivalent body in Cincinnati (the board of administration) to extend railroad franchises for periods not exceeding fifty years, in consideration of certain minor concessions on the part of companies operating under existing franchises. In Cincinnati alone, of all Ohio cities, advantage was taken of this act to grant a fifty-year franchise, conferring upon the company privileges for fifty years from 1896. The next State Legislature repealed the clause permitting the extensions of franchises for fifty years. After the repeal, the Cincinnati franchises were thrown into litigation, and the Superior Court of Cincinnati decided that the franchises were invalid because the law had been repealed. The Legislature of 1902 passed a municipal code which contained a provision for twenty-five year franchises in all cities. It also contained an act separate from the code called a curative act, which sought to make valid all the franchises granted in Cincinnati under the Rogers law. It really is this curative act which the Supreme Court now holds to be valid in affirming the validity of the Cincinnati franchises. The decision affects only what was done nine years ago, and concerns Cincinnati alone.

NEW YORK CITY RAILWAY COMPANY'S REPORTS FOR QUARTER AND THE SIX MONTHS

The New York City Railway Company, operating the surface street railway lines in Manhattan and Bronx Boroughs, New York, has reported its earnings for the quarter and the six months. The reports for the quarter cover that period in which the company's lines first came into competition with the New York Subway. The report follows.

	1904	1903
December 31, quarter:		
Gross receipts	\$4,286,275	\$4,397,775
Operating expenses	2,354,407	2,173,336
Net earnings	\$1,931,868	\$2,224,439
Other income	318,731	367,459
Total income	\$2,250,599	\$2,591,898
Charges	2,791,543	2,633,216
Deficit	\$540,944	\$41,318

From this it appears that these lines have only lost \$1212 in average daily gross earnings, as compared with the corresponding quarter in 1903.

	1904	1903
July 1 to Dec. 31:		
Gross receipts	\$9,850,851	\$9,409,819
Operating expenses	5,143,525	4,637,707
Net earnings	\$4,707,276	\$4,772,112
Other income	617,509	559,305
Total income	\$5,324,785	\$5,331,417
Charges	5,926,806	5,207,024
Deficit	\$602,021	*\$124,393

* Surplus.

SYRACUSE COMPANY SOON TO ORDER CARS

The Syracuse Rapid Transit Railway Company is to be in the market soon for eighteen semi-convertible cars. General Manager E. G. Comette announces that the Dudley and East Genesee Street and the Solvay lines of the company are to be equipped with new rolling stock this year. The company is planning on a considerable extension of its double trackage this season.

THE REORGANIZATION OF THE COLUMBUS, DELAWARE & MARION RAILWAY

The reorganization of the Columbus, Delaware & Marion Railway will shortly be perfected. The company was organized a short time ago for the purpose of taking over the Columbus, Delaware & Marion Electric Railway, the Marion Railway, Light & Power Company, owning the city lines and lighting plant in Marion, and the Columbus Northern Railway, Power & Equipment Company, which was formed a short time ago for the purpose of erecting a large central power station, stringing new high-tension lines, and purchasing additional rolling stock. The capital of the new company is \$2,500,000 of stock, and \$2,500,000 of 5 per cent 40-year gold bonds. One million of these bonds will go to retire an equal amount of 5 per cent 20-year bonds of the Columbus, Delaware & Marion Electric Railway Company; \$300,000 will retire an equal amount of Marion Railway, Light & Power Company's bonds; a like amount will retire an equal amount of bonds issued by the Columbus, Northern Power & Equipment Company; \$300,000 will be held in trust for future improvements and extensions, and the remaining \$600,000 will retire the preferred stock of the Columbus, Delaware & Marion Electric Railway Company, and pay the floating debts of the various companies.

The gross earnings of the consolidated properties last year were \$260,000. It is estimated that with extensions and improvements now under way these will be increased by \$100,000. The net earnings of the properties are estimated at \$162,000, and the fixed charges are \$110,000. As soon as the preferred stock has been exchanged, the consolidation will be complete.

KITTANNING & LEECHBURG COMPANY'S NEW PLANT-- GAS ENGINES A FEATURE

The Kittanning & Leechburg Railway Company has placed in operation its new power plant at Garrett's Run, Pa., a mile south of Kittanning, and a place central for development in the district. The building is of buff brick, 45 ft. x 95 ft., with a clearance of 18 ft. from floor to roof trusses, and was designed to accommodate four 500-hp gas engines. In the center of the building, in the basement, is installed a 20-hp gas engine, which furnishes power for the air compressors and water pump. A 1000-barrel tank is supplied from a well 15 ft. from the building, which is fed from the Allegheny River, always assuring a sufficient supply of water. The machine referred to is a three-cylinder, vertical 500-hp engine, manufactured by Struthers, Wells Company, of Warren, Pa. The generator is of 250 kw., direct connected to the engine, which is supplied by natural gas, the electric railway having a ten-year contract with the largest gas producers in the district. Provision has also been made for a producer gas plant in case it should become necessary at any future time. The consumption of gas per horse-power-hour shows, on a test in the shops of the manufacturer of this engine, a smaller consumption than any known record, considering the size of the engine. A lively interest has been created in this plant by all power and light interests in the vicinity of Kittanning, as it promises to be the most modern and economical in the State. Upon the successful operation of this unit, orders for additional equipments will be given at once. The Kittanning & Leechburg Railways Company has 9 miles of line in operation.

INCREASE IN DUES OF THE INTERNATIONAL TRAMWAYS & LIGHT RAILWAYS ASSOCIATION

The secretary of the International Tramways & Light Railways Association, which is composed largely of street railway companies on the Continent of Europe, has issued a circular announcing the increase of dues decided upon at the last meeting of the association at Vienna. There are three classes of members, and the new annual dues are as follows:

For railway companies having annual gross receipts of less than fr.1,000,000, fr.50; between fr.1,000,000 and fr.2,000,000, fr.100; between fr.2,000,000 and fr.3,000,000, fr.150; between fr.3,000,000 and fr.4,000,000, fr.200; between fr.4,000,000 and fr.5,000,000, fr.250; above fr.5,000,000, fr.300.

The second class of members consists of engineering or manufacturing firms or companies who are interested in the tramway industry. Their annual dues are now placed at fr.100. The third class of members consists of individuals whose annual dues are fr.20.

BROOKLYN EMPLOYEES ENTERTAIN

The engineers and firemen of the Brooklyn Rapid Transit Company, constituting Kings County Division 419 of the Brotherhood of Locomotive Engineers and Atlantic Lodge No. 219 of the Brotherhood of Locomotive Firemen, held their annual ball at the New Labor Lyceum, Myrtle and Willoughby Avenues, Brooklyn, Tuesday evening, March 1. Between 500 and 600 members of the two associations and their friends were present, and enjoyed a programme of some thirty numbers. A feature of the order of dance was the dedication to special interests of certain numbers of the order. The two-step, "Fooling You," for instance, was dedicated by the members "to our master." Another two-step, "Coax Me," was dedicated to the superintendent. Among the prominent officers of the company present were: Dow S. Smith, general superintendent; W. O. Wood, superintendent of the elevated division; A. K. Stone, trainmaster of southern division; E. D. Newly, mechanical department of southern division; Frank McMurrrough, general foreman of air brakes. Others of prominence in attendance were: Warren S. Stone, grand master of the Brotherhood of Locomotive Engineers; Albert Green, of the Galena Oil Company, and L. T. Gibbs, G. Ransom and George Curtain of the Westinghouse Company.

NEW YORK CENTRAL'S ELECTRIC PLANS IN CENTRAL NEW YORK—TURBINE STATION PROPOSED

John J. Stanley, of Cleveland, vice-president of the Utica & Mohawk Valley Railway Company, and a member of the Vanderbilt-Andrews syndicate, spent the greater portion of last week in Utica and Syracuse, and made several trips of inspection in company with officials of the New York Central & Hudson River Railroad over the West Shore Railroad, which is to be electrified between Little Falls and Syracuse. Mr. Stanley says that the plans for electrifying the West Shore, which have been under consideration for some time, will soon be ready, and that the work of electrifying that portion of the line between Frankfort and Mohawk, a distance of $3\frac{1}{4}$ miles, will be begun at once.

While in Syracuse Mr. Stanley made public the statement that it is the plan of the syndicate to erect a steam turbine power plant at Utica to take care of that part of the system. Mr. Stanley said that it had not been decided yet in what form the power will be applied to the motors of the cars. He said that the probabilities were that the cars on the West Shore would have a side contact trolley, as the third rail is dangerous and subject to interference from snow and ice. An overhead trolley would interfere with the continued use of the West Shore for locomotive-drawn freight trains.

THE INTERNATIONAL RAILWAY EXHIBITION AT WASHINGTON

Up to the present delegates have been appointed to the International Railway Congress from railways in the United States, Canada and Mexico, representing a mileage of over 150,000 miles. In nearly every case, the delegates chosen include officials of the mechanical and maintenance of way departments, and there will be over 400 accredited delegates to the congress from American railways. As already announced, this congress will be held May 3 to 14, and in connection with it there is to be an exhibit of railway appliances. The exhibition building is expected to be ready by April 15, but exhibitors proposing to erect their own booths or buildings will have access to the ground on or before March 20.

WELL-KNOWN RAILWAY AND MANUFACTURING INTERESTS IN A NEW COMPANY

The Electric Bond & Share Company, of Schenectady, N. Y., has been incorporated with the Secretary of State, at Albany, with a capital of \$4,000,000, to construct and equip railroads, street surface railways, hydraulic, gas and electric plants. The stock is divided into \$2,000,000 of preferred and \$2,000,000 of common stock. The preferred stock is to bear 5 per cent cumulative dividends. The directors are: Charles A. Coffin, Charles W. Wetmore, Alden M. Young, Sydney Z. Mitchell, S. Reding Bertron, William M. Barnum, Louis M. Stanton, of New York; Marsden J. Perry, of Provi-

dence, R. I.; Jacob K. Newman, of New Orleans; Philip L. Saltonstall, Robert T. Paine, second, of Boston, Mass.; Homer B. Johnson, of Cleveland, Ohio; William B. McKinley, of Chicago; Hinsdill Parsons, of Schenectady; William H. Alms, of Cincinnati; Dwight W. Morrow and Graham Sumner, of Englewood, N. J. The main office of the company will be located in New York.

TRACTION AND POLITICS IN CHICAGO

The political campaign preceding the city election in Chicago has begun, and, as for eight years past, the traction franchise question takes a prominent part. The Democratic candidate, Judge Dunne, favors an attempt at immediate municipal ownership of the street railways by bringing condemnation proceedings against the street railway companies to secure their tracks. John Maynard Harlan, the Republican candidate, favors the making of a deal with the companies whereby municipal ownership may be possible in time. He is for a peaceable settlement of the present difficulties rather than an attempt to fight them out in the courts, which is sure to take years. In the first speech of the campaign, Mr. Harlan referred to the traction problem as having been a veritable old man of the sea, hanging on the neck of Chicago, the city being taken up so much with the thought of the traction problem that it has neglected other important matters. In conclusion, he said regarding this matter:

"We must shake loose from the thrall of this traction problem. Something soon must be doing, and if the people and the Council and the Mayor stand together, and push together, and pull together, something soon will be doing. We have companies of all ages, some hoary with years, and others scarcely weaned; we have securities of different names, and of different character, piled in layers one on top of the other; we have securities filtered and unfiltered, securities digested and undigested, and now is the time when we must all join together and dig down until we touch rock bottom, and find out where the traction question is, and what property is really there."

ANOTHER OHIO ROAD IN TROUBLE

Delay in floating bonds has precipitated financial troubles for the Springfield, Charleston, Washington C. H. & Chillicothe Traction Company. The line was projected by Springfield people, and was designed to extend from Springfield to Chillicothe. It was placed in operation to Charleston about a month ago. Entrance to Springfield was provided over the tracks of the Springfield & Xenia Traction Company, from which it was supplied with power. Liens aggregating \$60,000 have been filed against the property by the General Electric Company, American Steel & Wire Company, and others who furnished material. Failure to pay for current caused the Springfield & Xenia Traction Company to shut off current. The stopping of the cars resulted in an arrangement whereby the Springfield & Xenia Company will operate the road temporarily, paying the crews and other expenses and keeping the balance of the receipts until claims are paid. Several parties are now looking over the property with a view to purchasing it.

STREET RAILWAY PATENTS

[This department is conducted by Rosenbaum & Stockbridge, patent attorneys, 140 Nassau Street, New York.]

UNITED STATES PATENTS ISSUED FEB. 21, 1905

782,982. Fender for Street Cars; William O. Mundy, St. Louis, Mo. App. filed March 14, 1904. Details of construction.

782,998. Track Bed Construction; Frank M. Turner, Dayton, Ohio. App. filed Aug. 22, 1904. Filler-brick so disposed in contact with an ordinary T-head rail that it may be used to serve the purposes of the flanged-head rail.

783,027. Electric Railway; Joseph DeLaMar, New York, N. Y. App. filed March 8, 1904. The third rail is hollow and serves as a carrier for a feed wire so that the rail will be normally out of circuit and dead. When a train passes along it will automatically cut in the current at the part of the rail opposite the train and cut it out as the train passes.

723,028. Electric Railway; Joseph DeLaMar, New York, N. Y. App. filed June 9, 1904. The contact shoe carries a roller adapted to engage a sliding switch arm in the housing for the feed wire,

and close the circuit to the latter, while another roller following the first, in a similar manner, opens the circuit.

783,080. Electric Coupling; Edward F. Ruth, Baltimore, Maryland. App. filed June 2, 1903. A coupling whereby a disabled car may be provided with light and heat from the same car.

783,228. Trolley; Charles J. Sosenheimer, Philadelphia, Pa. App. filed Aug. 11, 1904. Relates to the construction of the harp.

783,326. Tramway or Light Railway Car; Ethelbert A. Stanley, Preston, England. App. filed Oct. 1, 1904. Relates to that type of car convertible from a closed to an open car, or vice versa, and has special reference to the disposition of sliding panels, and to ventilation.

UNITED STATES PATENTS ISSUED FEB. 28, 1905

783,449. Street Car; William P. Michel, New York, N. Y. App. filed Aug. 17, 1904. An open car in which the handles are placed forward of each seat at the side where the passengers dismount, in lieu of being placed opposite the ends of each seat.

783,458. Trolley; James A. Norton, Wilkesbarre, Pa. App. filed Dec. 23, 1904. Relates to lubrication and provides means whereby the trolley wheel may be readily removed and replaced.

783,507. Emergency Device; Fred B. Corey, Schenectady, N. Y. App. filed June 16, 1904. Automatic means whereby the power is cut off and brakes applied when the controller handle is released by the operator.

783,537. Motor Controller; William A. McTaggart, Schenectady, N. Y. App. filed Aug. 15, 1904. Consists of an arc-deflector section comprising a thin deflecting plate having laterally projecting spacing bosses.

783,715. Circuit Controller; Rollin A. Baldwin, New Haven, Conn. App. filed Sept. 29, 1904. Comprises a shoe or frame to be applied to the trolley wire by clamping over the same, the trolley passing over the exterior surface of the shoe and in contact with a metal face thereon, so that current will, for the instant, be drawn through a branch circuit for the operation of signals or switches.

783,735. Ratchet Brake for Street Cars; Jacob Roediger, St. Louis, Mo. App. filed July 15, 1904. Details of a quarter-turn ratchet brake.

783,757. Street Car Construction; James Paton, St. Louis, Mo. App. filed July 11, 1904. In a vestibule car, an outer wall which carries the car headlight, an inner wall adjacent to said outer wall, and a removable panel in the inner wall opposite the headlight.

PERSONAL MENTION

MR. CHARLES W. CROSS, formerly electrical engineer for the Eastern Ohio Traction Company of Cleveland, has entered the employ of the Crocker-Wheeler Company at its Cleveland office.

MR. ORPHA JACKSON has resigned as superintendent of the Springfield Railway Company, of Springfield, Ohio. It is understood that he will go with the McKinley syndicate, which operates electric railway properties in a number of Illinois cities.

MR. CHARLES G. LOHMAN, a division superintendent of the Indianapolis Traction & Terminal Company, operating the city lines in Indianapolis, Ind., and the terminal station in that city, has resigned from the company to accept the position of superintendent of the Indiana Railway Company, of South Bend, Ind.

MR. W. T. PIERCE, of St. Louis, has been appointed general superintendent of the Mexico Electric Tramways Company, Ltd., of the City of Mexico, to succeed Mr. S. S. Neff, resigned. Mr. W. W. Wheatly, the general manager of the company, has been acting in the dual capacity of general manager and general superintendent since Mr. Neff resigned.

MR. HORACE E. ANDREWS, president of the Cleveland Electric Railway Company, and a member of the Andrews-Stanley syndicate, was in New York the latter part of last week accompanied by a party of prominent Cleveland citizens, who came to inspect the subway as being relevant to the talk of putting in a short underground railroad in Cleveland to relieve congestion on the public square. It is proposed by the party to visit Boston before returning home.

MR. ARTHUR C. RALPH, for several years in charge of the Marlboro Street Railway, of Marlboro, Mass., as superintendent, and formerly general superintendent of the Boston & Worcester Street Railway, has been appointed general manager of the Taun-

ton & Pawtucket Street Railway and Middleboro, Wareham & Buzzards Bay Street Railway, operating in Massachusetts and Rhode Island. Mr. Ralph will have headquarters in Taunton, and in his new capacity will have 50 miles of street railway to look after.

MR. J. C. HENDERSON has been appointed assistant to President Samuel Insull, of the United Gas & Electric Company, of New Albany and Jeffersonville, Ind., which operates the public utilities of both cities, including the traction line of the Louisville & Southern Indiana Traction Company. Mr. Henderson will have charge of the construction and the technical branch of the operating department of the gas and electric light plants of New Albany and Jeffersonville, the New Albany waterworks, the street railway lines of New Albany and Jeffersonville and the interurban line between the two cities, which is now being extended over the Big Four bridge at Jeffersonville to Louisville.

THE PARTY ACCOMPANYING MR. W. T. VAN BRUNT, formerly general manager of the St. Joseph Railway, Light & Power Company, of St. Joseph, Mo., which is visiting South America, has reached Rio Janeiro. It consists, besides Mr. Van Brunt, of Dr. Eugenio Dahne, who was Brazilian commissioner to the Louisiana Purchase Exposition; Mr. E. I. Robinson, general manager of the LaCledde Car Works; Mr. O. U. Von Schrade, St. Louis; Mr. J. C. Roberts, of Niagara Falls; Mr. M. R. Scherrerd, of Newark, and Dr. Thurlow W. Reed, of New York. The party sailed for Brazil in the yacht "Margaret," which was chartered from Col. Emerson, of Baltimore, and visited a number of the West Indian Islands on the way to Brazil.

MR. GEORGE W. PIERCE, superintendent of the Stamford Street Railway Company, of Stamford, Conn., has been appointed general manager of the New York & Stamford Railway Company and the Greenwich Tramway Company, which have just been formally transferred to the Consolidated Railway Company, representing the New York, New Haven & Hartford Railroad. Mr. Pierce has been connected with the Stamford Company since 1893, and was with the Norwalk (Conn.) Tramways when that company was interested in the Stamford system. When the latter was taken over by the New York, New Haven & Hartford Railroad, he was made superintendent of the lines. Under his direction the change in motive power from horses to electricity was made, and extensions were built to the system increasing it from 7 to 17 miles. Assistant Superintendent Webb, of the Stamford Company, will be continued in that capacity as lieutenant to Mr. Pierce.

MR. THOMAS W. WILSON, the new general manager of the International Railway Company, of Buffalo, was graduated from Lehigh University in 1894. In vacation periods prior to that time



THOMAS W. WILSON

he pursued the study of street railway construction in the drafting room of the Pennsylvania Steel Company at Steelton, Pa., and on the company's lines. Upon leaving college Mr. Wilson entered the permanent employ of the Pennsylvania Steel Company as engineer of survey and special work. In 1896 he resigned to become assistant engineer of the Charleston (S. C.) Railway Company. One month later he was made chief engineer of the system, and while with the company supervised the construction of the lines to electricity, and did much construction work. Early in 1897 Mr. Wilson returned to the Pennsylvania Steel Company, but resigned a few weeks after to enlist in the Eighth Regiment of Pennsylvania Volunteers. His transfer to the engineering corps soon followed, and at the close of the war he was chief topographer of the Second Army Corps. After a few months service with the Pennsylvania Steel Company, following his muster-out, Mr. Wilson went to Buffalo as assistant engineer of the International Railway Company. After serving in that capacity for four years he was appointed chief engineer of the company. His promotion to the general managership followed the resignation of Mr. Thomas E. Mitten. Mr. Wilson was born in New York City in 1872, and is a member of the American Society of Civil Engineers and American Institute of Mechanical Engineers, and is first vice-president of the Engineers' Society of Western New York.