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Smoking on Closed Cars

The perennial question of whether smoking should be permitted on closed cars and if so in what places has been brought to the front again in New York through the efforts of an anti-tobacco crusade conducted on the initiative of the editor of a religious magazine. Through his activity the attention of conductors has been called to violations of the anti-smoking ordinances, and at least one lover of the weed has been taken to the station house and fined. In this instance, the offender boarded the rear platform of a pay-as-

you-enter car and immediately passed through the aisle to the front platform. The practice in New York, as in many other cities, does not permit the carriage of lighted cigars, cigarettes or pipes on any part of a closed car, so that while the smoker may have thought that he was considerate in passing to the front platform, he was violating the rule as much as if he had indulged himself while occupying one of the seats. Of course, with open cars, the segregation of the smokers is possible and this we believe accounts largely for their popularity among a certain class of riders. Even the open car, however, when crowded or nearly filled, does not afford the relief which it should give to those to whom proximity to burning tobacco is objectionable. This fact is attributable to the laxity of conductors in enforcing rules. Trainmen frequently become careless or indifferent, although they are not always able to detect smokers easily in a crowded car. Rules affecting smoking should be enforced, but there would be very slight ground for complaint if the smokers who are familiar with the course which companies follow in this respect would try to avoid giving offense.

Wire Specifications

A paper at the recent meeting of the American Society for Testing Materials called attention to the importance of establishing some uniform specifications for hard drawn copper wire. Beginning with the question of size, which is being specified in no less than three wire gages as well as in thousandths of an inch, up to the subjects of conductivity, tensile strength and elastic limits, each purchaser has been a law unto himself. This is an anomaly when the amount of such wire used in trolley construction and overhead transmission lines is considered. To make the matter worse, many of the common conditions included in specifications of this kind involve maxima in opposed properties. Thus as the elongation of the wire must decrease with increasing amounts of cold drawing, there must be a compromise between maximum tensile strength and elongation. In each of these requirements also, as well as in elastic limit, a great variety of practice exists, some evidently based upon no very real necessity for the conditions under which the material is to be used. The society was requested to consider only the question of hard drawn wire, but the same lack of uniformity exists in specifications for covered conductors. A recent investigation, for instance, showed a wide diversity of practice in regard to the amount of pure Para required in the insulation of underground feeders by street railway companies operating under similar conditions. The subject is well worthy of consideration by either the Engineering Association, the Institute of Electrical Engineers or the Society for Testing Materials.

The Chester Strike

The disastrous effects of the encouragement, first of an active and then of a passive, resistance to law and order are strikingly exemplified to-day in the case of Chester, Pa. The street railway strike in that city is now in its thirteenth week, and during the latter part of its continuance the chief reliance of the strikers has been that un-American weapon, the boycott. At first violence was employed. Non-union men were attacked on the street and in the performance of their duty on the cars; a bridge was burned down, cars were dynamited. As the local authorities made no serious effort to put an end to the disorder, the State constabulary was called in. Deeds of conspicuous disorder have gradually decreased, but this stage of the quarrel has been followed by a boycott which has extended not only against the company and its employees, but toward any one seen riding on the cars.

The extent to which the persecutions have been carried can hardly be understood by one who has not been an eye witness of the events. A doctor who used a car on an urgent call to visit a patient was refused bread by his baker, lost his practice and had to leave town. A veteran who rode by trolley on Decoration day to the point where the G. A. R. procession was to start was not allowed to join the ranks, as the band declined to play until he had been excluded. Because two school teachers rode a short distance on a rainy day the scholars went on strike; the children were supported by their parents, and the teachers, to avoid transfer, agreed not to repeat the offense and publicly apologized for using the cars. In short, an attempt has been made with at least partial success to establish a lawless condition of affairs by terrorizing all who did not assent to the boycott.

The effect of this campaign is injuring the city far more than the company, whose lines in Chester comprise a small portion only of its entire system. Modern business conditions in any city depend very closely upon the maintenance of means for transportation, and if these are interrupted inconvenience and loss must follow. As a result of the boycott the merchants in Chester are finding that people are buying sparingly; many cannot afford to do otherwise, while others prefer to go to Philadelphia, only 40 minutes away by train. Real estate owners report a lack of demand for houses and apartments, especially in the outskirts of the city. Several plans for the establishment of large manufacturing plants in Chester have fallen through on account of its reputation as a strike town. Finally, the city and county have incurred a large debt for the wages of extra patrolmen and face a damage suit for \$200,000 which the Chester Traction Company will demand as compensation for the loss of property which the authorities failed to protect.

If anyone wishes to study an object lesson of the injury which a street railway boycott can cause to those who wield it let him visit Chester. He will find that this foolish and cruel means of waging industrial war injures first the weak and innocent bystander of the fray and then those who expect to profit by it. It has already become so unpopular that mass meetings of the citizens are being held to determine the best means of bringing it to an end. It is safe to say that its lease of life is well nigh over.

The Pass Situation in New York

One result of the Public Service Commission law in New York is that the issue of railway passes to anyone not a bona fide employee of the company is forbidden under heavy penalty to both issuing company and user. This rule, although stringent, has had a beneficial effect in cutting off the graft of politicians, petty office holders and others whose friendship is hardly worth cultivating but whose enmity is to be feared. A very prominent railroad passenger agent, recently retired, remarked once that his company was always perfectly willing to grant free transportation to any person who was really entitled to it; that is, one who could give the road a legitimate return, either in advice or advertising, for its gift. The trouble with passes arose through the grasping instincts of those whom the company was thus willing to favor—they could not understand why their favorite relatives or friends should not also be carried free—and also because the practice involved a discrimination against those who thought they had as much claim upon the company as many of those to whom the privilege had been extended.

The small politicians have felt the effect of the new law in New York State more than any one else, and several amusing situations have arisen from the fact that these men are now compelled to pay their fares. The limit was reached in the case of an assessor in the Second District who wrote under date of June 20 to the chairman of the Public Service Commission complaining that he and his two assistants could not get passes from a certain railroad company. He stated in his letter "inasmuch as our duties as assessors compel us to spend considerable of our time in connection with the assessments of the railroad company, it seems to us that our board would properly come under the heading of 'employees' and, this being the case, it seems as though we should be entitled to the transportation." As the railroad company took an opposite view, the assessor applied to the chairman of the commission for instructions as to whether transportation should not be issued.

In his reply the chairman called attention to the fact that the assessors were being paid for their work and were in no sense employees of the railroad company within the meaning of the term as used in the act; that the company would be liable to a penalty of \$5,000 for each offense if it issued the transportation and that any officers having anything to do with the violation of the law would be liable to imprisonment. The chairman also advised the writer of the letter that the law classes as a misdemeanor the solicitation either directly or indirectly for his own use or the benefit of another of any free transportation or discrimination of rates of this kind and that any office holder is liable to forfeiture of office for such an act. He explained further that the assessor had already committed a misdemeanor and was liable to removal from office and that if he had succeeded in securing a pass he would have been guilty of extortion, which is punishable as a felony by imprisonment not exceeding five years.

Few States have such stringent laws as these, but without them the pass question is a problem. Many companies make a practice of carrying members of the police force when in uniform without charge on their cars, but limit the number of officers on each car to one or two. The pres-

ence of the officers is a safeguard to the passengers of the company in case of disorder and the favor given is returned by prompt service in the strict discharge of their duty, for which, of course, direct remuneration cannot be made. Arguments can be advanced for the judicious and limited issue of free transportation in other ways for which a legitimate return can be secured, but the solicitation of transportation by any public officer is blackmail and is so recognized by the New York statutes. The tendency at present is undoubtedly toward the restriction of all free transportation.

A Fare Controversy on Elevated Roads

The controversy over the proposal to introduce through routing on the four elevated railway systems of Chicago has provoked conflicting opinions from the companies on the important question of the profitableness of the rearrangement of routes urged by the city authorities. As the controversy centers now on the adequacy or inadequacy of the fares and average length of haul involved it assumes a position identical with that concerned in the New York situation and has a bearing on every city in the country where there is an urban electric railway problem.

According to the report made to the Committee on Local Transportation of the City of Chicago, an abstract of which was published in the *ELECTRIC RAILWAY JOURNAL* of June 27, 1908, the Northwestern Elevated Railroad and the Chicago & Oak Park Elevated Railroad are ready to introduce through routes and to concede universal transfers. The South Side Elevated Railroad and the Metropolitan Railway will not agree to universal transfers at the flat fare of 5 cents. The South Side Elevated road is opposed to the introduction of through routes on a 5-cent fare.

The position of these companies will be understood better if the close relationship in the ownership of control of two of the properties is made clear. The Northwestern and the Chicago & Oak Park roads are controlled by the same interests. Ownership of the Union Elevated loop, which is used by the lines of all four of the companies, is held by the Northwestern company. The companies which favor the extension of service assume that advantages will be received from the introduction of a modern system of routing which will compensate for the extra expense incurred. The city would grant some concessions to the Northwestern company and its loop property in return for through routes and universal transfers; and the company believes that these advantages, affording an increase in capacity of the loop through the extension of station platforms and the building of an auxiliary stub terminal, would outweigh any loss that would be sustained by through routing and universal transfer privileges.

As the South Side and the Metropolitan companies both have auxiliary stub terminals, the city can give these lines no concessions of this character which would compensate in part for the installation of additional privileges without extra fare. The situation, therefore, must be decided by those companies solely upon the direct issue of their ability to provide the public with the additional accommodations desired without exacting a fare of more than 5 cents per passenger. In defense of the position of the South Side Elevated road, Charles V. Weston, its president, has sub-

mitted figures to show the costliness of the service and in connection therewith has given expression to general opinions respecting inadequacy of fares which are consistent with views that are accepted by many authorities.

In discussing the present fare situation, Mr. Weston states that street railways generally throughout the country are facing a crisis. This is undoubtedly a statement of fact applicable in many cities. With the growth of cities and the introduction of universal transfers, Mr. Weston says that a period has been reached when companies can no longer give the service required at the flat rate stipulated in the franchises. As analyses of statements make the facts clear with respect to many urban companies, and as the public is in dire need of education, it would be wise for all managers who are confronted with expiring franchises to prepare to submit full figures which will demonstrate the truth of arguments on this subject.

Taking up the case of the elevated railways, Mr. Weston states that the facilities and service they offer are entirely disproportionate to the compensation received and that any attempt to place additional burdens upon the companies causing "further reduction of the already small margin between gross earnings and operating costs, cannot be successfully defended by any course of reasoning." As Mr. Weston states, the South Side road is under-capitalized. Since the reorganization of this property it has been managed prudently. Mr. Weston quotes the present earnings as proof that "the length of the average haul is already greater than the maximum which will permit of a reasonable return on the investment, yet the short haul business of the company is decreasing, largely because of the stronger competition of the surface lines, and the increase in total business shown is due to a disproportionately large increase in the long haul traffic."

The elevated lines will probably feel the effects of competition from the surface roads in increasing measure as the rehabilitation of the latter properties progresses in accordance with the provisions of the new ordinances.

Mr. Weston adds to his argument a reference to the situation in New York and the large increase in transfer traffic on the New York City lines, stating: "No transportation company on earth can live, maintain its equipment and roadway, give an adequate service and live under those conditions, to say nothing of providing for depreciation reserve and a fair return to the investor." He also predicts bankruptcy for the Chicago surface lines as a result of their introduction of substantially universal transfers and development of long-haul traffic.

It is obvious that the Northwestern company, as the owner of the loop, will receive some advantages from the introduction of through routes, which would facilitate the movement of trains through the congested central loop and increase the total number of passengers, adding to the revenue of the proprietor road, which collects one-half cent for every passenger carried on the lessee roads. We shall not undertake to settle the merits in this controversy; but on account of other similar instances we believe that it is important to emphasize that the tendency is to increase the service in this country when proper recognition of the rights of investors would require that popular demands for extensions be denied.

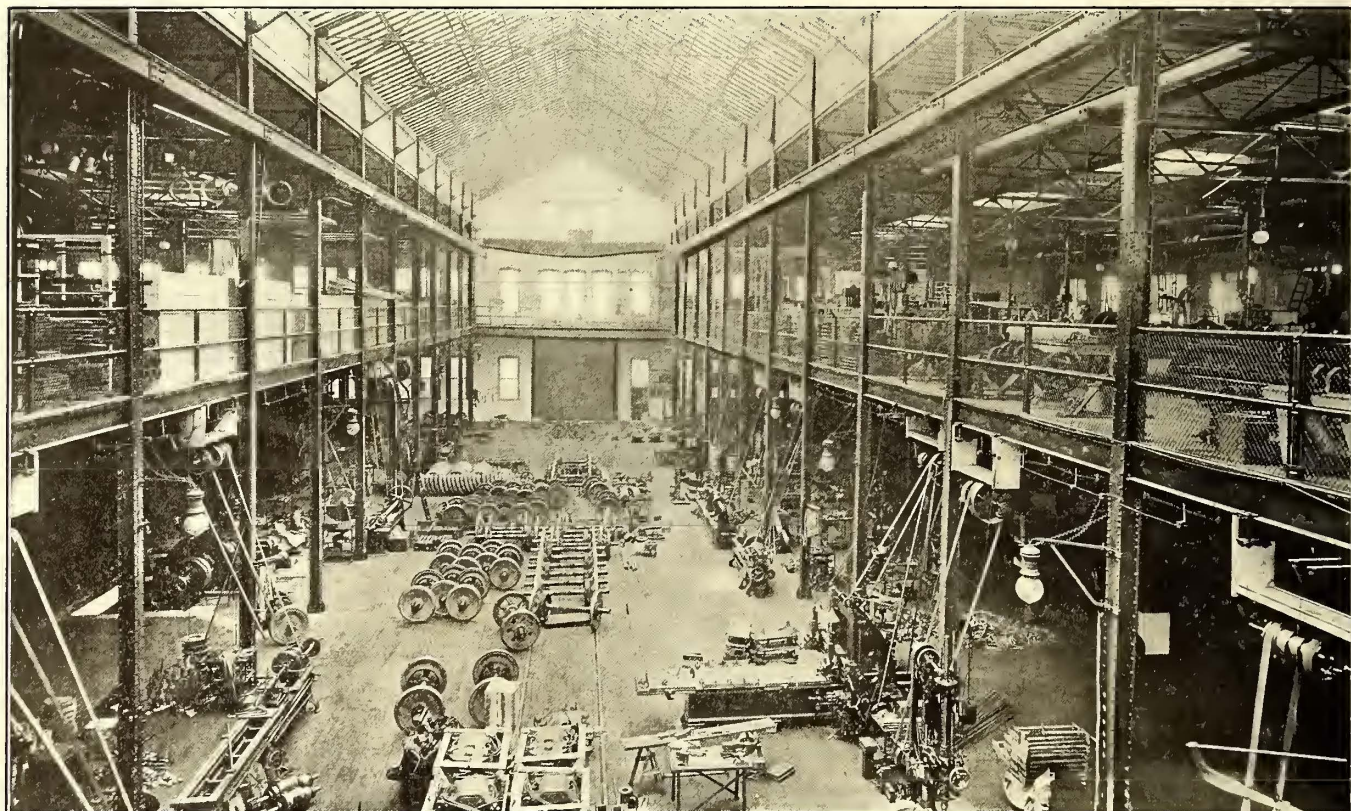
SPECIAL TOOLS AT THE SHOPS OF THE CHICAGO CITY RAILWAY COMPANY

The repair shops of the Chicago City Railway Company contain a large number of special tools and devices for facilitating manufacturing and repair work. This article includes concise descriptions of many such tools and devices, all of which with one exception have been designed and built at these shops.

An earlier article (STREET RAILWAY JOURNAL for April 11, 1908, page 597) describes the methods of car inspection and of making light repairs on the Chicago City Railway. The inspection crews raise the car bodies and put in new wheels whenever the presence of flat spots or the limit of wear demands a change. Imperfect wheels thus removed are sent to the repair shop, where, together with the wheels

centers without any lifting. A segment of the large central driving gear is fitted in with bolts so that it may easily be removed whenever a pair of wheels is to be rolled in or out of the lathe. Bushings are provided which tighten over the journals, accurately centering the wheels in the lathe. The wheels or tires are given a positive drive by grip jaws set against both sides of the wheels. Thus, with the journals centered by bushings and the grip jaws in contact at several points near the rims of the wheels, the tires are held during the turning so that they are finished true with the journals.

High-speed steel tools are used for turning tires in this lathe. Four tools are required in such work. These comprise a roughing tool for tread and flange; a forming tool for the inside of the flange; a forming tool for the outside of the flange, and a scraping tool for the tread. The tools



Chicago City Railway Shops—General View of Machine Shop Showing Wheel and Axle Division at the Left Below, and Coil-Winding Section on Balcony at Right

which are taken out in the ordinary course of truck repairs, they are reground or returned.

The wheel work is carried on in a section of the machine shop equipped in part with the following tools: Pond 42-in. boring mill; Niles 36-in. boring mill with hub facing attachment; Harrington 30-in. boring mill used for bearing work; hydraulic wheel press with 8-in. ram; car-wheel grinder; Pond car-wheel lathe (illustrated), and a complete installation of overhead carrying trolleys with air hoists serving the axle straightener, storage space, lathes, etc. Axles are turned in a heavy engine lathe placed in the wheel shop section of the machine shop.

The large tire-turning lathe illustrated herewith is the most interesting tool in the wheel shop. This lathe is direct-driven through gearing by a 25-hp motor, the top half of which may be seen projecting above the floor. The lathe itself is depressed below the floor level so that wheels mounted on their axles may be rolled directly to the lathe

are ground to templets. Rolling templets and a diameter gage are supported on a cross bar above and parallel the lathe centers so that no other measuring tools are required when tires are to be turned.

The pairs of wheels finished in the lathe are marked and classified with regard to the diameters so that all the wheels under one car may have the same diameter. Both steel and cast-iron wheels are used. The steel wheels are the Schoen make and about 10 pairs can be turned in this lathe in a working day. The cast-iron wheels used are of the spoke type manufactured by the Griffin Wheel Company. Double-plate wheels were formerly used, but were found to be too noisy.

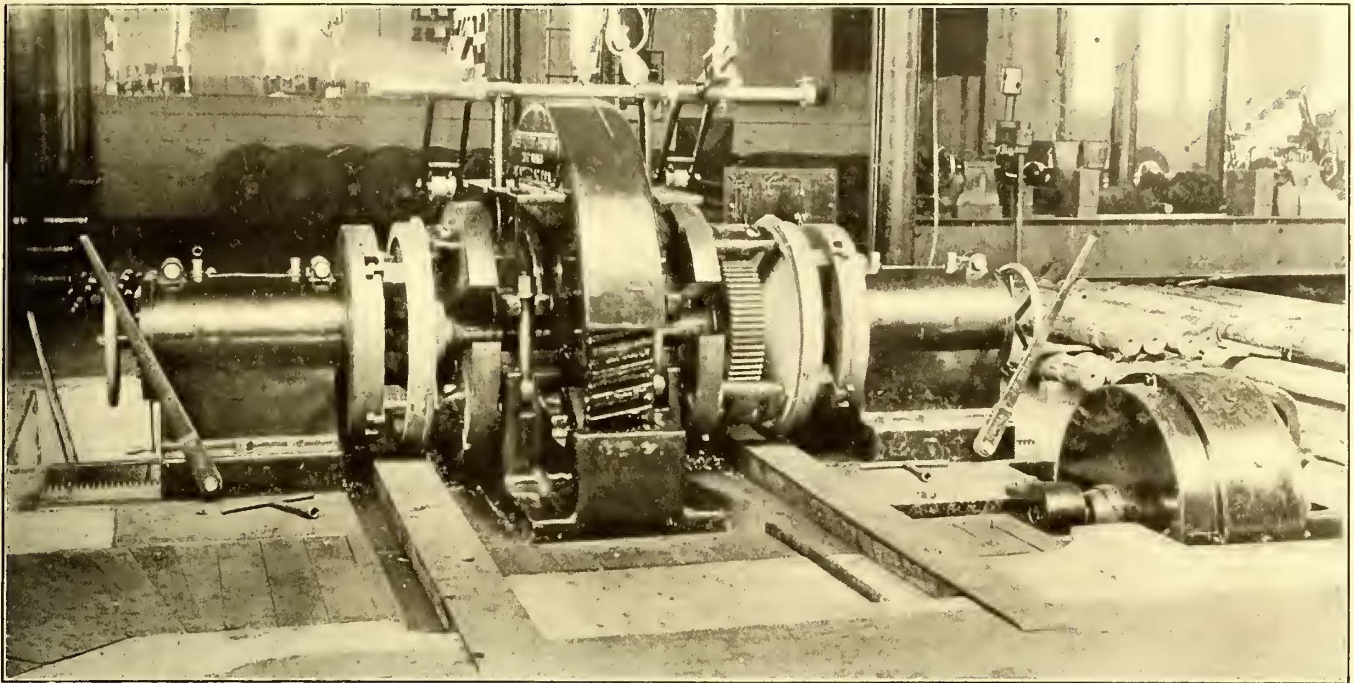
In placing motor gears on axles they invariably are pressed on whether the gears are of the split type or solid type. With new bolted gears the bolts are tightened before mounting and then the gear is pressed on as though it were a solid gear. It is stated that in this way a gear can be

mounted on the shaft in about one-third the time ordinarily required when the bolts are used to tighten the halves about the shaft.

BLOWING OUT ARMATURES AND MOTORS

Motors to be repaired are received on the main floor of the machine shop and here given a thorough cleaning with

placed over a motor shell or an armature with an exhaust outlet in the floor. The galvanized iron hood fits closely over the motor shell or the armature and in the side of the hood is an opening through which the compressed air nozzle can be placed when blowing out the dirt, copper dust, etc. This dust is sucked up by the fan and discharged outside of



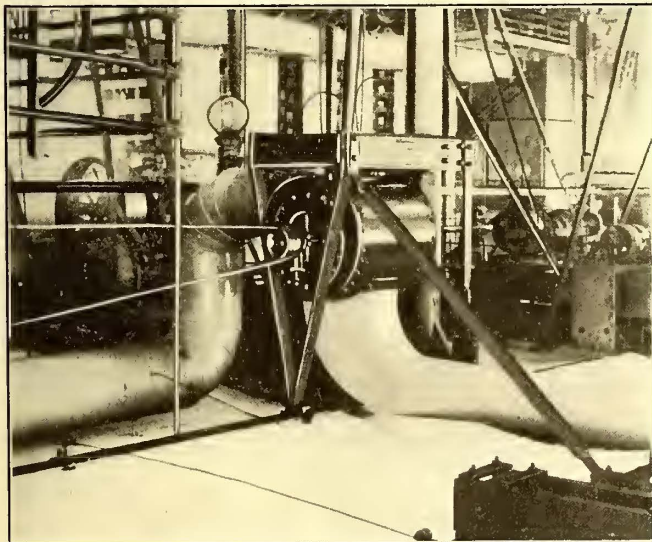
Chicago City Railway Shops—Large Tire-Turning Lathe with 25-hp Motor

compressed air. Unless special provision were made the dust resulting from this method of cleaning would contaminate the air about the shop. For this reason an exhaust system has been installed. This apparatus includes

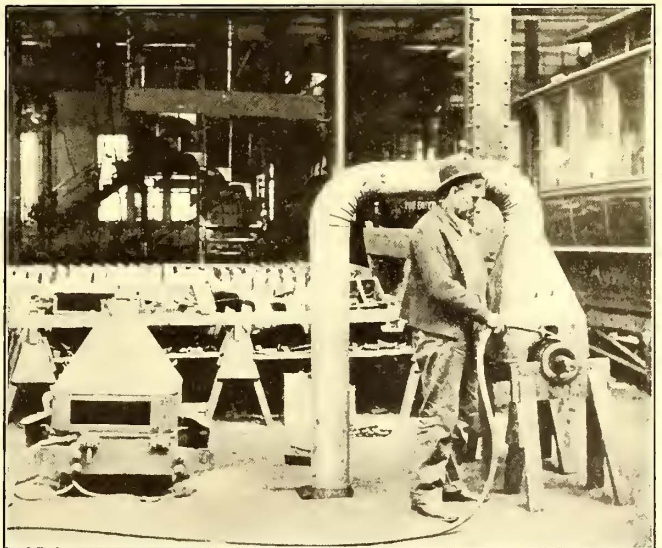
the building; thus, the health of the employees is protected and the shops are more easily kept clean.

REBUSHING ARMATURE SHAFTS

The railway company manufactures at its shops all the



Chicago City Railway Shops—Exhaust Fan Supported from Ceiling Over Repair Floor



Chicago City Railway Shops—Exhaust Hoods for Blowing Out Armatures and Motor Shells

an 18-in. suction fan driven at 2200 r.p.m. by a Westinghouse No. 3 railway motor which, together with the fan, is supported from the under side of a balcony floor of the machine shop. From the intake of the fan, pipes lead to openings in the floor of the truck and motor shop. There are 16 such openings each 8 in. in diameter and each covered by an iron cap when not in use.

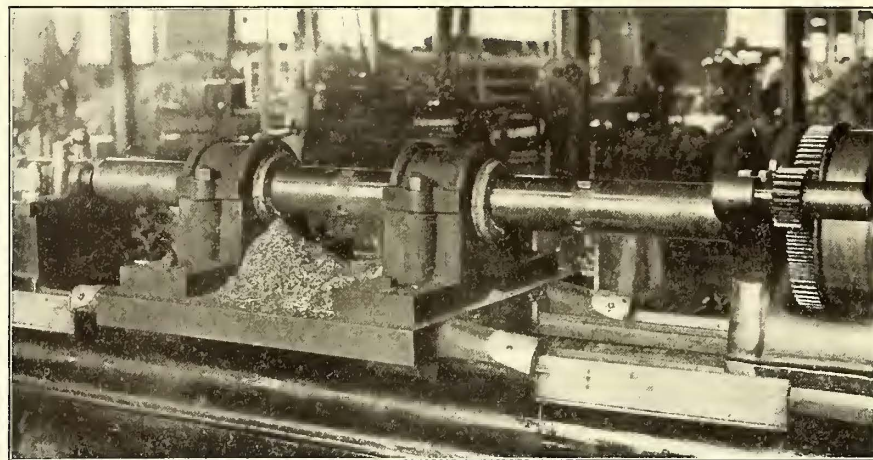
An engraving shows the method of connecting the hood

journal, armature and motor bearings required for the maintenance of its cars. Its foundry equipment for this purpose includes sets of iron mandrels varying in diameter in steps of 1/16 in. It is planned to keep all armature shafts close to standard sizes so that these bearings, which are cast to fixed sizes, can be used without requiring any special fitting.

An air hammer with a chisel attachment is used for

chipping babbitt and it also is found to be especially efficient in cutting oil grooves in bearings.

When an armature shaft is worn down $1/16$ in. a piece of cold-drawn tubing is shrunk on and this bushing turned down to the standard diameter of a new shaft. Each time an armature shaft is thus fitted with a bushing a mark is

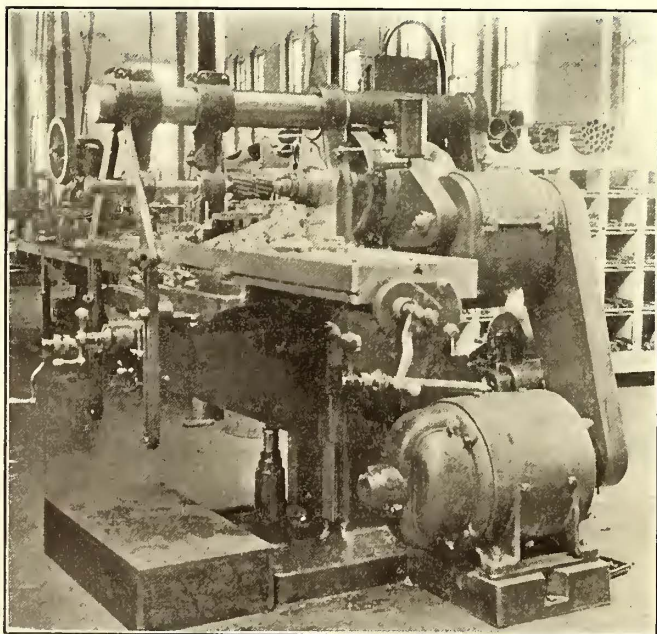


Chicago City Railway Shops—Arbor Attachment with Cutting Tools for Boring Axle Bearings

placed on the end of the shaft, so that the inspection of any shaft will show how many times it has been rebushed.

BORING BEARINGS

The motor axle bearings are bored on a lathe fitted with a special carriage and an arbor carrying the cutting tools. The accompanying engraving illustrates the way that the bearings are held in the lathe while being bored. The lathe carriage is built up with two special saddles, each of which is designed to hold one pair of motor brasses. These chucks or saddles are bored to hold the largest size of bearing ordinarily required. For smaller bearings special liners are used, thus doing away with any time-wasting adjust-



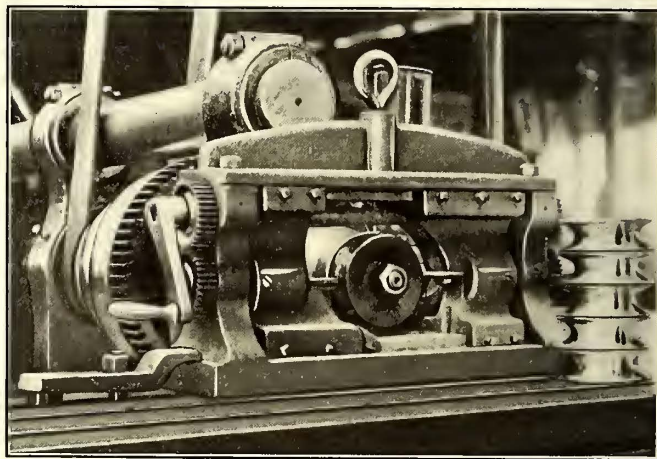
Chicago City Railway Shops—Motor-Driven Miller Planing Edges of Axle Collars

ments. Under the caps of the saddles are coiled springs placed under compression by the holding bolts, so that when the nuts are loosened the caps are raised by the springs and the operator has only to lift out the brasses which he

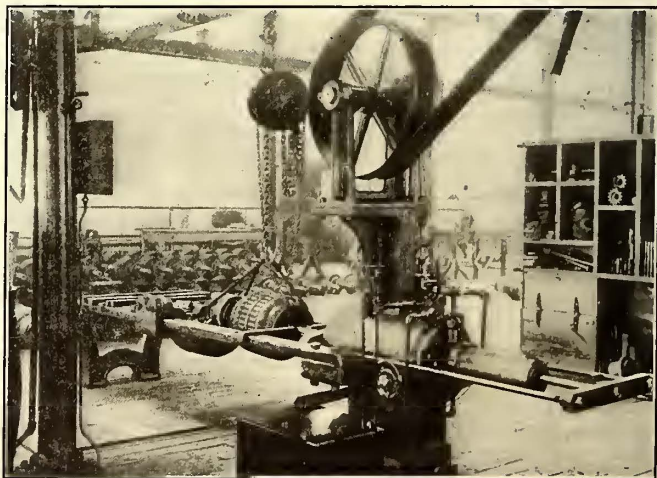
is boring. Four high-speed double-ended cutters are carried in the boring bar which screws onto the lathe spindle. These cutters are so placed on the bar that as the carriage moves along the lathe bed the inside of each bearing is first taken off with a roughing cutter. These roughing cutters leave about $1/32$ in. of metal which, as the carriage moves farther along, is taken off by the finishing cutters. There can be bored in this lathe in a day of nine hours about 50 pairs of 5-in. x 9-in. axle bearings.

The dowel pinholes in the bearings are drilled with a jig so that a considerable amount of time is saved over the ordinary method of laying out these holes before drilling.

The edges of various kinds of split bearings are planned in a No. 4 plain Cincinnati milling machine. This scheme of work is very efficient. A vise is provided so that two halves of a bearing may be clamped on the bed of the milling machine with edges upward. A single feeding under the milling cutters carried on the revolving arbor above serves to finish the edges of the bear-



Chicago City Railway Shops—Milling Machine Attachment for Finishing Trolley Wheel Grooves



Chicago City Railway Shops—Hydraulic Pinion Press with Case for Extra Parts at the Left

ings. An accompanying engraving shows the motor-driven milling machine finishing two axle collars at one feeding.

FINISHING TROLLEY WHEELS

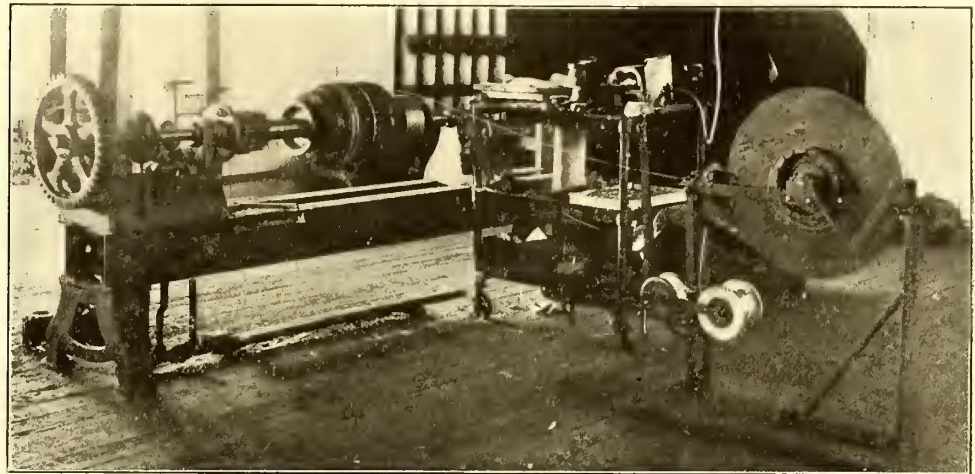
All the trolley wheels used are cast in the railway com-

pany's foundry. After having been bored they are finished in the grooves. A milling machine attachment, illustrated herewith, serves to do this finishing work with very little effort on the part of the operator and at an average rate of 45 wheels per hour. The attachment for the milling machine, as shown, comprises a framework and gearing clamped to the bed of the milling machine and at right angles to the spindle. In this frame are two carriages with a shaping tool mounted on each. The carriages are advanced toward the spindle of the milling machine by turning the crank shown on the left of the frame. In finishing a groove the rough trolley wheel is slipped on the spindle and held by an ordinary nut. The spindle is started and then the operator, by turning the crank, advances the shaping cutters into the groove of the wheel until the rough surface has been removed. By a reversal of this operation the cutters are then withdrawn and the trolley wheel is removed ready for service. Trolleys are also turned up in the machine after service on the line.

MOTOR WINDING SHOP

The motor coil and armature work for the entire railway system is done on a gallery over the machine shop. The various tools in the coil-winding department are so arranged that the work can be passed from one to another

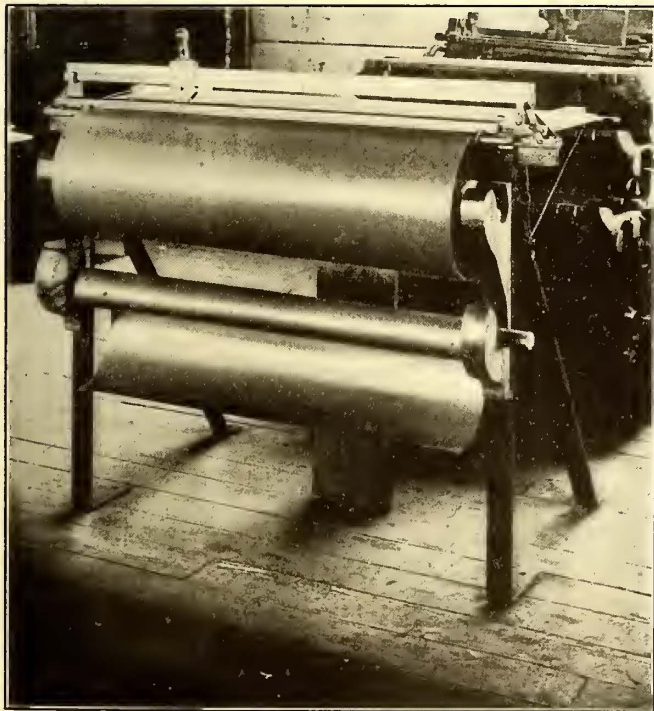
operated by power and served by a chain block traveling on an overhead trolley. The pinion press has a 6-in. ram operated by two oil pumps belt-driven from a line shaft. Special blocking is provided so that pinions may be pressed



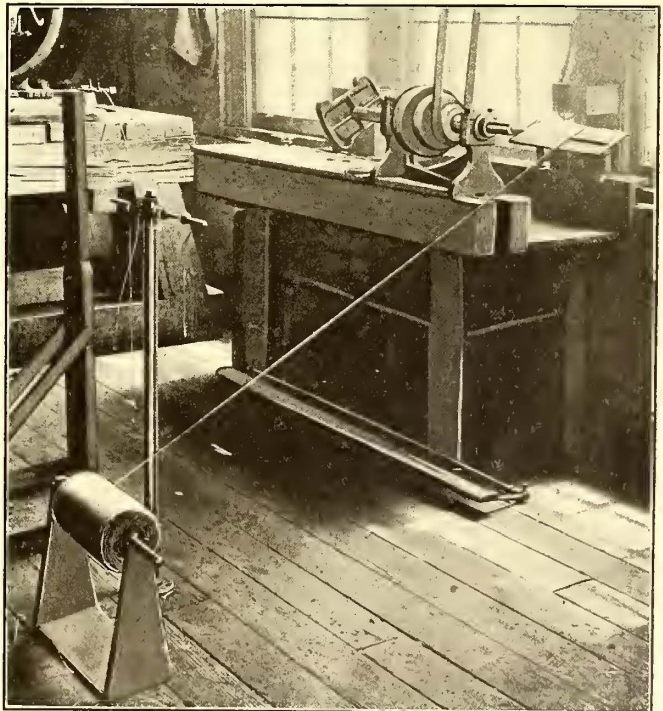
Chicago City Railway Shops—Adjustable Tension Device for Band Wire

on or pulled off with equal facility. At the rear of the hydraulic cylinder is an auxiliary air cylinder which serves to return the hydraulic plunger into the cylinder as soon as it has completed its work.

In manufacturing armatures complete, as is done in this shop, a comparatively large amount of paper must be cut. To facilitate this work of cutting insulating paper a special cutter, as illustrated, has been built in the shop. This cutter is designed along lines similar to those of paper cutters once used in printing plants. It comprises essentially a bed along which may be rolled a revolving knife with a



Chicago City Railway Shops—Machine for Cutting Insulating Paper



Chicago City Railway Shops—Special Winding Lathe Attachment Used in Cutting Sleeveing

with but little time wasted in handling. Practically all of the tools used in the coil-winding department were made in the shops.

An illustration is presented of a pinion press which is

sharp beveled edge. A roll of insulating paper 36 in. wide may be passed through the cutter and strips cut of any desired width. When a considerable number of strips of the desired width have thus been cut they are taken to a

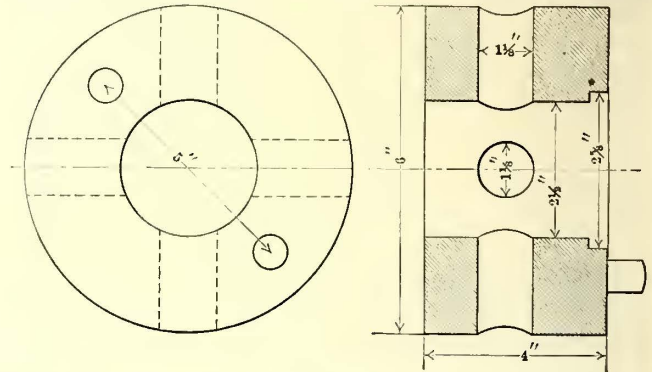
Reliance paper cutter and again cut crosswise into strips of a suitable size for insulating armature coils.



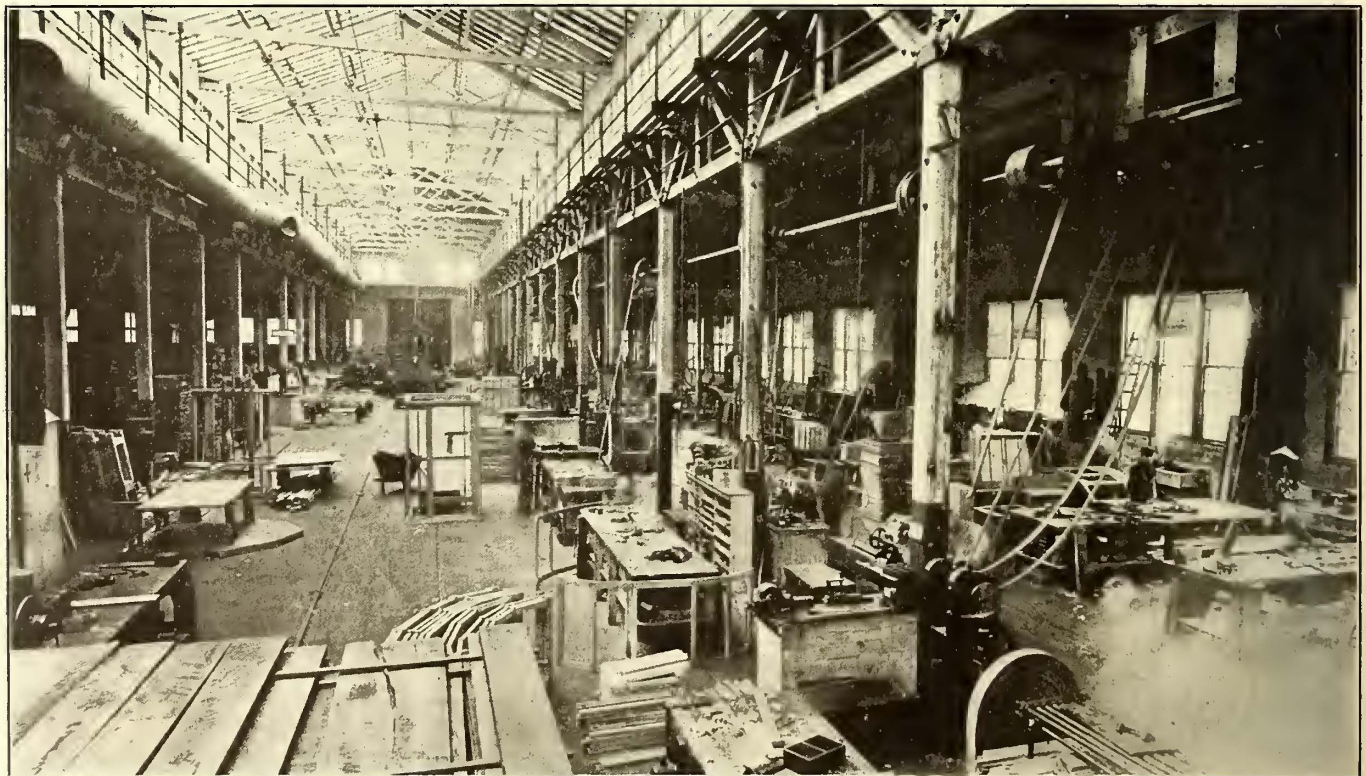
Chicago City Railway Shops—Storage Hopper for Refuse from Woodworking Machines

a drill shank. On one side of the blade, as shown in the illustration, is fastened a 1/4-in. square piece of iron. The drill shank is inserted in the spindle of the winding lathe and the sleeving wound on evenly. The length of the blade is such that it will accommodate about 100 turns and in winding it is covered with three layers. When thus filled the 300 turns of the sleeving are cut off with a pair of shears and the work repeated. In this way the 5000 sleeves can easily be cut in an hour and the average length of the sleeves will not vary 1/16 in.

After armature coils have been wound they are stored in a special case containing a large number of pigeon holes built at one end of the drying oven. Close to this coil storage are the dipping tanks where all coils are treated with Massachusetts Chemical Company's No. 50 compound. They are next rubbed with paraffin so that they may be more easily forced into the slots. After having thus been



Chicago City Railway Shops—Special Wrench for Commutator Jam Nuts



Chicago City Railway Shops—General View of Woodworking Shop

A special attachment for a coil-winding lathe is provided for saving time in cutting sleeves for armature leads. With this attachment one man can cut about 5000 sleeves in an hour and all sleeves will be uniform in length.

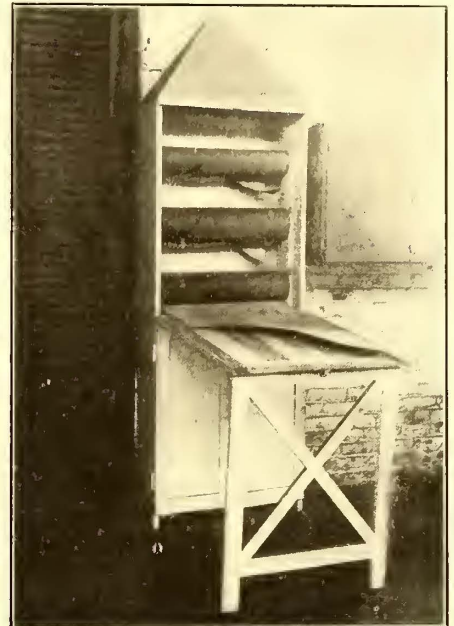
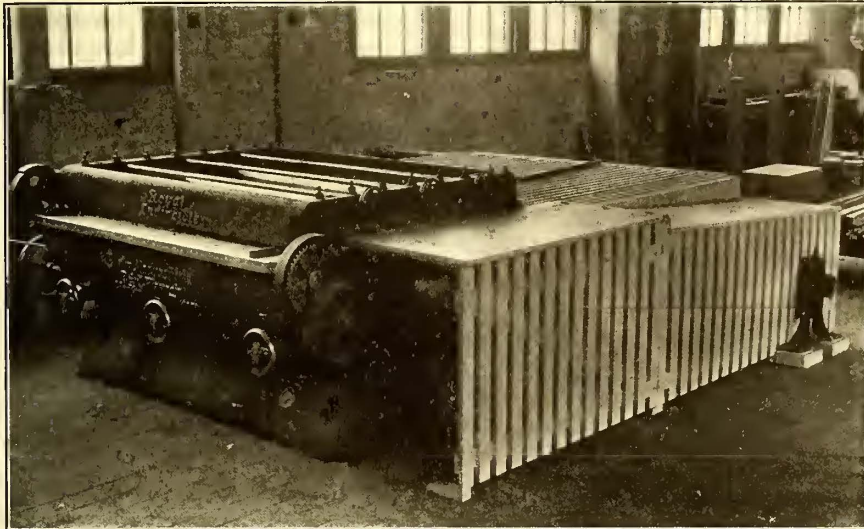
The attachment comprises a sheet-iron blade mounted in

treated they are baked in a steam-heated oven which is built on the coil-winding shop floor. This oven has walls of hollow tile and a rolling steel door. A 9-in. ventilator at the top of the baking room serves to keep the oven free of obnoxious gases.

A simple tension device for armature banding wires, as built in the shops of the Chicago City Railway, is illustrated. The essential parts of this device comprise a large iron wheel about which the banding wire passes; a strap brake to control the movement of this wheel, and fiber tension clamps for pinching the wire. An adjusting device is provided for the strap brake so that its pressure may be varied and the tension of the banding wire be adjusted to suit the needs of the work.

Waste shavings are hauled to the company's stable and used for bedding.

In the woodworking shop there recently has been installed a Royal Invincible sander manufactured by the Berlin Machine Works, Beloit, Wis. The sander as installed and as shown in the illustration is served by a table



Chicago City Railway Shops—Sanding Machine with Special Protection and Work Table

Case and Cutting Table for Sandpaper Supply

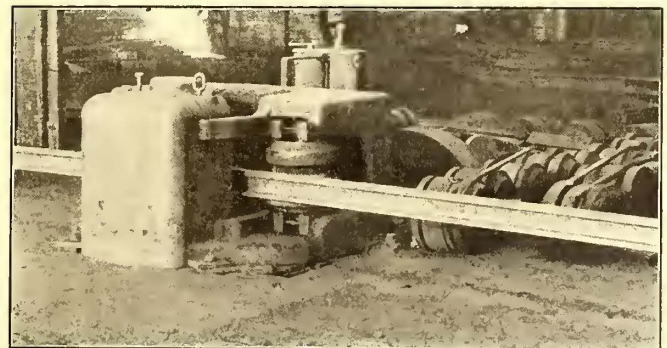
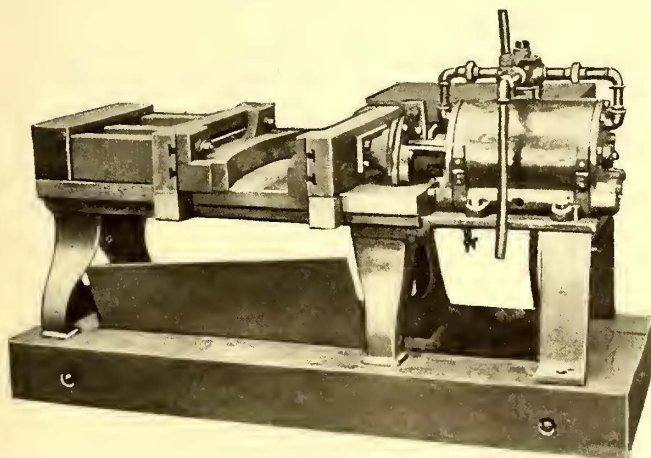
An accompanying sketch exhibits the detail dimensions of a special wrench used for screwing up commutator jam nuts. With this wrench, which is simply a block of iron properly bored and fitted with two protruding pins, it is possible with the assistance of a long bar to exert an enormous pressure on the commutator jam nut.

MISCELLANEOUS TOOLS

An interior view of the woodworking shop is also presented. The tools of this shop are group-driven by electric motors. The building is well lighted and is heated by hot air forced by blowing fans through galvanized iron ducts.

composed of narrow slats on which pieces as worked are handled. The table also covers the belt and jack shafts. The sander is driven by a 25-hp motor. A special cupboard has been built nearby to hold the rolls of sandpaper for this machine. This cupboard is illustrated. It has a storage capacity for three rolls as shown, and below the bottom roll is a compartment for keeping small tools. The door to the upper part of the case is so hinged and provided with folding legs that when opened it serves as a table on which the sand paper may be cut for the rolls.

The blacksmith shop is provided with a full complement of bulldozers, forging machines, shears, punches, cushion hammers, anvils, forges, etc. In addition to these tools there is the small air bulldozer illustrated herewith. This bulldozer was built in the Chicago City Railway shops. It has a 10-in. cylinder with a 12-in. stroke and is operated



Chicago City Railway Shops—Small Air-Operated Bulldozer

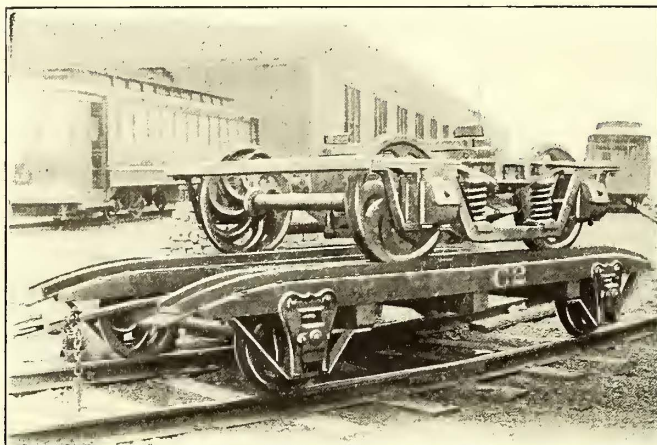
Chicago City Railway Shops—Rail-Bending Machine

Refuse from the woodworking machines is withdrawn from the shop through a system of exhaust pipes leading to a steel storage hopper. An illustration shows the hopper as supported over a yard track. By this arrangement the refuse may easily be loaded into cars and carried away.

from the shop air supply mains which carry 80 lb. pressure. The plunger is cushioned with rubber. The bulldozer has been found especially useful in forming small parts. There are available about 150 forms which can be fitted to this bulldozer.

In the rail shop, which is adjacent to the blacksmith shop and foundry, is a rail-bending machine, as illustrated. This rail bender comprises three rollers mounted in a heavy iron frame, the middle one of which rollers is direct-driven by a G. E. 800 motor. The two outside rollers are adjustable so that they may be set to bend rails rolled over them to any working radius. The rail-bending equipment here includes sets of rollers for each of the rail sections used in the Chicago City Railway Company's tracks.

An illustration is presented showing the transfer truck used for hauling an extra truck to the scene of a breakdown. Rather than chain up a broken axle and skid a car to the nearest car house, which may be several miles away, it is the practice to skid the car to a nearby crossover,



Chicago City Railway Shops—Transfer Truck for Break-down Service

seldom more than four blocks distant, and there to insert an extra truck in place of the damaged one. An extra truck is shown mounted on the carrying truck. It will be noted that this carrying truck is a simple platform mounted on two pairs of wheels. On top of the platform are channel irons in which rest the wheels of the extra truck. These channel irons are provided with extension inclines which lead to the track rails from either end and facilitate the placing of the extra truck on the track.

GERMAN ELECTRIC INDUSTRIES

Reporting on Germany's electrical industry, a United States consul says:

"Undoubtedly electric railways will be extensively used in the near future, and a great field of work lies open to the German electric companies. The next undertaking will probably be the electrification of the Berlin Metropolitan Railway. But it may safely be predicted that the next advance will be the impressing of Germany's water power into the service of the electric industry. The number of power stations for supplying electric energy over large distances will be increased by this means.

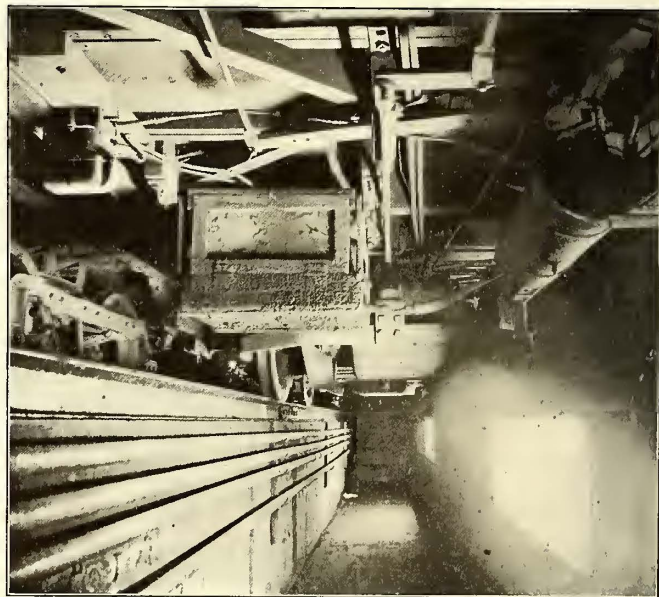
"The different States are alive to the advantage of utilizing streams and waterfalls and are determined to secure these for the public benefit, so as to prevent their monopolization by private concerns."

The York (Pa.) Railway will practically rebuild the road between York and Windsor, a distance of about 11 miles. The purpose is to reduce the ruling grade to 3 per cent. The changes will involve an expenditure of about \$120,000.

PIT LIGHTING BY MERCURY TUBES

A new idea in the method of lighting pits was suggested in the report of the committee on a model repair shop at the Niagara Falls Convention of the Street Railway Association of the State of New York. This was commented upon in an editorial of last week, and was suggested by H. A. Benedict, chief electrical engineer of the United Traction Company, of Albany, because it had been in use for some two months in the North Albany shops of that road. The advantages of mercury tubes for pit lighting consist in the cheapness of the illumination, in the absence of dark shadows, and the large area of illuminating surface. The fact that the cost of illumination is low permits the supply of very much more light than would probably be the case if incandescent lamps were employed, and this in turn makes the work more easily performed. In the North Albany shops three pits are equipped with Cooper-Hewitt 24-in. tubes. The latter are of 700 cp each and five tubes are connected in series. The current consumption is $3\frac{1}{2}$ amp. on 550 volts. The tubes are arranged 20 ft. apart, are all on one side of the pit, and are protected by wire framing, although in a new shop they would be set as shown in the drawing of the Model Car House last week, and would be protected from mechanical injury by being set in recesses in the pit wall.

The accompanying illustration illustrates the effect of these lights in the North Albany pits. The photograph



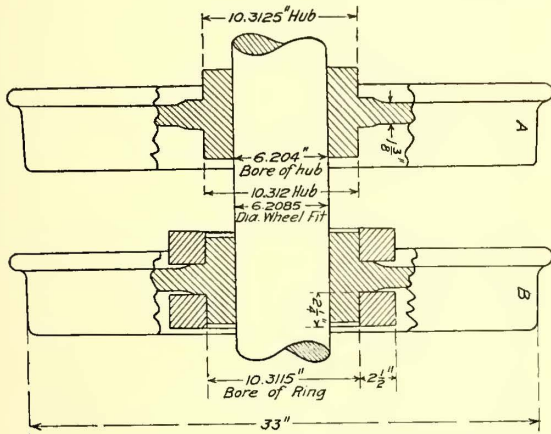
View of Pit and Under Side of Car Lighted with Mercury Tubes

from which the accompanying view was made was taken with a three minutes exposure at 9 p. m., and the distinctness with which every part of the under framing of the car stands out, as well as the absence of dark shadows, is clearly shown. The company has also introduced the use of the same lights in its substation.

The West Jersey & Seashore Railroad, Camden, N. J., inaugurated an all-electric line service to Ocean City on July 1. Through tickets are sold over the company's electric line, connection with the Ocean City road being made at Pleasantville, near Atlantic City. The fare is \$1.50, but a 15-days' round-trip excursion ticket is sold by the company for \$2.

THE CAR EQUIPMENT DEPARTMENT OF THE INTERBOROUGH RAPID TRANSIT COMPANY—ENGINEERING AND RESEARCH WORK*

The history of high-speed electric railway operation in New York is an interesting record of the efforts made to provide safe yet rapid transportation to fulfill the needs of the most congested business district in the world. The subway, in particular, developed many difficult problems, and some were of such a serious nature that their solution involved the expenditure of hundreds of thousands of dol-



Condition	Pressure in tons.		Per cent. increase in starting pressure
	Starting	Average	
A--Pressed on without Rings	40	37	
B--Pressed on and Two Rings Shrunk on.	135	78	237.5

Interborough Rapid Transit Company—Wheel Pressure Tests

lars by the Interborough Rapid Transit Company and the manufacturers who supplied its car apparatus. How well these troubles have been eliminated appears from the following report made last May by A. W. McLimont, engineer to the New York Public Service Commission (First District): "The general design and capacity of the working parts of the equipment are good and sufficient to meet the present requirements of the system. I found that the equipment was all in first-class operative condition, having been exceptionally well maintained, and, in fact, in some instances the original apparatus has been improved since its installation."

The numerous improvements which have been made in the original design of both the elevated and subway car bodies through the location of troubles by the operating men and the systematic researches of the engineering staff have been described in these columns from time to time, but it is now in order to consider some of the individual equipment changes in detail.

WHEEL STUDIES

In taking up the special researches of the car equipment department it may be well to start with the wheel question, as it offers, perhaps, the simplest example of the different behavior of material on the elevated and subway divisions of the Interborough Rapid Transit Company. When the elevated system was electrified the motor trucks were equipped throughout with steel-tired wheels with extended hub and shrunk-on gear. The steel-tired wheel so strengthened proved very satisfactory in the elevated

service, and there have been only three failures from either loose wheels or tires in four years on 850 cars. The original equipment of the subway trucks, however, was for a steel-tired wheel on which the gear was not mounted on

FAILURES PER WEEK OF ELECTRIC APPARATUS

Armatures grounded.....	.4	.2	.2	1.
Armature bearings hot.....	.6	.2	.8	.8
Contractor interlock plates broken....	1.2	2.2	2.	1.6
Controller fuses blown.....	.4	.4	1.2	2.4
Commutators flat.....	.6	.2	.2	.2
Contractor wipe springs broken.....	1.6	6.6	8.2	5.2
Contractor combinations.....	3.	2.4	4.2	3.2
Dowel pins sheared off axle oil well caps .....	.6	1.2	.4	.2
Flashovers	2.	.8	1.8	4.4
Fields loose .....	..	..	..	..
Fields grounded .....	.2	..	..	.4
Gears loose .....	.2	.4	..	..
Gears broken	1.8	2.2	1.4	1.4
Motor axle bearings hot.....	2.	3.6	1.	.8
Pinions loose .....	.2	.2	.4	.2
Pinions stripped or broken.....	1.2	1.8	1.2	2.4
Series fuses blown .....	.4	..	.2	..
Cars with No. 7 or No. 8 contractors welded due to flashovers preventing resetting of circuit breaker....	5.	3.8	7.8	11.

FAILURES PER WEEK CHARGEABLE TO INTERBOROUGH RAPID TRANSIT COMPANY

Hot journals, motor	1.	2.	2.2	1.6
Hot journals, trailer .....	..	..	.2	..
Cut journals, motor .....	.4	.2	.6	.2
Cut journals, trailer .....	..	.2	..	..
Swing hangers broken.....	.4	1.8	2.8	3.
Swing hanger pins working out.....	..	.2	.6	1.6
Main fuses blown	1.	.2	1.	.4
Reverser fuses blown .....	.8	.6	1.2	3.4
Pump fuses blown.....	4.4	.2	3.4	.8
Bus fuses blown .....	.4	.2	3.2	4.4
Power fuses blown .....	..	..	.2	.4
Leaky reservoir hose.....	22.8	16.4	28.8	31.4
Leaky train line hose	22.2	11.2	24.8	21.
Leaky tripper hose	15.6	2.8	4.	4.6
Leaky center trip hose	3.6	.2	.6	.2
Brake rods broken	6.8	9.	7.	4.8
Loose wheels .....	.8	.6	.6	.6
Loose tiers .....	.4	..	.2	.6
Flat wheels	2.8	2.4	8.8	4.6
Shoe fuses blown, Broadway	12.4	5.	11.2	16.2
Shoe fuses blown, Lenox Avenue ...	5.	24.	18.6	17.8
Light fuses blown	57.8	48.	46.8	73.
Elliptic springs weak .....	.2	.4	2.	2.8
Elliptic springs broken .....	..	.6	.8	1.2
Tire rivets loose and broken.....	..	..	1.4	3.6

COMPRESSOR PUMP FAILURES PER WEEK

Armature bands burst .....	.6	.2	..	.2
Armatures grounded .....	.2	.6	1.2	.4
Armatures and fields oil soaked. .	.2	..	.2	.2
Armatures open circuited	1.	..	.6	.4
Armature coils short circuited..	.6	.2	.4	.2
Armature bearings hot .....	.2	.2	.2	.2
Brush holders grounded .....	.2	..	..	.2
Brush holder springs broken....	..	..	..	..
Brush holder springs weak.....	..	..	.2	.2
Brush holder insulators grounded .....	..	..	.2	.2
Cord bands off .....	..	..	..	..
Fields ground .....	.2	.6	.2	.8
Fields baked	1.8	.6	.4	.4
Fields loose	1.6	.4	..	.2
Fields open circuited .....	..	..	.2	..
Flashovers .....	..	..	.2	.4
Main coils baked .....	..	..	..	..
Main coils grounded .....	..	..	..	..
Relay coils baked .....	.2	..	..	..

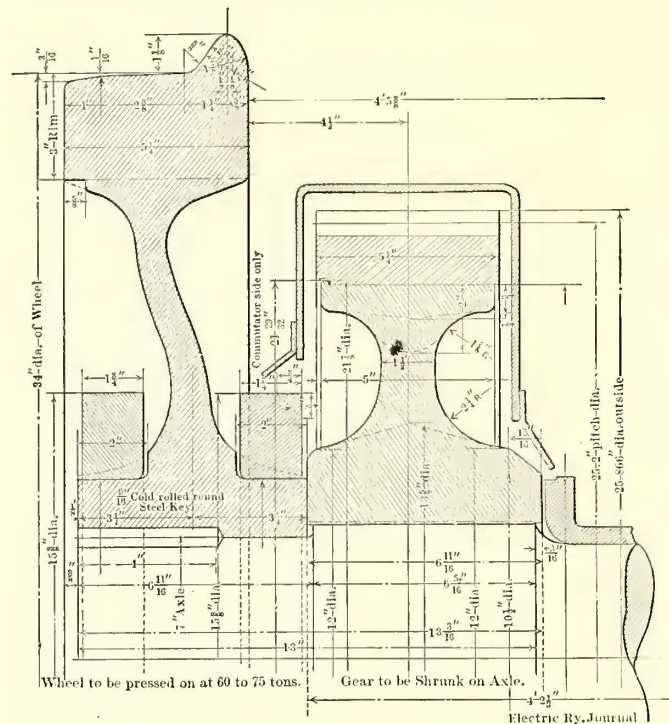
Interborough Rapid Transit Company—Average Failures Per Week, Based on Five-Week Periods, of Subway Equipment in 1906

an extended hub. In 1905, within a year after the opening of subway traffic, the number of loose wheels and loose tires became so great that a fundamental study of the

*For previous articles see STREET RAILWAY JOURNAL, March 28, April 4, April 25 and May 23, 1908.

whole problem was made imperative in order to prevent a continuation of such serious occurrences.

It was apparent that the loose tire failures could be ascribed to the excessive amount of heat generated by the rapid acceleration and braking of the heavy equipment and the aggravation of this effect due to operating in a tube with small opportunity for heat radiation. Of course, the



Interborough Rapid Transit Company—Section of Wheel and Gear

only way a tire could become loose was by reaching a temperature so much higher than the cast-steel center that it would lose hold because of its greater expansion. Temperature readings were taken at the face of the tire or tread and at the hub of wheels just taken from service. The object was to find the maximum differences in temperature between the two points, because the construction of the wheel center was such that a lower temperature at

tires varying in thickness from 2 5/8 in. to 1 1/8 in. and also at the temperatures found by test with the standard shrinkage allowance of 0.001 in. per 1 in. diameter. The following is a summary of the important data derived on this point:

Shrinkage allowance.	Temp. of tire.	Temp. of hub.	Radial pressure of tire on wheel center.	
	60° F.	60° F.	Tire 2 5/8 in. thick.	Tire 1 1/8 in. thick.
.03 in.	145° F.	88° F.	6,070 lb. per sq. in.	2,600 lb. per sq. in.
.03 in.			3,970 lb. per sq. in.	1,700 lb. per sq. in.
			Percentage reduction in holding power caused by wear..... 57 per cent	
			Percentage reduction in holding power caused by heat..... 35 per cent	
			Percentage reduction in holding power caused by wear and heat 72 per cent	

Having found that the steel-tired wheel was not good enough for its service, the company tried to secure a rolled steel wheel with an extended hub on the gear side and an auxiliary retaining ring on the other side. It was found impracticable, however, to secure such a wheel, so experiments were made to determine the value of shrinking cast-steel retaining rings on the wheel hub. These trials proved very successful, as will be noted from the accompanying drawing, in which it is shown that the two retaining rings increase the holding power of the wheel on the axle fully 237.5 per cent. Another view shows the wheel and gear in section.

It was felt that a great part of the trouble with loose wheels was due to improper machining. The greatest possible care is now exercised in this respect. All measurements are made with a micrometer and shrinkage allowances are strictly adhered to. The adoption of the solid forged rolled steel wheel has made loose tires a thing of the past, while the improved method of securing the wheel has eliminated loose wheels.

AXLES

All axles employed by the Interborough Rapid Transit Company are carefully checked up on the accompanying form, and the inspector's signature is required for each axle inspected. The axles are tested by balancing the wheel set on a wooden block and striking the axle with a sledge hammer at the center. If the axle is cracked a thin line of oil will ooze from the fissure.

The axles now used are of forged open-hearth high-silicon steel made according to the standard driving axle specifications of the large steam railroads of the United States. Nevertheless, the mileage obtained from this type of axle is not entirely satisfactory and changes are now under advisement.

REPORT NO.....		REPORT OF CHEMICAL AND PHYSICAL TESTS OF AXLES				I. R. T. Co's ORDER NO.....																											
MANUFACTURED BY.....																																	
FOR THE INTERBOROUGH RAPID TRANSIT CO.....						DIVISION																											
						Motor Trailer Truck. B. P. No.....																											
Axles Consigned to.....																																	
Date	Axle Number	Heat Number	CHEMICAL ANALYSIS								Diam. Cent.	Size Journal	...lb. Drop with fall of	Deflection before blow	Deflection after each blow on ctr.—supports 3'-0" apart					Condition after test	Total length	I. R. T. axle No.	REMARKS										
			Manufacturer's Analysis				Insp's Check Analysis								1	2	3	4	5					6	7								
			Car.	Phos.	Mang.	Sul.	Sil.	Car.	Phos.	Mang.																Sul.	Sil.						

Axles turned after Blows—Deflection to be measured from straight edge on length of axle. NOTE: All reports to be filled out with India ink.
 Accepted axles to be stamped with inspectors' mark alongside of maker's stamp and number.
 No. of axles rejected and caus. Inspectors

Interborough Rapid Transit Company—Blank Form Used to Record Axle Tests

the hub would prevent the rim from expanding to the extent that it would if its temperature were the same as the tire. It was found that the highest temperature of the tire was 145.4 deg. F. with a corresponding temperature of the hub of only 87.8 deg. F.

The next step in the investigation was to calculate the holding power of the tires under normal conditions with

MOTOR STUDIES AND IMPROVEMENTS

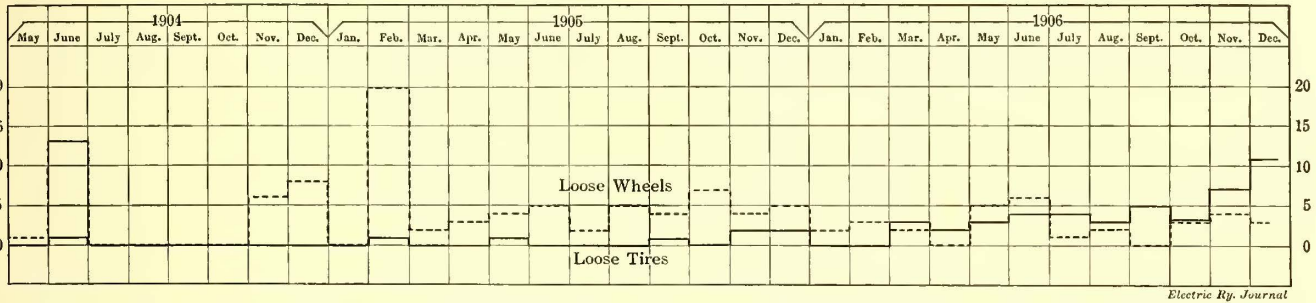
Soon after the opening of the subway it became evident that the motor troubles on that division were abnormal. The daily reports of motor defects for 12 months from Jan. 1, 1905, to Jan. 1, 1906, were therefore gone over most carefully in conjunction with the mileage records of the cars equipped with the two classes of motors in serv-

ice. By combining these data in the form of curves it was easy to show at a glance the comparative number of troubles due to particular causes, and the average mileage between breakdowns of cars carrying different equipments.

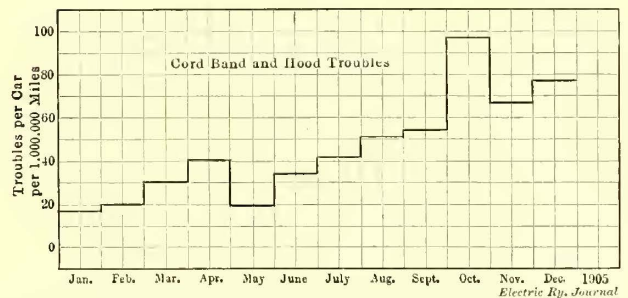
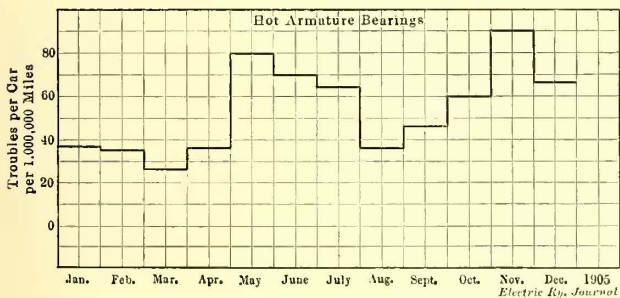
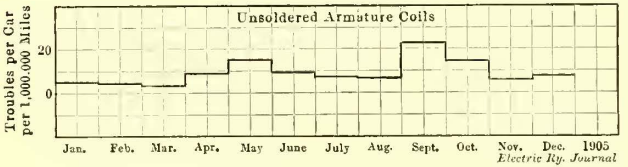
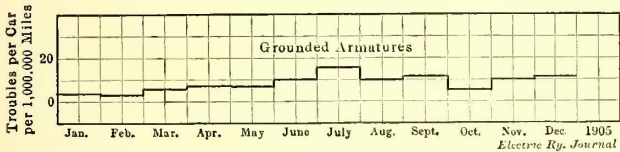
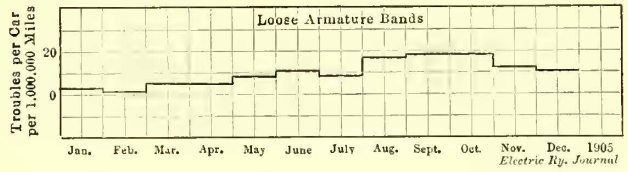
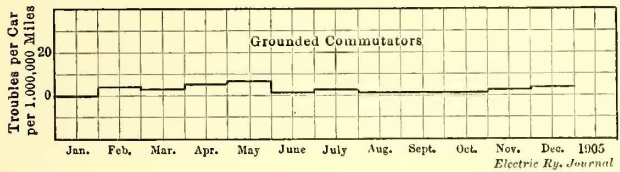
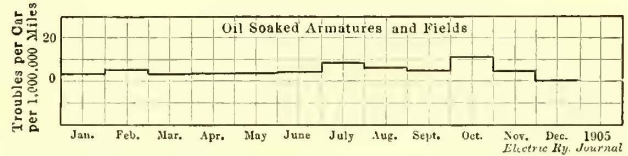
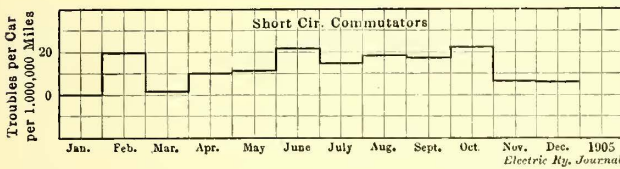
A study of these curves shows that one of the most expensive failures to correct was that of hot armature bearings, but the cause of this trouble was located and removed. The diagrams for 1905 printed herewith show the trouble at its height. The reduction in number of troubles during March, 1905, was due to the loss in mileage caused by a

fully designed carbon brushes, thereby requiring the sandpapering of hundreds of commutators a month. The trouble with the carbon brushes was eliminated by the adoption of Le Carbone brush, as mentioned in the STREET RAILWAY JOURNAL of April 4, and the slotting of commutators.

Unsoldered armature coils were excessive because the armature winding was poorly fitted into the commutator and the solder itself was too soft. These defects as well as the loose armature bands were obviated when new insulation was applied to the back of the commutator. Oil-



Interborough Rapid Transit Company—Record of Loose Wheels and Tires in the Subway from May, 1904, to December, 1906, Inclusive



Interborough Rapid Transit Company—Graphic Records of Subway Motor Troubles in 1905

strike and that of August to the lesser mileage run by the cars using the motors which failed.

The failure next in importance was the grounding of armatures caused by an insufficient amount of insulation behind the bars.

Brush-holder trouble was also a serious item, as is apparent from an inspection of the curves for the year 1905. Another important failure was the loosening of commutator bars due to the improper tightening of the commutators. Flashovers gave considerable difficulty owing to loose commutator bars, broken brush holders and imper-

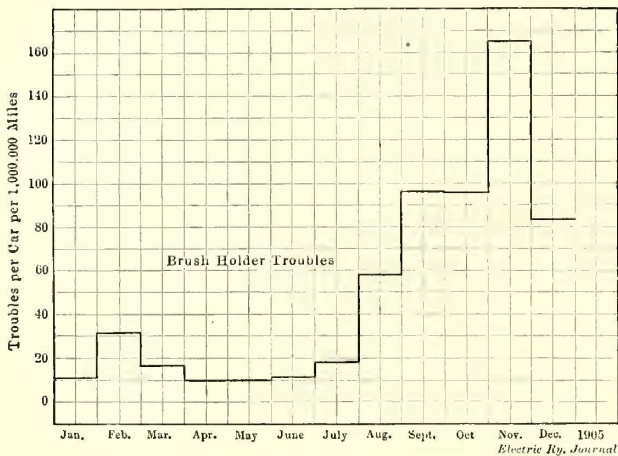
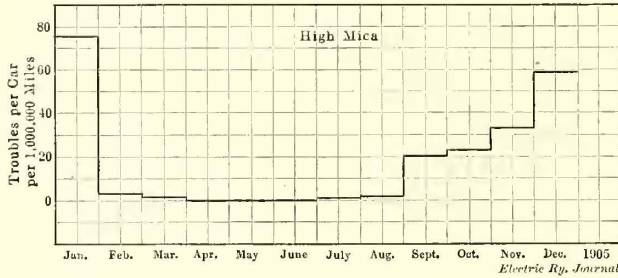
soaked armatures and fields were not of a comparatively serious nature and were easily corrected. Cord, band and hood troubles as well as grounded commutators were taken care of in the reinsulation of the commutators.

The most remarkable point brought out in this motor study was that over 90 per cent of the troubles was due to faults of commutation, thereby showing conclusively that the ordinary series motor was incapable of properly handling the large currents required for the rapidly accelerated eight-car trains. The experience gained here was a considerable factor in the development of the commutating

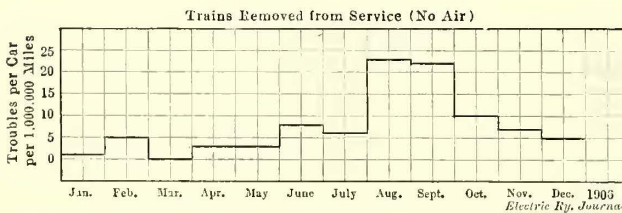
pole motor for railway service and its adoption by the company. Eighty interpole motors are now in use in the subway and 148 on the elevated division. These motors are giving very satisfactory results in both instances.

AIR COMPRESSORS

In 1903 extensive tests were made with different types of compressors to determine the best for subway service, and all three were adopted for use on different divisions. In January, 1907, a study was made to determine the comparative reliability of the elevated and subway methods



Interborough Rapid Transit Company—Subway Mica and Brush-Holder Troubles



Interborough Rapid Transit Company—Air Failure Record (No Trains Removed on Elevated Division)

of air compressor control. Investigation of the subway conditions showed that the trouble with the compressor governors was due to the high subway temperature and drop in line potential. The cotton-covered magnet wire contained in the governors attained a maximum temperature of 105 deg. C. This heat increased the resistance, reduced the magnetic pull and also baked the insulation, a condition which at times prevented the governors from cutting in and at other times from cutting out. One of the diagrams shows a comparison of governor failures in the subway and elevated divisions.

Although the elevated railway governors failed to a considerable extent, the efficiency of the braking equipment as a whole remained unimpaired, because the reliability of the governor control on the bus-line system is directly proportional to the number of governors employed on any train. The design of governor control also has a direct bearing

upon air-compressor capacity, because if the governor fails in the relay type of control, the capacity of the compressor equipment is reduced proportionately, thus imposing an additional load on the remaining compressors which in connection with the excessive subway temperature causes the destruction of the cotton-insulated magnet control. Since the completion of this study a satisfactory system of governor control has been developed for the Westinghouse high-speed, quick-action, graduated release, automatic recharge brake and this has been adopted to maintain the standardization of the subway air-brake equip-

	January.	February	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Tabulated subway motor troubles for 1905.												
Loose commutator bars	98	83	91	199	251	145	37	54	63	22	23	25
Flashovers	71	210	172	103	84	74	87	126	91	64	75	61
Flat commutators	140	44	11	5	22	5	7	14	74	129	151	64
Sandpap'd commutators	5	0	183	303	196	180	69	58	253	279	446	552
Grounded pump armatures of subway motor compressors.												
1906	3	5	3	1	5	11	8	33	60	66	22	29
1907	26	32	28	42	21							
Pump failures in 1906.												
Manhattan division	0	1	4	0	4	12	10	5	3	8	2	3
Subway division	12	10	6	3	9	16	12	41	84	86	31	31
Governor failures in 1906 for an equal number of cars.												
Manhattan division	26	30	41	42	31	33	25	42	18	8	4	19
Subway division	80	82	84	82	84	140	137	139	149	97	50	42

Interborough Rapid Transit Company—Tabulation of Subway Motor Troubles and Air Comparisons with Elevated Service

ments. Bus-line control still is employed on the elevated trains.

GEAR PRACTICE

The gear question has not yet been solved finally in the subway, where the conditions call for a gear that will withstand an acceleration of 35 tons at the rate of 1.25 m.p.h.p.s. The present subway gear, which was adopted after considerable experimental work, is of the open-hearth rolled and hammered steel ring type with the ring shrunk on the center like a tire. The gear centers and gear rims are made according to the following specifications:

Cast-Steel Gear Centers.—Castings must be made true to pattern, have a reasonably smooth and uniform surface, be sound and solid and free from slag, blowholes, shrinkage cavities, sand and excessive scale. All fins and risers must be trimmed off in a workmanlike manner. Steel must have a tensile strength of not less than 60,000 lb. per square inch, elastic limit 27,000 lb. per square inch, and an elongation of not less than 22 per cent in 2 in. Sulphur, not to exceed .05 per cent; phosphorus, not to exceed .04 per cent.

Rolled Steel Gear Rims.—Sixty-three teeth, 2½ pitch, as per dimensions shown on sheet No. 4512. Steel rims must have the following characteristics: Tensile strength, 85,000 to 105,000 lb. per square inch. Elastic limit by drop of beam, 45 per cent of ultimate strength. Elongation, 22 per cent in 2 in. of contraction of area, 35 per cent. Percentage of sulphur not to exceed .04 per cent. Percentage of phosphorus not to exceed .05 per cent.

The municipality of Buenos Ayres has granted to the Anglo-Argentine Tramways Company, which owns the important lines in the center of the city, the right to incorporate other tramway undertakings in Buenos Ayres or its vicinity, with a view to unifying the different systems. The company has taken the first step by acquiring control of the Buenos Ayres & Belgrano Electric Tramways. Negotiations are in progress for the further realization of the scheme, after the completion of which the total length of the combined systems will be about 350 miles.

GROSS RECEIPTS FOR 1907

The publication of "American Street Railway Investments," the Red Book for 1908, makes available the operating reports for 1907 of the principal electric railway companies in the country. These figures are given in the accompanying table. No attempt has been made in these statistics to indicate the trackage from which these earnings are secured and in some cases a considerable difference exists between that in 1906 and 1907, owing to extensions and consolidations. The fiscal year of the companies also varies. That for the New York and Pennsylvania companies, as reported in the table, in most cases ends June 30, that of the Massachusetts companies on Sept. 30 and that of the Ohio companies on April 30. In the case of other companies the fiscal year is that ended Dec. 31.

The companies are graded according to gross receipts, but it should be understood that the list below does not give all of the companies in the country within the limits mentioned, simply those whose operating reports are made public. In some cases the company's report shows the gross receipts of all of the subsidiary organizations; others give simply the receipts derived from securities owned. The latter companies are distinguished in the accompanying table by an asterisk. The meaning of the other emblems is explained at the foot of the column on page 277.

COMPANIES HAVING GROSS RECEIPTS FOR 1907 OF OVER \$1,000,000.

Name of Company.	1906.	1907.
Interborough Rapid Transit Co., N. Y.	\$20,411,097	\$23,179,635
Brooklyn Rapid Transit Co.	18,797,264	19,936,753
Philadelphia Co., Pittsburg, Pa.		18,762,848
New York City Ry.	19,385,398	18,459,109
Philadelphia Rapid Transit Co.	17,676,249	18,338,618
Boston Elevated Ry.	13,634,612	13,952,966
Brooklyn Heights Railroad.	13,329,864	11,705,860
United Railways Co. of St. Louis.	9,146,348	10,828,737
Public Service Railway, Newark, N. J.	9,773,965	10,582,857
Chicago Railways.		10,538,822
Pittsburg Railways.	9,597,171	10,316,523
Long Island Railroad, L. I. City, N. Y.		10,260,183
The Connecticut Co., New Haven, Conn.	6,000,574	7,994,903
Chicago City Ry.	7,871,126	7,562,694
Detroit (Mich.) United Ry.	6,121,940	7,133,751
United Ry. & Electric Co., Baltimore, Md.	6,587,827	7,024,587
California Gas & Electric Co., San Francisco.	5,712,102	6,756,685
Twin City Rapid Transit Co., Minneapolis, Minn.		6,055,743
New Orleans (La.) Ry. & Lt. Co.	5,773,190	6,041,301
Kansas City (Mo.) Ry. & Lt. Co.	5,153,168	5,715,339
International Traction Co., Buffalo, N. Y.	4,972,688	5,380,436
Interborough Metropolitan Co., New York		*5,278,485
United Railroads of San Francisco.	†5,955,786	†4,745,116
Boston & Northern St. Ry., Boston, Mass.	4,412,035	4,618,992
Cincinnati (O.) Traction Co.		4,459,225
Portland (Ore.) Ry., Light & Power Co.		4,050,145
Seattle (Wash.) Electric Co.	3,101,386	3,949,434
Milwaukee (Wis.) Electric Ry. & Lt. Co.	3,679,229	3,906,666
Rhode Island Co., Providence, R. I.	3,561,242	3,859,715
Illinois Traction Co., Danville, Ill.	3,013,107	3,779,187
Montreal (Que.) St. Ry.	3,100,487	3,558,745
Toronto (Ont.) Ry. Co.	3,109,740	3,511,198
Washington (D. C.) Ry. & Elec. Co.	3,133,240	3,385,749
Georgia Railway & Elec. Co., Atlanta, Ga.	2,894,924	3,309,341
Nassau Elec. R. R. Co., Brooklyn, N. Y.	3,414,654	3,300,126
Denver (Colo.) City Tramway.	2,652,219	2,913,650
Old Colony Street Ry., Boston, Mass.	2,795,480	2,906,663
Metropolitan West Side El. R. R., Chicago	2,637,901	2,878,588
Oakland (Cal.) Traction Co.	2,226,017	2,789,684
Louisville (Ky.) Ry.	2,592,996	2,668,146
Toledo (O.) Railways & Light Co.	2,047,610	2,565,200
American Lt. & Trac. Co., New York, N. Y.	*2,263,736	*2,463,158
Rochester (N. Y.) Ry.	2,105,421	2,451,701
Brooklyn Union El. R. R.		†2,410,579
Columbus (O.) Ry. & Light Co.	1,941,199	2,228,531
Birmingham (Ala.) Ry., Lt. & Power Co.	1,932,878	2,220,999
East St. Louis & Suburban Co., East St. Louis, Ill.		2,041,451
South Side Elevated R. R., Chicago Ill.	1,788,975	2,105,193
Northwestern Elev. R. R., Chicago, Ill.	1,948,727	2,100,316

Name of Company.	1906.	1907.
Washington Water Pr. Co., Spokane, Wash.	\$1,615,004	\$2,094,282
Indiana Union Traction Co., Anderson, Ind.	1,943,101	2,089,232
United Traction Co., Albany, N. Y.	1,785,113	2,048,424
Norfolk & Ports. Trac. Co., Norfolk, Va.	1,657,941	1,955,713
Northern Ohio Trac. & Lt. Co., Akron, O.	1,703,340	1,909,061
Mahoning & Shenango Ry. & Light Co., Youngstown, O.		1,670,088
Havana (Cuba) Elec. Ry.		1,662,072
Capitol Traction Co., Washington, D. C.	1,727,054	1,786,508
Tri-City Ry. & Light Co., Davenport, Ia.		1,774,954
Puget Sound Elec. Ry., Tacoma, Wash.		1,664,281
Worcester (Mass.) Consolidated St. Ry.	1,523,964	1,641,265
Coney Island & Brooklyn R. R., Brooklyn	1,663,279	1,621,615
Brooklyn, Queens Co. & Sub. Ry.	1,520,345	1,618,905
Memphis (Tenn.) Street Ry.	1,428,935	1,604,385
Union Railway, New York City.	1,521,182	1,583,656
Nashville (Tenn.) Ry. & Lt. Co.	1,395,234	1,578,207
Aurora, Elgin & Chicago R. R., Chicago, Ill.	1,243,757	1,415,729
Springfield (Mass.) St. Ry.	1,229,028	1,306,729
Fort Wayne & Wabash Valley Traction Co., Fort Wayne, Ind.		1,109,192
Syracuse (N. Y.) Rapid Transit Ry.	1,027,340	1,176,767
Spokane & Inland Emp. R. R., Spokane, Wash.		1,172,626
Dallas (Tex.) Electric Corporation.	1,023,136	1,125,673
Scranton (Pa.) Ry.	989,178	1,090,149
Forty-second St., Manhattanville & St. Nicholas Ave. Ry., New York.	1,004,103	1,083,871
Schenectady (N. Y.) Ry.	972,991	1,068,741
West Penn Railways, Pittsburg, Pa.	997,098	1,068,706
Northern Texas Elec. Co., Ft. Worth, Tex.	854,135	1,060,953
Utica & Mohawk Valley Ry., Utica, N. Y.	902,321	1,045,278
Lehigh Valley Transit Co., Allentown, Pa.	649,361	1,031,279

COMPANIES HAVING GROSS RECEIPTS FOR 1907 BETWEEN \$1,000,000 AND \$500,000.

Name of Company.	1906.	1907.
Manila (P. Is.) Elec. R. R. & Ltg. Corp.	\$909,080	\$978,863
Grand Rapids (Mich.) Ry. Co.	910,028	944,916
Wilkes-Barre & Wyoming Valley Traction Co., Wilkes-Barre, Pa.		860,403
Lake Shore Electric Ry., Cleveland, O.	866,970	938,162
British Columbia Elec. Ry., Vancouver	1,290,671	914,157
New York & Queens County R. R., Long Island City, N. Y.		852,193
Chicago & Oak Park El. R. R., Chicago, Ill.		890,555
St. Joseph (Mo.) Ry., Light, Heat & Power Co.	834,438	870,286
Utah Light & Ry., Salt Lake City, Utah.		804,499
Winnipeg (Man.) Elec. Ry.	627,127	863,990
Duluth (Minn.) Street Ry.	768,875	846,084
United Traction Co., Reading, Pa.	762,850	841,573
United Power & Transport Co., Phila., Pa.	824,021	840,119
Milwaukee (Wis.) Lt., Ht. & Trac. Co.	733,049	827,278
San Francisco, Oakland & San Jose Ry., Oakland, Cal.		668,832
Fonda, Johnstown & Gloversville R. R., Gloversville, N. Y.		776,885
Des Moines (Ia.) City Ry.		779,058
Portland (Me.) R. R.	727,979	759,871
Cleveland (O.) Southwestern & Columbus Ry.	645,849	756,898
Conestoga Traction Co., Lancaster, Pa.	629,320	742,161
Central Penn. Trac. Co., Harrisburg, Pa.	665,966	737,220
Charleston (S. C.) Consolidated Ry., Gas & Electric Co.		654,390
Houston (Tex.) Electric Co.	591,351	681,724
Richmond (Va.) Pass. & Power Co.	606,177	664,107
Little Rock (Ark.) Ry. & Elec. Co.	535,498	612,011
Dry Dock, E. Bway. & Battery R. R., New York	477,863	627,979
Hudson Valley Ry., Glens Falls, N. Y.	570,689	618,614
Mobile (Ala.) Light & R. R.	539,314	614,743
Knoxville (Tenn.) Ry. & Lt. Co.	505,341	605,777
Savannah (Ga.) Electric Co.	611,215	602,399
Pueblo & Suburban Traction & Ltg. Co., Pueblo, Col.		553,606
Rockford & Interurban Ry., Rockford, Ill.	510,042	591,396
Ottawa (Ont.) Elec. Ry.	525,747	574,278
City Ry. Co. of Dayton (The), Dayton, O.	493,661	562,840
Lexington & Interurban Rys., Lexington, Ky.	488,546	561,580
Southwest Missouri R. R., Webb City, Mo.	423,705	561,535
Chattanooga Rys., Chattanooga, Tenn.	481,831	563,861
Altoona & Logan Valley Elec. Ry., Altoona, Pa.	510,949	532,392
Boston & Worcester St. Ry., Boston, Mass.	514,465	531,465
Trenton (N. J.) Street Ry.	492,948	528,325
American Cities Ry. & Light Co., New York.		*527,123
American Rys., Philadelphia, Pa.	*486,712	*527,063
Tampa (Fla.) Electric Co.	469,222	521,181
New Jersey & Hudson River Ry. & Ferry Co. (The), Hackensack, N. J.		450,686
El Paso (Tex.) Electric Co.	391,656	506,693

COMPANIES HAVING GROSS RECEIPTS FOR 1907
BETWEEN \$500,000 AND \$100,000.

Name of Company.	1906.	1907.	Name of Company.	1906.	1907.
Lackawanna & Wyoming Valley R. R., Scranton, Pa.	\$424,390	\$483,540	San Juan (P. R.) Light & Transit Co.	.....	\$243,252
Union Street Ry., New Bedford, Mass.	396,093	407,853	New York & Long Island Traction Co. (The), Long Island City, N. Y.	\$207,301	242,526
Johnstown (Pa.) Passenger Ry.	425,571	461,385	Wichita (Kan.) R. R. & Light Co.	194,002	241,568
Richmond (Va.) Traction Co.	395,188	454,713	Toledo & Western R. R., Toledo, O.	.....	239,233
Holyoke (Mass.) Street Ry.	449,921	450,650	Paducah (Ky.) Traction Co.	227,279	237,513
Michigan United Rys., Lansing, Mich.	440,407	449,058	Consolidated Rys., Light & Power Co., Wilmington, N. C.	226,467	236,092
Butte (Mont.) Electric Ry. Co.	448,684	448,684	Norfolk & Atlantic Terminal Co., Hampton, Va.	98,150	235,505
Western Ohio Ry., Lima, O.	385,619	444,846	Quebec (Que.) Ry., Light & Power Co.	214,461	233,770
Yonkers (N. Y.) R. R.	341,258	417,587	London (Ont.) Street Ry.	202,911	232,377
People's Railway, Dayton, O.	351,666	415,683	Fries Manufacturing & Power Co. (The), Winston-Salem, N. C.	181,867	229,201
Chicago & Joliet Electric Ry., Joliet, Ill.	378,223	412,326	Worcester & Southbridge Street Ry., Worcester, Mass.	152,221	229,019
Ohio Valley Electric Ry., Huntington, W. Va.	381,284	410,741	Pensacola (Fla.) Electric Co.	.....	228,150
Columbia (S. C.) Electric St. Ry., Lt. & Pr. Co.	359,891	410,254	Elmira (N. Y.) Water, Light & R. R.	206,570	224,817
Berkshire Street Ry., Pittsfield, Mass.	266,672	409,286	Staten Island Midland R. R., New Brighton, N. Y.	196,266	223,033
Lincoln (Neb.) Traction Co.	376,461	408,216	Interurban Ry., Des Moines, Ia.	168,360	220,099
Halifax (N. S.) Electric Tramway.	387,518	405,452	Eastern Wisconsin Ry. & Light Co., Fond du Lac, Wis.	189,996	218,611
Jacksonville (Fla.) Electric Co.	326,468	392,394	Dayton & Troy Electric Ry., Dayton, O.	184,646	213,139
Springfield (Mo.) Ry. & Light Co.	320,094	378,046	Dartmouth & Westport Ry., New Bedford, Mass.	175,204	209,581
Chester (Pa.) Traction Co.	322,070	377,179	Wilmington & Chester Traction Co., Wilmington, Del.	*199,220	*206,987
Honolulu (Hawaii) Rapid Transit Co.	355,646	374,610	Valley Traction Co., Lemoyne, Pa.	179,304	206,475
Bangor (Me.) Ry. & Electric Co.	303,609	370,278	Waterloo, Cedar Falls & Northern Ry., Waterloo, Ia.	163,763	205,321
Galveston (Tex.) Electric Co.	315,135	369,168	Stark Electric R. R., Alliance, O.	172,296	205,192
Lewiston, Augusta & Waterville Street Ry., Lewiston, Me.	.....	366,234	Pittsfield (Mass.) Electric St. Ry.	187,283	203,530
Augusta (Ga.) Ry. & Electric Co.	329,747	366,193	Pittsburg, McKeesport & Greensburg Ry, Greensburg, Pa.	201,209	202,952
Evansville & Southern Indiana Traction Co., Evansville, Ind.	371,399	363,491	Schuylkill Ry. Girardville, Pa.	194,431	202,252
Schuylkill Valley Trac. Co., Norristown, Pa.	359,129	360,822	Long Island Electric Ry., Jamaica, L. I., N. Y.	184,808	200,182
Sioux City (Ia.) Trac. Co.	338,424	360,066	Indianapolis & Cincinnati Traction Co., Indianapolis, Ind.	117,444	199,620
Newton (Mass.) St. Ry.	361,596	357,588	Citizens' Traction Co., Oil City, Pa.	191,705	198,200
Macon (Ga.) Ry. & Light Co.	290,345	355,387	Ottumwa (Ia.) Ry. & Light Co.	.....	197,998
Whatcom County Ry. & Light Co., Bellingham, Wash.	279,469	354,469	Grays Harbor Ry. & Lt. Co., Aberdeen, Wash.	150,072	193,744
Auburn & Syracuse Elec. R. R., Auburn, N. Y.	311,109	354,346	Roanoke (Va.) Ry. & Electric Co.	200,508	192,608
Columbus (Ga.) Electric Co.	291,244	340,574	Mansfield (O.) Ry., Light & Power Co.	179,938	189,906
Easton (Pa.) Transit Co.	309,925	340,597	Kokomo, Marion & Western Traction Co., Kokomo, Ind.	168,872	188,176
Richmond Light & R. R., New Brighton, S. I., N. Y.	264,539	335,008	Ohio Traction Co. (Mill Creek Div.) Cincinnati, O.	.....	186,460
Toledo (O.) Urban & Interurban Ry.	347,931	331,076	Steubenville & East Liverpool Ry. & Light Co., Steubenville, O.	166,325	184,115
Scioto Valley Traction Co., Columbus, O.	.....	329,213	Connecticut Valley Street Ry., Northampton, Mass.	173,622	180,010
Washington (D. C.) Alexandria & Mt. Vernon Ry.	275,747	325,969	Joplin & Pittsburg Ry., Joplin, Mo.	.....	179,227
Westchester Electric R. R., New York, N. Y.	332,273	323,589	Milford & Uxbridge St. Ry., Milford, Mass.	176,590	178,871
Columbus (O.), Delaware & Marion Ry.	.....	310,995	Oklahoma (Okla.) City Ry.	125,768	178,726
Topeka (Kan.) Ry.	285,297	310,344	Hartford & Springfield Street Ry., Warehouse Pt., Conn.	170,277	178,092
Ft. Smith (Ark.) Light & Traction Co.	309,842	309,842	Lorain (O.) Street R. R.	146,878	177,804
Lynchburg (Va.) Trac. & Lt. Co.	264,967	306,964	Interstate Consolidated Street Ry., North Attleboro, Mass.	170,855	174,491
Newport News (Va.) & Old Point Ry. & Electric Co., Newport News.	298,340	306,545	Northampton (Mass.) St. Ry.	163,705	174,487
Atlantic Coast Elec. Ry., Asbury Park, N. J.	298,732	305,495	Lehigh Traction Co., Hazleton, Pa.	163,734	174,424
Cleveland (O.), Painesville & Eastern R. R., Cleveland, O.	271,100	296,318	Benton Harbor-St. Joe Ry. & Lt. Co. (The), Benton, Harbor, Mich.	139,990	172,790
Atlantic Shore Line Ry., Sanford, Me.	290,033	295,152	Wilkes-Barre & Hazleton Ry., Hazleton, Pa.	139,206	170,998
Union Electric Co., Dubuque, Iowa.	271,468	294,922	Cedar Rapids & Marion City Ry., Cedar Rapids, Ia.	160,050	170,904
Fitchburg & Leominster Street Ry., Fitchburg, Mass.	279,904	289,170	York (Pa.) Street Ry.	148,499	170,445
Binghamton (N. Y.) Ry.	291,943	287,224	Camden & Trenton Ry., Trenton, N. J.	175,933	170,049
Buffalo & Lake Erie Trac. Co., Buffalo, N. Y.	.....	285,670	Niagara Gorge R. R., Niagara Falls, N. Y.	143,272	167,146
Albany & Hudson R. R., Hudson, N. Y.	265,671	273,997	Jamestown (N. Y.) St. Ry.	157,794	166,445
Beaver Valley Traction Co., Beaver Falls, Pa.	276,941	270,612	Oneonta & Mohawk Valley R. R., Oneonta, N. Y.	d116,767	165,937
Eastern Pennsylvania Railways, Pottsville, Pa.	.....	270,555	Allentown & Reading Trac. Co., Allentown, Pa.	165,576	165,169
Niagara, St. Catharines & Toronto Ry., Toronto, Can.	265,071	270,463	Toledo & Indiana Ry., Toledo, O.	.....	161,227
Kansas City-Western (Kan.) Ry.	d225,085	d269,858	Chippewa Valley Ry., Light & Power Co., Eau Claire, Wis.	81,290	160,410
Asheville (N. C.) Electric Co.	239,099	269,185	Norfolk & Southern Ry., Norfolk, Va.	134,303	158,587
Helena (Mont.) Light & Railway Co.	.....	267,774	Louisville & Eastern R. R., Louisville, Ky.	117,839	156,372
Indianapolis, Columbus & Southern Traction Co., Indianapolis, Ind.	240,034	265,883	Boston & Maine R. R., Concord, N. H.	147,459	154,772
East Liverpool (O.) Traction & Light Co.	e202,028	263,551	Southern Wisconsin Ry., Madison, Wis.	130,255	154,158
Springfield (O.) Ry. (The)	231,280	263,129	Cincinnati, Georgetown & Portsmouth R. R., Cincinnati, O.	184,731	153,616
Montreal Park & Island Ry., Montreal, Ont., Can.	218,604	262,814	Sheboygan (Wis.) Light, Power & Ry. Co.	138,835	151,375
Phila. & West Chester Traction Co., Phila., Pa.	219,122	259,248	Lexington & Boston St. Ry., Boston, Mass.	160,582	151,135
Interurban Ry. & Terminal Co., Cincinnati, O.	226,055	259,148	Oakwood Street Ry., Dayton, O.	142,122	150,860
Rochester & Eastern Rapid Ry., Rochester, N. Y.	237,905	258,984	Cincinnati, Lawrenceburg & Aurora Electric Street Ry., Cincinnati, O.	.....	150,300
Louisville & Southern Indiana Traction Co., New Albany, Ind.	.....	257,972	Greensboro (N. C.) Electric Co.	130,309	150,000
Newport & Fall River St. Ry., Newport, R. I.	187,392	257,067			
Rutland (Vt.) Ry. Light & Power Co.	222,019	254,835			
Wisconsin (Wis.) Traction, Heat & Power Co., Appleton.	235,787	254,599			
Cape Breton Elec. Co., Sydney, N. S., Can.	258,417	250,065			
Houghton (Mich.) County St. Ry.	229,245	249,919			
Eastern Ohio Traction Co., Cleveland, O.	240,108	244,360			

Name of Company.	1906.	1907.
Anniston (Ala.) Electric & Gas Co.....	\$130,659	\$146,399
Rochester, Syracuse & Eastern R. R., Rochester, N. Y.....	..... e	145,605
Green Bay (Wis.) Trac. Co.....	137,989	143,052
Muscataine (Ia.) Light & Trac. Co.....	123,627	142,293
Kingston (N. Y.) Consolidated R. R.....	140,303	142,240
Bridgeton & Millville Trac. Co. (The), Bridgeton, N. J.....	132,656	141,793
Citizens' Light & Transit Co., Pine Bluff, Ark.....	.....	140,290
St. John (N. B.) Ry. Co.....	296,898	140,230
Western Massachusetts Street Ry., Westfield, Mass.....	35,049	138,760
Williamsport (Pa.) Pass. Ry. Co.....	122,956	137,358
Portsmouth (O.) St. R. R. & Light Co.....	125,724	137,257
New York & Stamford Ry., Port Chester, N. Y.....	137,477	136,748
Syracuse, Lake Shore & Northern R. R., Syracuse, N. Y.....	d75,883	136,345
Sandwich, Windsor & Amherstburg Ry., Windsor, Ont., Can.....	122,000	135,517
Fairmont Park Transportation Co., Phila., Pa.	134,501	133,823
Rockland, Thomaston & Camden St. Ry., Rockland, Me.....	134,151	133,432
Orange County Traction Co., Newburgh, N. Y.	129,919	133,029
Tarrytown, White Plains & Mamaroneck Ry., White Plains, N. Y.....	128,548	132,386
Dayton & Xenia Transit Co., Dayton, O.....	111,596	127,555
South Brooklyn Ry., Brooklyn, N. Y.....	.....	a126,970
Meridian (Miss.) Light & Ry. Co.....	105,683	126,063
Washington & Canonsburg Ry., Washington, Pa.....	116,244	125,961
Jackson (Mich.) Consolidated Trac. Co.....	112,067	125,566
Woonsocket (R. I.) St. Ry.....	121,133	125,466
Poughkeepsie City & Wappingers Falls Electric Ry., Poughkeepsie, N. Y.....	107,152	124,650
Iowa & Illinois Ry., Chinton, Ia.....	98,249	124,026
Cleveland, Painesville & Ashtabula R. R., Cleveland, O.....	103,095	122,363
Haverhill & Amesbury St. Ry., Haverhill, Mass.....	123,009	121,823
Brockton & Plymouth Street Ry., Brockton, Mass.....	114,429	121,749
Ponce (P. R.) Electric Co.....	107,327	120,087
Lewistown & Reedsville Electric Ry., Lewistown, Pa.....	106,564	119,919
Pennsylvania & Ohio Ry., Ashtabula, O.....	115,825	118,427
New Bedford & Onset St. Ry., New Bedford, Mass.....	96,426	117,888
Astoria (Ore.) Electric Co.....	107,493	116,760
Holmesburg, Tacony & Frankford Electric Ry., Philadelphia, Pa.....	113,019	116,339
Pascagoula St. Ry. & Power Co., Scranton, Miss.....	92,248	116,049
Citizens' Ry., Light & Power Co., Newport News, Va.....	97,957	115,146
Ithaca (N. Y.) Street Ry.....	110,944	113,644
Sydney & Glace Ry., Sydney, N. S., Can.....	113,129	113,614
Danbury & Bethel St. Ry., Danbury, Conn.....	101,563	113,200
Dayton, Covington & Piqua Traction Co., Dayton, O.....	92,228	112,740
Peekskill (N. Y.) Lighting & R. R.....	100,699	111,164
Delaware Co. & Philadelphia Electric Ry., Philadelphia, Pa.....	97,241	110,867
Bristol & Plainville T'way, Bristol, Conn.....	93,168	110,641
Augusta & Aiken Ry., Augusta, Ga.....	102,722	110,578
Athens (Ga.) Electric Ry. Co.....	93,728	110,446
Lebanon (Pa.) Valley Street Ry.....	98,596	109,510
Toledo, Pt. Clinton & Lakeside Ry., Toledo, O.....	.....	109,172
Denison & Sherman Ry., Sherman, Texas.....	104,591	108,448
Citizens' Electric Street Ry., Newburyport, Mass.....	105,657	108,383
Cedar Rapids & Iowa City Ry. & Light Co., Cedar Rapids, Ia.....	91,609	107,717
Syracuse & Suburban R. R., Syracuse, N. Y.....	106,078	107,473
Galt, Preston & Hespeler St. Ry., Galt, Ont., Can.....	91,091	107,093
Northampton Traction Co., Easton, Pa.....	98,333	106,495
Washington, Arlington & Falls Church Ry., Washington, D. C.....	107,422	106,338
Allegheny Valley St. Ry., Tarentum, Pa.....	72,156	105,677
Milford, Attleboro & Woonsocket Street Ry., Milford, Mass.....	91,342	105,470
Groton & Stonington St. Ry., Groton, Conn.....	112,711	104,073
Toledo & Chicago Interurban Ry., Kendallville, Ind.....	.....	102,592
Richmond & Petersburg Electric Ry., Richmond, Va.....	92,490	102,426

Name of Company.	1906.	1907.
Hull Elec. Co., Aylmer, Que., Can.....	\$81,229	\$101,905
West Chester (Pa.) St. Ry.....	85,374	100,422
Natick & Cochituate St. Ry., Natick, Mass.....	100,494	100,078

COMPANIES HAVING GROSS RECEIPTS FOR 1907 BETWEEN \$100,000 AND \$50,000.

Name of Company.	1906.	1907.
Burlington (Vt.) Traction Co.....	\$99,207	\$98,868
Springfield, Troy & Piqua Ry., Springfield,.....	86,125	98,660
Hudson, Pelham & Salem Street Ry., Hudson, Virginia Pass. & Power Co., Richmond, Va....	94,147	98,272
Philadelphia & Easton Elec. Ry., Doylestown, Pa.....	118,887	98,008
Warren (Pa.) Street Ry.....	81,559	98,001
Geneva, Waterloo, Seneca Falls & Cayuga Lake Traction Co., Geneva, N. Y.....	94,231	97,916
Dover, Somersworth & Rochester St. Ry., Dover, N. H.....	90,755	97,148
Chautauqua Traction Co., Jamestown, N. Y....	91,882	95,993
Montreal (Que.) Terminal Ry. (The).....	70,750	95,739
Cincinnati & Columbus Trac. Co., Cincinnati, O.....	88,536	95,526
New Jersey & Pennsylvania Traction Co., Trenton, N. J.....	.....	95,492
Black River Traction Co., Watertown, N. Y....	104,259	95,248
The Elec. Ry., Lt. & Ice Co., Junction City, Kan.....	84,918	94,221
Rome (Ga.) Railway & Light Co.....	91,449	93,738
Hudson River Traction Co., Rutherford, N. J.	74,536	92,695
Ocean Elec. Ry. Co., Rockaway, L. I., N. Y....	83,252	92,616
Butler (Pa.) Passenger Ry.....	54,281	92,578
Providence & Danielson Ry., Providence, R. I.	70,296	92,420
Cincinnati, Milford & Loveland Traction Co., Cincinnati, O.....	88,194	92,061
Middlesex & Boston St. Ry., Natick, Mass....	49,746	91,337
Jersey Central Traction Co., Keyport, N. J....	88,289	89,876
Worcester & Blackstone Valley Street Ry., Worcester, Mass.....	64,713	88,270
Blue Hill Street Ry., Canton, Mass.....	75,750	85,348
Atlantic City & Suburban Traction Co., Atlantic City, N. J.....	80,344	85,228
Fargo & Moorhead St. Ry., Fargo, N. Dak....	82,363	85,060
Warren & Jamestown St. Ry., Jamestown, N. Y.....	.....	85,000
Erie (Pa.) Traction Co.....	51,677	84,135
Monmouth County Elec. Co., Red Bank, N. J.	73,930	83,538
Sea View R. R. Co., Wakefield, R. I.....	57,809	83,500
Sea Beach Ry., Brooklyn, N. Y.....	82,279	81,902
Bluestone Traction Co., Graham, Va.....	.....	a81,471
Columbia & Montour Electric Ry., Bloomsburg, Pa.....	21,395	80,793
Conneaut & Erie Trac. Co., Erie, Pa.....	78,270	80,724
Joliet & Southern Traction Co., Joliet, Ill....	82,955	80,594
Toledo, Fostoria & Findlay Electric Ry., Toledo, O.....	79,678	80,109
Lawrence & Methuen Street Ry., Lawrence, Mass.....	76,623	79,989
Danville (Va.) Ry. & Electric Co.....	77,079	79,473
Waverly, Sayre & Athens Traction Co., Waverly, N. Y.....	74,618	77,315
Cortland (N. Y.) County Traction Co.....	72,738	77,303
Shamokin & Mt. Carmel Transit Co., Shamokin, Pa.....	59,143	77,298
Philadelphia, Bristol & Trenton St. Ry., Philadelphia, Pa.....	98,475	77,294
Waterville & Fairfield Ry. & Light Co., Waterville, Me.....	80,681	76,705
The Cambridge (O.) Power, Light & Traction Co.....	73,674	75,680
Newton & Boston Street Ry., Newton, Mass..	.....	74,032
Steubenville & Wheeling Traction Co., Steubenville, O.....	63,658	74,005
Great Falls & Old Dominion R. R., Great Falls, Va.....	65,261	73,114
Muskogee (Okla.) Elec. Trac. Co.....	.....	72,664
Ashtabula (O.) Rapid Transit Co.....	57,415	72,365
Rochester & Suburban Ry., Rochester, N. Y.....	59,738	72,180
Bristol (Tenn.) Gas & Electric Co.....	74,388	70,860
Cohoes (N. Y.) Ry. Co.....	60,738	70,142
Rock Island Southern R. R., Monmouth, Ill...	55,063	70,051
Port Arthur (Ont.) Electric Street Ry.....	.....	69,931
Norfolk & Bristol St. Ry., Norwood, Mass....	51,984	69,181
Jackson (Tenn.) Ry. & Light Co.....	68,135	69,029
Portsmouth (N. H.) Electric Ry.....	44,821	68,827
Fort Scott (Kan.) Gas & Electric Co.....	65,083	68,043
Biddeford & Saco R. R., Biddeford, Me.....	68,647	67,612
Morris County Traction Co., Morristown, N. J.	63,490	67,582
	51,045	66,845

Name of Company.	1906.	1907.	COMPANIES HAVING GROSS RECEIPTS FOR 1907 BETWEEN \$50,000 AND \$25,000.	Name of Company.	1906.	1907.
Northern Illinois Light & Traction Co., Ot-tawa, Ill.	\$62,395	\$66,420		Centre & Clearfield St. Ry., Phillipsburg, Pa.	\$50,612	\$48,909
The Southwestern Ohio Ry., Lt. & Power Co., Zanesville, O.	.....	66,067		Webster, Monessen, Belle Vernon & Fayette City Street Ry., Monessen, Pa.	36,981	48,486
Atlantic City & Suburban Traction Co., Atlantic City, N. J.	85,060	65,581		Bennington & North Adams St. Ry., Hoosick Falls, N. Y.	47,332	48,360
Wilkes-Barre, Dallas & Harvey's Lake Ry., Wilkes-Barre, Pa.	63,900	65,103		Pottstown & Reading St. Ry., Pottstown, Pa.	42,420	47,583
Gardner, Westminster & Fitchburg Street Ry., Gardner, Mass.	68,620	64,900		Sandusky, Norwalk & Mansfield Elec. Ry., Norwalk, O.	.....	47,473
Southwestern Street Ry., Phila., Pa.	62,538	64,841		Nahant & Lynn St. Ry., Lynn, Mass.	50,032	47,325
Newport & Providence Ry., Newport, R. I.	64,925	64,179		Westmoreland County Ry., Pittsburg, Pa.	43,217	40,997
Springfield & Xenia Ry., Xenia, O.	.....	63,979		Haverhill & Southern New Hampshire Street Ry., Haverhill, Mass.	48,228	46,925
Galesburg & Kewanee Electric Ry., Kewanee, Ill.	38,934	63,275		Egerton Tramway, Stellerton, N. C.	38,103	40,466
Oshawa (Ont.) Ry.	58,511	63,031		Athol & Orange Street Ry., Athol, Mass.	44,958	45,074
New York City Interborough Ry.	62,466	62,466		Portland & Brunswick St. Ry., Brunswick, Me.	43,371	45,447
Farmington Street Ry., Hartford, Conn.	56,220	62,342		Barre & Montpelier Traction & Power Co., Barre, Vt.	46,748	45,194
Providence & Fall River Street Ry., Swansea Centre, Mass.	61,746	62,057		Eastern New York R. R., Ballston Spa, N. Y.	39,771	45,109
Owensboro (Ky.) City R. R.	.....	61,863		Belton-Temple Trac. Co., Temple, Tex.	42,028	44,985
Van Brunt St. & Erie Basin R. R., Brooklyn, N. Y.	57,541	61,447		Lancaster (O.) Trac. & Power Co. (The)	29,933	44,826
Warren, Brookfield & Spencer Street Ry., Brookfield, Mass.	65,741	61,322		Berlin (N. H.) St. Ry.	44,654	44,512
Norfolk & Ocean View Railway, Norfolk, Va.	49,736	60,681		Springfield (Vt.) Electric Ry.	38,283	44,496
Slate Belt Electric St. Ry., Bethlehem, Pa.	59,642	60,406		Titusville (Pa.) Electric Traction Co.	42,077	44,431
York & Dallastown Electric Railway, York, Pa.	55,564	60,150		Templeton (Mass.) Street Ry.	42,653	44,265
Shamokin & Edgewood Electric Ry., Shamokin, Pa.	42,667	60,064		DeKalb, Sycamore & Interurban Traction Co., DeKalb, Ill.	.....	44,195
Concord, Maynard & Hudson Street Ry., Maynard, Mass.	60,130	59,982		New London & East Lyme St. Ry., New London, Conn.	.....	43,756
Walkill Transit Co., Middletown, N. Y.	54,255	59,866		International Transit Co., Sault Ste Marie, Ont., Can.	42,024	43,744
Columbus, New Albany & Johnstown Trac. Co., Columbus, O.	52,582	59,499		Worcester & Holden St. Ry., Holden, Mass.	44,854	43,722
Wrightsville & York St. Railway, York, Pa.	59,382	59,421		Chambersburg & Gettysburg Electric Ry., Chambersburg, Pa.	39,377	42,760
Toronto & York Radial Ry., Toronto, Ont., Can.	52,884	58,964		Merrill (Wis.) Ry. & Lighting Co.	.....	42,531
Buffalo (N. Y.) Southern Ry.	44,266	58,940		York-Haven Street Ry., York, Pa.	40,209	42,515
People's Street Ry., Nanticoke, Pa.	49,895	58,569		Ft. Wayne & Springfield Ry., Decatur, Ind.	.....	42,088
Ohio River Elec. Ry. & Pwr. Co., Pomeroy, O.	58,980	58,121		Monterey & Pacific Grove Ry., Monterey, Cal.	.....	41,597
Southern Boulevard R. R., New York	46,785	57,648		Grand Valley Ry., Brantford, Ont., Can.	42,161	41,064
Norton & Taunton St. Ry., Norton, Mass.	55,000	57,104		Meadville & Cambridge Springs Street Ry., Meadville, Pa.	39,646	40,924
Kittanning & Leechburg Rys., Kittanning, Pa.	57,321	57,029		East Taunton Street Ry., Taunton, Mass.	37,304	40,319
Jefferson Traction Co., Punxsutawney, Pa.	124,092	57,022		DuBois (Pa.) Electric & Traction Co.	39,694	39,773
Levis (Ont.) County Ry.	52,829	56,987		Montgomery Traction Co., Norristown, Pa.	37,660	39,526
Trenton & New Brunswick R. R., Trenton, N. J.	71,582	56,680		Lowell & Fitchburg St. Ry., Lowell, Mass.	.....	38,725
Oswego (N. Y.) Traction Co.	54,501	56,466		Columbian Street Ry., Pascoag, R. I.	40,040	38,683
Westchester, Kennett & Wilmington Electric Ry., Westchester, Pa.	54,942	56,309		Providence & Burrillville Street Ry., Providence, R. I.	27,628	37,858
Citizens' Ry., Lincoln, Neb.	.....	55,826		Sarnie (Ont.) Street Ry.	36,234	37,609
Bucks County Elec. Ry., Newtown, Pa.	58,637	55,548		Five Mile Beach Elec. Ry., Anglesea, N. J.	29,074	37,475
Burlington County Ry., Mt. Holly, N. J.	62,798	55,045		Millville (N. J.) Traction Co.	35,394	37,186
Vincennes (Ind.) Trac. & Lt. Co.	44,913	55,023		Haverhill, Plaistow & Newton St. Ry., Plaistow, N. H.	33,042	36,964
Torrington & Winchester Street Ry., Torrington, Conn.	50,251	54,835		Anderson (S. C.) Traction Co.	.....	36,844
Coney Island & Gravesend Ry., Brooklyn, N. Y.	48,028	54,387		Pittsburg & Butler St. Ry., Butler, Pa.	.....	36,684
Phillipsburg (Pa.) Horse Car R. R.	49,437	54,246		Buffalo & Williamsville Electric Ry., Williamsville, N. Y.	33,872	36,603
Trenton, New Hope & Lambertsville St. Ry., Yardly, Pa.	59,399	54,047		Berlin & Waterloo St. Ry., Berlin, Ont., Can.	30,371	36,571
Meadville (Pa.) Traction Co.	42,471	53,581		Toronto Suburban Street Ry., Toronto Junction, Ont., Can.	31,051	36,257
Chambersburg, Greencastle & Waynesboro St. Ry., Waynesboro, Pa.	47,516	53,428		Pawtucket Valley St. Ry., Westerly, R. I.	22,973	35,927
Coal Belt Electric Ry., Marion, Ill.	50,398	53,419		Carbon Street Ry., Mauch Chunk, Pa.	32,520	35,783
Corning & Painted Post Street Ry., Corning, N. Y.	48,157	53,247		Manitowoc & Northern Traction Co., Manitowoc, Wis.	.....	35,287
Taunton & Pawtucket St. Ry., Taunton, Mass.	52,338	52,925		Vallamont Traction Co., Williamsport, Pa.	34,532	34,705
Tiffin, Fostoria & Eastern Elec. Ry., Tiffin, O.	54,648	52,812		Bush Terminal R. R., Brooklyn, N. Y.	.....	33,798
Elmira & Seneca Lake Traction Co., Elmira, N. Y.	13,130	52,568		Peterborough (Ont.) Radial Ry.	29,701	33,597
Easton & Washington Traction Co., Washington, N. J.	.....	52,546		Ogdensburg (N. Y.) Street Ry.	30,655	33,509
Exeter, Hampton & Amesbury St. Ry., Exeter, N. H.	52,496	52,214		Troy & New England Ry., Troy, N. Y.	32,958	33,463
Norwich & Westerly Ry., Norwich, Conn.	.....	52,183		Sherbrooke (Ont.) St. Ry.	28,000	32,899
Charlottesville & Albemarle Ry., Charlottesville, Va.	49,829	52,162		Laconia (N. H.) Street Ry.	30,493	32,851
Claremont (N. H.) Ry. & Ltg. Co.	44,415	51,998		Waterville & Oakland St. Ry., Waterville, Me.	30,896	32,338
Pittsburg & Allegheny Valley Ry., Leechburg, Pa.	14,998	51,531		Central Passenger Ry., Atlantic City, N. J.	25,439	32,094
Northern Electric St. Ry., Scranton, Pa.	.....	51,234		Price Hill Inclined Plane R. R., Cincinnati, O.	29,332	31,401
Fishkill Electric Ry., Fishkill-on-the-Hudson, N. Y.	47,303	51,182		Brantford (Ont.) St. Ry.	28,983	31,294
Mason City & Clear Lake Ry., Mason City, Ia.	46,487	50,387		Marlborough & Westborough Street Ry., Westborough, Mass.	33,933	31,253
				York & Dover Electric Ry., York, Pa.	28,344	31,143
				Sharon & Newcastle St. Rys., Sharon, Pa.	31,350	30,838
				Kingston, Portsmouth & Cataract Elec. Ry., Kingston, Ont., Can.	27,555	30,693
				Philadelphia & Chester Ry., Chester, Pa.	27,188	30,445
				Susquehanna Traction Co., Lock Haven, Pa.	27,882	30,416
				Homestead & Mifflin St. Ry., Homestead, Pa.	22,260	30,300
				Penn Yann, Keuka Park & Branchport Ry., Penn Yann, N. Y.	26,195	30,028
				Lancaster & York Furnace Street Ry., Lancaster, Pa.	33,606	29,870

Name of Company.	1906.	1907.
Amherst & Sunderland St. Ry., Amherst, Mass.	\$38,363	d\$29,713
Uxbridge & Blackstone St. Ry., Uxbridge, Mass.	28,028	29,692
Radford (Va.) Water Power Co.	27,583	29,672
Rome (N. Y.) City Street Ry.	24,922	29,651
Youngstown & Southern Ry., Youngstown, O.	21,651	29,543
Chicago, Harvard & Geneva Lake Ry., Walworth, Wis.	28,717	29,506
Southwestern Trac. Co., London, Ont.	29,189	29,189
Danville & Bloomsburg Street Ry., Grovanna, Pa.	30,914	28,857
Calais (Me.) Street Ry.	29,099	28,466
St. Stephen (N. B.) Street Ry.	28,466	28,466
Guelph (Ont.) Radial Ry.	28,509	28,304
Lewisburg, Milton & Watsonstown Pass. Ry., Milton, Pa.	24,948	28,151
Keene (N. H.) Electric Ry.	26,530	28,077
Bangor & Portland Traction Co., Bangor, Pa.	27,529	27,929
Latrobe (Pa.) Street Ry.	20,497	27,415
Woodstock, Thames Valley & Ingersoll Elec. Ry., Woodstock, Ont., Can.	21,824	26,766
Omaha, Lincoln & Beatrice Ry., Lincoln, Neb.	26,612	26,612
Oneida (N. Y.) Ry. Co.	14,012	26,409
Amesbury & Hampton St. Ry., Amesbury, Mass.	23,941	26,187
Hornellsville & Canisteo Ry. (The), Hornell, N. Y.	25,689	26,152
Ashland (Wis.) Light, Power & Street Ry.	23,648	25,972
St. Thomas (Ont.) Street R.	18,797	25,908
Cornwall (Ont.) Elec. Ry., Lt. & Power Co. (The)	23,416	25,814
Plattsburg (N. Y.) Traction Co.	24,034	25,522
Waupaca (Wis.) Electric Light & Ry. Co.	22,746	25,342
Carlisle & Mt. Holly Ry., Carlisle, Pa.	22,362	25,255
Rochester, Charlotte & Manitou R. R., Rochester, N. Y.	22,493	25,095

*Income from securities owned.
 †Decrease in 1906 and 1907 due to earthquake.
 a For 4 months only; b for 7 months only; c for 6 months only; d for 10 months only; e for 8 months only; f for 7½ months only.

GLASGOW TRAMWAYS REPORT FOR YEAR

The report of the Corporation Tramways, of Glasgow, Scotland, for the year ended May 31, 1908, shows earnings as follows:

Gross revenue	£916,566
Expenditures:	
Traffic	£256,605
General	91,323
Repairs	122,750
Power	39,317
	£509,995
Set aside for renewal and depreciation	188,603
	698,598
	£217,968
Lease of Govan lines	£5,077
Rent of Paisley Dist. Tramways	4,784
Interest	53,152
Sinking fund	68,804
Income tax	9,436
Parliamentary expenses	2,885
Common good	35,000
	179,138
Leaving a net balance of	£38,830
which has been appropriated as under:	
Special depreciation	£4,061
General reserve fund	34,769

The following statement gives the number of passengers carried at each fare:

Fare.	Passengers.
½d.	64,325,789
1d.	135,383,185
1½d.	17,191,696
2d.	5,302,020
2½d.	2,135,602
3d.	1,426,011
3½d.	991,789
4d.	192,198
	226,948,290

An electric railway is being projected for the Zugspitze, the highest Alpine peak on German (Bavarian) territory, rising to a height of 10,000 ft. A Munich company will build the line, by which the Zugspitze is to be reached from Munich in three hours. The terminus will be at the summit itself. A hotel is to be built at the 7000-ft. level.

NOTICE IN REGARD TO EXHIBITS AT THE ATLANTIC CITY CONVENTION

The American Street and Interurban Railway Manufacturers' Association, which will have charge of the exhibits at the Atlantic City convention, has issued the following circular to all members of the association. It is signed by George Keegan, secretary:

The secretary of the American Street and Interurban Railway Association, under date of June 20, 1908, sent out announcement of the fact that the twenty-seventh annual convention of said association would be held at Atlantic City, N. J., Oct. 12 to 16, inclusive, 1908. In connection with this convention the Manufacturers' Association has secured the use of Young's Million Dollar Pier for its exhibition, and will use practically the same plant of booths as was used during the recent M. M. and M. C. B. convention, these booths having presented the best exhibition ever given by that association. Our association, however, on account of the lateness of the season, is able to make a more advantageous rearrangement of the space and to utilize much of the more desirable space not available during the spring convention. We shall have at our disposal upward of 70,000 sq. ft. of booth space, exclusive of aisles, all inside space and fully protected from the weather. There is no charge to us or to the exhibitors for the use of this space, but we have, however, arranged for the erection and use of booth structures and various accessories hereinafter mentioned for the very satisfactory sum of 23½ cents per square foot. This rate, however, includes the use without charge of a reasonable supply of steam, gas, water, compressed air and electricity at 110-volt and 220-volt a.c. and 220-volt and 550-volt d.c., for all purposes except for special lighting and electric signs, power for which will be billed to consumer at meter rates. It also includes the removal, storage and return to exhibit space of all crates, packing boxes, etc. Also all crex matting on the floors and aisles, burlap for the booths, and the use of 3-in. white enameled letters for signs. There will also be some unbooted space available.

Experience during the last conventions proved that exhibitors find it far more satisfactory and agreeable as well as more economical to have the booths erected and ready for occupancy, and to be relieved of the cares incident to booth building.

As stated above, electric power at 110-volt and 220-volt a.c., and 220-volt and 550-volt d.c., will be available as well as compressed air, steam, water and gas, and arrangements have been made for bringing this power to the booths without charge except for making the necessary connections.

Arrangements have also been made with the local civic bodies so that there shall be no exorbitant charges for cartage or labor, skilled or unskilled, and that the regular prevailing rates in Atlantic City shall obtain.

Atlantic City affords almost perfect hotel accommodations, and all may be assured of being taken care of satisfactorily. Detailed schedule of hotel rates and other information to follow. The Marlborough-Blenheim has been selected as hotel headquarters for the Manufacturers' Association.

The usual membership fee of \$35 will be in effect this year, such membership carrying with it, without charge, four badges, entitling holder and lady to all the privileges of the convention, and to such entertainment as may be provided.

Since the formation of the association the exhibitors have each year shown a most healthy growth, and present indisputable evidence of the value and usefulness of the association. With the admirable opportunities offered by Atlantic City, the prospects this year are favorable for the most successful convention ever held.

Enclosed you will find a space application blank which you will please fill out and return at once to the secretary, as it is desirable to start the allotment of space as early as possible, thus allowing exhibitors ample time in which to arrange their exhibits.

Any further information that you may desire will be gladly furnished by the secretary of the association at 2304 Park Row Building, New York City.

EARNINGS FROM FREIGHT AND EXPRESS BUSINESS OF NINE NEW YORK COMPANIES

Statistics in relation to the earnings and cost of operation of freight and express departments of nine companies, presented at the annual meeting of the Street Railway Association of the State of New York on June 30, by F. J. Walsh, general freight and express agent of the Schenectady Railway, are published herewith. The explanatory statement of Mr. Walsh, presented in connection with these figures, was published in the ELECTRIC RAILWAY JOURNAL of July 4, 1908, page 228. The analytical character of the figures regarding operating expenses makes the table of value to officials of all companies that are engaged in express or freight business or contemplate the introduction of service of this character.

Figures of the following companies are given: Auburn & Syracuse Electric Railroad, Hudson Valley Railway, International Railway, Rochester & Eastern Rapid Railway, Rochester & Sodus Bay Railway, Electric Express Company, Syracuse Rapid Transit Company, United Traction Company, and Utica & Mohawk Valley Railway.

Gross earnings of the freight and express service conducted by the nine companies during the 10 months ended Oct. 31, 1907, were \$350,148.31, and operating expenses

were \$247,701.68, or 70.74 per cent. The expenses were necessarily computed on an arbitrary basis. The net earnings from operation were \$102,446.63. All but one of the companies reported a surplus from operation, but the operating results were subject, of course, to charges on account of interest.

Great variation is shown in the different items, both in the totals and the unit figures. The average car-mile gross earnings were 60.68 cents, and the extreme high and low results were reported by the United Traction Company of Albany, at 128.15 cents, and the Syracuse Rapid Transit Company, at 32.80 cents. The former company operated this department of its business at 79.88 per cent of the gross revenue, while the expenses of the Syracuse company were equal to 100.72 per cent of the gross revenue, indicating a net loss on the business.

The average car-mile operating expenses were 42.93 cents, but the extreme figures were 102.39 in the case of the United Traction Company and 20.02 cents for the International Railway. Some of the companies made no charges in their expenses for maintenance. The average charge to the maintenance accounts of the nine companies reporting was 1.42 cents per car-mile. The largest, that of the Utica & Mohawk Valley Railway, was 3.72 cents expended on equipment. The Syracuse Rapid Transit Company and the

COMPARATIVE STATEMENT OF OPERATING EXPENSES FOR FREIGHT AND EXPRESS SERVICE DURING TEN MONTHS ENDING OCTOBER 31, 1907.

Table with 15 columns: Company Name, Car Mile, Dollars Per Car Hour, Cents Per 100 lbs., and four sub-columns for each company. Rows include Earnings (Car Mileage, Freight, Express, Milk, Gross Earnings, Net Earnings, Surplus), First Charges (Taxes, Int. on Debt, etc.), Detail of Expenses (Maintenance: Buildings, Horses, Wagons, Cars; Transportation: Motormen, Messengers, Warehousemen, Drivers, Cartage, Stable Expenses, Hired Equipment, Hired Power, Rent Tracks; General: Sal. Gen. Exp. Agents, Sal. Local Exp. Agents, Salaries of Clerks, Printing, Advertising, Insurance, etc.), and Totals.

* Foreign Freight

† Car Service

Rochester & Eastern Rapid Railway expended each 0.18 cent per car-mile on maintenance. The former company divided its expenditure on this account between wagons and harness and cars and equipment, while the latter company devoted the sum expended to wagons and harness.

The cost of conducting transportation averaged 30.54 cents per car-mile, as compared with the total operating expenses charged of 42.93 cents per car-mile. The transportation costs varied from 16.05 cents per car-mile, reported by the International Railway, to 67.46 cents, shown by the United Traction Company. In the latter case 41.45 cents of the amount shown was expended for cartage. This sum was equivalent to about 40 per cent of the car-mile operating expenses.

General expenses averaged 10.97 cents per car-mile. The lowest figure reported was 2.23 cents per car-mile, given by the Syracuse Rapid Transit Company, while the highest was 34.50 cents per car-mile, reported by the United Traction Company.

It will be observed that some of the companies did not charge against their income from this business, a proportion of the interest accrued on outstanding obligations, and in two instances no specific charge was made on account of taxes.

The report on freight and express from which these figures are taken was presented at the Niagara Falls con-

vention of the Street Railway Association of the State of New York, June 30, and is perhaps as complete an analysis of the freight and express transportation situation in any State as has been published. It was divided into three subjects and the paper on each was published in the last issue of the ELECTRIC RAILWAY JOURNAL.

The subject of rates was taken up by Albert Eastman, general passenger and freight agent of the Utica & Mohawk Valley Railway Company. The blanks and forms used in the freight and express business of electric roads considered were discussed by J. C. Collins, Jr., secretary and auditor of the Rochester & Sodus Bay Railway Company, and the financial side of the situation was treated by F. J. Walsh, of the Schenectady Railway Company. It was with Mr. Walsh's paper, as stated, that the accompanying table was presented to the convention.

All of the roads whose figures are quoted in the table are in the central part of New York State, so that the operating conditions of the different roads are largely similar and this fact makes the statistics of especial interest. Another valuable feature of the report is that seven of the nine companies whose figures are given in the table kept records of car hours and tonnage. The statistics of these companies could, therefore, be reduced to these bases and the averages thus obtained clearly appear in the table herewith.

COMPARATIVE STATEMENT OF OPERATING EXPENSES FOR FREIGHT AND EXPRESS SERVICE DURING TEN MONTHS ENDING OCTOBER 31, 1907.

COMPARATIVE SUMMARY OF OPERATIONS	Elec. Ex. Co. Schenectady.			Syracuse R'pd Tran. Ry. Co.			United Traction Co.			Utica & Mohawk Valley Ry. Co.			Total All Companies				
	Cents Per Car Mile	Dollars Per Car Hour	Cents Per 100 lbs.	Cents Per Car Mile	Dollars Per Car Hour	Cents Per 100 lbs.	Cents Per Car Mile	Cents Per 100 lbs.	Cents Per Car Mile	Dollars Per Car Hour	Cents Per 100 lbs.	Cents Per Car Mile	Dollars Per Car Hour	Cents Per Car Mile			
Car Mileage.....	59,174.00			14,013.00			30,515.00		84,081.00			576,989.00					
Car Hours.....	9,640.00			3,164.00					8,020.00								
Weight (100 pounds).....	247,496.00			38,301.00			434,460.00		299,269.00								
EARNINGS																	
Express.....	41,296.78	69.79	4.28	16.68	3,606.75	25.74	1.14	9.42	39,104.45	128.15	9.00	54,000.87	64.22	6.74	18.04	214,387.76	37.15
Freight.....	3,764.07	6.36	.39	1.57	989.58	7.06	.31	2.58								125,068.85	21.68
Milk.....	172.20	.29	.02	.07								1,063.20	1.27	.13	.36	10,442.30	1.81
Gross Earnings from Opr.....	45,233.05	76.44	4.69	18.27	4,596.33	32.80	1.45	12.00	39,104.45	128.15	9.00	55,064.07	65.49	6.87	18.40	350,148.31	60.68
Expenses.....	38,754.68	65.49	4.02	15.66	4,629.63	33.04	1.46	12.08	31,243.82	102.39	7.19	45,253.19	53.82	5.64	15.18	247,701.68	42.93
Net Earnings from Opr.....	6,478.37	10.95	.67	2.61	* 33.30	.24	.01	.08	7,860.63	25.76	1.81	9,810.88	11.67	1.23	3.28	102,446.63	17.75
Miscellaneous Income.....	836.36	1.41	.09	.34					330.48	.39	.04	.11				2,138.99	.37
Gross Income less Opr. Exp.....	7,314.73	12.36	.76	2.95	* 33.30	.24	.01	.08	7,860.63	25.76	1.81	10,141.36	12.06	1.27	3.39	104,585.62	18.12
FIRST CHARGES																	
Taxes.....	349.16	.59	.04	.14	45.96	.32	.01	.12				550.64	.65	.07	.18	3,467.33	.60
Int. on Funded Debt.....																22,083.32	3.83
Int. on Real Est. Mortgages.....																42.01	
Int. on Floating Debt.....																3,967.13	.69
Int. on Investment.....												2,560.55	3.05	.32	.86	8,040.85	1.39
Total First Charges.....	349.16	.59	.04	.14	45.96	.32	.01	.12				7,030.17	8.36	.88	2.35	66,984.98	11.61
Net Income.....	6,965.57	11.77	.72	2.81	* 79.26	.56	.02	.20	7,860.63	25.76	1.81	7,030.17	8.36	.88	2.35	66,984.98	11.61
Surplus.....	6,965.57	11.77	.72	2.81	* 79.26	.56	.02	.20	7,860.63	25.76	1.81	7,030.17	8.36	.88	2.35	66,984.98	11.61
DETAIL OF EXPENSES																	
MAINTENANCE																	
1 Buildings and Fixtures.....	17.27	.03	.00	.01								354.16	.42	.05	.12		
2 Horses.....												250.00	.30	.03	.08		
3 Wagons and Harness.....	668.28	1.13	.07	.37	11.30	.08	.01	.03				670.04	.80	.08	.22		
4 Cars and Equip.....					14.57	.10	.04	.04	131.27	.43	.03	1,852.62	2.20	.23	.62		
TOTAL.....					25.87	.18	.01	.07	131.27	.43	.03	3,126.82	3.72	.39	1.04	8,188.51	1.42
TRANSPORTATION																	
5 Motormen.....	685.55	1.16	.07	.28								3,173.98	3.77	.39	1.06		
6 Messengers.....	2,451.52	4.14	.25	.99	740.50	5.28	.23	1.93				3,111.19	3.70	.39	1.04		
7 Warehousemen.....	2,574.04	4.35	.27	1.04	742.03	5.30	.23	1.94	2,533.01	8.90	.58	1,466.00	1.74	.18	.49		
8 Drivers.....	1,767.96	2.99	.18	1.71					4,717.41	15.46	1.09	6,990.02	8.31	.87	2.34		
9 Cartage.....	7,179.44	12.13	.74	2.90								385.95	.46	.05	.13		
10 Stable Expenses.....	4,319.71	7.30	.45	1.74	27.30	.19	.01	.07	12,647.99	41.45	2.91	2,908.73	3.46	.36	.97		
11 Hired Equipment.....	9,697.78	16.39	1.01	3.93					686.55	2.25	.16						
12 Hired Power.....					328.27	2.35	.10	.86				2,370.14	2.82	.30	.79		
13 Rent Tracks and Term.....					2,453.51	17.51	.78	6.40				11,463.51	13.64	1.43	3.83		
TOTAL.....	27,990.45	47.30	2.90	11.31	4,291.61	30.63	1.35	11.20	20,584.96	67.46	4.74	31,941.37	37.99	3.98	10.67	176,234.84	30.54
GENERAL																	
14 Sal. Gen. Exp. Agent.....	1,350.00	2.28	.14	.54	25.00	.18	.04	.07	262.50	.86	.06	1,100.00	1.31	.14	.37		
15 Sal. Local Exp. Agents.....	2,909.94	4.92	.30	1.17	102.00	.73	.03	.27				5,078.80	6.04	.63	1.70		
16 Salaries of Clerks.....	2,768.23	4.68	.29	1.12	58.06	.41	.02	.15	3,990.51	13.08	.92	2,107.65	2.50	.26	.70		
17 Printing and Stationery.....	609.33	1.03	.06	.25	91.19	.65	.03	.23				215.89	.26	.03	.07		
18 Advertising.....					4.20	.03	.01										
19 Insurance.....	196.71	.33	.02	.08					187.20	.61	.04						
20 Rent of Land and B'ld'gs.....	1,427.83	2.41	.15	.58					4,500.00	14.75	1.04	470.37	.56	.06	.16		
21 Miscellaneous Expenses.....	666.54	1.13	.07	.27	24.10	.17	.01	.06	1,465.90	4.80	.34	643.73	.76	.08	.22		
22 Loss and Damage.....	150.10	.25	.02	.06	1.20	.00			121.48	.40	.02	299.46	.36	.04	.10		
23 Fuel.....					6.40	.06	.02					269.10	.32	.03	.09		
TOTAL.....	10,078.68	17.03	1.05	4.07	312.15	2.23	1.10	.81	10,527.59	34.50	2.42	10,185.00	12.11	1.27	3.41	63,278.33	10.97
TOTAL OPERATING EXP.....	38,754.68	65.49	4.02	15.66	4,629.63	33.04	1.46	12.08	31,243.82	102.39	7.19	45,253.19	53.82	5.64	15.12	247,701.68	42.93
PER CENT OF OPR. EXP.....	85.67				100.72				79.88			81.69				70.74	

* Deficit

COMMUNICATIONS

FREIGHT BUSINESS

FORT WAYNE & SPRINGFIELD RAILWAY
 DECATUR, Ind., July 3, 1908.

To the Editors:

We have been very fortunate so far as claims are concerned. During the year and six months in which we have been in operation \$15 would cover our claims in full.

We have so far not lost or injured one piece of baggage to our knowledge. The statements of B. R. Stephens [See ELECTRIC RAILWAY JOURNAL of June 27, 1908, page 160.—Eds.] are certainly very satisfactory to the traction companies. With careful handling of baggage there is no reason why every electric railway should not operate with very small damage or loss.

Freight is delivered directly to the electric railway companies, no merchandise need be held over and deliveries should be made directly to the consignees. In case loss or damage should result, the claim is known immediately and settled promptly. The loss and damage situation on the steam roads has provoked the public. Damage to freight on steam roads requires an investigation that is often long drawn out and frequently results in litigation also.

The Central Electric Traffic Association, which seems to be forming with the brightest of prospects, will assist the electric railways in making the most of their opportunities. With all the roads in this territory working in harmony, the electric lines will afford the best transportation facilities that have ever been offered to the traveling public.

A. G. KELLY,
 Auditor and General Passenger and Freight Agent.

SEAT FACTOR AND LOAD FACTOR IN TRANSPORTATION

ELMIRA WATER, LIGHT & RAILROAD COMPANY
 ELMIRA, N. Y., June 24, 1908.

To the Editors:

For a number of years I was employed by a banking house in New York City, which was interested financially in a number of properties in the Southern States, as an expert on street railway operation. A portion of my time was devoted to an investigation of traffic conditions and it was my duty to correct any abnormal situation that might come under my observation.

I attempted to create an expression that would express in figures what a traffic curve shows, and to apply power station load-factor expressions that would enable me to convey information to one familiar with railway work in regard to existing conditions in as few words as possible.

For instance, on one of the divisions of a property with which I was identified I found the following conditions:

	Out	In
Number of round trips.....	67	
Total passengers.....	2,058	2,186
Average load per car.....	31	33
Maximum load.....	76	69
Average seat capacity per car.....	48	
Ratio of average load to seat capacity	64	68
Ratio of average load to maximum peak	41	48

The ratio of the average number of passengers carried per car to the seat capacity shows the capacity you have provided for the existing traffic. The ratio of the average load to the maximum demand peak shows how closely the schedule follows the movement of traffic. In this case I assume that on the in trip the factor 68 shows that we are

32 points from a perfect schedule, which I consider exceptionally good. In the work of rearranging schedules on the various properties I attempted to give the excess seat capacity and schedule during light hours in direct ratio with the overload during peak hours. In other words, if the traffic exceeds the seating capacity of the equipment by 50 per cent during peak hours and the public is content and the crews are able to handle the traffic without missing fares, we would give this division a schedule during the light hours 50 per cent in excess of the demand. Of course, on short haul work this factor would vary considerably.

What meaning would you derive from the statement "the seat factor of a certain line is 60, and its load factor is 40"? The intention is to convey the information that there is an excess light hour schedule and the factor 40 shows the conditions existing during rush hours.

H. M. BEUGLER,
 Superintendent Electric Department.

[As the expressions used by Mr. Beugler are new, they seem somewhat strange. We think the terms proposed by Mr. Beugler might prove very useful in comparing schedules, but suggest the substitution of the words "car-seat factor" and "car-load factor" for those he uses.—Eds.]

SECRETARY SWENSON RETURNS FROM WESTERN TRIP

B. V. Swenson, secretary of the American Street and Interurban Railway Association, has returned to New York after a Western trip which lasted more than two months. The trip was taken primarily to give Mr. Swenson an opportunity to become acquainted with representatives of members of the association and non-members in the West. The plan of making a tour of this character, which is the first extended trip that has been made especially in the interest of the association, followed the decision that a committee of the association and of the American Street and Interurban Railway Manufacturers' Association should visit Denver to consider the desirability of holding the convention in that city this year. Full consideration was given the claims of that city, although it was decided best afterward, principally on account of financial reasons, to select a place that was nearer a large number of companies and Atlantic City, as announced previously, was named. As Mr. Swenson was to be in Denver, he thought it advisable to attend the annual meeting of the Southwestern Electrical and Gas Association at El Paso, Tex.

The cities visited by Mr. Swenson were as follows: Chicago, April 29 and 30; Omaha, Neb., May 1; Lincoln, Neb., May 2; Denver, May 3 to 6; Colorado Springs and Pueblo, May 7; El Paso, Tex., May 9 and 10; Tucson, Ariz., May 11; San Bernardino, Cal., May 12; Los Angeles, May 13 to 17; San Diego, May 18; Los Angeles, May 19; San Francisco, May 20 to 24; Oakland, May 25 and 26; Petaluma, Cal., May 27; Chico, Cal., May 28; San Francisco, May 29 and 30; Portland, Ore., June 2 to 4; Tacoma and Seattle, Wash., June 5; Spokane, June 6 to 8; Seattle and Tacoma, June 9; Olympia, Wash.; June 10; Seattle and Tacoma, June 11 to 16; Vancouver, B. C., June 15 and 16; Tacoma and Seattle, June 17; Portland, June 18; San Francisco, June 20 to 22; Salt Lake City, June 23 and 24; Denver, June 25; Omaha, June 26; Minneapolis, June 27; Chicago, June 29; New York, June 30.

In discussing the object of the trip, Mr. Swenson said that he desired to arouse and retain the interest of the Western companies in the association and its work. He

said that the representatives of the non-member companies whom he approached on the subject of joining the association spoke favorably, and that he hopes materially to increase the membership of the association as a result of his visit.

Mr. Swenson believes it will be desirable to hold a convention in the West in another year or two. He said in relation to this topic: "All of the Western companies are decidedly in favor of holding the next convention in the West, and those on the Pacific Slope think that within the next few years the association should go to California, Oregon or Washington. Denver, Los Angeles, Seattle, San Francisco and Portland want the convention. In order to keep the companies in the West interested in the association we should have a convention in some Western city. The representatives of Pacific Coast companies say that it takes their representatives from three to four weeks to attend a convention at Atlantic City. We should go to Denver, say, in 1909, and to the Pacific Coast in about five years."

In speaking of business conditions, Mr. Swenson said that the companies in the part of the country between Chicago and the Western coast had felt the business depression less than those in the section between Chicago and the Eastern coast.

Discussing features of electric railways that impressed him particularly, Mr. Swenson spoke of the important rehabilitation now under way in Salt Lake City and of the various interesting types of cars in Western cities. The Utah Light & Railway Company has begun improvements in all departments. The streets in that city are 92 ft. wide from curb to curb, and wires of all kinds have been carried on poles through the center of the streets. All light, power and telephone wires are being put underground. In a number of the cities visited the cars are built either by local manufacturers or by the railway companies. The Denver type of car is very light. The companies at Los Angeles build many of their own cars. Various types of cars are used in San Francisco. Some are of the Chicago type, others of the open type used in Los Angeles and Oakland. The counter-weight system is used in both San Francisco and Seattle on lines which run on steep hills.

Mr. Swenson said that most of the car houses he saw have open ends. The climate in some of the cities visited permits the storage of cars in the open air.

One of the most attractive trips that can be had on an electric railway, Mr. Swenson said, is the ride up Mount Lowe. The road which is operated on this mountain is owned by the Pacific Electric Railway, of Los Angeles.

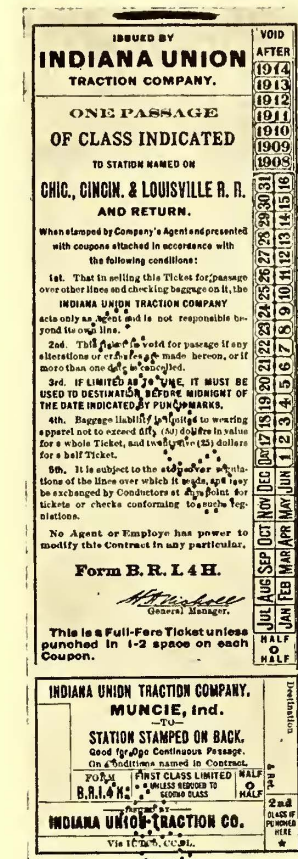
During his attendance at the meeting of the Southwestern Electrical & Gas Association Mr. Swenson spoke to the members of the relations between that organization and the American association. He said that the Southwestern association is progressive and enthusiastic.

Commissioner McCarroll and Chief Engineer Seaman of the New York Public Service Commission, First District, have returned from a trip to Europe. Mr. McCarroll said regarding the underground system: "The London underground roads have only two tracks, and do not run express trains. In that respect we are far ahead of that city, and even our local trains make much better time. All the subway cars have doors in the middle and at each end, and discharge their passengers very quickly. But the London crowds are much smaller than ours."

THROUGH TRAFFIC ARRANGEMENT OF INDIANA UNION TRACTION COMPANY WITH STEAM ROAD

The Indiana Union Traction Company has completed arrangements for joint rates and through routes with the Chicago, Cincinnati & Louisville Railroad, a steam line. Under this arrangement the traction company sells through tickets from Indianapolis to Chicago and has established a

special service to develop this business. Connection is made between the traction company and the steam road at various points; the place of connection for the Chicago traffic is Peru, Ind. The distance from Indianapolis to Peru on the line of the Indiana Union Traction Company is 77 miles. One train leaves Indianapolis at noon and reaches Peru in 2 hours and 20 minutes, making stops on the way only at Noblesville, Tipton and Kokomo. Passengers bound for Chicago are taken directly to the station of the steam railway at Peru, and reach Chicago at 6:40 p. m. In the evening trains leave Indianapolis at 7, 9 and 11:30 p. m. and, on arrival at Peru, passengers can get into a Pullman car which stands on a sidetrack until 2:35 a. m. At that time the car is added to a train bound for Chicago, which is reached at 6:40 a. m. Corresponding return service is afforded from Chi-



Top of Interline Ticket

cago to Indianapolis. The upper part is shown of one of the joint tickets issued by the Indiana Union Traction Company and the connecting steam railway. The rate for a berth from Peru to Chicago is \$1.50, or 50 cents less than the rate from Indianapolis. Passengers who travel by the combined electric and steam route also make a small saving on the price of a ticket on the steam line.

EFFECTS OF CHESTER STRIKE

The New York *Evening Sun* in commenting editorially on the situation at Chester, Pa., in the issue of July 3 said: "Those persons who talk glibly of the boycott as a desirable instrument in industrial progress would do well to pay some attention to certain incidents in the traction strike at Chester, Pa., which in 12 weeks has done more harm to the town than any disaster in its history. The sympathy of the citizens with the strikers, which was universal at first, was not alienated by acts of violence like the blowing up of a bridge, but rather by the vindictive boycotting of individuals. The result is a widespread feeling of exasperation on the part of the leading citizens of the city, who are determined to end the reign of terror which has made life unbearable. Those who once sided with the strikers are now prepared to give their support to a committee of public safety."

DATA SHEETS FROM THE COMMITTEE ON POWER GENERATION

The committee on power generation of the American Street and Interurban Railway Engineering Association has issued the following letter and data sheets:

ANDERSON, Ind., June 29, 1908.

To the General Managers and Superintendents of Power Stations of Member Companies:

GENTLEMEN—The committee appointed by the American Street and Interurban Railway Engineering Association to investigate certain subjects on power generation submits herewith for your consideration a number of questions bearing on the subjects of steam turbines, flue gas analyzers or CO₂ recorders and steam meters.

You can readily see the importance of the subjects as covered by this committee, and recognize their importance in connection with power plant economics, and you will note particularly that they are subjects that are being actively discussed and on which there is a great demand for information.

We hope that you will assist in getting a prompt reply to those questions and return it at as early a date as possible.

The committee was unavoidably delayed in getting these questions before the member companies, and as our time for making complete report to the association is very limited, we will appreciate your kind assistance in furnishing the information asked for, so that the committee's report on the above subjects may be of value to the member companies when presented at the next annual meeting. Please forward replies direct to G. H. Kelsay, superintendent of power, Indiana Union Traction Company, Anderson, Ind.

Yours very respectfully,

G. H. KELSAY, Chairman;
C. F. BANCROFT,
WM. ROBERTS,
GEO. B. DUSINBERRE,
G. O. HARVEY,
R. A. DYER, JR.,

Committee on Power Generation.

The data sheets follow:

FLUE GAS ANALYZERS

- Have you a CO₂ recorder or flue gas analyzer?
- What type CO₂ recorder or gas analyzer?
- How long has it been in service?
- What is the total capacity and average daily load of your boiler plant in b. h. p.?
- Do you use mechanical draft?
- Do you employ hand firing?
- What type of hand fire grates do you use?
- Do you use mechanical stokers?
- What type of mechanical stoker do you use?
- Do you find that there is any particular type of hand fire grate or stoker with which it is easier to obtain a high per cent of CO₂ flue gases?
- Have you records showing fuel economy before and after the use of the recorder?
- From such records what was the fuel consumption per kw-hour prior to using the recorder?
- What is the fuel consumption per kw-hour since adopting change in operation guided by the recorder?
- Was the coal used during the period covered by records with and without the recorder approximately the same grade?
- Do you find from day to day a uniform correspondence between high percentage of CO₂ and low coal consumption per kw-hour?
- What average per cent CO₂ do you usually obtain under the guidance of CO₂ recorder?
- What average per cent CO₂ did you find you obtained in your flue gases previous to being guided by the use of the recorder?
- Do you find loss account of insufficient air, excess air or lack of proper diffusion of air?
- Do you make coal analysis?
- If so, what is the analysis (B. t. u., moisture, ash, etc.) of the coal used?
- Has the maintenance and attention required to keep CO₂ recorder in service and operating accurately been a material factor, and if so, what expense?
- If excessive attention has been required has it been due to structural defects of the instrument or lack of proper skilled attention?
- Where several furnaces discharge their gas into one stack is it necessary to have a continuous record of the conditions of each furnace, or will not a record of the stack gases give all the information that is usually required?
- Do you find that your dampers require much more frequent regulation than before the installation of the CO₂ recorder?
- Are you able to maintain a good CO₂ record during time of very light load or while a number of your boilers are on banked fire?
- In the event of finding that recorder indicates unsatisfactory conditions what steps have you taken to improve results?
- What is the form and location of the gas collector in the flue which has been found most satisfactory?
- Does your gas analyzer give a record of other gases than CO₂?
- If so, is the additional information of practical value?
- Do you have the recorder checked by a chemist for accuracy and if so, how often?
- If you use CO₂ recorder that requires constant manual manipulation, how often do you make determination of CO₂ in flue gases?
- From only a frequent analysis of flue gases can conditions of firing be so regulated as to give good results with high per cent of CO₂ in flue

gases, or do you regard it essential that to obtain best results a CO₂ recorder should be constantly indicating the per cent of CO₂ in flue gases?

Should such record be so displayed that boiler room attendants can see and be guided by it?

Do you encourage boiler room attendants to obtain a good CO₂ record by paying a bonus on good record which they obtain?

PRACTICAL OPERATION OF STEAM TURBINES

- Have you steam turbines in operation?
- Mention number of turbine units, rated capacity (specify a. c. or d. c.) and by whom manufactured.
- How long has each been in service?
- Have you reciprocating engine type units in operation?
- Mention number of reciprocating units, rated capacity (specifying a. c. or d. c.), type (simple, compound or triple) and by whom manufactured.
- What is the difference between turbine plant and reciprocating engine plant in cost of repairs and maintenance under like conditions of load?
- Is it favorable to the turbine plant?
- What is the difference between turbine plant and reciprocating engine plant in labor cost of operation?
- Is it favorable to the turbine plant?
- What is the difference between turbine plant and reciprocating engine plant in fuel consumption per kw-hour under like conditions of load?
- Is it favorable to the turbine plant?
- From your experience do you regard the turbine as more reliable than reciprocating engines?
- Which type of units (turbines or reciprocating engines) do you prefer for operation under varying load?
- Which type under varying steam pressure?
- What type auxiliaries (steam or electric driven) do you consider most suitable for use with turbine units?
- What type auxiliaries most suitable for reciprocating units?
- What type condensers do you recommend for use with turbine units?
- What type of condenser do you recommend for use with reciprocating units?
- What vacuum are you obtaining under normal operation of your steam turbine?
- What is the highest vacuum which you regard practical to maintain with your operating conditions?
- Do you recommend condenser with or without dry vacuum pump for turbine units?
- Do you inspect your turbines systematically by opening?
- To what extent and at what intervals?
- What degree of superheat do you use, and what per cent saving have you obtained thereby?
- Do you consider it equally necessary for turbines and reciprocating engines to be heated up before starting?
- If not, which has the advantage in time, and how much?
- Does your experience indicate that the erosion of turbine blades is going to be a material factor in the maintenance of same?
- Have you replaced any turbine blades on account of the erosion of same?
- How long have they been in service before requiring replacement?
- Do you find that turbines grow less economical as they age and wear?
- Considering the decreased efficiency of the turbine under over-load, to what extent is the use of the over-load capacity justified in carrying the daily peaks of railway service?

STEAM METERS

- Do you use steam meters?
- What makes?
- For what purpose do you use them?
- Do you use them continuously or for short periods while testing?
- Do the meters integrate the quantity of steam used, or do the meters record by plotting curve or simply indicate instantaneous values?
- Do you consider steam meters reliable instruments?
- Do you regard them a desirable addition to steam plant equipment?
- What is the effect of moisture on the operation of steam meters?
- What is the effect of superheat on the operation of steam meters?
- What is the effect of slight variation of steam pressure on the operation of steam meters?

CHESTNUT POLE PRESERVATION

The United States Department of Agriculture gives, in Circular 147, a record of progress in chestnut pole preservation, based largely upon the results of a series of experiments conducted at Parkton, Md., from August, 1905, to June, 1907, in co-operation with the American Telephone & Telegraph Company. The results of the experiments establish chestnut as one of the best kinds of wood for use as poles. The department says:

"As the best poles come from sprout trees, care should be exercised in felling. It is sound policy for all pole users to encourage a careful system of cutting.

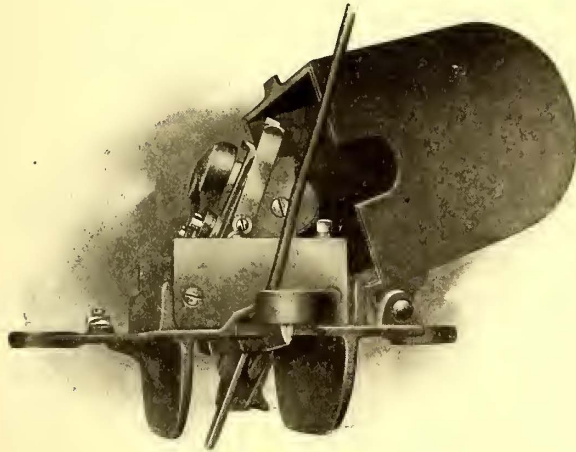
"Soaking poles in water preparatory to preservative treatment is not recommended, as it results in no better absorption or penetration of the oil.

"Incipient butt or top checks caused by careless cutting or natural defects should be treated with S-irons to prevent the poles from splitting. This applies especially to poles cut in spring and summer.

"The sapwood of chestnut, which is a thin layer, should be completely saturated with the preservative. This can be accomplished by heating the poles in oil for six hours and leaving them in the cooling oil overnight, or by heating them in hot oil for four hours and plunging them into cold oil for two hours.

SWITCH FOR BLOCK SIGNALS

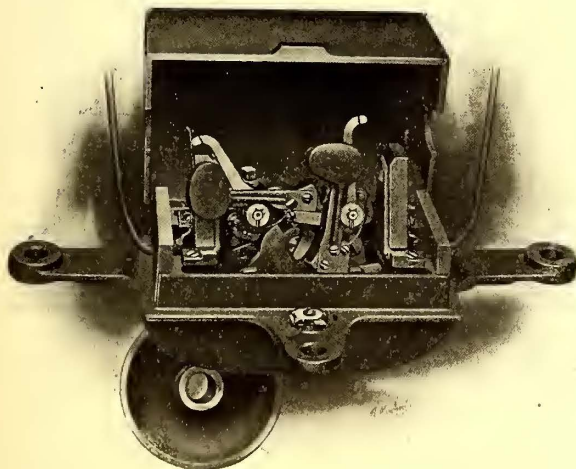
The United States Electric Signal Company, West Newton, Mass., has placed on the market a new trolley switch for operating block signals of the end-set type. The switch is only 8½ in. long x 5 in. wide and stands 5½ in. high on the trolley wire. The projecting ear and span lugs measure 14 in. and 10 in., respectively. Small side plates or ribs extend down 2 in. on each side and run the length of the casement, 8½ in. The cover is a one-piece malleable-iron casting, weather-proof and hinged at the side,



End View of Switch

making access easy. The switch equipped weighs about 19 lb.

On the underside of the casement there is a slanting bed plate for the pendulum which is secured to the casement and is designed to afford a good bearing. The bed plate has a groove under the lower edge that rests lightly on the trolley wire, and the switch is secured to the trolley wire by means of two trolley ears, one at each end of the switch. The end lugs being adjustable to the height of any standard ear, bring the top of the trolley wire up loosely into the groove of the bed plate.

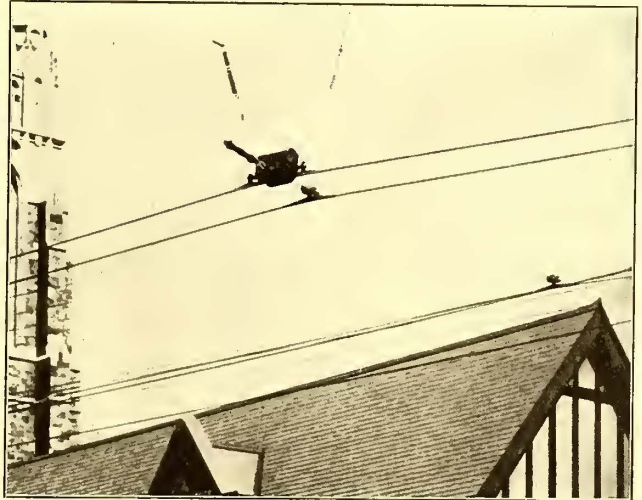


Side View of Switch

All the members, including the pendulum, are mounted loosely on their bearings. Each movable contact member has stationary contact springs which complete the circuit when the member is moved. The intermediate member consists of a roll and hanger 1 in. long from the center of the roll to the center of the axis on which it turns. Extending from the axis of the hanger at one side is a stop bracket co-operating with an extension of the inertia device that holds the two members in a relative position, and through the hanger from the other side a sleeve projects

through which the shaft passes which forms the axis of all the members.

Mounted loosely on this sleeve next to the intermediate member is the inertia device, by means of which the electric contacts are maintained long enough to operate the signal relay mechanism. The movable contact member mounted loosely next to the inertia device is governed by the latter and is held in a definite normal position by a torsion spring which yields to the action of the inertia



Switch in Place on Line

device to allow the latter to continue rotating after the contact member has made contact and come to a pause against its stop. Two combinations of members are used, one on the right and one on the left. They are so set that while one is acting it obstructs the action of the other so that the recoil of the pendulum will not operate reversely.

The operation of the device is very simple. When the passing trolley wheel touches the projecting lower end of the pendulum it causes it to swing in the direction in which the trolley wheel is moving. This brings one of the shoulders in contact with the roll of the intermediate member and causes the intermediate member to turn on its axis. As all of the members are rotated by means of the torsion springs the movable contact lever is thrown over and comes in contact with the stationary contact member, closing the electric contacts momentarily. This charges the magnet of the signal relay and operates the signals.

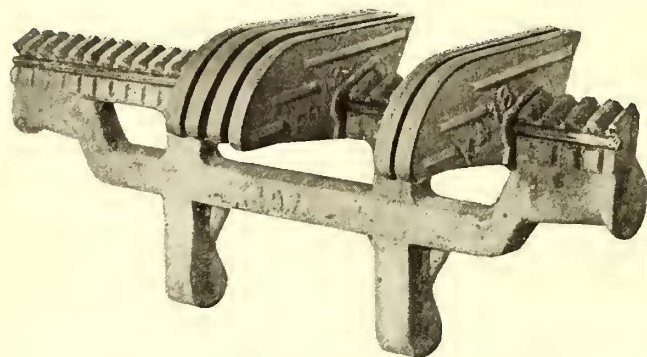
CHEMICAL FIRE EXTINGUISHER

The H. W. Johns-Manville Company, New York, has put on the market the Success portable fire extinguisher made of extra heavy Lake Superior cold rolled copper, securely riveted and reinforced by heavy shoulders of solder tested to withstand a pressure of 350 lb. to the square inch. The frame work, or bottle holder, containing the supply of sulphuric acid, is cast brass and virtually indestructible. The hose, tested to 400 lb. to the square inch, is detachable with a wrench, being joined to the body by a swivel joint. To put the apparatus in action it is only necessary to turn it bottom up and the resultant mixture of sulphuric acid with the 3 gal. of water charged with bicarbonate of soda develops instantly force enough to throw a stream 50 ft. By means of a lead stopper, fitting loosely, the flow of sulphuric acid is regulated and just the correct amount of gas generated at all times, making explosion impossible. The extinguisher is approved by the National Board of Fire Underwriters.

THE NEW MODEL RONEY MECHANICAL STOKER

The improvements embodied in the new Roney stoker illustrated herewith represent the gradual development from experience gained in the equipment of over a million and a quarter horse-power in boiler capacity. The following is a summary of the most important features of this latest design:

In the general type, the coal is fed to the stoker through a hopper extending across the boiler front, and from this



Sectional Grate Bar with Non-Sifting Top

hopper it is automatically supplied to the furnace by a reciprocating pusher operated from the rock shaft by an eccentric. The fuel descends through the throat of the arch on to the upper grate bars where it is subjected to an intense heat radiated from the incandescent fire-brick arch spanning the upper portion of the furnace. This entirely cokes the fuel and drives off all the volatile gases, leaving the coke or fixed carbon, which is then gradually worked down the inclined surface by the rocking motion of the grate bars, imparted to them from the eccentric on the rock shaft.

The oscillation of the grate bars not only works the fuel slowly down the furnace, but also keeps it constantly agitated, thus largely preventing the formation of clinker and bringing the fuel into intimate contact with the incoming air. After the solid combustibles have been totally consumed, the remaining ash is discharged on to the dumping grate at the bottom of the furnace.

From the foregoing it will be evident that the fuel is fed to the furnace at a uniform rate, depending upon the load; that the fuel is coked in the presence of a preheated air supply, and that combustible air is brought into intimate contact with the quantity of air required for complete combustion.

One of the most important features of the new stoker is the sectional grate bar illustrated, in which the number of grate bars has been reduced one-half. For the upper four grates a non-sifting type top is used, provided with abutting horizontal ledges to prevent the fine fuel from sifting through the bars, and yet permit free entrance of air. As only the thin edge of the fire top is exposed to the direct heat of the fire, while both sides and the bottom edge are cooled by the incoming air, it is evident that these tops are well protected from over-heating. For each square foot exposed to the fire, 7.4 sq. ft. of surface is cooled by the air, giving 7.4 times the cooling effect of the flat top grate bar.

The grate proper consists of thin plates set on edge in V-grooves. These hook over a trussed web, and are held in place by a key-rod slipped in from one end, so that they are easily removed. The webs have conical bearing surfaces at the end, which makes them self-centering in the

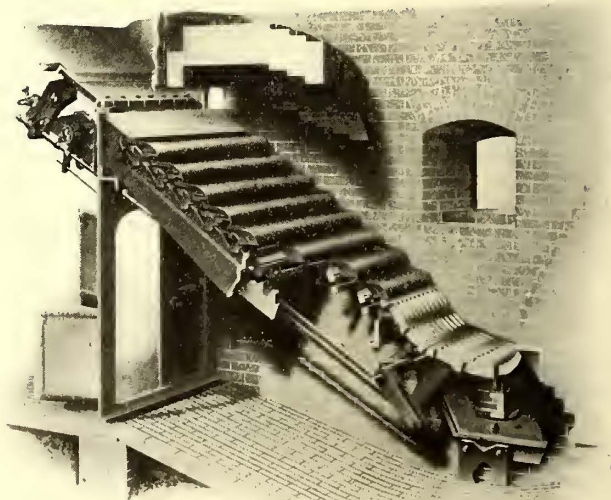
side bearers and prevents any uneven wear. By lifting the webs out of the bearers and removing the key-rods, the tops may be redistributed if desired, to equalize the wear in various parts of the furnace.

An average annual depreciation of about 17 per cent was shown in tests of eight sectional grates, indicating a probable life of about six years, if the bars are redistributed from time to time. In the upper part of the furnace the wear was practically nil. The boiler from which the samples were taken was subjected to unusually severe conditions, having been operated above rating practically continuously, and at times forced to 100 per cent above its rated capacity.

One of the principal advantages of the sectional grate bar tops is the reduction in scrap when they have worn far enough to be discarded. In this stoker all internal parts are made interchangeable. No bolts are used, and any part can be removed without disturbing the other.

The new guard prevents the fire from sliding into the ash pit when the dumping grate is operated. As the lower end of the guard is now raised, instead of cutting through the fire, as formerly, it not only makes it possible to dislodge from the fire all clinker formed at the bottom, but also provides an unobstructed descent for the ash and clinker separately. When dropped to its normal position, the guard permits the lower edge of the fire to settle without sliding.

The new dumping grate is hinged about one-third forward, dumping both front and rear. Being nearly balanced, it is very easily operated. The upward motion of the dumping grate breaks up any clinker bridge tending to form between the grates and bridge wall. Both the dumping guard and grates rest in U-shaped trunnions in the side bearings, the guard being simply hooked over the bearing



Section of Roney Stoker in Place

rods. The latter, therefore, can be easily removed without dismantling any portion of the stoker.

The rocking motion is transmitted to the grate bars by a connecting rod from the eccentric "agitator." As the grate bar tops are unbalanced, they return to the inclined position by their own weight, and, therefore, only one feed adjustment, made by the sheath nut on the end of the connecting rod, is necessary. As motion has to be transmitted to the connecting rod in one direction only, by the agitator, a simple locking device, or dog, is used for hold-

ing the grates open to permit rapid trimming of the fires.

A gradual coking of the green fuel and an adequate supply of preheated air admitted above the coking bed are provided for as one of the most essential elements in smokeless combustion. The air to effect the combustion of volatile hydrocarbons is admitted through two windgates located on either side of the stoker. It first passes to the rear of the fire brick arch, extending across the front of the furnace, and is then directed by baffles to the crown of the arch, at which point it enters the front air spaces. From the latter it enters the furnace through the spaces between the stoker front and the first ring of arch brick. Passing the air over the furnace preheats the air and assists materially in cooling the arch.

The fire brick arch cokes the green fuel and directs the gases downward over the hottest part of the fire, therefore permitting the volatile gases to be completely consumed before coming in contact with any of the boiler heating surfaces.

With the grates open maximum width, the effective admission area of the entire grate is 36.8 per cent of the projected area of the furnace. With the grates in their lower position, the effective opening is 24.2 per cent, the average effective draft area of this type of stoker being 27.4 per cent of the total projected area, as compared with an average of 17.9 per cent with flat horizontal fire tops. This increased admission area makes it possible to maintain a higher rate of combustion. This has been very effectively brought out by a series of capacity tests at East Pittsburg. During these tests an output of over double rating, 224.7 per cent, was maintained for six hours, with 0.42 in. furnace draft. This corresponds to a rate of combustion of 46 lb. per sq. ft. per hour, with a very reasonable overall efficiency of 63.5 per cent at this load. A test of 25 per cent above rating was maintained for six hours with 0.18 in. draft, with 74 per cent efficiency and 23 lb. of coal per sq. ft. of grate per hour. The fact that the boiler and grate passed through this severe test without damage while the brick setting was melted down, illustrates the effectiveness of the improved air distribution throughout the gates, and also the fact that a somewhat higher rate of combustion may be normally maintained with the same efficiency—in other words, a higher output per boiler unit.

The new model has been adopted in about 50 plants, with such good results that many equipped with the older type are voluntarily changing over to the new. In New York some of the large power stations are now being equipped with them, among them the Ninety-sixth Street station of the Metropolitan Street Railway Company.

ANOTHER NEW YORK BRIDGE OPEN TO ELEVATED RAILWAY TRAFFIC

The first elevated train of the Brooklyn Rapid Transit Company to cross the Williamsburg Bridge over the East River between New York and Brooklyn was sent over that structure soon after 2 o'clock p. m. on July 7, in charge of officials of the Bridge Department and of the Brooklyn Rapid Transit Company. Two test trains of three cars each—the first train of present B. R. T. equipment and the second of heavy all steel coaches—were successfully operated several times across the bridge. Tests of eight and ten-car trains will follow in the course of a few weeks. Until the subway station at the Delancey Street terminal of the bridge is completed regular service cannot be begun. Finishing touches are in progress on the station and it is hoped to have it ready for regular traffic by August 15.

CONCRETE BLOCK TIES

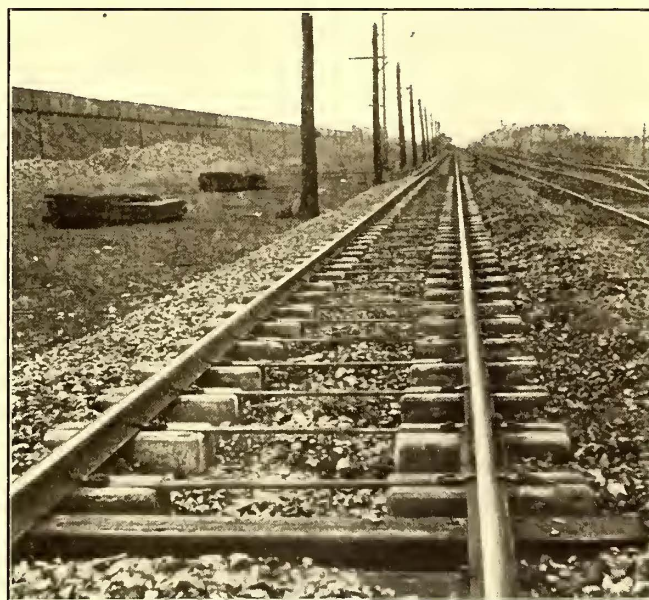
At last week's convention of the Street Railway Association of the State of New York, at Niagara Falls, there was exhibited the Corell reinforced concrete cross-tie with which a test section had been laid down for the International Railway Company, of Buffalo, N. Y. A paper on concrete ties by the inventor of this tie, H. J. Corell, appeared in the *STREET RAILWAY JOURNAL* for May 2.

The Corell tie introduces the idea of two blocks or sleepers, one under each rail, connected by a steel or iron cross-



Concrete Tie—Blocks with Cross Tie Rods

bar lying in a slot along the top of the block. Both block and bar are bolted to the rails by a U-shaped $\frac{3}{4}$ -in. bolt embedded in the tie. This bolt is carried down to a depth of 9 in. so that it has ample bearing surface. The advantages claimed for this construction are that the double block does away with center-bound tracks, avoids all the rocking motion and other objections to the long rigid tie, and places the rail support directly under the wheel load by a central pressure on the support instead of end pressure on long ties. These blocks are 28 in. long, 12 in. wide and



Concrete Tie—Section of Unballasted Track

10 in. thick, thus giving 50 per cent wider contact with the foundation ballast than an 8-in. tie and the support is directly under the wheel load.

As the blocks do not go across the track, opportunity is left for filling the center of the track solidly with ballast to prevent the track from shifting sideways, and as each block is bolted to the rail flange rail creeping is eliminated.

As concrete is fireproof and practically indestructible, these blocks should constitute a more durable support for rails than wood ties. They can be installed as cheaply per mile of track as white oak ties. Being 12 in. wide, the

inventor claims that only two-thirds as many are required, and as they can be made at the nearest gravel-pit, the freight need cover only the necessary cross-bars. The blocks are made with a portable hydraulic pressure machine, which produces them absolutely uniform.

The test section for the International Railway was installed last April, and has sustained a traffic with speeds up to 60 m.p.h. The ties are said to show not the first sign of wear or powdering under the rails. The firm bolting of the rail to the tie gives no chance for friction or blow between those surfaces. The cross-bar is gibbed up at each end to afford an additional support to the outside clamps, relieving the bolt from the most of the strain of



Concrete Tie—Section of Complete Track

wheel thrust, insuring perfect gage and preventing spreading rails.

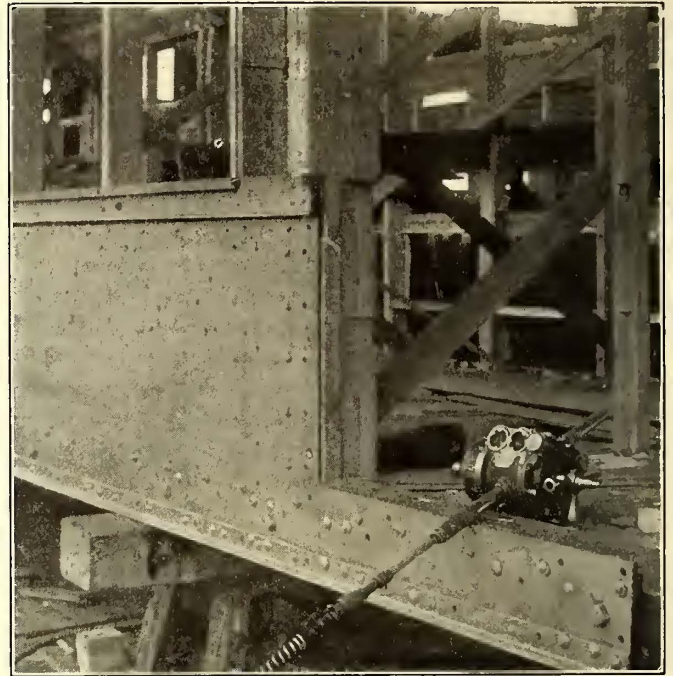
The tie is sold by H. A. Corell, Buffalo, N. Y.

INTERURBAN CARS FOR THE NORTHERN OHIO TRACTION & LIGHT COMPANY

The Northern Ohio Traction & Light Company on June 7, placed in its limited service between Cleveland and Canton, Ohio, four handsome interurban cars built by the G. C. Kuhlman Car Company. Several novel features in the design, construction and finish of cars of this class have been incorporated. Prominent among these is the window arrangement which adds materially to the light in the cars as well as leaving an unobstructed view to pas-

art-glazed sash, back of which the curtain has always been placed, the two together shutting out all light.

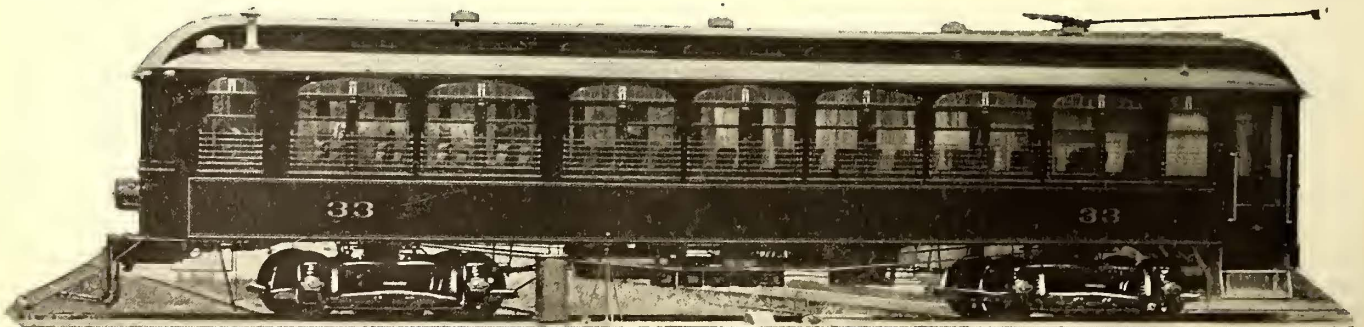
Reference to the illustrations of the method of constructing the sides will show the extra space acquired in a car



Northern Ohio Car—Method of Constructing Sides

narrow on account of terminal conditions to permit a wide and comfortable seat without decreasing the width of the aisles. To avoid inside trusses and braces, which take up the valuable space between the posts needed for the seat ends, a construction which appears more rigid than the ordinary method was devised to add $5\frac{1}{2}$ in. to the interior width of the car and allow the seats to be $2\frac{3}{4}$ in. longer.

The new construction includes a 30-in. x $5\frac{1}{16}$ -in. steel plate extending the full length of the car body between the belt rail and the bottom of the sill. The plate is reinforced at the top and bottom by 2 in. x $1\frac{1}{2}$ in. x $\frac{1}{4}$ in. angles with flange extending outwardly, and also at the bottom with a 7-in. x $3\frac{1}{2}$ -in. x $\frac{1}{2}$ -in. angle with flange extending inwardly. The plate, which is securely bolted to sill and posts, is entirely covered with a board made of full-



Northern Ohio Car—Exterior View

sengers compelled to stand in the aisle. This is accomplished by eliminating the usual letter board and placing the elliptical art-glazed sash which covers the space of each pair of side windows, against the side of the car as a dummy or stationary sash, thus permitting a greater window height below. In other cars of this type, even of recent construction, this space is occupied by the elliptical

length sections, tongued and grooved and glued together. As it is tightly fitted between the angles at the top and bottom, this board resists any tendency of the plate to buckle and serves as a truss plank. Over this board a sheathing of tongued and grooved poplar boards is placed, each board glued and nailed to hold it rigidly in position.

Particular stress has been laid upon sanitary conditions;

the finish has been designed to eliminate all moldings, carvings and other dirt catchers, and the aisle is covered with interlocking rubber $\frac{3}{8}$ in. thick, set in cement. The interior of the toilet room is finished in "Metile," while the floor is covered with a marble slab 2 in. thick with a drain outlet; this slab is also set in cement. The equipment of this room includes a disinfectant and globe ventilator.

The car interior is finished in a plain but rich manner, the wood employed being selected African mahogany. Particular attention is called to the novel and practical effect in lighting, all the lighting fixtures being of colonial design. A 16-cp frosted bulb is placed over each seat just below and extending outwardly from the lower ventilator rail. A handsome bronze lantern with art glass, in the center of which is a 50-cp G.E. Meridian lamp, is placed in the center of the ceiling in every other panel. These lanterns in the alternate panels are balanced by a handsome bronze grill opening to the globe ventilator, and back of the grill there is fine copper wire mesh, so good ventilation is assured. In the rear vestibule there is a dome and a 50-cp G.E. Meridian lamp mounted on a handsome colonial base. The location of the 45 lamps with a total of 890 cp

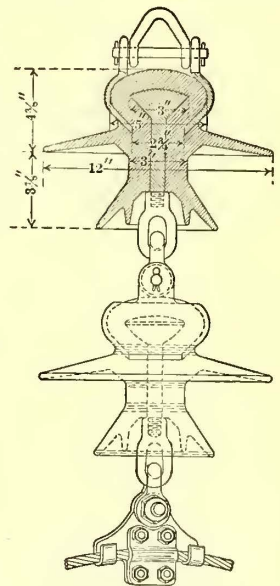
stead. Wrecking tools and box, motorman's tool box and a heavy oak box under the car containing a 15-ton jack and steel rope are other items of the equipment.

The cars are mounted on 7-ft. wheel base Brill No. 27-E2 solid forged frame trucks with triple elliptic springs. The motors are GE-202 with the same manufacturer's control. Westinghouse air brakes and Crouse-Hinds arc and incandescent headlights are used in addition to such specialties as automatic vestibule door controllers, seats and channel iron bumpers. The bumpers have an 11-in. face.

The chief dimensions of the cars are as follows: Length over the sheathing, 42 ft. $9\frac{1}{4}$ in.; over the crown pieces, 52 ft. $3\frac{3}{4}$ in.; width over the sills, including the sheathing, 8 ft. 6 in.; maximum width, 8 ft. 8 in.; centers of posts, 2 ft. $8\frac{1}{2}$ in.; height from the floor to the ceiling, 8 ft. $7\frac{1}{4}$ in.; from the track to the under side of sills, 3 ft. $5\frac{1}{2}$ in.; from the under side of sills over the trolley board, 9 ft. $\frac{1}{4}$ in.; size of side sills, 5 in. x 8 in.; center sills, 5 in. x $6\frac{15}{16}$ in.; intermediate sills, $3\frac{3}{4}$ in. x $6\frac{15}{16}$ in.; end sills, $5\frac{1}{4}$ in. x 8 in.; sill plates, $\frac{5}{16}$ in. x 30 in.; thickness of corner posts, 4 in.; side posts, $1\frac{3}{4}$ in.; wheel diameter, $34\frac{1}{2}$ in.; axle diameter, $5\frac{1}{2}$ in.

FLEXIBLE SUSPENSION INSULATOR

The accompanying illustration shows a suspension type of high-voltage insulator which is claimed to possess many desirable features. Between the two units, and between each unit and the structure which it supports, or from which it is suspended, there is provided a universal joint which allows absolute freedom of movement. Thus the insulator as a whole is entirely flexible and no portion of the dielectric is subjected to unnecessary mechanical stress. However, the units have been designed with special reference to mechanical stresses, it being estimated that a tensional force of 20,000 lb. can be withstood. Mechanically considered, the unit is built up of a central bolt $\frac{3}{4}$ in. in diameter, having a conical head 3 in. in diameter. External to this head and separated from it by 1 in. thickness of "Electros" insulation is an outer cylindrical bell having such dimensions that it cannot part company with the central bolt even though the insulating material were totally destroyed.



Suspension Insulator



Northern Ohio Car—Interior

gives a very pleasing effect at night. Coat hooks placed on the pilaster between each pair of windows, together with individual parcel racks, all of colonial design, add materially to the beauty and efficiency of the car.

The smoking room is separated from the passenger compartment in the usual manner, except that the glass in the door of this partition and the end and vestibule doors as well have the plate glass carried down to within 22 in. of the floor, adding greatly to the beauty of design and finish. This feature, together with the low windows in the front vestibule, permit observation from the interior. A Peter Smith hot water heater is located in the motorman's cab, the floor of which is covered with a $\frac{3}{8}$ -in. perforated rubber mat. A folding theater seat is placed at the right hand for an inspector or other official when riding in the cab. Signal bells have been excluded, air blast being used in-

The dimensions given above refer to an insulator having a hood 12 in. in diameter, each unit being capable of withstanding an electrical pressure of from 35 kw to 40 kw, and the insulator as a whole is designed for 60,000-volt circuits. It has been selected for use at this voltage by the Indiana Steel Company. It is interesting to note that each element of this insulator is practically identical with the 12-in. insulators employed exclusively on the Niagara-to-Buffalo transmission line of the Canadian Niagara Power Company, which company recently placed an order for 900 additional insulators of the same type. The insulators described are built by the Electrose Manufacturing Company, of Brooklyn, N. Y.

ELECTRIC RAILWAY LEGAL DECISIONS

CHARTERS, FRANCHISES & ORDINANCES

Alabama.—Taxation—Street Railway Corporations—Liability for More Than One Tax.

A traction company, having paid the license tax expressly required of street railway corporations by Code 1896, Section 4122, subdivision 34, as amended by Act March 4, 1903 (Acts 1903, p. 204), is not liable for the corporate tax imposed by Section 4122, subdivision 55, as amended by Act March 5, 1901 (Acts 1900-01, p. 2616), or any other corporate, license, or privilege tax.—*Montgomery Traction Co. v. State*, 44 S. Rep., 541.)

California.—Appeal—Persons Entitled—Parties Aggrieved—Taxation.

A railroad was taxed by the county and city of San Francisco as an ordinary street railroad, and also taxed by the State as a railroad operated in more than one county. The city and county taxes were higher than the State taxes, and the State was entitled to a greater amount of tax by taking their share of the city and county tax than by taking their own tax. The railroad paid the higher tax into court, and interpleaded the parties, and from the judgment sustaining the higher tax the State appealed through its State Controller in the interest of the State only. Held that, inasmuch as the reversal of the judgment would deprive the State of a portion of the amount of the tax to which it was then entitled, neither the State nor the State Controller was a party aggrieved, entitling them to appeal.—(*United Railroads of San Francisco v. Colgan, Controller, et al.*, 94 Pac. Rep., 245.)

Maine.—Street Railroads—Acceptance of Franchise—Effect—Negligence—Failure to Repair Streets—Discrimination.

Whenever a franchise or right coupled with a corresponding duty is conferred by the Legislature upon a person or corporation and is accepted, such person or corporation is answerable by the common law to a third person who sustains damage by the neglect of that duty.

An acceptance by a street railway company of a franchise to occupy portions of the streets of a town with its railroad, coupled with the duty of keeping such portions of the streets in repair, gives a right of action against the company by a traveler injured by its neglect of that duty.

An act of the Legislature that no action shall be maintained against a particular street railway company therein named for injuries caused by its neglect of duty to keep in repair those parts of the street of a town occupied by its railway, unless one of its directors had 24 hours' actual prior notice of the defect and subsequent notice of the injury within 14 days, is to that extent unconstitutional and void.—(*Milton v. Bangor Ry. & Electric Co.*, 68 Atl. Rep., 826.)

Michigan.—Street Railroads—Franchise—Forfeitures—Grounds.

The fact that a corporation, authorized by Comp. Laws, Section 6234, paragraph 5, to construct its railroad on streets pursuant to the consent of the municipality, and possessing a franchise to operate a street railroad in a city pursuant to an ordinance imposing the conditions on which the railroad should be operated, carried freight not authorized, and charged excessive fares, and obstructed the streets of the city, was not a cause for the forfeiture of the franchise, but called for the regulation of the business done by the corporation.—(*Attorney-General ex rel. City of Monroe v. Toledo and Monroe Ry. et al.*, 115 N. W. Rep., 422.)

Minnesota.—Carriers—Carriage of Passengers—Performance of Contract—Transfers—Duty to Give Proper Transfer—Evidence of Right to Ride—Actions—Nature and Form—Damages—Wrongful Ejection—Necessity for Actual Force—Duty to Leave.

A passenger on a street car, who has paid his fare, is by virtue of that fact entitled to ride to the end of a line to which, under the city ordinances, he is entitled to be transferred. The contract of carriage is complete when the fare is paid.

Upon demand by the passenger it is the duty of the conductor to give a proper transfer slip, such as should be accepted by the conductor of the car to which the passenger is transferred.

The duty to see that a proper transfer slip is given rests upon the conductor, and not upon the passenger.

The transfer slip is not the sole and exclusive evidence of the passenger's right to ride.

No absolute duty rests upon the passenger to examine the transfer slip when it is delivered to him and see that it is for the proper car and is properly punched. He may rely

upon the inference that the conductor has properly done his work and performed the duty imposed upon him.

A passenger entered a crowded interurban car in the city of Minneapolis, paid her fare, and asked for a transfer to the Chicago Avenue line. A transfer slip was given her by the conductor as the car approached the transfer point. Without examining the slip, the passenger entered the Chicago Avenue car, which was then waiting. Upon presenting the slip it was refused by the conductor of the Chicago Avenue car, and upon her refusal to pay another fare she was ejected from the car. She acted in good faith, and informed the conductor of the circumstances under which she received the slip. Held that:

(a) She can maintain an action in tort against the railway company for the damages resulting from her expulsion from the car, and is not limited to an action for damages for breach of the contract to carry.

(b) The damages recoverable in such cases are such as naturally result from the wrongful act of the conductor in ejecting the passenger, taking into consideration the humiliation suffered, and including such special damages as are alleged and proven.

(c) The right of action is complete when the passenger is ordered to leave the car under circumstances which show that force will be used unless the order is obeyed. Actual force need not be used.

(d) When a passenger is thus ordered to leave a street car, it is his duty to comply with the order quietly and without insisting upon the application of actual force. If he resists the efforts of the company's agent to eject him, he can recover no additional damages resulting from the use of such force as is reasonably necessary to accomplish the purpose.—(*Morrill v. Minneapolis St. Ry. Co.*, 115 N. W. Rep., 395.)

New York.—Taxation—Corporations—Capital Stock—Railroads—Deduction of Indebtedness.

Tax Law, Laws 1896, p. 802, c. 908, section 12, provides that the capital stock of every company liable to taxation, etc., after deducting the assessed value of its real estate and all shares of stock actually owned by such company in other corporations which are taxable on their capital stock, shall be assessed at its actual value. Held that, where a street railway company leasing property from other companies paid taxes on the property of the lessor companies as part of the rent, it could not be compelled to again pay taxes based on the fee value of the leased property.

Tax Law, Laws 1896, p. 800, c. 908, section 6, provides that no deduction shall be allowed in the assessment of personal property by reason of the indebtedness of the owner contracted in the purchase of non-taxable property, etc. By Railroad Law, Laws 1890, p. 1104, c. 565, section 72, as amended by Laws 1891, p. 706, c. 362, all property of certain railroad corporations, merged under the statute in another railroad corporation, was by operation of law vested in the new corporation. Section 73 imposed on the new corporation an obligation for all debts of the old corporations. Held, that there was no purchase of property by the new corporation, and that it was entitled to have deducted from its assessment for taxation the amount of the existing obligations assumed by it and represented by bonds secured by mortgages.—(*People ex rel. Metropolitan St. Ry. Co. v. Barker et al.*, Tax Com'rs, 106 N. Y. Sup., 336.)

LIABILITY FOR NEGLIGENCE

Indiana.—Municipal Corporations—Obstructions in Street—Personal Injuries—Contributory Negligence—Questions for Jury—Use of Streets by Rider of Bicycle.

In an action against a street railway for injuries to plaintiff, while riding a bicycle at night, by running into bricks piled by defendant in the street and left without a warning signal thereon, plaintiff's alleged contributory negligence was a question of fact to be determined in view of all the circumstances.

One has the right to ride his bicycle on a public street at night, using ordinary care, and to assume that a street railway has done its duty in placing warning signals on an obstruction made by it in the street.—(*Kokomo Ry. & Light Co. v. Studebaker*, 83 N. E. Rep., 260.)

Iowa.—Street Railroads—Actions for Injuries—Instructions—Trial—Instructions—Conformity to Issues—Street Railroads—Collisions with Vehicles—Contributory Negligence—Injury Avoidable Notwithstanding—Street Railroads—Actions for Injuries—Questions for Jury—Contributory Negligence.

In an action for personal injuries caused by a collision between a street car and a team which plaintiff was driving, an instruction leaving the jury to determine whether ordinary care would require plaintiff to ascertain whether he could cross safely, by the use of his senses of sight and

hearing, was error, as plaintiff was bound in law to ascertain whether or not it was safe to attempt a crossing.

Where, in an action for personal injuries caused by a collision in the night time between a street car operated over one street and a team which plaintiff was driving on an intersecting street, the undisputed evidence showed that the accident occurred notwithstanding the efforts of both the motorman and plaintiff, upon discovering the danger, to avoid the collision, the doctrine of "last fair chance" did not apply, and an instruction based on such doctrine was erroneous, under the rule that the charge must be confined to those matters on which an issue has been joined.

A street railroad company is liable for injuries caused by a collision between one of its street cars and a team, notwithstanding the contributory negligence of the driver of the team, where in the exercise of due care by the motorman the danger might have been discovered in time to have avoided the calamity.

In an action for injuries caused by a collision between plaintiff's team and a street car, whether or not plaintiff was guilty of contributory negligence in not seeing the approaching car and thus avoiding the collision, held, under the evidence, a question for the jury.—(Doherty v. Des Moines City Ry. Co., 114 N. W. Rep.)

Kentucky.—Street Railroads—Injuries to Persons on Track—Evidence—Sufficiency—Street Railroads—Injuries to Persons on Track—Misleading Instructions—Liability.

Evidence, in an action for the death of plaintiff's intestate, who was run down by a street car, held not to warrant a peremptory instruction for the street railway company.

Where, in an action for the death of plaintiff's intestate, who was run down by a street car, there was no evidence that the brakes were defective or out of repair, and the defendant's evidence showed that they were in perfect condition, it was error to submit that question to the jury, and was calculated to confuse and mislead them.

Where a child runs out in the street so close to a car, running at a reasonable rate of speed, that the motorman cannot, by ordinary care, perceive its danger and stop the car, the street railway company is not liable for its death.—(Lexington Ry. Co. v. Van Loden's Amd'r., 107 S. W. Rep., 740.)

Maine.—Carriers—Who Are Employees—"Passenger"—Injuries to Passenger—Action—Declaration.

Where the assigned place of work of an employee of a street railroad company is at a distance from his home, he may, notwithstanding such employment, be a passenger with the rights of a passenger while riding in the cars of the company from his home to his assigned place of work.

Such employee so situated is a passenger while riding on a regular street car of the company from his home to his assigned place of work, if he so rides of his own volition, and not by the direction of the company, and pays his fare in coupons for fare issued to him by the company as a part of his wages.

In an action by a passenger against a street railroad company for injuries received through a derailment of the car, it is sufficient to allege generally that such derailment was caused by the negligence of the company or its servants without more particular specification.—(Herbert v. Portland R. Co., 69 Atl. Rep., 266.)

Massachusetts.—Street Railroads—Collisions—Contributory Negligence.

One driving an automobile backward in the principal street of a town onto an electric railway track collided with a car. He expected a car to pass about that time. After starting backing he did not look where the car was, though there was nothing to obstruct his view to the rear. The car, before colliding with the automobile, stopped to take on passengers. Held, that he was guilty of contributory negligence as a matter of law, though he looked when starting backward and the car was not then in sight.—(Birch v. Athol & O. St. Ry. Co., 84 N. E. Rep., 310.)

Massachusetts.—Discovery—Under Statutory Provisions—Subject Matter of Examination—Materiality—Street Railroads—Actions for Injuries—Instructions—Res Ipsa Loquitur—Discovery—Under Statute—Putting Answers in Evidence—Effect on Plaintiff's Case.

In an action for injuries to a passenger on a street car, where plaintiff did not declare on negligence in employing an incompetent conductor or motorman, interrogatories filed under the statute, to be answered by the president of the defendant company, as to the length of time the motorman and conductor had been in the service of the company, and as to whether either was a spare or extra motorman or conductor, respectively, were not material.

In an action by a passenger for injuries received from the overturning of a car, though there was no showing that the car was not in good condition, it was proper to refuse requested instructions that the jury could not find against defendant unless satisfied from the evidence that the derailment was due to some negligence on the part of defendant or some of its agents, and that the jury were not entitled to find such negligence from the mere happening of the accident, and that they were not entitled to guess or speculate as to the nature of such evidence, but that they must be able to reach some conclusion as to what the negligence was; for a car does not ordinarily leave its track and overturn unless something is wrong, and that is true whether the car is in good condition or not.

Where a plaintiff puts in the defendant's answers to interrogatories, he does not thereby bind himself to the truth of the facts therein stated; but, until contradicted by evidence, the truth of the statements stands as against the plaintiff who puts them in. Hence, in an action by a passenger for injuries from the overturning of a car, where there was no evidence in addition to the answers to plaintiff's interrogatories but the fact of the accident, and the fact of the accident was not evidence warranting a finding that the car was not in good condition, plaintiff is bound by evidence contained in the answers to the effect that the car was in good condition, and requested instructions to that effect are improperly refused.—(Minihan v. Boston Elevated Ry. Co., 83 N. E. Rep., 871.)

New Jersey.—Street Railroads—Person Struck by Car's Overhang on Curve—Liability for Injury.

A street railway company is not liable for injury to one who, while waiting for a car, was struck by the overhang of the rear end of the car moving in the ordinary way around a loop, where he saw the car was moving, but thought he was far enough away to be safe, where he had no contractual relation with the company, and where the motorman saw him two or three feet away from the car, and had no reason to suppose that he would remain where he was likely to be struck.—(Jelly v. North Jersey St. Ry. Co., 68 Atl. Rep., 1091.)

New York.—Carriers—Passengers—Who Are Passengers—Payment of Fare.

Where a person boarded a street car and tendered the conductor a transfer in payment of his fare, he was a passenger, although the conductor refused to accept the transfer, and the carrier was liable for an assault upon him by the conductor.—(Lewyt vs. Dry Dock, E. B. & B. R. Co., 107 N. Y. Sup., 14.)

Pennsylvania.—Carriers—Injuries to Passengers—Connecting Lines.

A street railway company sold a return ticket to a point on another railway with which it connected and ran a car operated by its own crew to the point in question. Held, liable to a purchaser of the ticket injured by the negligence of its employees while the car was running on the connecting line.—(Moss vs. Lancaster & York Furnace St. Ry. Co., 67 Atl. Rep., 869.)

West Virginia.—Appeal—Review—Award of Damages—Trial—Instructions—Damages.

The verdict of the jury in an action by a passenger against a carrier for injuries sustained must govern, unless the damages allowed are so excessive as to warrant the belief that the jury was influenced by partiality or prejudice, or misled by some mistaken view of the merits of the case.

In such action, where there is a demurrer to the evidence, it is not error for the court to tell the jury, if the issue is found for the plaintiff, "the damage should be at least one cent."—(Nichols v. Camden Interstate Ry. Co., 59 S. E. Rep., 968.)

Wisconsin.—Carriers—Carriage of Passengers—Relations—Who Are Passengers—Acquiescence of Company—"Trespasser"—"License"—Failure to Pay Fare.

A policeman entered a street car in good faith believing that he had a right to ride free, and was permitted to ride because of a custom based on an ordinance requiring the free transportation of policemen, and paid no fare. Held, that he was a passenger, even if the ordinance was void under the law prohibiting the granting of free transportation.

One who enters and takes passage in a street car with the consent of the company, and does not refuse to pay fare, is not a trespasser.

Mere failure to pay fare does not deprive one riding on a street car of his rights as a passenger, nor does it convert his relation to the owner into that of a mere license.—(Gabbert v. Hackett, 115 N. W. Rep., 345.)

News of Electric Railways

Capital Traction Company Distributes Gratuities

The Capital Traction Company, of Washington, D. C., on July 1 divided its conductors and motormen into three classes and will give them substantial monetary rewards—divided in proportion to the number of years each has satisfactorily served the company—at the end of each succeeding year.

The three classes include, respectively, the men who have "served satisfactorily" for two years; those who have "served satisfactorily" for five years, and those who have "served satisfactorily" for 10 years or more. At the end of each year, until they have become eligible as members of Class B, the members of Class A will receive a gratuity of \$50. Similarly until they become eligible to Class C, the members of Class B will receive \$75. Members of Class C will be given \$100 each.

These sums are to be considered solely as rewards of merit, because within any one year a motorman or conductor may make himself ineligible to receive the gratuity by failure to live up to the standard established by the company.

Any man will be ineligible if within the year the record charges him: First, with six reprimands for violations of the rules or regulations severally of the company; or, second, with two reprimands for the violation of the same rule or regulation, and three reprimands for the violation of the rules and regulations severally; or, third, with one suspension and two reprimands for the violation of the rules and regulations severally; or, fourth, with two suspensions; or, fifth, with continued indifference and inattention in service, without a positive violation of rule or regulation when said inattention or indifference has been called to his attention at least three times within the year by the general manager. Dismissal, of course, forfeits all opportunity for reward.

The announcement by the company to its employees was included in a circular letter to the motormen and conductors, signed by G. E. Hamilton, president, and D. S. Carll, superintendent, which said in part:

"On accepting service in the Capital Traction Company, in consideration of wages agreed upon, you assumed the duties of operating cars carefully and according to rule, of polite and considerate attention to passengers, of correct personal habits, a recognition of the rights of the public in the streets occupied by our lines, and of the positive avoidance of every act of commission or omission that might result in the loss of life or limb, or in the destruction of property.

"To perform well these important duties, it is necessary that you should at all times realize that a street car in operation is a thing of danger, not only to passengers, but to all persons using the streets, and that safety to passengers and to the public can only be secured by a prompt and implicit obedience to rule, and exceeding care, especially at crossings, at stops and on crowded thoroughfares.

"We desire particularly to enjoin upon you the absolute necessity of giving ample time to passengers to get on and off of cars. Never run in excess of the legal speed limit, and within that limit moderate and control your speed where intersecting streets, curves and crowds make faster travel dangerous.

"To save the company from loss, obedience to rule and the avoidance of accident is a positive obligation, but to save passengers and the public from bodily harm and the loss of life is even a more imperative duty.

"A neat appearance while on duty, polite attention and always polite language to passengers, especially to the old and the infirm, to women and children; close attention to every point of operation, the giving of full and sufficient time at all stops to passengers to get on and off cars, and a never-failing lookout for incompetent drivers of vehicles, crossing pedestrians and small children playing in the street, should characterize the conduct of every conductor and motorman.

"In urging these considerations upon you, we are not unmindful of the fact that a large percentage of the conductors and motormen of the Capital Traction Company have in the past given good service, and have earned thereby the confidence of the company and the commendation of the public. It is, however, our wish that you should, by greater interest and care, measure up even to a higher standard of excellence, and thus aid the company in its effort to give to Washington a street railway line equal in service and equipment to any in this country.

"To increase your interest and gain your co-operation, we

propose to place it in the power of every conductor and motorman who gives to the company good, careful, honest service, to receive, outside of and in addition to his wages, a pecuniary reward, graded according to his time of service and as set forth and explained in the accompanying pamphlet.

"To this system of rewards for efficient service and good conduct we call your particular attention, believing that it will prove of mutual benefit to the company and its employees."

The Strike in Chester, Pa.

On July 1 a committee of business men, comprising E. P. Maddux, C. P. Dickinson and A. L. Lapham, addressed letters to the Chester Traction Company and the trolley men's union, requesting them to submit the trolley strike by arbitration or otherwise, setting forth that failure to reach a settlement of the difficulty by July 6 would result in a general public meeting being called to consider what should be done by the public in regard to the matter. J. A. Rigg, president of the company, replied commending the meeting, but said the company could not consistently take part in such an assemblage. He said:

"The Chester Traction Company is gratified with this manifestation of a purpose and determination of the citizens of Chester to put an end to the tyranny that has dominated them for so long a time to the amazement of the civilized world. It would not be graceful or expedient for the traction company to take any part in this popular movement. This corporation is a public servant, and obedient to the popular will when lawfully expressed, but not submissive to the arguments of violence and disorder, or the reign of terror which has held the community in bondage for so long a time.

"The traction company has done everything possible to execute the trust committed to it as a transportation company. At great and extraordinary expense it is operating its cars on schedule time in the face of a methodical system of dynamiting and burning its property and of murderous assaults upon its employees and of the personal violence and disaster in business of all who dare to avail themselves of the use of the public service.

"The company has, at the instance and suggestion of citizens, from time to time consented to take back former striking employees as vacancies might occur, excepting only criminals, upon the general terms of original employment, but these concessions proved unfortunate and only tended to encourage the disturbers of the peace to prolong the period of disorder and confusion which they had brought about. We hope that an aroused community may now re-establish the supremacy of the law and restore the rule of peace and order which in the past the city of Chester so notably enjoyed."

In addition to the communication to the company from the committee of business men a letter was received demanding arbitration and recognition of the union.

In its reply to this communication the company said:

"Inasmuch as your threatening letter does not reveal the names of the organizations for which you speak, it should, perhaps, be treated as an anonymous communication, and as such unworthy of notice; but it has a significance, in view of the atrocious crimes committed in Chester within the past three months, and charged to the good people of the community under the false and preposterous pretense that honest men and worthy citizens have ruined each other's business and the prosperity of the city; terrorized the people by exploding dynamite under cars containing operators and passengers; brutally assaulted men peaceably engaged in their honest vocations, and perpetrated innumerable other outrages because of their sympathy for a hundred men who voluntarily quit their jobs and took to rioting and inciting to riot.

"The strike is a thing of the past, but the boycott is a crime to which submission is cowardly; and when, at the public meeting, the issue is joined between the men of Chester assembled and the organizations which you claim to represent, there can be but one result—a declaration of independence and the stamping out of the miscreants who have so dishonored the oldest and one of the noblest of our Pennsylvania cities."

The company had planned at the meeting of the Council on July 6 formally to present a bill against the city aggregating about \$200,000 for damages to its property owing to the failure of the police to afford proper protection. The

inventory was not completed in time, however, but an officer of the company who was present at the meeting said that the bill had been passed upon by the directors and is now in the hands of the legal department. He said that the claim specifies damage done to cars, signal systems, bridges and roadbed, and the loss in fares because of the intimidation of the people.

Fender Tests by the Public Service Commission of New York

The Public Service Commission of the First District of New York will conduct two public tests of fenders and wheel guards suitable for use on the street railways of Greater New York within the next three months at the works of the General Electric Company at Schenectady, N. Y., and of the Westinghouse Electric & Manufacturing Company at Pittsburg, Pa. The first test will be held at Schenectady probably early in September and the test at Pittsburg will follow a month later. Manufacturers and inventors of fenders and wheel guards will be invited to present their inventions for practical demonstration. The purpose of the tests is to enable the commission to decide what types of fenders and wheel guards are best adapted for use in New York to the end that the devices which most commend themselves may be recommended for installation by the operating companies.

It was found by the commission that an average of 40 or 50 persons a month were killed on the street railways of the city. The commission accordingly had a general investigation made of operating conditions on all lines and appointed a special committee on safety devices to receive and consider suggestions, investigations and existing devices for the prevention of accidents. This committee consists of A. W. McLimont, electrical engineer of the commission; Daniel L. Turner, chief engineer of the transit inspection bureau, and George F. Daggett, chief of the accident bureau. Since its appointment last fall the committee has had meetings every week and has received innumerable suggestions for the prevention of fatal accidents. All these have been carefully examined and so far as possible given model tests in the offices of the commission, but the committee soon determined that, in order to reach a just conclusion and properly to gage the merits of competing inventions, it would be necessary to hold public tests.

It was found that the General Electric Works at Schenectady and the Westinghouse Works at Pittsburg not only afford every facility in the way of tracks, trolley wires, cars, motormen, etc., for such tests, but that neither the General Electric Company nor the Westinghouse Company has any interest whatever in any device which will enter into the competition. Both companies offered the commission every facility for carrying on the competitions. Each will provide a stretch of track properly electrified and cars and motormen to run over it. Care will be taken also to reproduce as far as practicable the actual conditions of street pavements, grades, etc., existing in New York.

To test the fenders dummies will be used to represent persons. These will be placed on the tracks and will be run into by the cars with fenders attached at speeds varying from 8 miles to 20 miles. There will be three dummies, the largest weighing 170 lb., to represent a full-sized man; another, weighing 120 lb., to represent a youth, and the smallest weighing 50 lb., to represent a child. Ten different tests which each dummy will be called for, including an upright posture with the side of the body toward the car; the position of lying on the track in various attitudes, and lying along the rail with head and arms in dangerous positions.

It is expected that the test at Schenectady will take about 10 days, and that at Pittsburg a shorter time.

The Situation in Cleveland

The Municipal Traction Company, Cleveland, had its first test in handling crowds during the convention of the National Educational Association in Cleveland last week. There were 20,000 visitors in the city. Wednesday evening a reception was held at the Case School of Applied Science and the Western Reserve University for the teachers and there was a fireworks display at the Lagoon in the park which attracted between 75,000 and 100,000 persons. As a result the company was unable to care for its regular business properly. The strike, of course, reduced the number of experienced employees and a number of cars are in the shops to be changed into pay-as-you-enter cars.

The investigation of the referendum petition will be made by the board of elections without pay. The members are divided in their opinions as to whether persons who have

moved from one precinct to another since the last registration are electors. They believe, however, that they will be able to secure enough names about which there can be no dispute to make the call for a vote imperative. If they cannot, the courts will probably be called upon to decide the question of who are electors.

President DuPont says that the Municipal Traction Company is losing money on the service to East Cleveland and that the matter will be taken to court again in an endeavor to show that the requirements of the City Council are unreasonable. The count of passengers going and coming from the village has not been completed.

The statement of the Municipal Traction Company for May, made to the City Council a few days ago, shows as follows:

Gross earnings.....	\$355,843
Operating expenses.....	276,920
Net earnings.....	\$78,923
Miscellaneous income.....	537
Gross income.....	\$79,460
Taxes	21,808
Net income.....	\$57,652
Interest on indebtedness of Cleveland Railway....	39,190
Net income for dividend requirements.....	\$18,461
Dividend requirements	73,378
Deficit	\$54,917

President DuPont says that he looks for a deficit for perhaps a year, as a large system cannot be taken over, the operating ideas rearranged and the fare reduced and the earnings not suffer temporarily. He states that he considers the statement a good one if the strike and all other troubles are taken into account. While the gross earnings are \$179,035 lower than for the corresponding month a year ago, there was a reduction of \$48,331 in operating expenses. As to giving free transfers later, Mr. DuPont said that is a matter for the directors to consider. It is estimated that the transfers now earn about \$1,000 a day for the company.

The Westinghouse Reorganization

The readjustment committee of the Westinghouse Electric & Manufacturing Company, of which James N. Jarvie is chairman, has issued a circular announcing the results of the conferences with the other committees which are concerned in the reorganization plan, showing that subscriptions of \$9,770,862 have been received toward the \$10,000,000 required by the merchandise creditors' plan. This has been subscribed as follows: \$4,135,912 by the merchandise creditors, payable by the surrender of claims against the company; \$595,650 by employees of the company, payable in monthly instalments of 10 per cent; \$2,214,300 by stockholders, payable in cash; \$1,500,000 subscriptions secured by underlying subscription of George Westinghouse; \$1,325,000 by the Security Investment Company, conditional subscriptions, payable in cash.

In extending the time for the plan to go into effect until Sept. 1 the circular imposes the condition that at least \$10,000,000 of subscriptions for new stock and all payments of matured instalments on other subscriptions be actually in hand by that date.

The circular states that unless all conditions of the plan are satisfied by Sept. 1 the readjustment committee will continue with the readjustment or reorganization of the company, which may include a judicial sale of the entire assets and property of the company and the resulting impairment of the company's good will and organization and consequent loss to creditors. In such a readjustment, it is stated, a considerable part of the debt would in all probability be represented by preferred stock and shareholders would be subject to an assessment.

New Line Opened at Shreveport, La.—The Shreveport (La.) Suburban Railway formally opened its lines on July 1.

Line Between Buffalo and Erie Opened.—The Buffalo & Lake Erie Traction Company has opened its line between Buffalo, N. Y., and Erie, Pa.

Railway Between South Bend and Michigan City Opened.—The Chicago, Lake Shore & South Bend Railway opened its line between South Bend and Michigan City on June 30.

Los Angeles Pacific Company Opens New Line.—The first regular electric service from Los Angeles to Santa Monica Canyon and the long wharf over the old Southern Pacific tracks was inaugurated on July 1.

Denver & Interurban Railroad Operated by the Colorado & Southern Railway.—The operating department of the Colorado & Southern Railway Company has assumed direct control of the Denver & Interurban Railroad.

New Line at Ardmore (Okla.) Opened.—The Ardmore Traction Company has placed its line in Ardmore in operation. Only a few miles of track have been laid in the city proper, the intention being to extend the road north about $7\frac{1}{2}$ miles.

Line Between Princeton and Patoka Opened.—Regular service on the Evansville & Southern Indiana Traction Company's line between Princeton and Patoka was begun July 2, cars running to the south bank of the Patoka River. The bridge over the river will be completed soon and through passenger service will be begun.

East Liverpool Traction & Light Company Opens Extension.—The Beaver County extension of the East Liverpool (Ohio) Traction & Light Company's lines has been placed in operation and cars are now running on regular schedule between East Liverpool and Rochester, Pa., passing through Smiths Ferry, Midland, Industry, Merrill, Vanport and Beaver.

To Experiment with T-Rail in Detroit.—The Detroit United Railway has been granted permission by the City Council to lay T-rails as an experiment on streets still to be designated. The understanding is that the rails shall be removed at the request of the Council if in the opinion of that body they do not fully meet all requirements. The question of permitting the use of T-rails in Detroit has been considered for some months, and committees from the Council have visited other cities where the rails are in use to study the situation.

Strikers at Pensacola Sentenced.—Following the strike of employees of the Pensacola (Fla.) Electric Company three members of the local division of the Amalgamated Association of Street and Electric Railway Employees of America at Pensacola were sentenced to 60 days in jail for violating the injunction of the United States Court by setting fire to the trestle of the company spanning Big Bayou several weeks ago. The company long ago secured men to operate its cars, and to protect itself from violence obtained an injunction from the court restraining anyone from interfering with the operation of the property.

Lima-Bellefontaine Branch of Ohio Electric Railway Completed.—The completion of the Lima-Bellefontaine branch of the Ohio Electric Railway was celebrated last Wednesday at Bellefontaine. The first car carried W. Kesley Schoepf, president of the company, and other officials. A three-hour schedule is now in force, but the plan is to increase to a bi-hourly service. The terminals of the Lima & Toledo branch within the city limits of Toledo will be completed shortly, after which a through service will be established between Cincinnati and Toledo. This will mark the first electric railway between the Ohio River and Lake Erie.

Increase in Wages in Washington.—The Washington (D. C.) Railway & Electric Company has announced an increase in the wages of its employees effective Aug. 1. Conductors and motormen will receive $2\frac{1}{2}$ cents per hour more than at present, and starters, inspectors and depot clerks will get advances, to be decided upon later. The increase is granted, it is announced, in accordance with the policy of the company to reward faithful work and to grant increases in pay from time to time. The first step was to raise the pay of the trainmen on the suburban lines from 16 to 18 cents per hour. Later both city and suburban trainmen were granted 20 cents an hour, the pay which practically all the trainmen on the system now draw.

Terminal in Hoboken for Public Service Corporation.—Plans are being prepared by the Public Service Corporation for the erection of a passenger terminal at the junction of Hudson Street, Hoboken, and the terminals of the Delaware, Lackawanna & Western Railroad and the Hudson & Manhattan Railroad operating under the Hudson River between New York and Hoboken. The structure will have a capacity for handling 70,000,000 people a year and will cost about \$500,000. The building, which is to be of brick, concrete, steel and ornamental limestone construction, will be three stories high. The first floor will be used for the traffic from the Hudson & Manhattan Railroad, the main floor for the surface lines, railroad and ferry passengers, and the third floor for the Delaware, Lackawanna & Western railroad traffic. Separate stairways will prevent congestion. The plan is to begin construction in the fall and complete the building early in 1909.

New York Franchise Valuation.—An increase over last year's figures of between \$45,000,000 and \$50,000,000 in the aggregate special franchise valuations in New York is

indicated in the final valuations completed July 1 by the State board of tax commissioners. According to the board's tabulation, the total valuations this year are \$590,269,462. These figures do not include the assessments to be levied on corporations operating special franchises in the cities of Albany, Mount Vernon, New Rochelle and Yonkers, where the valuations are not certified to by the State board until September. Last year the aggregate valuations in the State were \$555,308,797. The total for the four cities not included in the valuations just completed was \$9,435,500. The increase this year is general and is due partly to the assessment as special franchises of crossings under a new law. New York shows the largest increase, the valuations this year being \$492,492,970, as against \$466,855,000 last year. The principal increases in counties this year over 1907 are: Erie, 1908, \$23,733,074; 1907, \$19,021,025; Monroe, 1908, \$13,016,095; 1907, \$11,118,490; Onondaga, 1908, \$7,909,125; 1907, \$7,104,255; Rensselaer, 1908, \$4,506,885; 1907, \$2,790,150; Schenectady, 1908, \$2,808,920; 1907, \$1,089,870; Chautauqua, 1908, \$2,143,230; 1907, \$1,499,765; Niagara, 1908, \$3,068,075; 1907, \$2,097,900; Dutchess, 1908, \$1,373,690; 1907, \$812,030.

Chicago Elevated Railway Situation.—As outlined in the ELECTRIC RAILWAY JOURNAL for July 4, page 248, the legal representatives of the transportation committee of the Chicago City Council are endeavoring to find laws or weak franchise clauses which can be used to enforce reforms in the service of the four elevated railroads of Chicago. A voluminous legal opinion in which the rights of the city to control the Union Elevated loop will be set out is being prepared by the corporation counsel under the direction of the chairman of the local transportation committee. The city officials threaten to compel the elevated roads to tear down about \$75,000 worth of structural steel work which was erected three years ago when it was thought that the city would permit the extension of the elevated loop platforms. According to the chairman the transportation committee will fortify itself to attack the railroads with a study of the following points: (1) Status of loop litigation pending in circuit court; (2) basis of suit, grounds of suit and authorities bearing on subject; (3) digest of the grants of all elevated railroads, including special report on loop grants; (4) report on whether any other grounds for action exist against the loop or the elevated railroads; (5) report on the extent to which the city can control or regulate the service with particular reference to existing agreements between the various companies using the loop, especially where it limits the maximum capacity of one of the elevated roads. The city authorities also threaten to compel the Union Elevated Railroad Company to paint the loop structure and provide ten 32-cp lights at each street intersection and five such lights at all alley entrances.

Roebling's Memory Honored.—As a tribute to the memory of John A. Roebling, founder of the John A. Roebling's Sons Company, Trenton, N. J., a monument has been erected in Cadwalader Park, Trenton, by the Roebling Memorial Association. The monument was dedicated on June 30. Henry D. Estabrook, of New York, general counsel for the Western Union Telegraph Company, was the orator at the dedicatory exercises. Mr. Estabrook reviewed Mr. Roebling's career from the time he sailed for America in 1831. He was then 25 years of age and had been graduated from one of the Continental universities as an architect and engineer. He first established himself 25 miles from Pittsburgh in the village of Germania, now Saxonburg. It occurred to Mr. Roebling that he might increase his income if, between crops and during the winter, he could obtain employment as an assistant engineer in making surveys, building canals and dams for slack-water navigation and such work in his vicinity. His services were readily accepted, his real merits were soon recognized and it was not long before his knowledge and skill were in actual demand. Canals were then thought of for transportation, and Mr. Roebling became impressed with the idea that the costly, short-lived hemp rope could be replaced by wire rope. Then followed the idea of the wire cable for bridge work and soon Mr. Roebling had a commission for wire rope for a bridge over the Monongahela River. A factory was needed and at the suggestion of Peter Cooper a plant was secured at Trenton, which was the forerunner of the present Roebling establishment. Mr. Roebling's greatest achievement, the construction of the Brooklyn Bridge, followed the construction of such other notable structures as the Wheeling bridge, the Niagara bridge and the Cincinnati bridge.

The Public Service Commission of the First District of New York has approved the change of name of the New York City Interborough Railway Company to the Bronx Crosstown Railway Company.

Financial and Corporate

New York Stock and Money Markets

JULY 8, 1908.

Trading in the first two days after the holiday was marked by considerable activity in Wall Street. Few definite reasons were assigned for the better business and better prices. Nothing startling had happened and the general condition of trade was about the same as it had been for a fortnight. It was simply a case where the time had arrived for a change. During the few days immediately preceding Independence Day nobody wanted to trade and prices sagged. The volume of transactions was almost the record low mark in the history of the market. As business was so slack in securities it could not get any worse there was nothing for it to do but to get better. It has been known for a long time that there were many bargains on the list, money was easy to borrow, crop conditions were encouraging and the liberal re-employment of labor indicated that the end of the depression was in sight. All of these factors had influence and when the upturn began the movement was aided by the timidity of many little shorts who sought cover.

The optimistic statement given out by E. H. Gary, in which he said that the United States Steel Corporation had done more business in the two preceding weeks than at any other like time since last October, was a favorable feature. Steel shares were more active and recorded slight advances. Reports from several important railroads were also encouraging and added to the improvement in tone if not to higher prices. The returns did not indicate increases in gross earnings, but demonstrated that the managers of the properties had reduced operating expenses successfully.

The feature of the money market, which was apparent on July 7, was the fact that European lenders were offering money in this market. Both England and France sold 60 and 90-day bills at the prevailing rates of discount, which were low.

The demand for money locally has improved to some extent, although rates are not advanced. Call loans were quoted July 7 at 1@1½, while 90-day funds were obtainable at 2@2¼ per cent.

Other Markets

After activity and advances, traction securities on the Philadelphia market closed easier on July 7. Philadelphia Rapid Transit, which had been above 17 for several days, declined on few offerings until the closing sale was made at 16. Union Traction was active and closed at 52. Bonds were quiet with prices practically unchanged.

In Boston there was practically no trading in tractions, the greater part of the business being confined to copper shares. Massachusetts Electric closed on July 7 at 9 bid for the common and 46½ bid for the preferred. Boston Elevated was 133½ bid.

In Chicago there were few sales of tractions during the week, but prices were well maintained. In the trading July 7 a few shares of Metropolitan Elevated were traded in at from 15 to 17, with the close at the latter figure. Chicago City Railway was quoted nominally at 170.

In the Baltimore market, United Railways & Electric income bonds were more active, closing July 7 at 52 on transactions amounting to \$14,000 for the day. The 4s were less active and sold at 85½. United Railways stock was held firmly at 11.

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

	June 30.	July 7.
American Railways Company, Philadelphia.....	a45	a44¼
Boston Elevated Railway.....	a134	133½
Brooklyn Rapid Transit Company.....	47¾	49¼
Chicago City Railway.....	a190	a190
Cleveland Railway.....	—	a94½
Consolidated Traction Company of New Jersey.....	70	a70
Consolidated Traction Company of New Jersey, 5 per cent bonds.....	a103	a103
Detroit United Railway.....	42	40¾
Interborough-Metropolitan Company.....	a11	11¾
Interborough-Metropolitan Company (preferred).....	a29¼	31
Manhattan Railway.....	136	a137
Massachusetts Electric Companies (common).....	9½	9
Massachusetts Electric Companies (preferred).....	46	46½
Metropolitan West Side Elevated Railway, Chicago (common).....	a16	a17
Metropolitan West Side Elevated Railway, Chicago (preferred).....	a50	a50
Metropolitan Street Railway.....	*25	*25
North American Company.....	60¼	61¾
Philadelphia Company, Pittsburg (common).....	38¾	38¾
Philadelphia Company, Pittsburg (preferred).....	40¼	40
Philadelphia Rapid Transit Company.....	15¾	16
Philadelphia Traction Company.....	a88	88¼
Public Service Corporation, 5 per cent collateral notes.....	a97	a97
Public Service Corporation, certificates.....	a68	a68½
Twin City Rapid Transit Company, Minneapolis (common).....	a90	a90
Union Traction Company, Philadelphia.....	a49¼	50

a Asked. * Last sale.

Toledo Railways & Light Company Defaults on Interest

The Toledo Railways & Light Company defaulted on the July 1 coupons on its 4 per cent consolidated mortgage bonds. The coupons on the underlying bonds, however, which matured on July 1, were paid. A member of the protective committee of bondholders says that this action is taken in accordance with the plan of the bondholders' committee, which proposes to bring about a reorganization of the company without a receivership, as the earnings of the parent and subsidiary companies are more than adequate to rehabilitate the finances. The plan is to apply to the city of Toledo to renew franchises expiring next summer. As soon as these franchises have been extended the protective committee will effect reorganization of the company with an adequate plan for extending bond issues. The reason the parent company defaulted on its bonds was partly because it had to pay many importunate creditors who have been pressing the company for payment on floating indebtedness.

A circular to the holders of the 4 per cent consolidated first mortgage bonds of the company, issued by J. R. Nutt, chairman of the reorganization committee, says:

"In view of the expected default by the Toledo Railways & Light Company in the payment of the interest to become due July 1, 1908, on its 4 per cent consolidated first mortgage bonds, dated Aug. 10, 1901, secured by a mortgage to the United States Mortgage & Trust Company, a committee has been formed to act under a certain deposit agreement, for the purpose of adjusting the finances of the company, of protecting and conserving the interests of the depositors under said agreement, and submitting, if thought desirable, a plan for the reorganization of the company.

"Of the 4 per cent consolidated first mortgage bonds of the company, there are now outstanding in the hands of investors, bonds to the principal amount of \$4,866,000, and there are outstanding, held as collateral security for indebtedness of the company, bonds to the principal amount of \$1,134,000. A majority in amount of both such classes of bonds has already been deposited with the committee.

"The early expiration of important franchises of the company, and the early maturity of the underlying bonds of the company, makes it most necessary that the holders of the 4 per cent consolidated first mortgage bonds of the company should deposit their bonds with the committee without delay. The committee has fixed Aug. 1, 1908, as the date on or before which the holders may deposit their bonds with the committee, after which date no bonds will be received, except subject to such terms and conditions as the committee may see fit to impose."

Aurora, De Kalb & Rockford Electric Traction Company, Aurora, Ill.—The property of this company is to be sold at auction in Chicago on July 21 to satisfy claims against the company. Plans are being made by the bondholders' protective committee to purchase the property, and it is rumored that the system may be taken over by the Aurora Railway Company.

Toledo & Chicago Interurban Railway, Kendallville, Ind.—W. L. Taylor, attorney for the receivers of this company, is quoted as saying that the reorganization of the company has been delayed by legal obstacles, but that progress is being made and the company will soon be out of the hands of the receivers. He states that a new company will be organized under the laws of Indiana to acquire the property.

Michigan United Railway, Lansing, Mich.—The Michigan United Railway has filed a mortgage at Marshall, Mich., in favor of the Knickerbocker Trust Company, of New York, as trustee, for \$12,500,000. The mortgage is dated June 24, and secures an issue of bonds running for 30 years at 5 per cent interest. All the property of the company is pledged.

Columbus, Newark & Zanesville Electric Railway, Newark, Ohio.—It is reported that the recent issue of \$736,000 of general mortgage 5 per cent bonds by the Columbus, Newark & Zanesville Electric Railway, now a part of the Ohio Electric Railway, was made for the purpose of securing funds to be used in improving the line between Columbus and Zanesville. In connection with the sale of the bonds the company has made a statement of earnings for 1907 as follows: Gross earnings, \$707,730; operating expenses, \$326,160; other income, \$7,168; total income, \$388,738; deductions for bond interest, taxes, etc., \$222,170, leaving net earnings \$166,568. As the dividends on preferred stock and the organization expenses were \$30,500, there is a net surplus of \$136,068.

Interborough Rapid Transit Company, New York.—The Interborough Rapid Transit Company's statement to the Stock Exchange in connection with the Manhattan Rail-

way's application to list additional consolidated mortgage bonds shows the earnings of the Interborough Rapid Transit Company for the nine months ended March 31, 1908, with the amount contributed respectively by the Manhattan and subway divisions, as follows:

MANHATTAN DIVISION		
July 1 to March 31—	1908	1907
Gross earnings.....	\$10,560,070	\$10,350,081
Operating expenses.....	4,664,611	4,192,205
Net earnings.....	\$5,895,459	\$6,157,876
Other income.....	322,059	307,233
Total income.....	\$6,217,518	\$6,465,109
Interest, taxes, rent and dividends.	5,642,805	5,389,685
Surplus	\$574,713	\$1,075,424
SUBWAY DIVISION		
July 1 to March 31—	1908	1907
Gross earnings.....	\$7,250,985	\$5,989,060
Operating expenses.....	3,261,981	2,801,915
Net earnings.....	\$3,989,004	\$3,187,154
Other income.....	592,803	270,208
Total income.....	\$4,581,807	\$3,457,362
Interest, taxes and rentals.....	2,340,204	1,829,110
Surplus	\$2,241,603	\$1,628,252

Manhattan Railway, New York.—The New York Stock Exchange has approved the listing of \$11,712,000 Manhattan Railway Company consolidated mortgage 4 per cent bonds, due 1990.

Mexico City Tramways Company, Mexico City, Mex.—A stockholder of the Mexico Tramways Company, Ltd., has begun proceedings in London for an accounting, under claim that the terms of the recent lease of the company to the Compañia de Ferrocarriles del Distrito Federal de Mexico were not sufficiently favorable to the tramways company. The suit is brought in the High Court of Justice of England. A. J. Pfeiffer, referee in Chancery, has just completed an examination of the affairs of the company and will report to the court on his return to England.

New York, New Haven & Hartford Railroad, New Haven, Conn.—A decree was entered by the Superior Court at New Haven July 3 by which the New York, New Haven & Hartford Railroad is ordered to endorse a guarantee of payment of dividends on the preferred shares of the New England Investment & Security Company, which is the holder of certain electric railways in Massachusetts formerly owned by the New York, New Haven & Hartford Railroad. The decree is a step toward taking the questions at issue to the Supreme Court of Errors. The New York, New Haven & Hartford Railroad is ordered forthwith to endorse upon the certificate of the plaintiff the guarantee that it will pay cumulative semi-annual dividends at the rate of 4 per cent per annum upon the par value of the outstanding preferred shares, and to pay any accrued dividends if demand is made for them, and also to pay \$105 a share, with dividends accruing, should the certificates be called in for redemption.

Norfolk & Portsmouth Traction Company, Norfolk, Va.—The authorized issue of \$1,800,000 convertible gold notes of this company dated March 2, 1908, maturing \$600,000 annually on March 1, 1910, 1911 and 1912, present issue \$1,358,000, is described by Middendorf, Williams & Company, of Baltimore, as follows: "These notes were issued to refund obligations incurred in making extensions and improvements. The outstanding notes are secured by deposit with the Baltimore Trust & Guarantee Company, as trustee of the following collateral, valued at \$1,812,050: \$752,000 Norfolk & Portsmouth Trading Company first-mortgage 5 per cent gold bonds at 90, \$676,800; \$600,000 Norfolk & Ocean View Railway first-mortgage 5 per cent. gold bonds at 75, \$450,000; \$500,000 Norfolk & Atlantic Terminal Company general mortgage 5 per cent gold bonds at 85, \$425,000; 482 shares (total issue 5000 shares) City Gas Company stock at 125, \$60,250; 5000 shares (entire issue) Norfolk & Atlantic Terminal Company stock at 40, \$200,000. The unissued notes (\$442,000) may be issued on the deposit of additional collateral, under terms of trust agreement. The notes are subject to redemption at par and interest on any interest period, the notes of the shorter terms being redeemed first. Collateral may be withdrawn by the company on the payment to the trustee of cash, on the basis of the above prices, the cash as paid to be applied to the redemption of the notes. Subject to prior sale or withdrawal, the notes may be converted at the option of holder into first-mortgage bonds of

the Norfolk & Portsmouth Traction Company or general mortgage bonds of the Norfolk & Atlantic Terminal Company on the basis of par for the notes, and 90 and interest for the Norfolk & Portsmouth Traction Company first-mortgage bonds, or 85 and interest for the Norfolk & Atlantic Terminal Company general mortgage bonds, said privilege of conversion being in proportion that the total of outstanding notes bears to the amount of said bonds on deposit and available for conversion."

Philadelphia (Pa.) Rapid Transit Company.—It is reported that for the year ended June 30, 1908, the gross receipts of the Philadelphia Rapid Transit Company increased about \$300,000 over the previous year, making the total gross receipts for the year about \$18,400,000.

Summerville & Charleston Electric Railway, Charleston, S. C.—This company has increased its capital stock from \$100,000 to \$300,000.

Toledo, Ann Arbor & Detroit Railroad, Toledo, Ohio.—Indications point to a reorganization of the Toledo, Ann Arbor & Detroit Railroad. The company has been in the hands of a receiver for some time and Judge Lockwood has announced his decision as to the status of the claims. Outstanding bonds, to the number of 746, given to Lawrence Barnum & Company and Patrick Hirsch, were found to have been delivered without consideration and are ordered cancelled. Of the remainder outstanding, all but four are now in the hands of the court. Full face value and interest are allowed on 91 of these bonds; 145 are held to be good at face value and interest, but are subject to stock liability, and 354 are held to belong to the company, subject to the claims of the persons with whom they were placed as collateral security, amounting to \$178,000. The Carnegie Steel Company's claim of \$21,275 is held to be a prior lien to the mortgage. No other claims are allowed with the exception of a few small amounts for labor. The company has until July 15 to settle these claims, and if they are not paid Receiver Willis Baldwin has been given instructions to advertise the property for sale, the upset price being \$60,000. The purchaser may pay \$10,000 and it is thought that the court will allow time on the remainder. If the company should be unable to pay the claims, the bondholders are expected to organize a company to take over the property and complete it.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio.—Certain stockholders of the Toledo, Bowling Green & Southern Traction Company have asked for an injunction to prevent that company from purchasing the property of the Toledo Urban & Interurban Railway. It is said that the lease by which the latter operated the Toledo, Bowling Green & Southern Traction Company provided that if the rentals should lapse for 30 days, the company had the right to take possession of its property. The fact that the rentals were not paid on April 1, when due, causes the Toledo Urban & Interurban Railway to forfeit all its rights, the petitioners say.

Virginia Passenger & Power Company, Richmond, Va.—Judge A. L. Holladay, on June 27, submitted his report as special master to Judge Edmund Waddill, Jr., of the United States Circuit Court, in the Virginia Passenger & Power Company receivership case, and the report is complete as to all matters involved except a few small supply and equitable liens and other trifling claims, and it is thought that these, as well as all others, will be wound up this month. Thirty days from June 27 are given to file exceptions, and at the end of that time the case will be ready for the court to determine the rights of all parties interested. It is believed that a sale of the property will be ordered shortly after the expiration of the 30 days provided by law for filing exceptions to the report of the special master, and that the Goulds, who own a controlling interest in the consolidated companies, will be the purchasers.

Westchester & Wilmington Street Railway, Westchester, Pa.—This company has filed a mortgage of \$500,000 to the Security Trust & Safe Deposit Company there as trustees, and increased its capital stock from \$254,000 to \$500,000.

The statute forbidding the operation of steam locomotives through the Park Avenue tunnel of the New York Central & Hudson River Railroad went into effect July 1. It was to comply with this law that the New York Central and New Haven roads have introduced electric power on their New York terminal lines. Steam locomotives can still be used outside the tunnel within the city limits, and are being employed north of High Bridge on the Central division and north of Mt. Vernon on the Harlem division. It is uncertain when the electric service will be extended, as planned, to Croton and North White Plains. The New York, New Haven & Hartford Railroad, which also operates through the tunnel, is hauling all its trains into the terminal by electricity.

Traffic and Transportation

Decision of Public Service Commission Affecting Improvements and Additions

The New York Public Service Commission, Second District, has rendered a decision regarding the Port Jervis Electric Light, Power, Gas & Railroad Company. The decision was written by Commissioner Decker and an abstract follows:

"The one company controls the gas and electric light service for the city as well as the street railway operation. The reports made by the company covering these departments for the year ending June 30, 1907, show, for the railroad, gross earnings of \$13,898, and operating expenses, excluding taxes, of \$16,759. The gross earnings of the gas and electric portion of the company's operation for that year were \$57,372, and operating expenses were reported to be \$34,712 (excluding taxes of \$3,553). The division of operating expenses between the railway and light departments is made on an arbitrary basis as to those expenses which are common to both departments. The company has outstanding \$450,000 capital stock, and \$285,000 bonds bearing 5 per cent interest. It had on the date mentioned bills and accounts payable amounting to \$21,642, and interest due and accrued amounting to \$35,573. Against said interest and current debt it had on hand \$1,695 cash, and accounts receivable to the amount of \$8,308, together with some materials and supplies, the value of which is stated at \$5,163. The deficit claimed for the railway department for the year ending June 30, 1907, was \$9,437, and a total deficit from operation of \$28,876. The net income for the lighting departments on said date was \$9,785, and a total surplus from operation of \$348.

"Counsel for the company stated at the hearing in Port Jervis that a plan to raise money was then under consideration by the bondholders, which was intended to reduce the capitalization and put the company on a better basis, but that the progress of such plan had been seriously interfered with by the then recent suspension of the Knickerbocker Trust Company, New York, which company is the trustee under the company's mortgage. The case was adjourned to April 7, 1908, at the office of the commission in Albany, to give the company opportunity to perfect and present its plans for securing money with which to put the property in a condition of safe and satisfactory operation.

"On April 7, 1908, the company appeared before the commission by its attorney, president and superintendent, and a representative appeared for a committee of the bondholders. At this hearing it appeared that no plan had been formally adopted, and that the company was not prepared to make any definite statement of what it could do. Incidentally it appeared that the company desires to abandon a part of its line in the city of Port Jervis known as the Kingston Avenue extension, which it claimed was operated at a loss of approximately \$1,700 per year; and some fault was found with the system of taxation followed in the city as affecting the company's total taxation, including the State tax upon its franchise. The company was granted still further time to perfect its plans for raising funds, and the case was set down for final hearing at the office of the commission in Albany on May 5, 1908, at which time and place the company was again represented. It again transpired that the company had been unable to perfect its financial arrangements. It did appear that a plan had been proposed by the bondholders conditioned upon the abandonment of the Kingston Avenue extension. This plan contemplated suspension of the payment of interest on the bonds for a period of five years, the coupons to be surrendered by the stockholders in exchange for an issue of cumulative 6 per cent preferred stock, an equivalent amount of common stock to be canceled, and an amount approximating \$60,000 to be furnished by the stockholders as individuals upon notes of the company, and that this amount should be used to rebuild and re-equip the road. But this arrangement depended upon the condition above stated.

"The commission decided, and announced at the hearing that the question as to revision of the basis of taxation in Port Jervis was not a subject for its consideration or action; that the proposed abandonment of the Kingston Avenue extension involves a separate and distinct proceeding; and that as the company in connection with the bondholding committee had, notwithstanding intimations expressed at the hearing of April 7, that the rehabilitation of the line should not be made to depend upon these matters, perfected a plan making such line abandonment a condition precedent to raising necessary funds, the only course left to the commission was to issue its order requiring the company to make the repairs, construction, improvements or additions necessary to the adequate operation of the line.

"A chief purpose of the regulating statute is that common carriers by railroad in this State shall at all times render to the public safe, adequate and proper service, and maintain their line or lines in a condition to afford such service. It is the duty of this commission to secure their enforcement. The law entitles a carrier to fair return upon the property necessarily devoted to public use, and ordinarily it must be assumed that such fair return affords means to maintain the property in condition to enable the carrier to provide service which is safe and adequate for the reasonable public needs. Unfortunate or improvident management of its finances by a common carrier corporation, and neglect in the maintenance and operation of its line and equipment, cannot be held to exempt or excuse the carrier from reasonable compliance with such statutory requirements. In this case it is plain that the company has allowed the line and equipment to deteriorate far below any reasonable standard, and this commission must, in the discharge of its duty under the statute, issue its order requiring the company to promptly reach and henceforth maintain such reasonable standard of public service."

Pay-as-You-Enter Cars for Philadelphia.—The Twelfth Street and the Sixteenth Street lines of the Philadelphia Rapid Transit Company are to be equipped with pay-as-you-enter cars.

Ohio Court Upholds Order of Railroad Commission.—M. G. Evans, Judge of the Common Pleas Court of Franklin County, Ohio, in a recent decision, upheld the Ohio Railroad Commission in its order affecting the rates charged by the Southeastern Ohio Railway, Light & Power Company for the town of Ironstot, 9 miles from Zanesville. The order was issued on the complaint of citizens of Ironstot.

Charges Against Jersey Company Dismissed.—Chief Justice Gummere has dismissed the three indictments returned by the December term grand jury of 1906 against the North Jersey Street Railway, Newark, N. J. The indictments charged overcrowding of cars, the operation of cars in an unsanitary condition and the use of defective fenders. The bills were dismissed on the ground that there is no evidence which would sustain them if they were moved for trial.

Toledo Roads Join Central Electric Traffic Association.—All but two of the electric railway companies operating into Toledo, Ohio, have arranged to become members of the Central Electric Traffic Association. Those agreeing to become members are: Lake Shore Electric Railway; Toledo Urban & Interurban Railway; Toledo, Bowling Green & Southern Traction Company; Toledo & Indiana Railway; Toledo, Port Clinton & Lakeside Railway; Toledo, Fostoria & Findlay Railway, and the Lake Erie, Bowling Green & Napoleon Railway. In all these companies represent about 600 miles of road. The two companies still considering the matter are the Detroit, Monroe & Toledo Short Line and the Toledo & Western Railroad.

The Right of a Steam Road to Reduce Fares Questioned.—A case involving the right of a railroad to sell twin tickets at reduced prices in competition with an electric railway has been appealed to the Supreme Court of Ohio. The case involves the question whether a railroad may make a reduction in the fare over a portion of its system and not give the same advantages to patrons on other portions. The case is that of A. E. Price, Athens, against the Hocking Valley Railway, which has been selling the so-called twin tickets along portions of its line which come into competition with the lines of the Scioto Valley Traction Company. The State Railroad Commission decided that the company has not the right to issue such tickets, but the Common Pleas and the Circuit Courts held an opposite opinion.

No Change at Present in Operation of Central Park Line.—Oren Root, manager for the receivers of the Metropolitan Street Railway and the New York City Railway, when asked about the company's position as the result of Judge Lacombe's decision in regard to the Central Park line, said that the outcome of the matter was clearly defined in the decision, and that no deviation would be made. Mr. Root said that the Central Crosstown lines now having a transfer system with the Metropolitan Street Railway and the New York City Railway would cease to be links upon the court's order. H. H. Vreeland, president of the Central Park, North & East River Railway, assured Chairman Willeox, of the Public Service Commission, on July 7, that no hasty changes are to be made in the operation of the line. The hearing on the inquiry as to what service the company will give when its lease is terminated has been put over for a week.

Personal Mention

Mr. E. P. Bryan, president of the Interborough Rapid Transit Company, New York, is planning to spend the summer in Europe.

Mr. Wilbur Lewis has been appointed supervisor of motormen by the Brooklyn (N. Y.) Rapid Transit Company, with headquarters at East New York.

Mr. J. B. Jordan has been elected president of the Citizens' Electric Company, Eureka Springs, Ark. Mr. C. F. Ellis was elected vice-president and Mr. C. C. McCarty, secretary.

Mr. Henry Rainey has recently been elected secretary of the Ft. Wayne & Wabash Valley Traction Company, Ft. Wayne, Ind. Mr. Rainey was formerly assistant secretary. His headquarters are at the Philadelphia office of the company.

Mr. T. Scullin, who for a long time has been master mechanic of the Cleveland (Ohio) Electric Railway, has resigned to become master mechanic of the Rochester (N. Y.) Railway Company. Mr. Scullin succeeds Mr. F. P. Maize in this position.

Mr. A. A. Lightfoot has resigned as manager of the Mankato (Minn.) Electric Traction Company to become manager of the Birmingham & Gulf Railway & Navigation Company, Birmingham, Ala. Mr. Lightfoot will be succeeded in the Mankato Electric Traction Company by Mr. H. E. Hance, superintendent of the company.

Mr. Ernest D. Atkins, inspector of the Worcester (Mass.) Consolidated Street Railway, has been appointed superintendent of the Worcester & Blackstone Valley division and the Uxbridge & Blackstone Street Railway branch of the system to succeed Mr. Charles T. Rogers, who has been made superintendent of the Milford, Attleboro & Woonsocket Street Railway.

Mr. John W. Carter, for four years general superintendent of the Kansas City Railway & Light Company, Kansas City, Mo., has resigned, and Mr. William E. Satterlee, assistant general manager, has been appointed to succeed him. Mr. Carter has purchased a large farm near Olathe, Kan., and it is announced that hereafter he will devote all his time to managing that property.

Mr. J. D. Welch, general superintendent of the Colorado & Southern Railway, has been appointed general superintendent of the Denver & Interurban Railroad. Both roads are controlled by the same interests and Mr. Welch will continue as general superintendent of the Colorado & Southern Railway. Mr. Welch succeeds Mr. E. Hartman as superintendent of the Denver & Interurban Railroad. Mr. Hartman is dangerously ill as the result of an operation.

Mr. F. E. Low, formerly superintendent of the St. Paul lines of the Twin City Rapid Transit Company, Minneapolis, Minn., has been appointed manager of the Chatham, Essex & Lake Shore Railway, operating a single-phase electric railway between Chatham and Windsor, Ont. Mr. Low was chief clerk to the general manager of the Twin City Rapid Transit Company before his appointment as superintendent of the St. Paul lines. Before Mr. Low became connected with the Twin City company he was general agent at Minneapolis of the Pullman Company.

Mr. Charles A. Lutz, who for 16 years has been in the service of the accounting department of the Louisville & Nashville Railroad, and since 1901 has held the office of assistant comptroller, has accepted the position of chief examiner of accounts in the division of statistics and accounts of the Interstate Commerce Commission. By this appointment Mr. Lutz assumes direction of the examinations of the books and accounts of the carriers, as provided by the twentieth section of the act to regulate commerce. Prof. Henry C. Adams, who has had charge of this work since 1887, will continue his general supervision over the entire division of statistics and accounts.

Mr. J. McMillan has been appointed to the re-established office of general manager of the Pacific Electric Railway and the Los Angeles Interurban Railway Company. Thirty-two years ago Mr. McMillan entered the employ of the Houston & Texas Central Railway in the capacity of telegraph messenger. He soon became an operator and later was made station agent. In 1878 he entered the employ of the Galveston, Harrisburg & San Antonio Railroad. Subsequently Mr. McMillan went to San Antonio as freight agent and later he was made commercial agent, district freight and passenger agent and finally division passenger agent. Early in 1903 Mr. Epes Randolph, vice-president and general manager of the electric railways which Mr. H. E. Huntington planned for Los

Angeles and Southern California, selected Mr. McMillan as chief clerk. When Mr. Randolph retired Mr. McMillan was chosen traffic manager, and since the retirement of General Manager Schindler, who succeeded Mr. Randolph, Mr. McMillan has handled both the traffic and transportation interests of the Pacific Electric Railway and Los Angeles Interurban Railway.

Mr. David W. Ross has been elected vice-president of the Interborough Rapid Transit Company, New York, in charge of contracts and supplies. Mr. Ross has recently been in the supply business in New York. He was for many years connected with steam railroads, and before becoming a resident of New York was director of purchases of the Isthmian Canal Commission. He was born on Nov. 9, 1869, at Mineral Point, Wis., and removed to Chicago in September, 1887. In March, 1888, he entered the service of the Illinois Central Railroad as a clerk in the telegraph department, serving with the company in various capacities until June 1, 1905, when he entered the service of the Government. During his connection with the Illinois Central Railroad, Mr. Ross was in turn secretary to the general superintendent, secretary to the general manager, secretary to the assistant of the president, secretary to the second vice-president, chief clerk to the second vice-president, purchasing agent, and finally superintendent of transportation. The position to which Mr. Ross has been elected with the Interborough Rapid Transit Company is a new one, created in accordance with a new plan of organization of the company, providing for three vice-presidents.

Mr. Frank Hedley, general manager of the Interborough Rapid Transit Company, New York, has been elected vice-president of the company, and hereafter will have both titles. Mr. Hedley has been connected with the company since June 1, 1903, when he was appointed superintendent. In October, 1904, he was appointed general manager of the company. Upon Mr. Hedley in these positions devolved the arduous duties of organizing the staff of the underground railway and of solving the complex traffic problems of the subway. In addition, he had to meet the trying conditions of the ever-increasing traffic of the elevated railway division of his company. Mr. Hedley began his railway work with the Erie Railroad as a machinist in its Jersey City shops. Later he became connected with the Manhattan Elevated Railway, and subsequently became master mechanic of the Kings County Elevated Railroad, now part of the Brooklyn Rapid Transit Company's system. After serving three years with the Brooklyn company he went to Chicago, where he became connected with the Lake Street Elevated Railway as superintendent of motive power and transportation. Later he was appointed superintendent of the company. It was this position that he resigned when he became superintendent of the Interborough Rapid Transit Company.

Mr. S. J. Dill, Youngstown, Ohio, has been appointed general manager of the Elmira (N. Y.) Water, Light & Railroad Company, to succeed Mr. W. W. Cole, who, as announced in the ELECTRIC RAILWAY JOURNAL of June 13, has become connected with Dodge & Day, Philadelphia. Mr. Dill will take charge of the Elmira property about Aug. 1. Mr. Dill has had large experience in the operation and management of railway properties, commencing with the Metropolitan Street Railway in New York City. He was promoted to division foreman and was in charge of the Forty-second Street Crosstown and the Boulevard lines during the change from animal power to electric traction. Leaving New York in 1901 he removed to Michigan and became superintendent of the Detroit, Ypsilanti, Ann Arbor & Jackson Railway, operating about 100 miles of electric railway. Later he became general superintendent of the Michigan Traction Company, Kalamazoo, with full charge of the operations of the city lines in Kalamazoo and Battle Creek and the interurban railway connecting the two cities. In the autumn of 1904, Mr. Dill was selected as general manager of the Youngstown & Southern Railway, then under construction. The road has been completed and placed in operation under Mr. Dill's management. It is one of the best equipped electric railways in Northeastern Ohio.

OBITUARY

N. C. Flygara, superintendent and purchasing agent of the Ogden (Utah) Rapid Transit Company, is dead.

David Griffith Campbell, who had been connected with the street railway companies in Brooklyn for 54 years, is dead. Mr. Campbell was a stage driver before street cars were introduced in Brooklyn and served in many capacities for the Brooklyn Rapid Transit Company. In recent years he had been connected with the accounting department of the company.

Construction News

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

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

FRANCHISES

***Omaha, Neb.**—C. C. Shimer has applied for a franchise to lay tracks and operate a street railway between South Omaha and Seymour Park.

Fremont, Ohio.—The Fremont Street Railway has been granted an amended franchise which will permit the company to extend its lines and build the belt around the city. The franchise is for a period of 25 years, and part of the work must be completed by Jan. 1, 1909.

Mount Hood Railway & Power Company, Portland, Ore.—This company has been granted a franchise for a right of way for an electric railway across property on the Bull Run Reserve controlled by the municipality.

***Brownwood, Tex.**—W. S. Walker, of Granbury, has applied to the Council of Brownwood for a franchise for a street railway.

RECENT INCORPORATIONS

***Scott Creek Railway, San Francisco, Cal.**—Incorporated in California to build a line 2½ miles long from a point on the Ocean Shore Railway, at the Scott branch, to the San Vicente grant. Capital stock, \$50,000. Directors: J. Downey Harvey, John B. Rogers and Bert Corbet.

***Gary & Joliet Traction Company, Gary, Ind.**—Incorporated in Indiana to build an electric railway which is to connect Joliet, Chicago Heights and Gary, Ind., a distance of about 40 miles. Capital stock, \$2,000,000. Incorporators: W. S. Reed, G. Townsend and J. W. Thomas, of Joliet, Ill.

***Northern Minnesota Railway, Minneapolis, Minn.**—Incorporated in Minnesota to build an interurban line from a point in Warroad township, in Roseau County, to a point in Marshall County, on the Red River. This distance is 60 miles, and would pass through the villages of Warroad, Roseau, Badger, Pelan and Karistad. Capital stock, \$100,000. Incorporators: George Seeley, Waldron M. J. Jerome and Hector G. Spaulding.

***Twin City Underground & Elevated Electric Railway, Minneapolis, Minn.**—Incorporated in Minnesota to build an underground electric railway from Minneapolis to St. Paul. The estimated cost of the road is \$6,000,000, and the time required to build, three years. At a terminal to be determined upon a 40-ft. subway will be built and continued a little over 11 miles to the St. Paul terminal. The entire length of the subway will be of steel and concrete, faced with glazed brick. It is proposed to build a station at Midway, and also to extend branch lines from the tunnel to various portions of the Twin Cities. Through trains will make the distance, it is estimated, in 12 minutes; local trains, 20 minutes. The third-rail system will be used. Negotiations have been opened with the United States Government for a bridge across the Mississippi River. If the company fails to secure permission to do this, it is planned to tunnel under the river. W. G. Stewart, constructing engineer, will, within the next 10 days, organize a surveying corps and go over the ground between the two cities. It is said that the company will shortly apply for franchises to operate the road. Capital stock, \$50,000. Officers: George Norris, president and treasurer; William G. Stewart, vice-president; Jay W. Crane, secretary. Temporary offices, 908 Guaranty Loan Building, Minneapolis.

Kansas City, Ozarks & Southern Railway, Ava, Mo.—Incorporated in Missouri to build and operate a standard-gauge electric railway between Mansfield, Wright County, and Ava, Douglas County, a distance of 15 miles. Capital stock, \$300,000. Incorporators: J. H. Murray, H. E. Bush, J. M. Adams, A. P. Miller and J. S. Clark, all of Ava. [E. R. J., June 13, '08.]

Kansas City-Southeastern Traction Company, Kansas City, Mo.—Incorporated June 25 to construct a standard gauge railway, which is to extend from Kansas City through Leeds, Raytown, Little Blue to Lee's Summit, a distance of 18 miles. We are informed that it is the intention of the company to begin construction work Sept. 1. An amusement park is to be built near Little Blue, operated by the company. Gasoline electric cars will be operated. Capital stock, \$880,000, authorized; \$180,000 issued. Officers: Chas. A. S. Sims, president and general manager; Howard W. Gibson, vice-president; C. G. Minturn, secretary; B. F. Shouse, treasurer; C. W. McDaniel, purchasing agent. J. C. Herring, 2201 Jackson Avenue, chief engineer, all of Kansas City, Mo. [S. R. J., March 21, 1908.]

Suburban Railway, Rochester, Pa.—This company has been formed by its consolidation with the following street railway companies in Western Pennsylvania: Suburban Electric Railway, Freedom & Baden, Sewickly & Leetsdale, Beaver & Bridgewater, Beaver Falls, Rochester, Beaver & Vanport, New Brighton, Beaver Falls & Marado and the Economy & Harmony Electric Street Railway. Capital stock, \$150,000. Headquarters, Rochester, Pa. Directors: W. A. Park, Rochester, president; Samuel Morgan, Freedom; J. H. Park, P. A. Smith and Charles Connel, New Brighton.

TRACK AND ROADWAY

Birmingham (Ala.) Railway, Light & Power Company.—It is reported at Bessemer that this company will extend its line from the plant of the U. S. Cast Iron Pipe Company via Dolomite to Wylam, thence connecting with the Wylam-Ensley line into Birmingham. G. H. Harris, Birmingham, manager.

Sacramento, Cal., Electric, Gas & Railway Company.—This company has broken ground on T Street preparatory to constructing an additional branch to its lines in Sacramento to extend from Front to Twenty-eighth Street. [E. R. J., June 13, '08.]

***Denver, Col.**—O. F. Olson, who has been completing arrangements for the construction of the new electric railway from Fort Collins, Col., to Hudson, has signed a contract with the Burlington Railroad for the delivery of the rails and ties at Hudson to build the line from Hudson to Kerscy.

***Greeley, Col.**—It is stated that D. A. Camfield proposes to build an electric railway from Greeley to Pleasant Valley.

Macon (Ga.) Railway & Light Company.—This company has begun work on Cotton Avenue and will, it is reported, convert the line there to double track between City Hall and College Street. J. M. McFarland, superintendent.

Sterling, Dixon & Eastern Electric Railway, Dixon, Ill.—The company has awarded a contract to J. T. Harvey, of Amboy, for repairing its bridge. E. B. Kirk, general manager.

Des Moines & Sioux City Railroad, Fort Dodge, Ia.—M. H. Miller, vice-president and general manager, writes that the preliminary survey has been completed for this line from Des Moines to Newell via Perry and Lake City. The financial report will be made at once. Right of way is being secured and stock subscriptions are encouraging for active work in the near future. [S. R. J., July 4, '08.]

Central Kentucky Traction Company, Lexington, Ky.—This company has decided to construct an extension from Lexington to Nicholasville. The line will be built along the Nicholasville pike, and men will be sent into the field at once to make surveys and secure rights of way. The line will probably be completed and cars running some time next fall. The Central Railway Traction Company is owned and operated by the Lexington & Interurban Railways Company. J. B. Crawford, general manager.

Baltimore, Halethorpe & Elkridge Railway, Baltimore, Md.—It is announced that work is about to begin on this proposed electric railway, the line having already been surveyed and some of it graded. It is said the actual construction will commence at once and the line as far as Halethorpe may be in operation this fall. The road is to extend from Baltimore to Elkridge. The Maryland Electric Railways Company, it is said, will aid in the building and will operate the road when completed. The new road forms a connection with the Wilkens Avenue line of the United Railways in Southwest Baltimore. From this line patrons will be granted transfers to any section of the city. [S. R. J., Nov. 30, '07.]

Boston (Mass.) Elevated Railway.—This company has purchased 500 tons of rails from the Pennsylvania Steel Company. Contracts have also been awarded to the American Bridge Company for 400 tons of steel work required for extensions.

Union Street Railway, New Bedford, Mass.—The Railroad Commissioners have approved the petition of this company for locations for its tracks in Durfee and Summer Streets in New Bedford.

Marquette, Negaunee & Ishpeming Interurban Railway, Marquette, Mich.—This company has authorized an issue of \$400,000 bonds to defray the expense of building its proposed electric railway to connect Marquette, Negaunee and Ishpeming. The securities are being handled by Charles Schley & Company, Milwaukee. [S. R. J., May 2, 1908.]

Owosso & Corunna Electric Company, Owosso, Mich.—It is stated that this company contemplates extending its

system from Corunna to Durand, a distance of 9 miles, within 60 days. L. Manning, general manager.

Duluth-Superior Traction Company, Duluth, Minn.—This company is said to be considering the construction of a viaduct at Lamborn Avenue.

***Vineland, Minn.**—A. P. Jorgensen, Wm. Anderson, E. E. Dinwiddie and John Faught are said to be taking steps to secure the construction of an electric railway between Vineland, Minn., and Onamia.

***Joplin, Mo.**—It is reported that a company will be organized shortly to build an electric railway from the Miami mines to the city of Miami. A. D. Hatton, W. G. Labadie, C. P. Williams and J. S. Cheyenne are interested.

Blue Valley Railway, Kansas City, Mo.—Construction work has already been started by this company on its proposed standard-gage electric railway system, which is to connect Kansas City, Leeds, Mo., and Swope Park. The line will be 10 miles in length and cars will be operated by means of the overhead trolley, power to be rented from the Metropolitan Street Railway. Capital stock, \$100,000, issued \$10,000. Bonds authorized, \$100,000. Headquarters, 514 Bryant Building, Kansas City, Mo. Officers: Alexander Massey, Kansas City, Mo., president; P. G. Walton, Anthony, Kan., vice-president; J. S. Chick, Jr., Dwight Building, Kansas City, Mo., secretary and treasurer; F. W. Wallenhaupt, Independence, Mo., electrical engineer; D. W. Pike, First National Bank Building, Kansas City, Mo., chief engineer. We are advised that all construction material has been purchased. [S. R. J., Nov. 23, '08.]

Omaha & Council Bluffs Street Railway, Omaha, Neb.—Work has been begun on an extension of the company's system from Courtland Beach to the club house of the Omaha Rod and Gun Club.

Omaha & Nebraska Central Railway, Omaha, Neb.—We are advised that the proposition to adopt the third rail has been abandoned by this company, and it is now intended to use the overhead trolley system. The company is constructing a railway from Omaha to Hastings. Officers: Anthony Texter, David City, Neb., vice-president; C. H. Deeter, Omaha, secretary; Eldon R. Long, David City, treasurer; W. H. Fuller, Hastings, Neb., chief engineer; S. C. Nelson, Omaha, assistant to vice-president. Headquarters, 320 First National Bank Building, Omaha, Neb.

Dover, N. H.—A number of Boston, Northwood and Dover promoters of the proposed Concord, Dover & Rochester Street Railway held a meeting in Dover on June 29 with a view to taking over the charter for the railway and beginning the construction of the line at an early date. Those present were: F. H. Parker, of the firm of Stone & Webster, Boston, engineers; C. S. Sprague, of the General Electric Company, Boston; Dr. George Fiske, John G. Towles, James A. Bickford, Fred R. Caswell, Orrin N. James, F. G. Scott and Edwin G. Batchelder. The charter for the line was granted in 1903, and the route covers 37 miles. It is estimated that building and equipping the line would cost approximately \$1,000,000.

***Asheville, N. C.**—J. H. Carter and R. S. Howland, of Asheville, are reported to be interested in the project to build an electric railway branch to connect Asheville and Weaverville. It is said that plans have already been completed and it is the intention of the promoters to begin construction within a month. The line will be 4 miles in length.

Cleveland, Brooklyn & Elyria Electric Railway, Cleveland, Ohio.—This company has been granted a 90-day extension of time in which to begin constructing its system. J. J. Breiting, Cleveland, vice-president.

Ohio Electric Railway, Lima, Ohio.—The commissioners of Defiance County have granted this company an extension of one year in time for completing its bridge at Defiance in compliance with a request made some time ago. This applies to the electrification of the Columbus & Lake Michigan steam road, which is now owned by the company.

***Sulphur, Okla.**—G. W. Angle, of New York, is reported to be interested in a proposition to construct an electric railway out of Sulphur to Oklahoma City and Chikasha via Pauls Valley.

Port Arthur (Ont.) Street Railway.—It is reported that plans are under consideration for extending this municipal street railway system to Kakabeka Falls. An extension is also proposed to Murillo. T. H. McCauley, manager.

Southern Cambria Railway, Johnstown, Pa.—P. J. Little writes that this company has already laid 2 miles of track and 11 miles of grading has been completed. All contracts have been let. The company plans to connect the following cities with its proposed standard gage railway: Johns-

town, Conemaugh, Mineral Point, South Fork, Ehrenfeld, Summerhill and Ebensburg. The entire system will comprise about 24 miles of track. The power station and repair shops will be located at Mineral Point. The overhead trolley will be adopted. Officers: George M. Wertz, Johnstown, president; P. J. Little, Ebensburg, secretary; G. Walters, Johnstown, treasurer; James Bryan, Pittsburg, electrical engineer, and William Butler, Johnstown, chief engineer.

Ashaway & Westerly Railway, Westerly, R. I.—The firm of Allen & Phelps has been awarded the contract to build the Ashaway & Westerly Railway. The proposed road is about 5 miles long and work upon it will begin at once. It is stated that the road will be under the management of the Norwick & Westerly Railway, which will furnish the rolling stock. [E. R. J., June 6, '08.]

Greenville (S. C.) Interurban Railway.—It is officially stated that plans are still in preliminary state regarding construction of this electric railway, which will extend from Spartanburg to Greenville. John C. Carey, Greenville, S. C., president; Lockwood, Greene & Company, 93 Federal Street, Boston, Mass., engineers. [S. R. J., Feb. 15, '08.]

Corsicana (Tex.) Transit Company.—J. W. Carpenter, president, writes that the company contemplates reballasting its system and laying heavy rails. The company operates 3.75 miles of track in Corsicana.

***Marlin, Tex.**—A meeting was held in Marlin on June 24 in the interest of an electric railroad connecting Waco, Temple and Marlin. Among those interested in the proposition are: Mayor William Ginnuth, C. W. Wilson, Pat Cheeves, A. Lee Brown, A. J. Jarrell, Wm. Ginnuth, F. B. Slagle, F. F. Downs, R. O. Culp, A. L. Flint, A. H. Mayler and W. C. Knight, all of Temple.

Twin State Gas & Electric Company, Brattleboro, Vt.—This company is building a concrete arch bridge over Whetstone River. The National Light, Heat & Power Company, 30 Pine Street, New York, owns and operates this system.

POWER HOUSES AND SUBSTATIONS

Americus (Ga.) Railways & Light Company.—This company, it is reported, will take over the water, gas and electric light plant by July 15, and after that work will be started on the street-railway plan. W. A. Dodson, Americus, counsel. [S. R. J., April 4, '08.]

Aurora, Elgin & Chicago Railroad, Chicago, Ill.—L. E. Palm, of Elgin, has been awarded the contract for the company's substation to be erected on Grove Avenue, north side of Fulton Street, in Elgin.

Greensboro (N. C.) Electric Company.—It is announced that this company expects to install in its power station 1-300-kw Westinghouse railway generator and a 500-hp Corliss engine.

Southern Cambria Railway, Johnstown, Pa.—The directors of this company have awarded to the General Electric Company contracts for the installation of all the power house equipment and appliances of the line. The amount involved is said to be about \$95,000 and deliveries begin in August.

Laredo (Tex.) Electric Railway.—This company is planning to build 12 miles of three-wire, three-phase transmission line and 5 miles of transmission line, for which the type of construction has not yet been decided.

SHOPS AND BUILDINGS

British Columbia Electric Railway, Victoria, B. C.—This company is installing a complete new water system for fire protection, using the standard hydrants and nozzles on its properties in that city. The company has purchased from the Allis-Chalmers-Bullock Company, Limited, an 8-in. two-stage turbine pump, direct coupled to a 150-hp, 2200-volt, three-phase, 60-cycle induction motor.

Chicago, Lake Shore & South Bend Railway, South Bend, Ind.—Contracts have been awarded to the Cleveland Construction Company, Cleveland, Ohio, for the erection of the company's car house and repair shops.

Dayton & Troy Electric Railway, Dayton, Ohio.—This company is erecting a steel and brick car house, 150 ft. x 40 ft., at Piqua, Ohio. The company is also building a brick freight station in this city.

Roanoke (Va.) Railway & Electric Company.—This company expects to begin shortly the erection of a new office and terminal building at the corner of Campbell Avenue and Randolph Street in Roanoke. It is estimated that the building will cost \$30,000.

AMUSEMENT PARKS

Indianapolis, Ind.—The White City Amusement Park at Broad Ripple, on the Indiana Union Traction Company's line, was destroyed by fire on June 28. It has not been determined to rebuild the resort.

Manufactures & Supplies

ROLLING STOCK

Chicago & Southern Traction Company, Chicago, Ill., is considering the purchase of two cars.

Washington, Frederick & Gettysburg Railway, Frederick, Md., wants particulars on gasoline cars for railway service.

United Traction Company, Reading, Pa., has placed an order with the J. G. Brill Company for five double-truck cars.

Allentown & Reading Traction Company, Reading, Pa., has ordered one car from the John Stephenson Company.

St. Louis & Suburban Railway, St. Louis, Mo., is reported to be preparing specifications for an order of from 100 to 150 new cars.

Calumet & South Chicago Railway, Chicago, Ill., will probably be in the market soon through A. L. Drum & Company, American Trust Building Chicago, for 15 cars.

Gary & Interurban Railway, Majestic Building, Chicago, has placed an order with the Danville plant of the J. G. Brill Company for some Danville standard semi-convertible semi-steel cars for September delivery. These will be two-motor equipments, GE-80, with bodies 32 ft. long and 42 ft. over all.

Seattle (Wash.) Electric Company, through Stone & Webster, Boston, general managers, has placed an order with the St. Louis Car Company for 4 motor cars and 16 trailers for delivery in eight weeks. The trail cars are to be 39 ft. over all, but the motor cars will be 43 ft. over all. Otherwise the cars will be identical. They will be equipped with the Standard Motor Truck Company's trucks and the St. Louis Car Company's seats and sanders. Each of the motor cars will be equipped with four GE 80-A motors. The cars will be equipped with National straight air brakes and Peacock hand brakes. The fenders will be supplied by the purchaser.

TRADE NOTES

Joseph B. Mayer, New York, has moved to the Trust Company of America Building, 37 Wall Street, New York.

Elmer P. Morris Company, New York, announces that F. W. Roth, formerly with the Sterling-Meaker Company, has joined the sales force of the Morris Company in New York.

Chicago Concrete Machinery Company, Chicago, Ill., has opened offices at 911 Rothschild Building, Philadelphia, Pa., with Henry T. Peirce in charge as representative of the company.

Wyckoff Pipe & Creosoting Company, Inc., Stamford, Conn., has opened offices in the Hudson Terminal Buildings, 50 Church Street, New York, where the main office will be located hereafter, instead of at Stamford. The office of the president of the company, however, will be at Stamford.

Harry De Steese, New York, for the past 15 years actively connected as a supply man with the electric railway industry, has recently gone into business for himself with headquarters at 312 West 111th Street, New York. Mr. De Steese is acting as manufacturer's agent in the New York territory for the L. D. Company, Frank Ridlon Company, Jos. F. McCoy Company and the International Timber Preserving Company.

H. F. Vogel, who was president of the Danville Car Company, has severed his connections with that company and has become interested in the Natural Power Company at St. Louis, of which he is the president and general manager. This company has works at Kirkwood, Mo., and is building a pressure and suction blower, which Mr. Vogel says is superior to any other. He is, in fact, very enthusiastic over the operation of this machine and plans to exhibit one at the Atlantic City convention next October.

F. A. La Chance, Brooklyn, N. Y., has withdrawn from the Cross-La Chance Electric Company, New York, and gone into business for himself. He has a well-equipped shop in Brooklyn and is prepared to repair steam and electrical machinery. Mr. La Chance will make a specialty of reseating valves, resetting and retubing boilers. He will also make steam fittings and cut to sketch. His long and active experience as an operating engineer in high-class power plants will be of value to him in his new enterprise.

McClintic-Marshall Construction Company, Pittsburg, Pa., announces that Paul L. Wolfel, formerly chief engineer of the American Bridge Company, and lately consulting engineer for that company, has accepted the position of chief engineer of the McClintic-Marshall Construction Company, with works at Pittsburg, Pottstown and Carnegie, Pa. Mr.

Wolfel was in the employ of the Pencoyd Iron Works from 1888 until the American Bridge Company was formed. He became chief engineer of the latter company one year after its formation. For the last two and one-half years he has been acting as consulting engineer for the company, with headquarters in New York.

Cutler-Hammer Manufacturing Company, Milwaukee, Wis., has completed arrangements whereby it will be represented on the Pacific Coast by Otis & Squires, 111 New Montgomery Street, San Francisco. A large stock of standard Cutler-Hammer controllers will be carried by Otis & Squires enabling them to make prompt delivery of apparatus. A. W. Vinson, who has been connected with the engineering department of the Cutler-Hammer Manufacturing Company for several years, has been transferred to the office of Otis & Squires, where his services will be available to those confronted with problems of electric control which cannot be met by the use of standard apparatus.

Lumen Bearing Company, Buffalo, N. Y., has remodeled its babbitt and soft metal department. This department is run as a separate plant in charge of a competent manager, who has had wide experience in the production of soft metal alloys. The plant is a one-story brick and cement building 40 ft. wide by 150 ft. long. It has a cement floor and is equipped with two small pots for mixing small quantities, a medium sized pot and a large pot, giving a daily capacity of from 10 to 15 tons. The furnaces use oil as a fuel. The machinery in the plant is all motor-driven by Niagara Falls power and includes a magnetic separator, a large shear and a drop hammer. The company has also two oil furnaces for melting turnings, and has just completed a lead refining furnace. A specialty is made of producing mixtures to engineers' formulae. The products of this department include also solder, type metal and pig lead. The company is prepared to furnish quantities up to carload lots.

ADVERTISING LITERATURE

Pratt & Whitney Company, Hartford, Conn.—The spline milling machine, made by this company, is described in a new catalog. The company says the machine embodies new principles and does work for which heretofore there has been no suitable machinery, and that it will at once appeal to the manufacturer who has formerly been compelled to resort to expensive broaching operations or hand milling for cutting keyways with closed ends and for all operations which owing to their depth require extreme care in the manipulation of the tools.

Lidgerwood Manufacturing Company, New York.—A new catalog has been issued describing and illustrating Lidgerwood cableways. It contains 168 pages, furnishing convincing proof of the adaptability of the Lidgerwood cableways to the purposes of the engineer and contractor. The skillful modifications of the cableways in details and setting to fit them for the economical conduct of the various kinds of work required are shown by half-tone illustrations and the descriptive text makes clear the important conditions met in the prosecution of each of these enterprises.

Expanded Metal & Corrugated Bar Company, St. Louis, Mo.—The second of this company's bulletins on designing methods for reinforced concrete construction has been issued. It deals with the detailed design of a typical building, based on the methods outlined in the first bulletin. Owing to popular demand, the company has included the analysis for the strength of rectangular and 8-shaped beams. The same subjects were treated in the 1906 catalog of the company, but the discussion has been revised and considerably extended in the bulletin. The next issue will have for its subject highway bridges and culverts of the flat slab and girder type.

Sterling-Meaker Company, Newark, N. J.—A number of blotters and a placard have been sent out by this company to advertise its products. The blotters direct attention to the Sterling car destination sign, the Sterling safety brake chain and the Sterling fender and life guard. Some excellent reasons are given for the use of the Sterling chain. Pictures illustrate the good points of the sign and the fender and life guard. The placard calling attention to the Sterling sand box is illustrated with line cuts of the complete box and the feed and with cuts showing the details of the valve mechanism. At the bottom of the placard is a piece of sandpaper for scratching matches or sharpening pencils.

United Copper Foundry Company, Boston, M: s.—This company has issued a little folder giving the price at which it is offering its standard copper trolley wheels. The company makes wheels for city, city and suburban, interurban and cross country service. It says that the wheels are tough but not hard, and that the wear on the trolley wire

with these wheels is reduced to a minimum. The company also makes a specialty of trolley wheel bushings and a balanced spring harp with a flexible washer and contact combined. Owing to the frequent changes in the metal market the company proposes to revise the list every two months so that its patrons will be assured of the latest quotations.

Chicago Concrete Machinery Company, Chicago, Ill.—“Success Winning Machinery” is the title of a little booklet in colors which reviews briefly this company's machinery. While the machines of the company generally are designed for general paving work, the company includes in its list a mixer designed expressly for the use of street railways to pave the right of way. This machine can be used on one track while the other is in service. It is right and left handed, enabling the operator to work from either end. The equipment consists of the company's No. 1 Chicago mixer with discharge spout emptying into a swinging spout with sufficient range to cover the entire right of way. The dimensions, weights and capacities of the mixers are given in a table on the last page.

Western Electric Company, Chicago, Ill.—This company has reprinted Bulletin No. 103, which has for its subject, “The Street Railway Telephone.” The use of the telephone in street railway work has increased rapidly, but the real value of a telephone of clear quality and ample volume of transmission does not seem to be fully appreciated. These are the points the bulletin covers, discussing first the telephone proper and then taking up the details of the equipment. An interesting feature of the publication is a discussion of the merits of the pole and the portable types of equipment. Each serves admirably the purpose for which it was designed, but the question of which type it is best to use sometimes arises.

General Electric Company, Schenectady, N. Y.—This company has issued a bulletin (No. 4593) devoted to the subject of “Railway Converter Substations.” The publication gives a general description of the various pieces of substation apparatus, including rotary converter transformers, reactances, blowers, cables, switchboards, etc., and includes illustrations of converter stations operated by various railway companies. It contains also plans and elevations showing different arrangements of substation apparatus. The company says that the purpose is to present to prospective customers the results of years of experience in railway substation practice and to give the standard voltages and capacities of apparatus for railway substations which have been adopted by the company. The sizes and weights of standard apparatus are listed, and with the outlines, sizes of conductors, etc., sufficient data are supplied for the complete preliminary layout of a standard railway converter substation of any capacity. In concluding the pamphlet the company says that it hopes that electric railway managers will co-operate in effecting a more complete standardization of substation design and railway transmission potentials.

ELECTRIC RAILWAY PATENTS

UNITED STATES PATENTS ISSUED JUNE 23, 1908.

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

Railway Tie and Fastening, 891,237; Charles J. Everhard, Cleveland, Ohio. App. filed Jan. 21, 1908. Relates to a one-piece fastening device for securing the rails to a metallic channel-shaped tie.

Automatic Railway Switch, 891,269; Anatole R. Levy, Oak Lane, Pa. App. filed Sept. 28, 1907. Means whereby the switch may be automatically operated by an approaching car, said operation being dependent upon the rate of speed at which the car approaches the switch, and means for preventing the automatic completion of the operation of the switch.

Car-fender, 891,270; Harry L. Libby, Boston, Mass. App. filed Sept. 18, 1907. The fender may be quickly raised by means of a lever in order to avoid an inanimate object on the track.

Signaling System for Railways, 891,303; Louis H. Thullen, Edgewood Park, Pa. App. filed June 9, 1906. A block signal system of the type having one continuous track rail and another interrupted rail, the sections being energized by direct current and an alternating current being used for power purposes. Employs a type of relay which is responsive only to direct currents.

Railway Tie, 891,311; Henry P. White, Kalamazoo, Mich. App. filed Aug. 12, 1907. Details of construction of a combined metallic and cement railway tie.

Railway Signal, 891,339; Franz Hirt, Berlin, Germany. App. filed Dec. 11, 1907. A selenium cell is arranged in cir-

cuit so as to be responsive only to polarized light, and the train carries a source of properly polarized light adapted to cause a signal.

Generation and Transmission of Motive Power, 891,350; George W. Mascord, London, England. App. filed Feb. 17, 1908. Has a supplemental motor and automatic means for clutching the supplemental motor to the driving shaft when more than a certain power is required.

Amusement Device, 891,388; Arthur Visser and Henry Grote, Holland, Mich. App. filed Nov. 19, 1907. A boat gains momentum sufficient to carry it about a spiral canal by means of an inclined chute.

Trolley for Electric Cars and the Like, 891,410; Edward J. Dacey, Prescottville, Pa. App. filed Oct. 11, 1907. Comprises a vertically arranged cylindrical casing in which is contained a depressible plunger. The trolley wheel is supported on the plunger and is cushioned in its movement thereby.

Switch-operating Mechanism, 891,427; James W. Keating, Portland, Ore. App. filed Aug. 28, 1907. Includes fixed rails and movable points, a bar extending between and connecting the points, weighed locking levers between the points provided with lugs for engaging the rails and points, and a slidably arranged rod for operating the locking levers and moving the points.

Rail Joint and Brace, 891,546; Louis T. Joerden, St. Louis, Mo. App. filed April 9, 1907. Comprises a pair of castings, one of which serves as a combined base and fish plate, while the other is a combined fish plate and brace.

Rail Tie and Fastener, 891,547; Thomas Johnson, Trempealeau, Wis. App. filed Nov. 29, 1907. Comprises oppositely disposed longitudinal sections, each section having a longitudinal downwardly extending flange, said flange having a flat face and a beveled face, smaller flanges depending from the edges of the sections, and means extending through the first mentioned flanges for securing the sections together.

System of Electric Traction, 891,619; Samuel H. Hoopes, Jr., West Chester, Pa. App. filed Aug. 10, 1907. Has a plurality of rods joined together beneath the car bodies in place of the usual collector shoe and which engage stationary trolley wheels between the track rails.

Electric Brake Mechanism for Cars, Elevators, Cranes and Other Purposes, 891,632; Michael E. Neenan, New York, N. Y. App. filed March 22, 1905. The brakes are released or retracted by electromagnetic appliances adapted to apply the brakes in conjunction with the usual hand devices.

Metallic Railway Tie, 891,662; Aulson S. Bouchard, St. Louis, Mo. App. filed Oct. 12, 1907. Utilizes discarded or worn out railway rails for ties. A suitable supporting base for the traction rail is secured to the tread of the tie rail.

Metallic Tie and Rail Fastener, 891,664; Oscar M. Boylan, McKeesport, Pa. App. filed Oct. 28, 1907. A metallic tie of I-beam construction having a fastener consisting of a base plate and two clips, said clips being securely bolted to the upper flanges of the tie.

Rail Splice, 891,707; Jonas A. Kretzer, Mound City, Mo. App. filed March 8, 1907. Details of construction.

Trolleys, 891,712; Abel Molnar, Pittsburg, Pa. App. filed March 14, 1908. A pair of arms mounted on the trolley harp and extending above the wheel. Said arms having prongs adapted to close over the trolley wire under spring pressure.

Coupling, 891,718; Thomas B. McMillan, Sherry, Tex. App. filed June 21, 1901. Provides a construction of coupling for connecting the air, gas and steam pipes of conductors upon all cars of a train.

Interlocking Tie-plate, 891,750; John G. Toy, Edinburg, Pa. App. filed Oct. 10, 1907. Provides a rail fastener comprising two clamping members, each provided with means for engaging the rail, and also with means for interlocking it with the other clamping member.

Electrically-governed Automatically Operable Train-controlling System, 891,779; Harvey B. Miller, Staunton, Va. App. filed Oct. 10, 1907. The locomotive has a tappet which will establish mechanical and electrical connection with contact plates included in signal circuits along the track.

Car Stop and Speed Signal, 891,792; Joseph F. Bush, Schenectady, N. Y. App. filed Nov. 20, 1907. A plurality of tail lights for trains which will automatically exhibit in different combinations depending upon the conditions of movement of the train; that is, whether in motion or at rest, and if in motion, at what speed.