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Henry W. Blake, Editor.
L. E. Gould, Western Editor. Rodney Hitt, Associate Editor.
Frederic Nicholas, Associate Editor.

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Of this issue of the ELECTRIC RAILWAY JOURNAL 11,000 copies are printed.

Neglecting Passenger for Freight Service

Freight transportation has become an established factor in the operation of many interurban railways, but sometimes to the detriment of the passenger business. The fact that all classes of rolling stock on an electric railway receive power from a single source and are therefore interdependent explains why heavy freight haulage is injudicious when the power supply and schedule conditions are unfavorable. This point is illustrated by the following in-

stances culled from the present practice of three interurban lines operating out of large cities. On one of these lines it is not infrequent to couple several freight cars to a motor coach with the inevitable result that the passengers reach their destinations 30 to 60 minutes late. The dispatcher of a second road has the habit of allowing a train of standard freight cars on the line just when the home-going commuters have settled down to their newspapers or whist. The next moment their car is moving about fast enough to synchronize with the gentle jog of a brewery horse and the lamps by their blushing guiltily admit the drop in voltage. A third railway uses the passenger cars as spare freight vans with no good consequences to their inside finish and cleanliness. Delayed schedules, poor lighting and unkempt cars in no wise help to build up the suburban towns along these railways. When the greatest attractions of passenger transportation by electricity are so neglected as by these companies it cannot be said that their large freight business necessarily indicates progressive management. To an electric railway freight rarely if ever is as profitable as the passenger business; hence there is no reason why it should be permitted to hamper the latter.

Mr. Ely's Article

It is doubtful whether any of those who devoted so much time and thought to the reorganization of the association between 1903 and 1905, even Mr. Ely himself, realized the extent and importance of the work which the association as an organization would be called upon to perform during the following four years. But through a fortunate combination of circumstances, a working body was created in 1905 to take up systematically the various problems in all the departments of the electric railway industry before the time when the need for such an organization would be most strongly felt. It was another case in which wise forethought has been justified, because since the reorganization serious problems which the railways can best solve by co-operative action have come on apace. They have not been confined to matters of public relations, but questions of an engineering, legal, accounting and transportation character have proved as important, although of a different nature, as those concerned with the relations of the roads with the State. In another column of this issue Mr. Ely makes an eloquent plea to those companies who are not fully acquainted with what has been done to learn for themselves by giving the matter a half-hour's serious consideration. That much, at least, is due the importance of the subject, and we believe is all, in fact more, than is necessary to prove the necessity of the present work of the American Street & Interurban Railway Association.

The Milwaukee Fare Case

The proceeding under which the Railroad Commission of Wisconsin is making an inquiry into the rates of fare charged by the Milwaukee Electric Railway & Light Company had its origin in a resolution passed by the City Council of Milwaukee, which was designed to force, if possible, the establishment of 2-cent fares. As no analysis was needed to show that this rate of fare was impossible, the council afterward amended its resolution to provide for a 3-cent rate, which is equally unattainable.

During the progress of the hearing the company has presented testimony to justify its charges to capital account, its appropriations for reserve funds, and all other operations pertaining to its finances, regarding which any question has been raised. The thoroughness with which the company has prepared its case and the completeness of the testimony submitted in its behalf are evidenced by the reports of the hearing published in the *ELECTRIC RAILWAY JOURNAL*.

Beginning with the original consolidation of the Milwaukee properties and their electrification, the advantages made possible by years of development have been demonstrated by the various witnesses. In the improvement which substituted electricity for horse and mule power, the property conferred incalculable benefits upon the residents of the city of Milwaukee, not, of course, as a matter of benefaction, but as a business enterprise, for which an adequate return should be allowed without question or demur by the public which is enjoying the advantages of the betterment. Other changes have been made by the company, as described by Mr. Beggs in his account of the history of the property; and while they are less spectacular than the progress from the horse car to electric equipment, and not subjects of public observation, they were just as much in the nature of benefits, were required by the advance in the art, and are legitimate elements which should be taken into account in any computation relating to the cost of operation of a street railway system.

Among the improvements which may be ranked as public benefits is the Public Service Building, which Mr. Beggs properly said was the last thing that should have been attacked by the city, because of the attractive appearance of the structure and the wholesome quarters which it offered the employees who worked there during the day, as well as those of a recreational and educational character. This important improvement provided quarters as a substitute for old offices in which, Mr. Beggs stated, the employees stayed too long. The advantages to the employees of attractive quarters cannot be controverted, but it was stated that inside of 10 years the building will carry itself and pay a dividend to the company, without cost to it, making the investment a wise one, if viewed solely from a business standpoint, without consideration of the humanitarian aspect involved.

In addition to the tangible elements entering into the cost of the property, the testimony included a recital of the intangible values which are apparent in the success of the company. The value of the service rendered by the railway continuously depends upon constant efficiency in management; unless this quality is to receive recognition in earnings sufficient to recompense those who give it for

the effort put forth, and to stimulate to further endeavor, the ultimate effect would be the loss of the ability desired in public utility corporations and the withdrawal of the capital which bases its confidence on the belief that an adequate return will be allowed for successful administration.

Franchises, Limited, Perpetual and Indeterminate

Commissioner Milo R. Maltbie, of the Public Service Commission, First District of New York, discussed the relative merits of perpetual, indeterminate and short-term franchises in an instructive report recently submitted to the other members of the commission. The report has been printed, and is the valuable contribution to the literature on the subject which one would expect from the careful student of governmental policies which Mr. Maltbie has shown himself to be, although we do not believe that railway companies will agree with all of the conclusions reached. Mr. Maltbie marshals nine objections to the short-term limited franchise, and cites only one merit, namely, the possibility of municipal purchase and of re-adjusting operating methods to public needs at short intervals. But he explains that this is usually secured only at the expense of good service and low fares, and that where the franchise provides that at the expiration of the term the property shall revert to the municipality without payment, a poor service is almost inevitable.

Mr. Maltbie is a strong advocate of the indeterminate franchise, but believes that it should always be coupled with a provision that in case the franchise is revoked the company should be paid the value of its property, plus a prescribed bonus where the profits are small or non-existent during the first few years of an enterprise, or where the purchase takes place within a short time after capital expenditures have been incurred. Absence of such a provision of purchase constitutes the chief defect in the Massachusetts system of indeterminate franchises. Mr. Maltbie also considers that the power of purchase should not be confined to the municipality, but should also be permitted to another company, to be authorized by the city, because the latter may not have the financial means to pay for the plant, even temporarily, and municipal operation may be neither feasible nor desirable. The new public utilities law of Wisconsin provides for the purchase of the property by the municipality, but does not permit the alternative of private purchase suggested by Mr. Maltbie, and in this respect he considers it to be seriously defective. The Chicago plan, on the other hand, authorizes either method of purchase, and if the option is exercised before the expiration of the franchise term of 20 years for any purpose other than direct municipal operation or for transfer to a company which agrees to limit its profits to 5 per cent, a bonus of 20 per cent must be paid.

The chief defect of the indeterminate franchise, as we see it, is that it places a tremendous amount of arbitrary power in the hands of those to whom the question of revocation is delegated. "Good behavior," the usual expression to describe the condition under which a railway company is permitted to continue to operate, is a very difficult term to define. If provision is made for the return of the

capital invested, including initial and organization expenses, the injustice of revocation will, of course, be very much less than otherwise. Yet if there is constant danger that a company's affairs will be summarily suspended or turned over to somebody else at the whim of a commission, or even of the electorate at large, it will militate against good service and permanent plans for the future. Experience with indeterminate street railway franchises in Massachusetts has been successful only because, while the franchises are revocable, none of importance has ever been revoked. That is, the franchises are practically perpetual, so that while the two methods theoretically are removed as far as possible in this case they are practically identical. On the other hand, the perpetual franchise, which Mr. Maltbie condemns, has been shown in New York to afford as much opportunity for regulation as those which are revocable, and at the same time gives a sense of greater security to the company, and thus affords more encouragement to install permanent improvements.

The chief objections which Mr. Maltbie urges against perpetual franchises are four in number. He says that "it is unwise and unsafe for a city to grant permanent vested rights to use public property when * * * no one can foresee what the future needs of a community will be, and what may be desirable at one moment is very likely to be undesirable in the near future." But experience has shown that such changes can be required with a perpetual franchise, and when the New York Central was obliged to install electric motive power in the Park Avenue tunnel it could afford, with its real estate rights in perpetuity, to go far beyond the demands of the State. Mr. Maltbie further considers that "it is inconsistent with the idea of free government, instituted for the benefit of the people, to surrender for all time to private interests a valuable special privilege in the public streets." But we cannot see that it constitutes any greater inconsistency than is involved by the right to cross streets, followed by every steam railroad company, or, in fact, in the grant of title of any private property within the city. The third objection is that "perpetual franchises tend ultimately to produce over-capitalization, high rates, poor service, indifference to public welfare and lack of progress." But this presupposes no public regulation.

Finally, it is claimed that "even under an effective system of public regulation and control, there are times when * * * a complete reorganization is the only remedy that will effect a complete cure. In such instances a perpetual franchise is often an insurmountable obstacle. If the situation becomes unendurable the power of eminent domain may be invoked, but the extreme cost of acquisition under such procedure is often prohibitive, as it represents not the actual value of the property, but the capitalized value of prospective earnings for all time to come." We admit that there must be some give and take policy when both the railway and the municipal authorities have rights which must be considered. It is very questionable, however, whether the other alternative is not far worse. If the authorities have arbitrary power to overturn a company's business, even by the payment of a nominal sum, or if such a tempting bait is constantly dangling before the eyes of rival promoters as control of a large city

property, will it not be the inevitable tendency of railway companies in States which really have revocable franchises to enter into politics and thus insure the election of those favorable to the retention by them of their property? With a perpetual franchise as complete regulation is possible as with revocable franchises, even to the practical confiscation of a company's profits through taxation. But as the amount of property at stake is less, the company is farther removed from politics than with a franchise revocable at any time by a regulating body or even under stress of temporary political excitement by a referendum.

Car Records as Legal Evidence

In examining the numerous kinds of car inspection and repair records in use it is astonishing to find how few of them would be admissible as legal evidence. Some vouchsafe no more information than a cryptic "o.k." opposite a car number, others bear the initials of the employee with an explanation of the work done, and a select few give the repair account legal value by including the signature of the inspectors and the countersignature of their foremen.

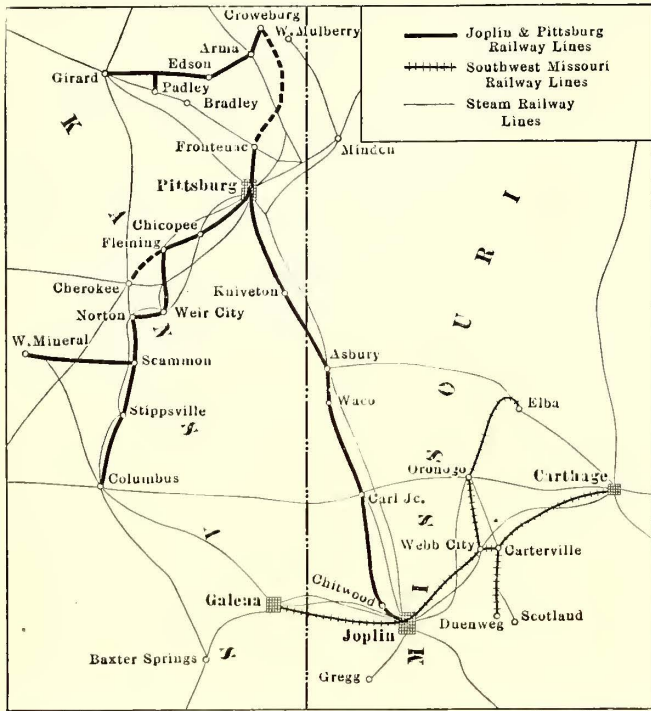
Surely this laxity must be the cause of unnecessary trouble for the claim department. If records are kept at all, it is worth while to make them respected in the courts. Signatures alone, however, would not constitute a satisfactory exhibit. For example, inspection records of the card type with a signature opposite each division of equipment are faulty in so far as they fail to reveal special circumstances. If the car required other than perfunctory attention, the card should be reinforced by an additional signed report, giving the details. In some shops the repairs are recorded by the individual employees in one book. This log system must prove a rather clumsy procedure, and, besides, it is not feasible to allow such a record of all cars to be removed every time the legal department wants to submit it as evidence regarding particular rolling stock.

It is essential that these detailed reports should not be limited merely to those cars which are brought into the terminal in connection with a reported accident. Conductors often fail to report that passengers have entangled their clothing on a projecting bolt, slipped on an icy platform or tumbled backward from a moving car. Perhaps six months or a year afterward, some of the people thus involved become imbued with the idea of mulcting a transportation company, and hand in a claim for injuries to body and peace of mind. The legal department may assiduously dispute the allegations of the complainant but, having no evidence that the cars were not in a neglected state, it must seek a compromise in preference to more costly litigation.

All of this trouble would be eliminated if the maintenance department could offer records of value to its legal fellow-workers. It is highly desirable, therefore, that both branches of the service co-operate in preparing a form which will fulfill both mechanical and legal functions. Incidentally, the filing of the original papers with the legal department will make it unnecessary to bother the shop force every time the history of a car is wanted in connection with liability for negligence cases.

NEW INTERURBAN LINE OF THE JOPLIN & PITTSBURG RAILWAY COMPANY

In October, 1908, the Joplin & Pittsburg Railway Company inaugurated service on a new, well-built line from Pittsburg, Kan., to Joplin, Mo. With this addition of 24 miles of track, the company now has a system of 68 miles of city and interurban lines centering in Pittsburg



Joplin & Pittsburg—Map of System Showing Connections in Joplin

and radiating in three directions. Reference to the accompanying map will show that these lines are located in southwestern Missouri and southeastern Kansas. In this territory is to be found the very unusual combination of great fertility of the soil and extensive mines of coal, lead and zinc.

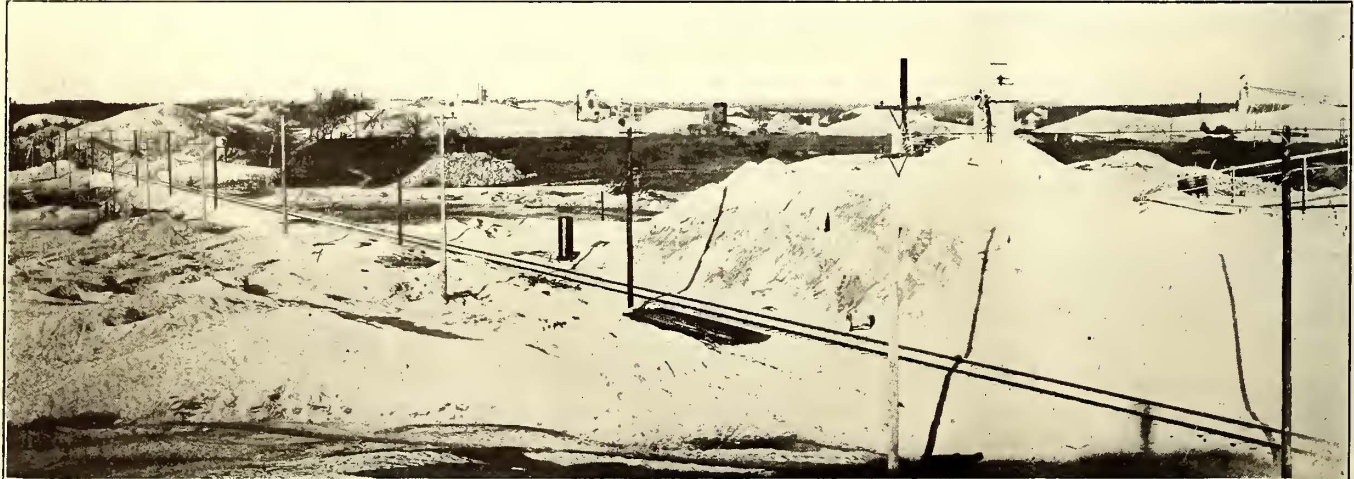
In addition to the Joplin-Pittsburg division, which forms

tending from Scammon on the Pittsburg-Columbus line, west to West Mineral, was completed. The construction of this new branch corresponds with that of the Pittsburg-Joplin division. In the city of Joplin the company has 6.5 miles of track through principal streets, which track is built of 70-lb. rails with white oak ties laid in concrete and paved to correspond with the street surface. The lines of the Girard Coal Belt Electric Railway Company, running from Girard, Kan., in a northeasterly direction through the towns of Arma and Franklin to Croweburg, with a branch to Radley and Dunkirk, have just been purchased, and arrangements are under way for the construction of from 8 to 10 miles of track to make the connection with the lines of the Joplin & Pittsburg Railway Company. This will give the company as complete control of the situation in the rapidly developing coal fields lying north of Pittsburg as it already has in the thickly populated region south of that city. The town of Cherokee has recently granted a liberal franchise to the company, and a branch line about 2½ miles long will immediately be built to it from the main line. When these extensions are all completed the company will be operating more than 100 miles of finely built, well-equipped electric railway. At Joplin connection is made with the Southwest Missouri Railway, an interurban electric line operating between Joplin, Webb City, Carterville, Carthage and Oronogo, Mo., and Galena, Kan.

These three lines, the Joplin & Pittsburg, Girard Coal Belt and Southwest Missouri, serve a population of over 250,000, so distributed as to insure a relatively much larger business than would usually be obtained from the same number of people.

TERRITORY SERVED

Joplin, the southern terminus of the new division, is the center of an important mining district, which has had a remarkable growth. In 1890 the population of Joplin was 9943; in 1900, 26,123, and at the present time it is estimated to be in excess of 45,000. The city itself has large public buildings, one of the finest hotels in the State of Missouri and many fine residences. It is the shipping center for a large region. The Missouri Pacific, the Missouri, Kansas & Texas, the St. Louis & San Francisco



Joplin & Pittsburg—Zinc Mines and Chats Piles from Which Ballast is Obtained

the subject of this article, the company operates an older division, about 32 miles long. This line extends from Frontenac, Kan., south through Pittsburg, and thence southwest through Weir City, Scammon and Stippsville to Columbus, Kan. Last spring a branch of 5.5 miles, ex-

and the Kansas City Southern railroads afford excellent transportation facilities. In the zinc fields immediately surrounding Joplin the estimated zinc and lead production for the last year was \$18,500,000, which is said to have been about 60 per cent

of the zinc and lead mined in the United States and about 30 per cent of that of the world.

The city of Pittsburg, which is the northern terminus of the interurban railway, now has a population of more than 20,000. In 1900 the population was 10,112, a growth of about 100 per cent in eight years. Pittsburg is the center of the finest bituminous coal fields between the Mississippi River and the Rocky Mountains. In these fields more than 10,000 miners are employed, and the value of the mine output is more than \$20,000,000 a year. Pittsburg is surrounded by extensive shale beds and great quantities of brick, tile, sewer pipe and cement are manufactured near by. The city is well equipped with public utilities, has fine hotels and many handsome residences. Pittsburg also is a large shipping center, the Kansas City Southern, Santa Fe, St. Louis & San Francisco and the Missouri Pacific railroads giving it unusually good transportation facilities.

Both Joplin and Pittsburg are near the Kansas oil and gas fields, and are supplied with natural gas from these fields. There is an unusual mutuality of interest between these two mining fields, the Pittsburg district supplying the coal for fuel, power and other purposes in Joplin. In the Pittsburg district are located the smelters where the zinc and lead ores from the Joplin district are treated.

The new interurban division connecting the cities of Joplin and Pittsburg is 24 miles long, and is located on a private right of way the entire distance. Woven wire fencing supported on concrete posts encloses the 100-ft. right of way.

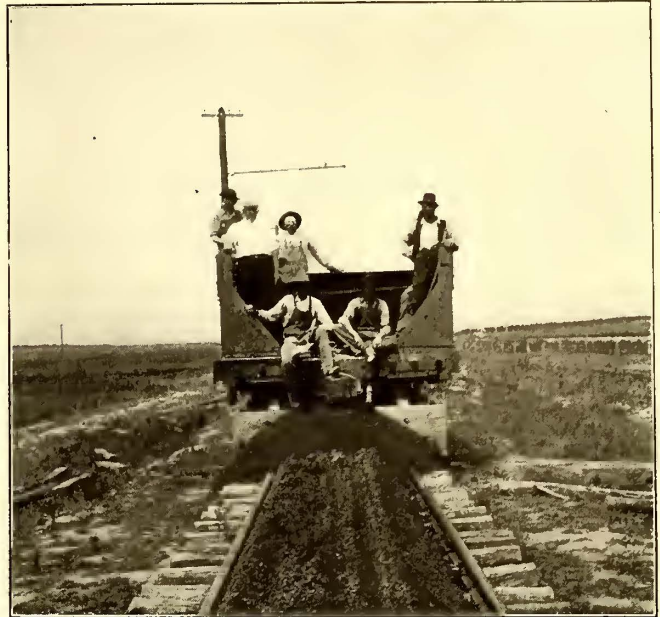
ROADWAY

Steam railroad standards were followed in the roadway construction. The total curved track on the 24 miles is but 7300 ft., and no curve exceeds 3 deg., and there are only two of these, the remainder being 2-deg. curves.

The grades are very light, considering that the south

Carl Junction, Mo., to Pittsburg, Kan., about 18 miles.

All openings for drainage less than 8 ft. and requiring more than 24-in. pipe have standard square-box and double-arch culverts of modern design. The concrete used for the track substructures comprised the Kansas hydraulic cement mixed with cherts and river sand in the proportion of 1:5:2. The concrete boxes were so designed as not to require steel reinforcement.



Joplin & Pittsburg—Spreading Ballast

There are seven bridges between Pittsburg and Joplin; one is a 250-ft. through-truss bridge and the other shorter structures are I-beam and built-up girder spans. The bridges were all built and erected by the Southwestern Bridge Company, Joplin, Mo. The concrete abutments and



Joplin & Pittsburg—Main Street in Pittsburg, Kan.

end of the roadway is in Joplin, Mo., at the north foothills of the Ozark Mountains. The heaviest grade is one of 2 per cent for 2000 ft. On 80 per cent of the total length of the interurban road the grades do not exceed 1 per cent. The road is built on prairie country from

piers were designed and constructed by the contracting engineers.

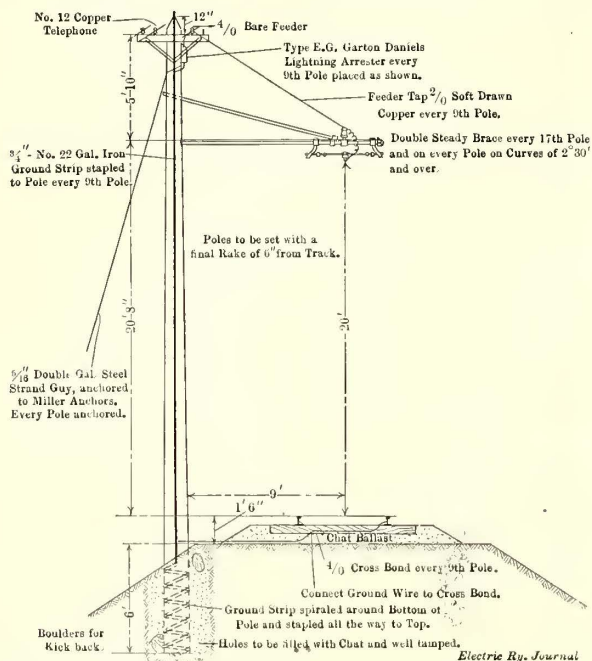
TRACK CONSTRUCTION

The track is laid with 33-ft., 70-lb., A.S.C.E. Bessemer rail with "100 per cent" joints, supplied by the Cambria

Steel Company. The No. 1 oak ties are spaced on 2-ft. centers. The joints are bonded with two No. 0000 U. S. concealed bonds. The bonds have 7/8-in. terminals. All drilling for the bonds was done after the rails were spiked down. Oil or water was not used, and the bonds were compressed immediately after drilling, with a view to preventing any rust from accumulating on the bright

zinc and lead districts make a special effort to use chats for ballast. The greatest expense in connection with this ballast is in the hauling and distributing, as it can be obtained from the mines for 3 1/2 or 4 cents a cubic yard.

Accompanying engravings show the methods used in handling the ballast. The chats were loaded from the piles at the mines into Rodger center dump ballast cars



Joplin & Pittsburg—View of 100-ft. Right of Way Showing Double Pole Line

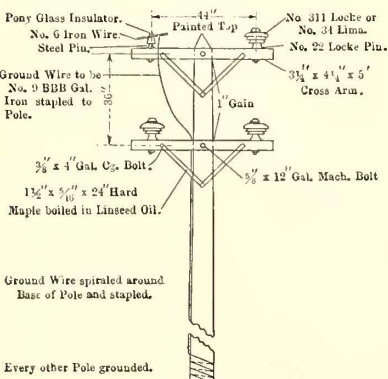
Joplin & Pittsburg—Standard Track and Overhead Construction

surface formed by the drilling. The rails are cross-bonded every 1000 ft. with No. 0000 bonds.

The road has seven sidings, one double-end siding and six single-end sidings. Standard 15-ft. split-point switches and 8-deg. spring rail frogs are used. The switchstand is 6 ft. high, with a target rod bearing the red and white signals, and also the red and white oil-burning lamps. The switches and frogs were built by the Weir Frog & Switch Company, of Cincinnati, and the Falk Company, of Milwaukee. The special work for the car barns and the railroad crossings was also manufactured by the Falk Company.

by a steam shovel, and also by an elevator system, which is used extensively in the Joplin district. By the latter method the material was pulled with horse and scraper over a small pit and dumped into a conveyor, which hoisted it to a sufficient height to allow it to fall into the center of a car. One such outfit could load from 300 to 400 cu. yd. per day. This method was used in addition to the steam shovel capacity.

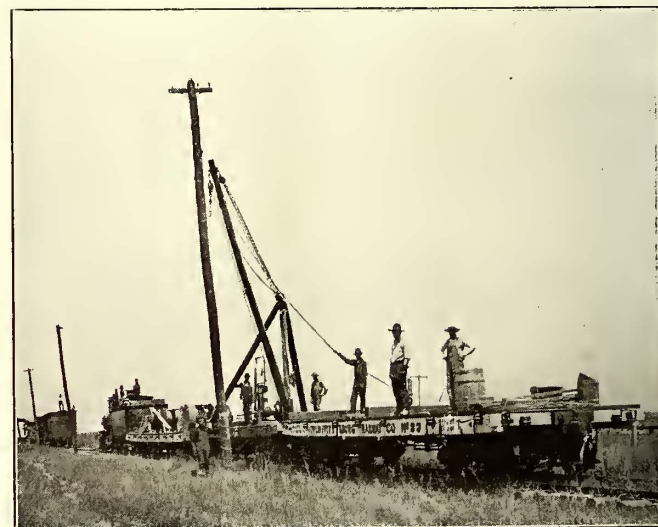
Each ballast train consisted of eight cars. The crew was composed of a conductor, two brakemen and a helper. In unloading, all the cars were first dumped in the center of the track. This left a ridge between the rails about as high as the axles. After the cars had all been dumped a



BALLASTING

The material used for ballasting is the ordinary tailings from the zinc and lead mines, commonly called "chats," which range from 1/4 in. to 1/2 in. in size. All of this material used was obtained along the line of the railway company in the Joplin district. An average of about 2400 cu. yd. of ballast per mile was

used, but was so distributed in rock cuts as to offer just the necessary thickness to bed the ties and a sufficient amount at the outside ends of the ties to hold them in their proper place. On fills and soft ground the ballast is from 8 in. to 10 in. deep underneath the ties, with a shoulder about 1 1/2 ft. outside of the ties. The steam roads in the

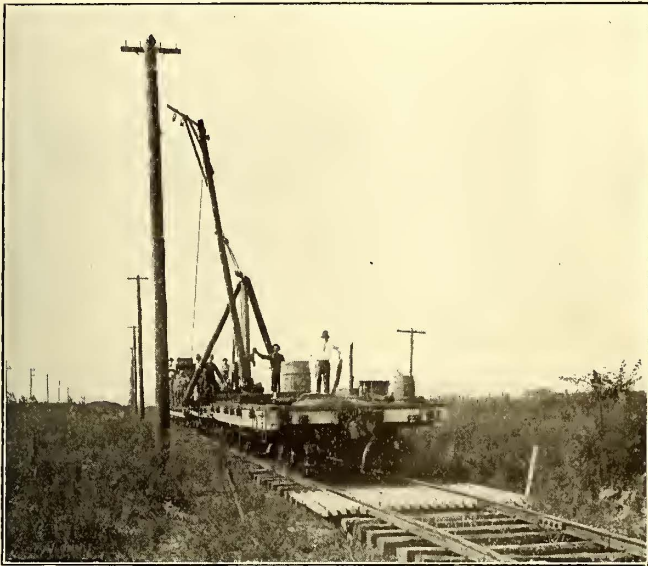


Joplin & Pittsburg—Setting Trolley Poles

"push board," made of 4-in. x 12-in. oak plank 24 in. high and 8 ft. long, was fastened to the forward truck so that it rested on the top of the rails. The locomotive then started to push back over the material that had just been dumped, and thus leveled it off in a smooth and uniform manner even with the tops of the rails. Then the

surfacing gang made the first lift and brought the rails practically up to their final height.

The second ballasting operation was similar to the first, with the exception that a piece of 4-in. plank 4 ft. 6 in. long was bolted below the push board and between the rails. In pushing back over the second layer of ballast this lower board cleared the space between the rails. This

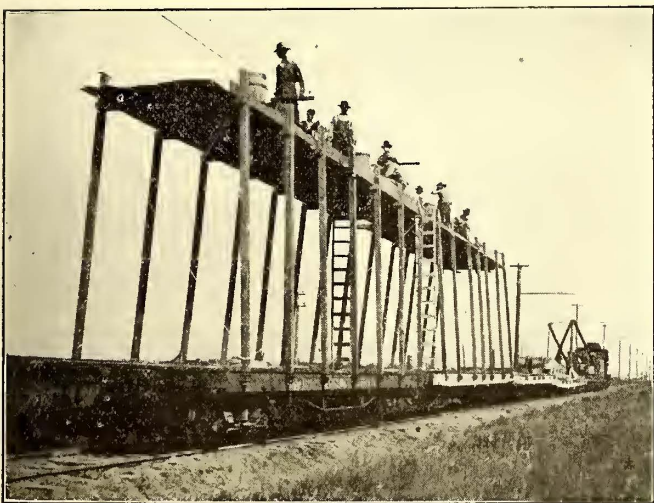


Joplin & Pittsburg—Stringing Wires on Trolley Pole Line

made it unnecessary for the workmen to shovel any material off the top of the ties. With practice the men could dump just a sufficient amount to properly ballast the track, leaving material for the 1-ft. slope on each end of the ties. A train of eight cars could be dumped in from 20 to 25 minutes. In ballast hauling three 80-ton, 10-wheel locomotives were used. The older line from Pittsburg to Columbus is ballasted with smelter cinders, which afford a very solid roadbed.

OVERHEAD CONSTRUCTION

The pole line for the support of the catenary and feeder



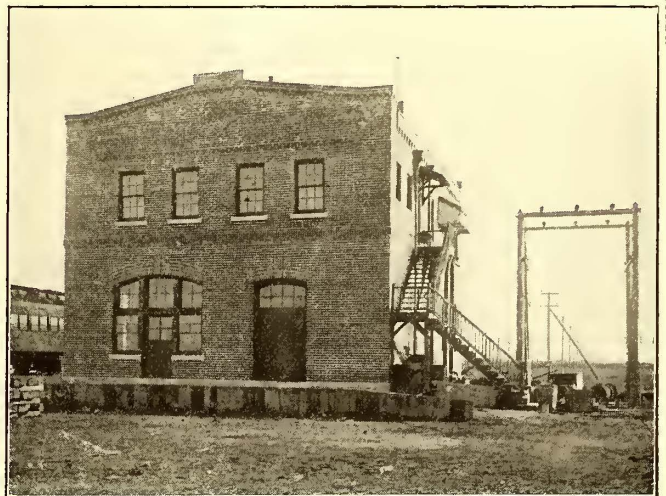
Joplin & Pittsburg—Platform Car Used in Erecting Catenary Trolley

system consists of 35-ft. 8-in.-top yellow pine, zinc and oil-treated poles with the ordinary form of T-iron brackets 11 ft. long. The treated poles were supplied by the Zinc-oil Pole Company, Texarkana, Tex. The trolley is suspended 21 ft. above the head of the rails. The feeder system consists of No. 0000 hard-drawn round copper wire

with feeder taps 1000 ft. apart and Garton-Daniels lightning arresters at each feeder tap. The lightning arresters are grounded by using Roebbling's Sons Company's $\frac{3}{4}$ -in. triple-galvanized ribbon wrapped around the pole at the bottom to give a sufficient ground contact. This ribbon is also connected with the rail to give an additional ground.

Although 600-volt direct current is used to operate the cars the trolley wire is catenary supported. The messenger is $\frac{3}{8}$ -in. Siemens-Martin double-galvanized steel cable. Twelve hangers support the No. 0000 trolley wire between the brackets, which are 120 ft. apart. The trolley fittings were supplied by the Electric Service Supplies Company.

A very efficient method was used in setting the trolley poles and stringing the overhead and feeder lines thereon. The essential part of the equipment for doing this work was a derrick mounted on a flat car and operated by a small hoisting engine. In setting the poles a second flat car was coupled to the derrick car and both were pushed by a locomotive. The second car was used to carry the poles to be set. While the derrick was lowering one pole in its hole and while the train was being moved ahead to the next pole hole the men on the pole-supply car had time to fasten the block and fall to a second pole, thus making it ready for



Joplin & Pittsburg—Substation at Asbury, with Living Rooms Above

hoisting and setting as soon as the train reached the second hole. It is stated that in this manner and with a crew of three men about 3 miles of poles could be set in an hour. Accompanying illustrations show the construction train as arranged for setting poles, stringing feeders and hanging trolley wire.

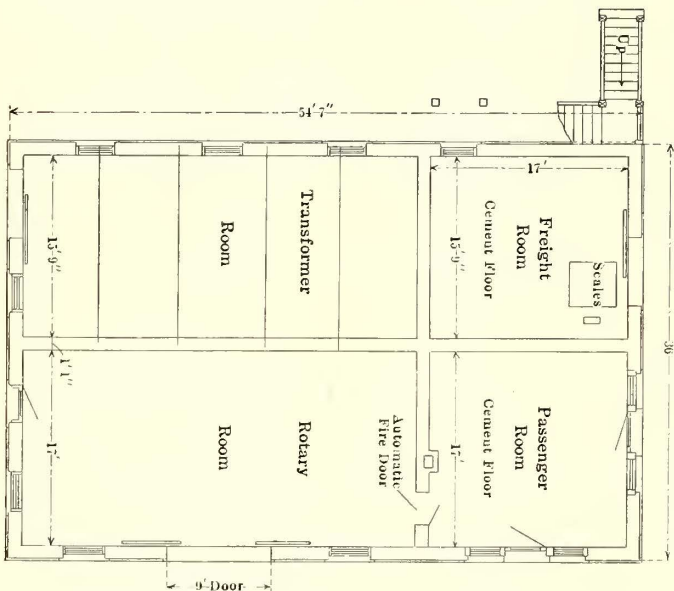
The feed wires, which are carried on short cross-arms at the tops of the poles, were placed with the same derrick car that was used in setting the poles. A carload of reels of wire was coupled next to the derrick car so that when one reel had been emptied the wire from a fresh reel placed on the opposite side of the derrick car could be made ready for splicing to the wire just payed out. The splicing and soldering was finished as the wire was placed and the stretching progressed at a rate of about 3 m.p.h. The catenary messenger and the trolley wire were placed by this same derrick car and after they had been properly drawn up and anchored special tower cars, as shown in the illustration, were used while the hangers were placed. These tower cars comprised two flat cars with elevated platforms long enough to cover half a span and thus six hangers could be placed without moving the train. Twelve linemen were

used to fasten on the ears and place the hangers. Before beginning the work all the material was sorted along the platform so that there would be no mistaking the length of hanger for each location as the train moved forward.

Western Electric telephone equipment is used, consisting of pole boxes, jack boxes and also portable telephones for the cars. The telephone line consists of two No. 12 hard-

a 400-kw, 600-volt Bullock railway generator. There are also two 150-kw, 600-volt generators belt driven by high-speed engines. The latter are emergency units. Both of these stations are non-condensing and it is necessary to treat the water at both.

A part of the new division is supplied with direct current by two rotary converter substations which receive power from the hydraulic plant earlier mentioned. One substation (No. 1) is located just north of Joplin and the other (No. 2) is at Asbury, Mo. Current at 33,000 volts is

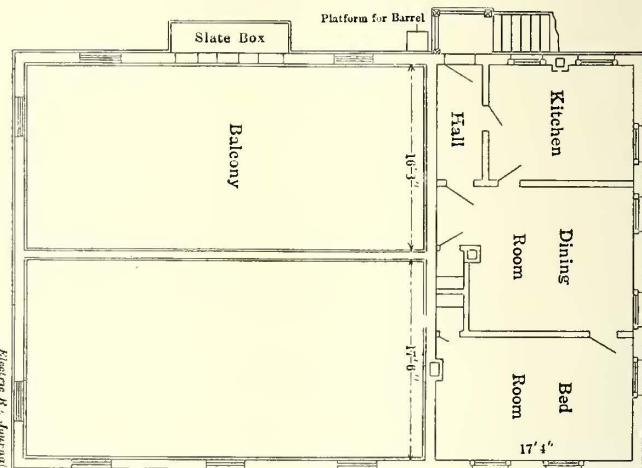


Joplin & Pittsburg—Plan of Ground Floor of Asbury Substation

drawn copper wires transposed every 1000 ft. Telephone boxes are placed at each siding and jack boxes for portable car sets are installed at intervals of 1 mile.

POWER SUPPLY

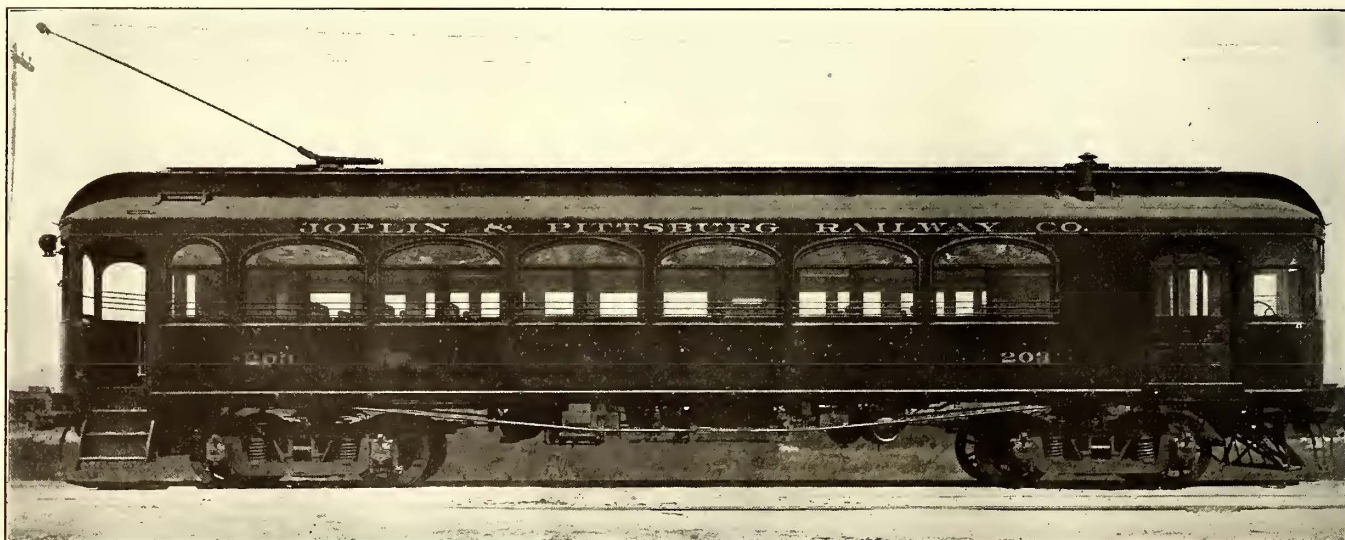
The power for operating the new division is partly supplied by the Spring River Power Company, which has a water-power plant located at Lowell, Kan. The railway company has a power station in Pittsburg which feeds the city lines and part of the interurban system. At this sta-



Joplin & Pittsburg—Plan of Second Floor of Asbury Substation

brought to each substation from an independent branch of the generating company's transmission system. Substation No. 1, near Joplin, is fed by a transmission line owned by the power company, but the railway company built and owns the high-tension line from Carl Junction, 10 miles north to the Asbury substation.

One of the views shows the location of the transmission line at one side of the railroad right of way and at a safe distance from the overhead trolley system. The type of pole-top construction adopted was that used by the Spring



Joplin & Pittsburg—Standard Passenger Car

tion are three Heine 375-hp water-tube boilers arranged for firing with either coal or natural gas. The main generating units are two Siemens & Halske 700-volt d.c. generators direct driven by two Russel tandem-compound engines. A second power house at Scammon on the Columbus division has an Allis-Chalmers Corliss engine which drives

River Power Company. In this company's experience the design had shown itself to be the most satisfactory. The transmission line comprises 30-ft. and 35-ft. cypress poles with 8-in. tops carrying on two cross-arms three No. 4 hard-drawn copper wires arranged at three corners of a rectangle. At the fourth corner is a No. 6 iron wire in-

stalled for lightning protection. At every second pole the iron wire is connected to ground by a triple-galvanized soft-iron ribbon. The poles of this line are treated with carbolineum to a point above the ground line.

The substation buildings are constructed of Kansas red brick laid with $\frac{1}{4}$ -in. white mortar joints. The roof is covered with tar paper and gravel. The stations and equipment are in duplicate except that the Asbury station has an extension of 18 ft. to accommodate a waiting room and a freight room and also has on the second floor, over these rooms, comfortable apartments for the operator and his family. An outside stairway serves for entrance and exit to and from the second floor.

The freight room is equipped with Buda platform scales for weighing freight. The passenger room has all the modern conveniences for taking care of passengers in the way of heat, drinking water, etc. The heat is furnished for the living apartments and the passenger room by coal stoves.

The 33,000-volt transmission wires are taken into the machine room through a box made of Carthage limestone slabs $1\frac{1}{4}$ in. thick. The wires pass up through the bottom of the box, which is attached near the roof on the outside of the rotary room. There are three 60,000-volt insulators in the floor of the box and also on the inside wall of the building, which is so close to the openings that it is impossible for birds to short-circuit or to foul the wires.

Each substation has two 300-kw Westinghouse, 25-cycle rotary converters with transformers, switchboard and all the necessary equipment. The rotaries are located in a room 70 ft. 6 in. long by 34 ft. 8 in. wide. The ceilings, 22 $\frac{1}{2}$ ft. high, give sufficient overhead room for proper ventilation, both in the rotary room and the transformer room. The floors are of concrete 6 in. thick. All conduits for the wires to and from the switchboard are concealed in the floor and the ducts are large enough so that any wire may easily be replaced. The rotary foundations are hollowed out to form pits 3 ft. square and 12 in. deep. These openings immediately under the center of the rotaries accommodate the wires which pass into the ducts leading to the back of the switchboard, where there is another pit 18 in. deep, 3 ft. wide and 28 ft. long. The oil-break switches for opening the 33,000-volt circuits in the transformer house are manipulated by levers from the switchboard.



Joplin & Pittsburg—Express Car

In the transformer room are six oil-insulated, air-cooled Westinghouse transformers of 100-kw capacity each. The floor of this room also is of concrete with the necessary ducts concealed in it.

CAR HOUSE

The Joplin division car house at Joplin is located at the

west end of the city on a lot 211 ft. x 420 ft. in size. The outside dimensions of the car house are 292 ft. 6 in. x 63 ft. The barn is divided by a 12-in. firewall running in the center of the building and extending 2 $\frac{1}{2}$ ft. above the roof. The structural material of the building is Kansas red brick laid with white lime mortar and trimmed with Carthage limestone. The building has a flat roof supported on 10-in.



Joplin & Pittsburg—Car House and Shop at Joplin

I-beams and built of 4-in. Southern pine covered with tar paper and gravel.

In the southern portion of the car house are two 60-ft. repair pits of concrete. This compartment contains the work shop. There is also a car pit 95 ft. long affording sufficient room to work under two of the 53-ft. passenger cars at the same time.

The northern portion of the car house was planned to have when extended the same number of car pits as the southern portion. Each compartment has two tracks the entire length of the car house. The opening at the east end of the car house for car entrance is closed by large iron swinging gates. There is a small workshop 25 ft. long in the rear of the car house. The main repair shop of the Joplin & Pittsburg Railway is in Pittsburg, Kan.

The special track work leading to the car house in Joplin is so arranged as to form a "Y." On this cars may be turned and started in either direction without first having to run up into the center of the car house to be turned. Both compartments of the car house are equipped with 2-in. hose for fire protection. There are also separate hydrants for car washing.

The offices for the operating department and the rooms for the motormen and conductors are stationed just in front of the car house. This location affords a view of both sides of the car house and of the street at the same time. These offices are built of wood and are heated by natural gas stoves. Here the motormen and the conductors have a card room and lockers for their extra clothing.

ROLLING STOCK

The rolling stock equipment of the entire road includes the following cars:

- 5 double-truck 53-ft. passenger.
- 2 double-truck 53-ft. express.
- 15 double-truck 43-ft. passenger.
- 4 double-truck open, seating 85 each.
- 7 single-truck closed.
- 12 single-truck open.
- 2 line and wrecking.
- 10 flat.
- 3 ballast.
- 6 coal.

The general characteristics and dimensions of the large passenger cars which are operated on the new line and

which were described in the *ELECTRIC RAILWAY JOURNAL* for Sept. 26, 1908, page 712, are as follows:

Length over all.....	53 ft. 9 in.
Length of main compartment.....	24 ft. 1 in.
Length of smoking compartment.....	10 ft. 5 in.
Length of rear platform.....	4 ft. 0 in.
Width over all.....	9 ft. 6 in.
Height—bottom of sill to top of roof.....	9 ft. 8 in.
Trucks.....	Class 78-30 Baldwin.
Axles.....	5½ in.
Wheel base.....	78 in.
Center-pin load (capacity).....	30,000 lb.
Wheels.....	33 in. Standard.
Weight of truck with motors.....	11,000 lb.
Control system.....	Electro-pneumatic.
Headlight.....	Imperial.
Heater.....	Smith.
Air brakes.....	Westinghouse AMM.
Motors.....	4 Westinghouse 112-B.
Air sander.....	Lintern.
Curtain material.....	Pantasote.
Curtain fixtures.....	Forsyth.
Window fittings.....	Edwards.
Couplers.....	Tomlinson.
Signal system.....	Lintern.
Fare register.....	Ohmer.

The bodies of these large interurban cars were built by the Jewett Car Company. The bottom framing of the bodies consists of six yellow pine sills. The side and center sills are of compound construction, the former having 7-in. I-beam and the latter 6-in. I-beam reinforcement. The bolsters are extra heavy and have pressed-steel fillers extending their full length. The body framing throughout is of white ash and the construction follows the steam-coach type.

The cars are divided into three compartments—baggage compartment in front, smoking compartment in the center and main compartment in the rear. The main and smoking compartments are finished in selected figured mahogany and the baggage compartment in ash, painted white. The ceiling is of the full Empire style and is painted green with gold decorations. The seats in the main and smoking compartments are wide, are of the stationary type with high roll-top backs and arm rests, and are upholstered in green plush. The cars are lighted by 45 incandescent lamps, which are so placed that they form arches of five lamps each across the ceiling. Push buttons and parcel racks form desirable features of the inside furnishings. Both ends of the car bodies are round and glazed with three single drop sash. A motorman's cab on the left side of the front end has a narrow exit door through the side of the car. The doors in the interior partitions are 20 in. wide and are supported on hinges. A toilet room with wash basin and flush hopper is placed at the rear end of the main compartment.

OPERATION

Hourly service is operated over the new line between Pittsburg and Joplin. Express is carried on all passenger cars and a special freight and express train makes a round trip on each division every day. A minimum rate of 25 cents is charged for packages carried on passenger trains. The service on the Columbus, Frontenac and Mineral branches is operated on half-hour headway. In Pittsburg a local service with 15-minute headway is operated and in Joplin a 10-minute city service is given. On the interurban division the Nicholl autographic register is used when transmitting orders. These registers are carried in the baggage compartments of the cars and are mounted close to the Western Electric telephone set, which is supported on the bulkhead. The train dispatcher is located in the gen-

eral office at Pittsburg and has to assist him in following the trains, route boards with plugs numbered for each train, which plugs are moved forward as the trains progress and as orders are issued.

ORGANIZATION

The personnel of the operating staff of the Joplin & Pittsburg Railway Company is as follows: Joseph J. Heim, president, Kansas City, Mo.; W. W. Calhoun, vice-president, Carthage, Mo.; John A. Prescott, secretary and treasurer, Kansas City, Mo.; D. L. Robinson, assistant secretary and treasurer, Buffalo, N. Y.; E. S. Bigelow, auditor, Kansas City, Mo.; R. W. Harris, general manager, Pittsburg, Kan. A. L. Register & Company, Philadelphia, Pa., were the general contractors for the construction and equipment of the Joplin-Pittsburg and the Scammon-Mineral branches and the Joplin city division.

A. C. LINES AT MILWAUKEE TO BE CHANGED FOR D. C. OPERATION

The Milwaukee Electric Railway & Light Company is completing plans for changing over its single-phase, 3300-volt lines for 1200-volt operation. It has been found that the single-phase equipment installed more than a year ago is not capable of handling the increased traffic on the Watertown division of the road. For that reason this division and new interurban lines under construction will be equipped for 1200-volt operation. The present a.c. service extends from Waukesha Beach to Watertown, Wis., 42 miles; from St. Martins to East Troy, 21 miles, and on a new extension of 18 miles from St. Martins to Burlington, Wis. The trolley wire on the single-phase lines is now insulated for 3300 volts and therefore will have a considerably increased factor of safety on 1200-volt direct current.

Five new converting substations will be built. It has not yet been decided whether two rotary converters or two motor generator sets in series will be used to convert the transmission current for feeding the 1200-volt trolley. Each of the two substations which will handle the heaviest load near Milwaukee will be equipped with two sets of 500-kw rotary converters or motor-driven generators. The outlying substations each will have two sets of 300-kw machines. Current will be transmitted over the steel-tower line described in the *ELECTRIC RAILWAY JOURNAL* for Sept. 26, 1908, page 692, at a potential of 66,000 volts.

The change-over from 3300-volt a.c. to 1200-volt d.c. operation will require the re-equipment of 10 passenger cars and two utility cars. The company also is having built at the G. C. Kuhlman plant of The J. G. Brill Company 15 large interurban cars which will be equipped for 1200-volt operation. When the new cars are received and the old ones are re-equipped each will have four 125-hp standard interpolar GE motors designed for 600 volts across terminals, but insulated for 1200 volts to ground. The control connections will be arranged for operating two motors in series on 1200 volts and for series-multiple operation on 600 volts. The control equipment will also be designed for train operation. The air compressor motors will be built to operate at full speed on 1200 volts and at half speed on 600 volts. The pump and reservoir capacity will be large, so that there may be plentiful storage on low-voltage sections. A dynamotor will be installed on each car to convert the 1200-volt current to 600 volts for use in lighting the car.

ARE WE GETTING OUR MONEY'S WORTH IN THE ASSOCIATION?

BY HON. W. CARYL ELY, PRESIDENT OF THE AMERICAN STREET & INTERURBAN RAILWAY ASSOCIATION, 1903-1906

At the time of the adoption of the new constitution and by-laws and the revised scale of dues payable by member companies of the American Street & Interurban Railway Association in 1905, there was considerable discussion as to whether it would be possible for the association to render service equivalent in value to the annual dues. The very nature of the case precludes one from establishing affirmatively by reference to concrete examples the rendition by the association to individual companies within any given period of an exact number of dollars' worth of work or service. The proposition, then, if it is affirmatively established, must be by reference to the work of the association in general with regard to its applicability to individual members through their occupancy of a position in the general situation.

The change that has taken place within the past few years in the status of the business itself is constantly tending to require from railroad companies the devotion of time and work, particularly with reference to the investigation of questions general and public in their nature, which a few years ago practically did not exist. The business of electric railway transportation is subject to public opinion in its various methods of expression to such a degree that the questions raised cannot be evaded, but must be squarely met. No individual organization can possibly be equipped to meet these various questions. True, as they arise they seem to be concrete and individual because they come out of a particular situation; but they are at the same time coming out of all situations, and to be settled rightly these questions must be treated in their larger aspect as affecting the transaction of the business everywhere, as a whole, as a line of work. To meet these questions with an array of facts carefully gathered throughout the whole country in such a manner as to leave no question as to their truth is, to-day, one of the prime efforts of the American Street & Interurban Railway Association. Some of the leading minds engaged in the business are dwelling with great intensity upon the necessities of the association as a servant of the business and the statistical bureau of the association is being made, and will be made, a collector, conservator and disseminator of facts gathered everywhere, which will become available upon the mere request of any company having any one of the questions to meet that may be involved in this general situation.

The managements of some of the large companies, with receipts running into millions, may say, "Well, we have a staff of men who can do this work should we be called upon to meet a situation that requires it." Very true; but every company has, in the every-day conduct of its business, all the work that all of its staff can do without sidetracking any one of them to an examination of special questions requiring long and constant effort. Moreover, it would not be possible to obtain that degree of acquiescence from a board of experts to information thus specially gathered that could be readily obtained to facts not collected with reference to a special situation, but patiently gathered throughout the years with special reference to their value as facts, rather than as facts for the purpose of proof in a special case. With the growth of the constant tendency toward a larger and wider degree of

public regulation and control, the value of a properly conducted and wisely administered statistical bureau of the association will constantly and rapidly increase. It should and will be so conducted as to be immediately available to any one in the time of his necessity. This will be of immense value to the medium-sized companies, but, nevertheless, of great value to the largest companies.

Notwithstanding the statement made above concerning the difficulty of adducing concrete examples to prove the value of the service, the writer knows a case where, within the last year, a controversy between companies and employees was settled favorably to the companies, largely because of the valuable statistics concerning wages of conductors and motormen which had been disseminated by the association in Confidential Bulletin No. 101. These statistics were found to be much more potent in the minds of the three arbitrators who had been chosen by the parties to settle the dispute than if they had been collected by the agents of the companies themselves for use as proof in the particular case at issue. They were general and had been dispassionately collected for their statistical value, and were looked at in that way by the arbitrators. The saving effected in the wages of that particular class of employees would pay the dues of the companies involved for a considerable period, and there are a number of similar cases which have occurred within the last two years in different sections of the country.

I was asked to be brief in this article, and cannot, therefore, argue special instances, but will merely refer to certain well-known achievements of the association within the last two or three years, which are conceded by all to be and have been of the greatest value; for instance, the work before the Interstate Commerce Commission on the classification of accounts, the standardization of equipment, the revision of city and interurban train rules and the establishment of the index bureau of the claim agents, not to mention many other important subjects of vital interest to the electric railway companies which have been actively taken up. But the strongest proofs that can possibly be afforded of the value of the association, as at present conducted, are the things which have occurred since the last annual convention—the general manifestation of a desire throughout the country on the part of the strongest people in the business to get together and, shoulder to shoulder, work for the general improvement of the entire electric railway situation.

At the time of the annual midwinter meeting of the executive committee there were meetings of a number of other committees. These meetings were attended by prominent men from all parts of the country. Two days were devoted to earnest discussion and work; there were no distracting incidents, but committee after committee met at the headquarters of the association in New York and ardently and earnestly performed the work that had been assigned to them. The exchange of opinion thus effected, the discussion brought forth, the acquaintance with new ideas and thoughts evolved out of the situations in the different sections which were brought up for discussion were illuminating and beneficial in the highest degree. These meetings proved to be so valuable that the executive committee expressed itself in favor of holding similar and more extensive annual midwinter meetings in the future.

The value of the association can be made apparent to the individual only if he will take the time to examine what is being done, and the personnel of those

who are engaged in the conduct of the work through the means of the various committees and the permanent bureau of the association at its headquarters in New York. Investigation will surely result in an affirmative answer to the question we are discussing, and without investigation no proposition was ever correctly solved by any one. The principal reason why the association has slowly advanced to a position of prominence, strength and value has been the reluctance manifested by the individual to investigate what results might reasonably be expected to follow from an organized effort from all the members of one of the greatest businesses that is being prosecuted on the earth. Why, the proposition answers itself, if a man will give to the consideration of it 30 minutes of honest thought, and if he cannot give 30 minutes to the consideration of this subject, then, to use a slang but very effective expression, "he is not on to his job." It would seem that the affirmative of the proposition has been established by the very large increase in the membership and the greatly increased interest which is being manifested throughout the country. Personally, I have been familiar with every branch of the discussion of this point from the beginning of the agitation for the change down to the present time, and I have no hesitancy in expressing it as my opinion that there is to-day a general acquiescence in the proposition that the members of the association who work and take an interest are receiving benefits far in excess of the amount of money they are paying. Furthermore, I would hazard this expression of opinion: That, as this work goes on and its value becomes more and more apparent, any scale of dues that any reasonable man might propose would meet with cheerful acquiescence and immediate adoption.

The value of the association is being largely increased through the medium of associate membership. Effort is now being made to secure 1000 associate memberships within the present association year. This effort should be successful, and these associate memberships should be eagerly sought by every branch of trade and business connected with electric railroad transportation. Especially is this true of the banking element. How valuable the work of the association is becoming to the financial people whose moneys are invested in the street railways! Through the medium of associate membership any one in any business connected with electric traction is brought into close contact with the affairs and the conduct of the association, and is placed immediately in a position where he can obtain information concerning it and the people who are connected with it that cannot be obtained in any other way.

I will refer again to that most important work which is now receiving the earnest attention of the association, namely, the effort to impress upon the minds of the people a recognition of the tremendous increase in the value of the services rendered by the transportation companies to the people. Upon a proper recognition and appreciation of this point will inevitably largely depend the condition of the public mind toward the transportation interests. That there is coming to be this recognition in certain quarters on the part of at least some of the people, as well as public officials, is shown in Massachusetts, in which State an increase of fare has been permitted where it is shown that the existing fares afforded an inadequate return for the services rendered. This bears upon the general proposition of the formation and the shaping of public opinion toward our business. We are stating to ourselves in

friendly discussion and beginning to contend in public places that we are not paid enough for the service which we render. This proposition is true or is not true; we believe it or we do not believe it. We claim it is true, and we claim to believe it, and we therefore ought to be able to establish it, as and when it is established the conviction of the truth of it must grow in the public mind; that ripens into public opinion, which is the common judgment of men. When the public forms a proper estimate of the value of the service many bugaboos which now perplex the common mind with regard to capitalization, etc., will disappear like the mist before the sun.

With a united effort participated in by all the people who ought to be interested in the results to be obtained, the value of the association will be immeasurably increased and the value in a monetary way will become constantly more and more apparent as a properly informed and molded public opinion acts with increasing justice and fairness toward the general conduct of the business.

REPORT ON THE NEW YORK RAPID TRANSIT CONDITIONS BY THE CHAMBER OF COMMERCE

The special committee of five appointed by the Chamber of Commerce of the State of New York, Nov. 4, 1908, to investigate the subject of rapid transit conditions in New York City, submitted its report to the Chamber of Commerce March 4 and the resolutions suggested were adopted by practically unanimous vote.

The committee reported that the obstacles which now obstruct further progress in rapid-transit problems are financial, legal and public opinion.

FINANCIAL OBSTACLES

The financial obstacles are that the city has not the funds to construct the lines and with its commitments its borrowing capacity will not increase sufficiently for a long time to permit it to do anything serious in rapid-transit directions. In the meantime it has been impossible to interest private capital, partly because of the legal limitations on the length of franchises, partly because the return on the investment is not large and partly because of the ever-present uncertainty as to what taxes and regulations may be imposed on public-service corporations in the future. The committee stated that formerly an enormous amount of capital was poured into transportation fields in most large cities, often with an improper knowledge or total disregard of the results to be obtained from operation, although the opinion generally prevailed that such enterprises must pay. With the advent of regulations of corporate issues and securities and a better knowledge of the small profit to be earned, this stream of speculative capital has now been diverted to other directions.

LEGAL OBSTACLES

The most important of the legal obstacles is the Elsberg bill, passed in 1906, which limits the franchise for a subway to 20 years with the privilege of 20 years' renewal instead of a total of 75 years as previously. The committee considers this as obstructive "as though it had been designed for the purpose of preventing any other construction of rapid-transit lines." The public-service law enacted in 1907, while possessing some advantages, also acts to prevent the investment of capital. The commissioners can practically assume the usual prerogatives of operating officers and their rulings can be contested to the courts only on the ground of confiscation. The commissioners do not have to be experts, they are under con-

tinuous pressure from associations of citizens and the public generally and presumably cannot altogether escape from political influences. Moreover, an entire change of personnel in the commission can occur every five years and no act or order of the commission is binding on its successors, so that corporations cannot anticipate the financial responsibilities which may be imposed on them. In other words, however wise and conservative the exercise of its powers may be by one set of commissioners, there can be no absolute assurance that these powers will always be so exercised and this makes it impossible to estimate accurately in advance with what conditions a company will have to deal in order to justify large expenditures.

OBSTACLES ARISING FROM PUBLIC OPINION

There is also a popular misconception as to the value of transportation franchises and a mistaken impression that private capitalists are waiting to seize the supposedly productive fields of street railway transportation and bind the people in bondage while reaping a rich harvest for themselves. The attitude of a portion of the public press assists in inspiring and maintaining this state of the public mind.

METHODS OF RELIEF

In considering methods of relief the committee makes a strong plea for a third track for express service on the Second and Third Avenue elevated lines, although the present law will have to be amended so as to permit the grant of a franchise for a much longer period than at present before this is possible. From its examination of the subject the committee believes that such an extension could be constructed and put in service in two years and its estimated capacity would be reached before any new subway could be put into operation even if started promptly. The objections generally held against any increase of elevated structures in New York City would hardly apply to the same extent in this case because the proposed lines is merely for an addition to structures already in existence.

It is also suggested that the present subway company might accept a franchise for an extension south from Times Square on the west side of the city to the Battery, and north from Forty-second Street and Park Avenue to a connection on the Bronx division, provided it should be relieved from taxes or franchise charges on these extensions, though it might possibly agree to pay a certain share in the profits to the city after certain dividends had been earned. The committee believes that the Steinway tunnel should be put into operation without delay.

For future relief the committee mentions seven possible plans for construction of future subways, but dismisses briefly several as impracticable. Among those worth consideration are construction, equipment and operation by private capital, with the option of the city to purchase and, in any event, the reversion at the expiration of a definite term to the city of the structures and appurtenances, the term being long enough to effect amortization of the capital invested. Another is a profit-sharing plan with the option of the city to purchase, similar to that in Chicago, and this the committee urges as the most effective method of obtaining future rapid transit lines in New York.

Consideration is given to the suggestion of the City Club to raise funds for construction of future rapid transit lines by direct assessment upon the property benefited, but the committee believes that legal and other complications of such a plan are considerable. Two other suggestions worth consideration in the opinion of the com-

mittee are to increase the fare to 10 cents on express trains and a subsidy by the city for lines which prove unprofitable. With such a guarantee as is embodied in the latter plan capital could be secured on better terms than without it, as the minimum return on the capital at least would be fixed. At the same time there might be an agreement to share profits between the city and private capital if a high income should be earned. Municipal operation at the present time, the committee considers, would prove a failure economically and a disaster politically and socially.

If any plan of profit sharing should be adopted, the committee suggests that it might not be necessary to make any change to the public service commission law in advance, but it would be important to make legal provisions by which the security of the investment and a stated degree of return on it would not be jeopardized by changes arbitrarily ordered by the commission which might then happen to be in office. The Chicago plan of an engineering commission in which the corporations are represented is more desirable.

The committee also believes a great deal would be accomplished in overcoming the apprehensions which the owners of private enterprises must now entertain with respect to the future if there should be some method of determining by arbitration the reasonableness of orders issued by the present Public Service Commission before they were finally promulgated, other than by an appeal to the courts on the ground that the orders are oppressive and confiscatory. In concluding, the committee urges prompt action, because the approaching completion of the North River tunnels will encourage settlement in New Jersey of a suburban population which otherwise might be kept in New York to its great interest.

The recommendations of the committee consisted of a series of resolutions embodying the points outlined in the report.

A CHEAP METHOD OF REFINISHING OLD CARS

An editorial in the *ELECTRIC RAILWAY JOURNAL* of Jan. 23, 1909, with the title "Submitting Samples of Car Painting," has elicited many inquiries as to the exact method of refinishing an open car for \$5.50, which was referred to in general terms in the editorial in question. Through the courtesy of the Philadelphia Rapid Transit Company this paper has been given permission to publish the formula for the oil composition used and directions for applying it. The composition consists of 1 gal. raw linseed oil, $\frac{1}{8}$ gal. turpentine and 2½ oz. beeswax. The beeswax is melted in the oil and the turpentine is then added. This solution is applied to the woodwork of the car either with a brush or waste. After all the woodwork has been coated with the compound the surface is wiped off and polished by rubbing lightly with dry waste.

It is reported in government circles at Toronto, Ontario, that a far-reaching electrical merger is being formed, having for its object the protection of the various independent electrical companies threatened with great loss of revenue by the initiation of the government power scheme. All the companies operating within the confines of Ontario are included. Where the organizers hope to rival the hydro-electric commission will be in embracing the radial traction lines of the Eastern Provinces.

HEARING ON MILWAUKEE FARE CASE BY WISCONSIN RAILROAD COMMISSION

The hearing before the Railroad Commission of Wisconsin in the case concerning the rate of fare of the Milwaukee Electric Railway & Light Company was continued at the City Hall, Milwaukee, last week. The testimony presented on behalf of the company included that of Prof. M. E. Cooley, of Ann Arbor, Mich., who has been actively engaged in appraisals of the property of public utility corporations; Charles J. Marr, of Dickinson, Wilmot & Sterrett, certified public accountants; Prof. W. D. Pence, of the University of Wisconsin, and that which was given under additional examination by John I. Beggs, president and general manager of the company. An abstract of Mr. Marr's testimony will be published next week. Those of the others follow:

ADDITIONAL TESTIMONY OF MR. BEGGS

The examination of John I. Beggs, president and general manager of the company, was resumed on March 2. It was stated by Mr. Beggs that if the cost of transporting a passenger had not been reduced the company would have been bankrupt long ago. Costs of labor had increased, and new economies and equipment had to be devised to make such savings as were absolutely required. All the improvements which had been effected had benefited the public, not capital; in fact, the return to capital had been reduced. Wages of trainmen had been increased possibly 30 per cent on the average since the speaker became interested in the property.

Mr. Manson, assistant city attorney, asked if it were not a fact that in a great many instances in this country street railway companies maintained amusement parks and places of that kind for the purpose of creating traffic where there would be no traffic otherwise.

Mr. Beggs said it used to be, but that this policy was not now general "except in the case of some of those who were foolish enough to invest a large amount of money in that kind of enterprise, upon the false idea of the profits that would be realized from them; and some of them still have to maintain these resorts. But, as a general policy and rule, the roads have learned by sad experience that it is not profitable. I have never done it. I could not see any profit in it."

In speaking of the difficulty in handling traffic in Milwaukee when the weather became disagreeable suddenly and many who usually walked took the cars, the speaker said that the people of the city were very economical and that short riding was limited. Possibly one-half of the force in the accounting department was required to audit the large number of tickets used on the city system. The units of expenses on the system had increased and the unit of revenue had decreased, and was still being reduced.

INCREASED FARE SUGGESTED

Mr. Beggs referred again to the expectation held when the ordinance was extended to 1934 that not more than about 60 per cent of the total revenue passengers would ride on tickets, whereas the result last year was a little over 81 per cent, and said that the fraction of a cent difference which that change made was great. If present tendencies continued, the next hearing before the Railroad Commission concerning the company would be one to permit an increase in the rate of fare sufficient to keep the property running. The company had now about reached the limit of economies from increased volume of business.

The power plants were operated as if they were owned by an entirely independent corporation, and at the end of each month the cost of operation was divided among the different departments on the basis of the current consumed. Statistics showing the results of operation of the power plants were sent to every operating engineer in the company, and an effort was made to disclose reasons for unnecessary costs, if they existed.

Owing to business conditions, the operating force was much more efficient last year than in 1906 or 1907. More changes occurred in trainmen in 1907 than in any other year because of the large number of positions that were available. Not one man was leaving now where 10 left during the boom period. The transportation department was watched closely, and Mr. Beggs received semi-monthly reports from that department where he had monthly reports from the other branches of the service.

The cost of skilled labor entering into any piece of apparatus was 25 per cent less than two years ago, because of the increased efficiency acquired by the men. More money was spent constantly to meet the increasing demands of the public. Shop expenses were higher and the cost of cleaning cars was greater.

OPERATING OF THE PROPERTY FUNDAMENTAL

John T. Kelly, city attorney, asked about the difference in the attitude of the public and the employees. Mr. Beggs said that the employees were not in politics and were not influenced by sensational newspaper articles. The employees knew that the fundamental principle governing the management was the operation of the property; they believed in the management and realized that they would receive consideration from it. The public in general would not start any of the attacks which were common. Such attacks were caused by sensational criticisms.

It had been only 12 years since one fare case affecting the company had been decided, and the speaker asked what assurance there was that, after the settlement of the present fare case, another would not be started.

The company studied changes in routes to accommodate the greatest number of people. A great many requests for changes arose from managers of department stores; every merchant in the city would like every car to pass by his store.

W. J. Curtis, counsel for the North American Company, asked further concerning the company's Public Service Building. Mr. Beggs stated that in his judgment there was more property in the Public Service Building for the dollar expended than in any other building in Milwaukee.

TESTIMONY OF PROF. W. D. PENCE

Prof. W. D. Pence, engineer for the Railroad Commission, was examined by Mr. Manson on behalf of the city on March 2. Referring to the valuation of the property of the Milwaukee Electric Railway & Light Company, Professor Pence said that operating property was considered as that which was directly in use and necessary for operating purposes. There was certain trackage in the city of Milwaukee, with its overhead equipment, that appeared to be non-operating, and was so classed, based upon actual statements of the company and upon investigation. There was certain real estate in the city which was not directly connected with or necessary for the operation of the railway, and there was other property of the same nature. Vacant space in the Public Service Building, together with that space which might be classed as used

for general purposes, was apportioned upon a special basis to meet actual conditions. A fraction of that building which was unoccupied was called non-operative.

The subdivision of the railway operating property between the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company was primarily upon a territorial or geographical basis. At the beginning of the investigations by the engineering staff it was ascertained, both by requests in writing and by oral discussion with the officials of the road, that the company claimed a separation of the property between the two companies at practically the city limits. There were some minor deviations from this separation as stated. Having determined that separation as a fact, the property was then separated with reference to its position or its use, as, for instance, with cars used primarily on the out-of-the-city line, but stored in the city chiefly over night. The claims of the company as to the ownership of such cars by the rural company were found to be correct and consistent with the use of the cars.

In speaking of the apportionment of power plants, Professor Pence read the following paragraph from the report of the engineering staff on the valuation:

"In apportioning the power plants between the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company, it was found that purely geographical separation of the power plant valuations for railway purposes only, with respect to city limits, differed only 2 per cent from a separation upon car-hour basis." The fact that a part of the power produced within the city was used for operating the interurban lines outside of the city was taken into account in the investigation.

Mr. Manson asked upon what theory paving was included in the report as a part of the property used for railway purposes.

Professor Pence responded as follows: "I may answer that question by saying that we do not necessarily include it. The staff is engaged in making reports to the Railroad Commission, and also, when called upon to do so, to the State Board of Assessment; and the summing up of our items is made upon a basis whereby the item may be included or excluded according to the final decision of either commission. There is nothing in the fact that we have included it in our summary which would bind or influence the commission as to the inclusion or exclusion of the item."

Mr. Mack, during the cross-examination, asked further about the division of property between operating and non-operating. Professor Pence said that anything which might reasonably be used at any time in the year or probably would be used in the ordinary course of operation, was included as operating property. Outlying real estate of the company that is held with the ultimate intention of use as a car-house or shop site was classed as non-operating.

Under cross-examination by Mr. Curtis, it was stated by Professor Pence that in engineering estimates for the cost of construction of property it is customary to make an allowance for contingencies, varying with the completeness or detail of the preliminary surveys, the completeness of the plan, etc. The allowance may be as much as 10 per cent in some cases and as low as 5 per cent in others. In the valuation of the Milwaukee properties the contractors' profits were regarded as covered by the items on the unit prices which the staff used in its work. The

usual allowance was 4 or 5 per cent for superintendence and engineering.

Testifying regarding the adoption of 3 per cent for interest during construction, the witness said that it was considered that any ordinary extension of the property in all probability would be put into operation within the year in which it was undertaken, and that, with a well-organized company like this, the funds would be so available that there would be an interest charge equivalent to probably not more than one-half the time.

In testifying regarding the allowance of time for the construction of a property of this character, which seemed pretty short to Mr. Curtis, it was stated by Professor Pence: "There are two ways of viewing a matter of this sort. For instance, a steam railroad line is being built across country, from terminus to terminus, and there will not be much development of traffic until the line is completed. Such line may be considered as being under construction until the through traffic is established. A different case is found in a street railway system in a large city, where the extensions are not all made in one continuous process. The work is finished by degrees or stages, and the length of the construction period is a matter of interpretation."

Mr. Curtis said he believed it required three years to equip the property electrically, and the witness said he believed it would take some such length of time as that.

Resuming his testimony on March 3, Professor Pence explained further that "the term which is called the term of construction might be subject to several interpretations. For instance, one interpretation might fix the end of the construction period when traffic first begins, even though the actual construction work should still be incomplete; and there might be the other view in which the construction period would not be regarded as ended until the work was completed in all its details. In the first case a fraction of the system is completed, according to the plans of the company, and a return obtained upon part of the line; in the latter case the property might not be regarded as used in the full sense until wholly completed."

In continuation, he said it was believed that the valuation of all the physical property included in the inventory was on the basis of actual cost for such installation, and where that was contract work the contractor's profit was covered.

Discussing further the allowance for contingencies, under examination by Mr. Manson, the witness stated that in construction the difference in cost resulting from unforeseen difficulties "is usually, as experience has shown, in the direction of increased cost, and different engineers will make different allowances, according to the uncertainties of construction. It may run as high as 10 per cent and on down to a much less figure. This valuation being upon a known inventory, or upon an inventory which is as nearly complete as can be made, is upon quite a different basis from an estimate made in advance of construction. The contingency does not cover uncertainties in unit prices, because it is intended to have each item essentially correct on a middle-ground basis."

The values of the generating machinery were taken according to actual use. Those that were strictly railroad were so classed. Those which were strictly for light were so classed. Then those which were used for the two purposes jointly were apportioned. The value of the railway property thus ascertained was apportioned according to the car-hours operated by the two companies, which

agreed, as already stated, closely with a territorial separation at city limits.

Mr. Manson brought up the question of the use of power plants within the city for the common purpose of railway and light service, both inside and outside of the city limits. Mr. Mack said that the essential and important point should be taken into consideration of the extent to which the cost of power for railway use within the city was reduced because of the generation of the greater amount required to supply the service outside the city and the lighting business within the city as well as the railway business inside the city. The cost per kw-hour was reduced as the total output was increased. The net result of furnishing power to the Milwaukee Light, Heat & Traction Company was to make the power cost for the Milwaukee Electric Railway & Light Company less than would have been the case if the plant had been operated for the city railway only.

Mr. Mack suggested a difference that would be paid for experience while doing the work and because of inevitable mistakes, to which Professor Pence responded: "If I adhere rigidly to my statement that 3 per cent consists only of omissions or defects of inventory, then I must admit that there are some items which should perhaps be covered by a further allowance for these rejected parts during the period of construction." Professor Pence thought, however, that such an expense would be infinitesimally small compared with the total value of a property of this character, and it brought back the question of whether the 3 per cent allowance was sufficient on a reasonably perfect inventory of the property, made from excellent company records and supplemented by careful field investigations.

TESTIMONY OF PROF. M. E. COOLEY

Prof. Mortimer E. Cooley, consulting engineer and dean of the department of engineering, University of Michigan, took the stand on March 5 and, under examination by George P. Miller, of counsel for the company, testified regarding depreciation, valuation of tangible property and other subjects of fundamental principle or practice involved.

Professor Cooley described his experience as an engineer, giving in detail his connection with important public works. He appraised property of the Detroit railways in 1889 and a year later was appointed appraiser of all the public utilities in Michigan which paid specific taxes. The latter appraisal was followed by two other appraisals of steam railroads; in all of these appraisals Professor Cooley represented the State of Michigan. With Bion J. Arnold and A. B. du Pont Professor Cooley valued the Chicago properties. A number of other public services in which the witness has taken part were mentioned. The total approximate valuation of properties which Professor Cooley had taken part in appraising and of which he had charge was between \$800,000,000 and \$900,000,000. During his testimony the witness discussed at length the difficulties which are encountered in making valuations. He said that reproduction value frequently failed to include moneys expended (or to recognize such expenditures at anywhere near their actual amount) for preparing the way for construction of the property, as, for example, in acquiring the several properties in Milwaukee preparatory to the present investment, which had led to a single system for the entire city as against the five or six different systems which existed previously.

No account was taken in such reproduction value of the

advance in the state of the art which may have led to the disappearance of property before the appraisal was made; although in such appraisal obsolete property found in use should be, and sometimes was, considered at its proper value. As examples of the necessities which had developed from the advance in the state of the art the following were mentioned:

1. Necessity for heavier rails.
2. Necessity for better track foundation.
3. Necessity for larger and better cars.
4. Necessity for more powerful car equipment.
5. Necessity for larger and more economical power stations.
6. Necessity for larger and more capacious distributing means.

All of these grew out of public demand and the rejected materials were scrapped at great sacrifice usually; and this sacrifice included, Professor Cooley said, not only the materials themselves, but the cost of the labor involved in their original installation in removing them from their place of use and in disposing of them as well as the cost in the form of interest on the money required for the purpose of making the changes as well as on the cost of the original installation.

Other elements of original cost usually not found in making an appraisement were contingency items. Provision was made for these by adding a percentage item (usually 10 per cent) to the estimated cost. Such items, for the most part, were concealed and hence unknown to the observer unless he found them entered in the construction accounts. They were just as much a part of the property, however, as though visible to the eye and, presumably, were the property to be reproduced the expense of such items would have to be incurred and hence become a part of the reproduction cost.

CONTINGENCIES

As examples of such contingency expenses, the following were cited:

1. Grading.—Original estimates and costs were based on accurate and complete surveys; since the surveys were made the contour of the ground may have been changed materially.
2. Clearing and Grubbing.—Obstructions found at the time of the original construction were not present at the time of the appraisal owing to the development or improved condition of the locality.
3. Ballast.—The allowance for ballast would probably be short because no account would be taken of its gradual disappearance. The roadbed had been improved thereby and the cost of such improvement had appeared in re-ballasting.
4. Alignment.—Changes in alignment or location necessary for improvement in the service growing out of the development of the city.
5. Foundations.—Only the property in sight was considered, Professor Cooley said. Expensive foundations were overlooked because their extent was unknown; sink-holes and quicksand frequently involved extraordinary expenditures far exceeding those covered by any usual percentages. On this point several examples were cited. The cost of the Ponchartrain Hotel, Detroit, and of the Ford Building, in Detroit, far exceeded the original estimates because of difficult foundation work. The track of the Ann Arbor Railroad for one-half mile in length sunk out of sight two or three times after it was built and had to

be rebuilt, the route being changed finally to avoid the sink-hole. Bridge foundations frequently involved similar extraordinary expenditures. In a city the cost of overcoming obstructions due to water pipes, sewers, gas mains, electric conduits and paving may be unknown. The expense of taking up and replacing pavement was an important item, particularly in congested districts, and the construction costs in certain localities may be even double that in more favored districts.

6. Crossings, Switches and Frogs, Special Work.—It was stated by the witness that unless great care was taken a proper allowance for this work may not be made. Sometimes these items were computed the same as main track while the actual expense was much greater. Turn-outs may be included in main track and hardened center work may be overlooked entirely.

7. Rails and Track Fastenings, Bonded Joints.—The tendency had been steadily toward heavier rails. While the cost of the present construction in itself may be found readily, the concurrent costs of removing the old rails, ties and foundations were almost sure to be underestimated and may be overlooked altogether.

8. Bridges.—The tendency was to underestimate the original cost of bridges, as usually the costs were based on weights, and these were determined very carefully in the original estimates. The centering and falsework may have been expensive and unusual difficulties may have been experienced in erecting, all of which may be unknown to the appraiser. Bridges sufficiently strong for the traffic of 10 years or 15 years ago had to be replaced for the heavier traffic of to-day. The original cost of pile and trestle construction was usually overlooked when these constructions had been filled afterward.

9. Buildings and Miscellaneous Structures.—In speaking of buildings, Professor Cooley said that structures originally in use and which had disappeared were omitted in an inventory, although their cost still remained in the property. Buildings in use for only 15 years or 20 years were valued frequently at only a small fraction of their actual cost as they had ceased to be suitable for present purposes and this notwithstanding that the depreciation of such structures was based almost always on a life of 50 years. The cost of removal of an unsuitable building to make way for a new building may not appear in an inventory, although it was a proper item under clearing and grubbing.

10. Power Stations.—While it was comparatively easy to value the larger units in a power plant it was practically impossible to find all the small items that made up the complete whole. It was very common to undervalue the piping and cost of wiring. One hesitated to double or triple an item obtained by straight figuring, even though his judgment, based on experience, had taught him the necessity of so doing. Foundations for machinery were frequently considered to suffer but slight depreciation; in the installation of new machinery the old foundations often have to be removed. This, like the item of clearing and grubbing, entered into the cost of the property, although it did not appear in the inventory.

CHANGES IN EQUIPMENT

11. Rolling Stock.—In speaking of equipment Professor Cooley discussed the changes in the habits of the American people. He said that very great changes had been necessary in the cars owing to the increased demands of the public.

12. Shop Machinery and Tools.—As in buildings and

power plants a complete inventory of the machinery and tools of a plant was practically impossible, in the opinion of the speaker. The items are too numerous and scattered. Belting, shafting and pulleys could be seen readily, but any attempt to measure and value them, to be at all exact, must be very laborious. This was even more true of the hand tools and of the cutting tools used in connection with machines. Jigs and patterns were rarely ever estimated at their true value or cost and almost always when a change was made the old special tool, jig or pattern became worthless. Its cost appeared on the books, but the item found no place in the inventory.

13. Miscellaneous Equipment.—This equipment, including snow plows, sweepers, repair cars, construction cars, hydraulic and screw jacks, block and tackle and other things required in repairing damage due to accidents and the elements, was scattered and difficult to find and measure and any inventory of such equipment involved much patience and labor. It was frequently determined approximately only by adding something to the main items of the equipment.

14. Stores and Supplies.—These were even more difficult of appraisal than shop machinery and tools, said the witness, and it was customary to take the value when possible from the books of the company.

15. Scrap-Heap.—Discussing this subject, Professor Cooley said that probably no part of a plant undergoing valuation was more instructive as an aid to forming an opinion as to the cost of the plant than the scrap-heap. It usually was either neglected altogether or received but a passing glance.

As an example the history of the Pittsburg Water Works was cited. Twenty-five years ago the large yard in front of the water-works building was almost completely filled with the enormous casting of the pumping engines which had failed and had to be replaced. A few years later these pumps were scrapped and replaced by some of more modern design. To-day still a third set is being installed. An inventory to-day would reveal only the pumps now in use, but the cost of the plant included all three sets of pumps. The scrap-heap revealed one of the most important elements in the valuation of a property, namely, the difference between what the plant had cost and its reproduction cost as shown by an inventory. In the valuation of the Michigan railroads in 1900 the reproduction cost was found to be approximately \$200,000,000 and the existing value of the physical properties a little more than \$160,000,000. The books showed construction costs of about \$300,000,000. The appraisal covered approximately 10,000 miles of single track, including second track, spurs and sidings. The reproduction cost, therefore, was about two-thirds the construction cost shown on the books and the property was maintained at a little better than 80 per cent of its reproduction cost. A similar result was found in subsequent reappraisements of the Michigan railroads in 1903 and 1905 and in the appraisal of the street railways of Chicago in 1906. In Minneapolis in 1908 the property of the General Electric Company was found to be maintained in a fairly uniform condition at from 75 per cent to 80 per cent of its reproduction cost, and such had been found to be substantially true of other properties, including water works, manufacturing concerns, telegraph and telephone properties, although in telegraph properties the value maintained was nearer 50 per cent than 80 per cent.

CONCLUSIONS AS TO VALUATION

From his detailed discussion of the various items Pro-

Professor Cooley drew the following conclusions: In the valuation of a property there was the cost shown by the books, the cost of reproduction as shown by inventory and the existing value of the physical properties, the second being about two-thirds of the first and the latter about three-quarters of the second. In addition to these costs and values there were the cost of making the property a going concern and the value of the property as a going concern. This latter value Professor Cooley called the kinetic or dynamic value of a property as distinguished from its potential or static value. These costs and values were found in all classes of property from the wheelbarrow used in moving earth, the lathe used in making machinery, the farm used to raise crops and animals, to the railroad used to transport earth, machinery, farm products and passengers.

There was also the working capital required to keep the property going, and without which, or its equivalent in credit, the property cannot be made to go. This working capital must be provided and maintained constantly the same as a supply of fuel to an engine. Its provision, in the first place, was an element of capital invested and its maintenance an element of operating expense.

Other elements of cost were contingencies of construction, contractors' profits, engineering, insurance during construction, organization, legal expenses, general contingencies, including incomplete inventories, interest during construction and finally brokerage or the cost of floating the securities to cover all of the expenses incurred up to the time the complicated and inert structure became a thing of life and through the early years required to give it the strength and vigor necessary to make it self-supporting. At this point it became in reality a going concern and not before.

UNIVERSAL TRANSFERS AND INCREASED EXPENSES

Professor Cooley also discussed universal transfers, stating that they increased travel, but diminished earnings per passenger. All expenses advanced with the number of passengers carried; therefore, universal transfers had resulted not only in decreased net earnings per passenger, but in decreased net earnings for the company.

Density of traffic, which was formerly supposed to lead to increased earnings, had not resulted in such increase in business districts, owing to frequent stops and interruptions. Frequent stops meant wear and tear of cars and rails, increased platform expense and greatly increased current consumption in starting and getting the car up to speed. This was one of the elements offsetting the supposed greater current consumption with the heavier cars and faster speed of interurban roads.

The dollar had a less purchasing power; all expenses have increased.

DEPRECIATION NEGLECTED

Depreciation, Professor Cooley remarked, had been neglected in the past through ignorance of its necessity. To neglect depreciation was to borrow from the future. A property must be maintained at a suitable working standard out of earnings if it was to be permanent. If not so maintained it must deteriorate and eventually must be rehabilitated or built over. Chicago was cited by the speaker as an illustration. The public demanded satisfactory transportation facilities and objected to overcrowding. This meant larger and finer cars and more of them, all of which necessitated greater investment, greater operating expense and decreased earnings.

This must be true whether the property was operated

privately or by the public. A deficiency due to public operation must be met by taxation. The necessary money to maintain and operate the property up to public requirement must come from some source. The issue was real and should be squarely met.

ELEMENTS OF DEPRECIATION

Depreciation consisted of several elements which should be understood carefully, Professor Cooley stated, to avoid confusion in the use of the term. These elements were defined by him as follows:

1. Depreciation Due to Wear and Tear and Exposure to the Elements.—This is continuous. All elements have a wearing life varying with the element itself. No element can be completely worn out; it can be worn only to a point below which it becomes unsafe or no longer serves its original function. In practice the average condition of all elements must be maintained at a high percentage of the original cost if the property is to serve its purpose properly. This percentage varies from 75 per cent to 85 per cent of the cost new of the property. The difference between this percentage of from 75 to 85 and the original 100 is a depreciation which is inherent in the property and cannot be dispensed with. It must be met by a sinking fund, or its equivalent, otherwise this part of the original investment becomes lost.

2. Depreciation Due to Accidents, a Sudden Depreciation.—An engine or a boiler may be wrecked and with it other machinery. This might, and probably would, involve a considerable expense for repairs or replacement, besides possibly crippling the plant in part. Cars may collide or a car may drop through a bridge. A bridge itself may fail or be carried away by floods. A storm, as a cyclone, may work havoc, entailing costs in excess of those proper to be charged to ordinary maintenance of property.

3. Depreciation Due to Inadequacy.—Cars suitable in the past had already been superseded several times by larger and better cars. This has rendered the track, structure and bridges inadequate, and as more power is required to propel the larger cars, the power plants have become inadequate. The public demand is largely responsible for this depreciation due to inadequacy.

4. Depreciation Due to Obsolescence.—This, while closely allied to the depreciation due to inadequacy, is different in that it embraces changes due to advance in the art. More efficient and effective machinery has appeared, which must be substituted for the old to keep abreast of the times. For example, in steam-engine practice the turbine has come into general use during the past five years and the art of steam turbines is at the beginning. Generators adapted to piston-engine practice are not adapted to steam-turbine practice and must also be changed. Boilers adapted to piston-engine practice must be replaced to carry the higher pressures required. Condensers must also be changed to secure the better vacuum required to realize the full advantage of the steam turbine. Owing to the rapid disappearance of coal beds, the price of fuel must advance, and this presumably will before many years force the adoption of the gas producer and the producer gas engine. Water powers are wisely being developed, but to utilize them requires the scrapping of large parts of the machinery in use at present.

REPLACEMENT FUND THE ONE LIVE ISSUE

Continuing, Professor Cooley said that the ordinary operating expenses included the cost of maintenance and repairs, but this was limited usually to the work required to keep the elements of a property up to a proper condition for continuous use and to prolong the useful life of the elements. Only to a limited extent did this ordinary maintenance and repair account include expenditures for replacement or renewals of any except minor elements. The replacement of major elements involved a sum in addition to that appearing in the cost of operation, and it was this fund that was receiving so much attention throughout the railroad world to-day. It was the one live issue of prime

importance involved in the successful management of railroad properties not only in cities, but throughout the entire land. The Interstate Commerce Commission had recently undertaken to investigate the subject in its broad aspects. The belief was widespread that a greater fund than ever before must be set apart if railroads were to continue on a paying basis.

RELATION OF LOAD FACTOR TO POWER COSTS

On March 2 papers were presented and a discussion held before the Chicago branch of the A. I. E. E. and the electrical section of the Western Society of Engineers on "The Relation of Load Factor to Power Costs." The authors of the papers were C. A. S. Howlett, Western Electric Company; J. M. S. Waring, Electric Storage Battery Company, and E. W. Lloyd, Commonwealth Edison Company. The papers and discussion dealt largely with the problems of lighting and industrial power loads.

Mr. Waring's paper set forth the desirability of the use of a storage battery for improving the load factor of the purchaser of large amounts of current. He pointed out that a power rate to be equitable, first, should distribute the fixed charges on the plant in proper proportion among the various customers and, second, should also distribute the operating cost in proportion. Any rate to be equitable, therefore, should have a primary fixed charge and a variable operating charge. A large power consumer might reduce the primary or fixed charge, which should be proportionate to the maximum demand that he might make upon the generating station by installing a storage battery to handle the peak and thus purchase power at a lower rate.

John F. Gilchrist, Commonwealth Edison Company, called attention to the increasing diversity of load on a large central power station which gradually adds every class of customers. In the case of the central station which supplies residences and business lighting districts and also street railways where the peak of the load is likely to occur in January or February, and on account of the use of electric car heaters the time of this peak is largely dependent upon the temperature. The method of determining the peaks of railway load upon which to base the fixed charges per kilowatt of maximum demand may have an important influence on the amount of such fixed charges. For example: The method of determining the maximum demand made by street railways in Chicago, as stipulated in a recent contract (see *ELECTRIC RAILWAY JOURNAL* for Oct. 31, 1908, page 1291), is by taking the combined output of six hours, three of which shall be the hours of greatest output in the first half of the day for three consecutive days and the other three the hours of greatest output for three consecutive days in the second half of the day. These six hours of output divided by six determine the maximum demand for the year. If momentary peaks were the basis of measurement the Chicago railways would have to pay for about 12 per cent greater maximum demand. The yearly load factor of the Chicago railways is from 38 to 40 per cent.

G. H. Atkin, Electric Storage Battery Company, called attention to the large storage battery which the Chicago City Railway has installed in its Plymouth Place substation. This battery makes the maximum demand by that company 2500 kw less than what it would be if there were no battery. It was stated that this reduction brings about a yearly saving of \$37,500 to the railway company in the purchase of power from the Commonwealth Edison Company.

NEW STEEL CAR OF UNITED RAILWAYS COMPANY OF ST. LOUIS

A steel passenger car of considerable interest has just been built at the shops of the United Railways Company, of St. Louis. This car is designed for the pay-as-you-enter method of fare collection, and includes improvements made after the successful operation of composite cars of the same



St. Louis Steel Car—Front End, Showing Fuse-Box on Vestibule Corner Post

general type during the past year. The use of steel for the entire main structure below the window rail has served to reduce the body weight of this car by 1000 lb. below that of the cars of the earlier design. This gain in weight has been brought about by the omission of side-wall lining and sheathing. The thin side-wall construction also has made possible an increase in the effective interior width of the body by 8 in. with the same outside width over all. Other



St. Louis Steel Car—Interior View, Showing Wide Aisle

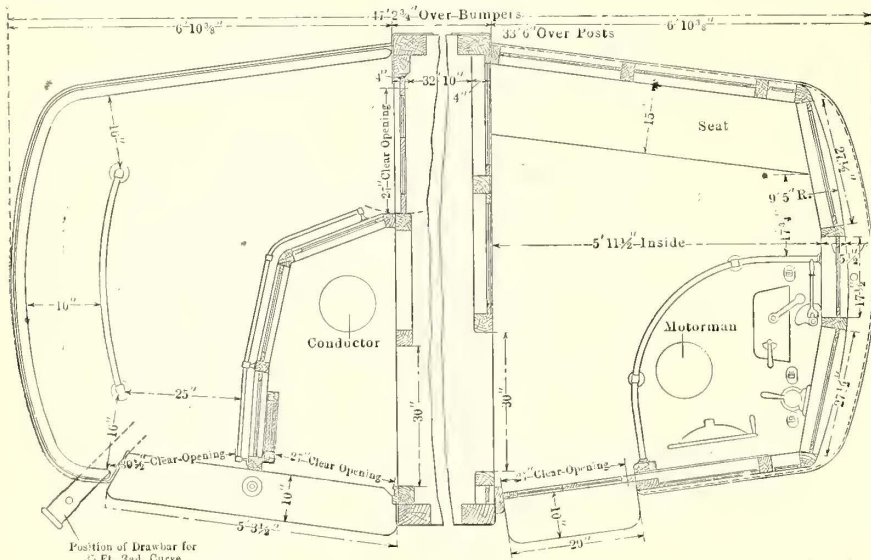
improvements include enlarged front vestibule; more satisfactory window arrangements; sanitary composition floor, and larger doors with improved fittings. The design and construction of the new steel car were executed at the car shops under the care of Robert McCulloch, president, and M. O'Brien, master mechanic. The new car will be used as

a model for future construction. A second car of this design is now being built, and others will follow as soon as an appropriation is made for them.

DETAILS OF BODY CONSTRUCTION

Accompanying engravings present the general dimensions of the platforms and body and illustrate the details of side and window arrangement as shown by a model sec-

angle, which is 3 in. x 4 in. x 3/8 in. in dimensions, and rests on top of the 4-in. cross sills, thus securing them against vertical movement. Both angles are riveted to the side piece and the cross sills are riveted to the angles. There are no center sills. The belt rails are 3/16-in. steel, specially rolled, so that it may be riveted to the side plates and fitted under the wooden window capping. All the window posts extend to the floor, and each is fastened to the side plate by five 3/8-in. bolts.



St. Louis Steel Car—Plan of Platform Arrangement

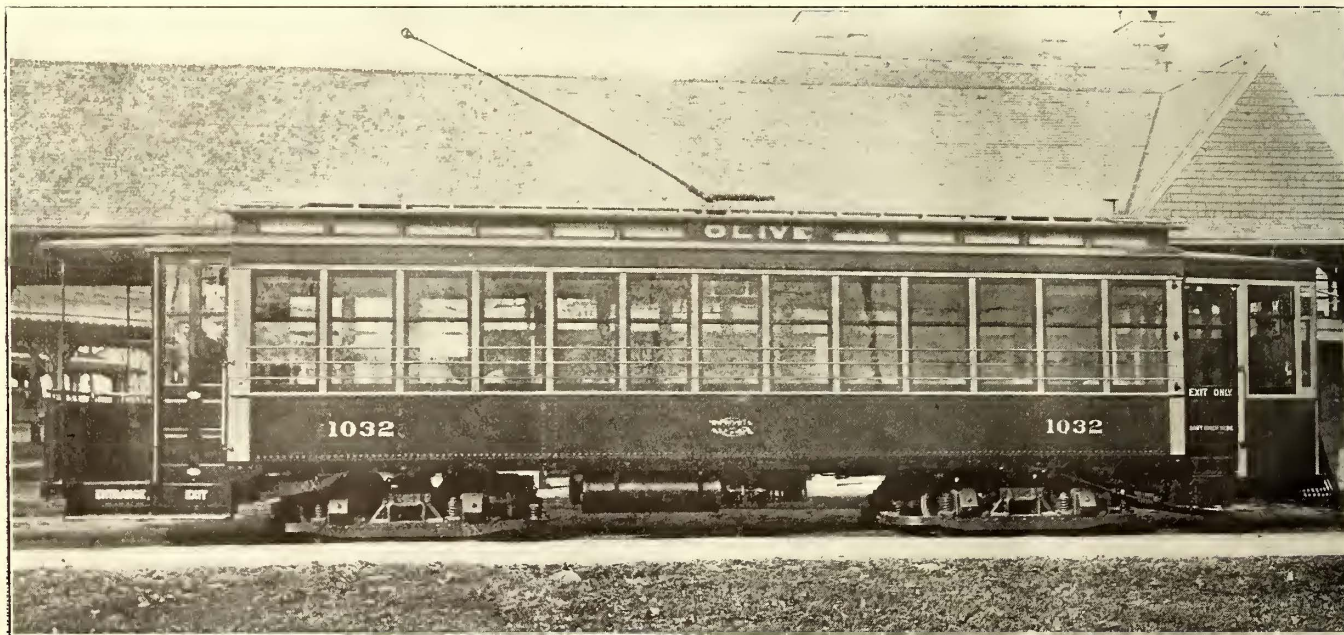
tion. This sample section was built before the car was set up, so that the special sill, window and floor details might be studied.

The body below the arm rails and the underframe is made of structural steel shapes and plates. The main members of the underframe are the 3/16-in. steel side plates 26 in. high. These are made in three sections for each side, butt-riveted to form the side sills and the siding of

One of the half-tone engravings illustrates the roof construction. It is similar in design to the roof formerly used by the United Railways except that the slope is not so great at the sides. The additional height thus obtained affords space for the bottom window sash to raise into the roof.

The floor construction is fireproof. On top of the 4-in. I-beam cross sills is placed a covering of galvanized sheet iron to protect the superstructure against damage by fire or water. A 7/8-in. yellow pine tongue-and-groove floor is laid on the galvanized iron and supports a composition floor surface about 11/16 in. thick reinforced with wire netting. The edges of the trap doors and openings

through the floor are protected by angle-iron frames and a drain opening is placed in the center of the car floor. The wearing surface of the floor is "marbleoid," supplied by the St. Louis Marbleoid Manufacturing Company. This material is a composition of granite and cement, which is said to wear well and be water and fireproof. In placing the composition, which has the appearance of red concrete, it was brought up along the sides of the car body to cover



St. Louis Steel Car—Exterior View, Showing Front and Rear Platform Arrangement

the car below the window rails. Riveted to the bottom and inside of these side plates are two angle irons, which form the connection for the 4-in. I-beam cross sills. One angle iron is 8 in. x 3 1/2 in. x 1/2 in., with its long side riveted to the 26-in. side plate. The cross sills rest on the flange of this L-shaped iron. Above the cross sills is the second

a row of rivets and also to afford a joint which would not catch dirt. This feature is clearly illustrated.

The windows of the car body all raise to leave large openings for summer service. The top sash is fixed and the lower sash raises so that the bottoms of both sash are even, leaving an opening 27 1/2 in. high by 27 1/4 in. wide. The

lower sash is fitted with a $\frac{3}{8}$ -in. rubber bottom piece to provide a tight joint with the arm rail in wet weather. Edwards lock lifts and compression rollers are used to keep the sash from rattling and to maintain a close fit under various weather conditions.

The interior woodwork of the new car is natural cherry and the steel side plate exposed below the window rail is colored and grained to imitate cherry wood. The headlining is three-ply birch, painted light blue. A combination of colors very pleasing to the eye is presented by the blue ceiling, cherry woodwork and red floor. The most noticeable body improvement which results from the use of the uncovered steel sides is the additional leg space of about 4 in. obtained under each arm rail. The width of the car between arm rails is 8 ft. $1\frac{3}{4}$ in., but the available width at the level of the seat cushions is 8 ft. $9\frac{1}{2}$ in. There are seats for 46 passengers inside the car body and for 4 on the platform. The seats are 34 in. over all in length and the aisle between seat ends is $34\frac{1}{2}$ in. wide. The car is built for single-end operation and the body is heated by a stove set at the forward end of the aisle.

PLATFORMS

Each platform is 6 ft. $10\frac{3}{8}$ in. long over all. On account

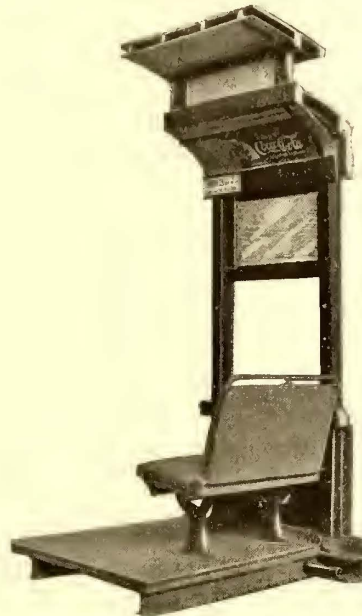
car from 46 inside to 50 total. The exit door from the front platform has a 27-in. clear opening and a 29-in. x 10-in. folding step. Both door and step are connected for operation by a handle above the controller.

A specially designed fuse box is built above the motorman's head and between the two posts at the forward right-hand corner of the car. This box is so designed and placed that when a fuse blows the bases pass to the outside of the car through slat-covered openings in the side of the car, as shown in one of the illustrations. The fuse can be replaced by the motorman without leaving his place at the controller. The box is built with a door which opens into the front vestibule. On this door are carried contact points which are so wired that when the door is not tightly closed no electrical connection is made with the fuse holder. Thus after a fuse has blown the motorman opens the door of the fuse box and thereby disconnects the fuse-holding terminal. Then he can handle the terminals and parts without danger of shock.

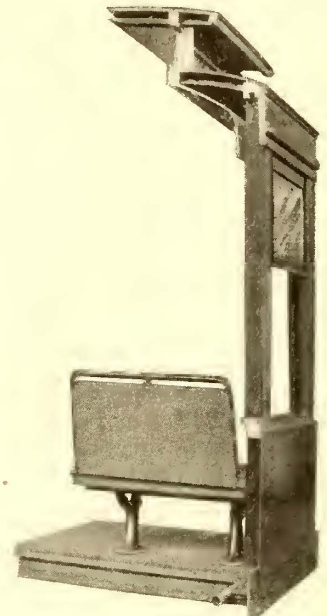
The general arrangement of the rear platform is the same as that described in the *ELECTRIC RAILWAY JOURNAL* for Aug. 22, 1908, page 515. The conductor is protected from the weather by a full-height partition with three sash



St. Louis Steel Car—Leg Space Between Posts



St. Louis Steel Car—Window and Roof Details



St. Louis Steel Car—Details of Exterior

of the space occupied by the bumper and the front vestibule wall the inside length of the front platform is 5 ft. $11\frac{1}{2}$ in., while the open rear platform is available for standing passengers for its full length. Each platform is supported by four 8-in. x $3\frac{1}{2}$ -in. x $\frac{1}{2}$ -in. angle irons sheared to a taper at the outer ends. The platform floors are of wood and are dropped 10 in. below the level of the car-body floor.

There are six window openings in the front vestibule and all the sash raise except that in front of the motorman. This is arranged to lower for the convenience of the motorman in throwing switches. This window has ratchet locks so that in inclement weather the motorman may fasten it at any height desired. As shown, the platforms are arranged for single-end operation only and on the front platform the operating equipment is installed at the right-hand corner and the motorman is separated from the passengers by a pipe railing. A longitudinal seat 15 in. wide and 5 ft. 6 in. long is built along the wall of the vestibule on the blind side, thus increasing the seating capacity of the

and a folding outside door. A pipe railing 16 in. from the rear dash serves to separate smokers from incoming passengers who, on boarding, pass between the railing and the vestibule, entering the car body through a 27-in. swinging door. The conductor collects the fares as the passengers pass the window of his compartment nearest the entrance door. This door is hung on spring double-swing hinges and is controlled by a double-acting door check. The door check serves to prevent the quick closing of the swinging door and thus eliminates accidents.

In the first design of pay-as-you-enter cars built at St. Louis a stop was placed to prevent the rear-entrance door from swinging outward. An objection to this was raised because of the possibility of this opening thus not being available as an exit in emergency. For this reason the door of the new car is built to swing both ways and a latch is provided so that unless tripped by the conductor the door will only swing inward. An inside check also is fastened on the door post within reach of the conductor so that he

may lock the rear door against movement in either direction. A folding seat is provided for the conductor. The window sash of the conductor's compartment are hung with balances so that they may be placed at the most convenient height for receiving fares. The conductor's and motor-man's bells are enclosed in neat cherry boxes so that they may not be deadened with paper, waste, etc.

The electrical equipment of this car includes four GE-80 motors with K-35 C controller. All wiring is carried in loricated conduit supported under the cross sills and terminating in malleable junction boxes under the controller. Westinghouse storage air-brake equipment is used.

The weight of the new car here described complete and without passengers is 49,550 lb. The car body with seats, fittings, etc., weighs 23,300 lb. and the trucks, electrical and brake equipment weigh 26,250 lb. The general dimensions of the new steel car follow:

Length of car body.....	33 ft. 6 in.
Length over all.....	47 ft. 2¾ in.
Length of platforms.....	6 ft. 10⅜ in.
Width over all.....	9 ft.
Width of inside plates.....	8 ft. 9½ in.
Width between arm rails.....	8 ft. 1¾ in.
Width of aisle.....	2 ft. 10½ in.
Height from track to trolley base.....	12 ft. 3 in.
Truck centers.....	22 ft. 3 in.
Wheel base.....	40 ft. 6 in.
Seating capacity (persons).....	50

MEETING OF THE CENTRAL ELECTRIC ACCOUNTING CONFERENCE

The eighth meeting of the Central Electric Accounting Conference was held at Lima, Ohio, March 6. A list of the members of the association presented at the meeting showed that it included the chief accounting officers of some 34 of the principal interurban electric railways in the Central States.

The first order of business was the presentation of the report of the committee on permanent organization. Messrs. Elkins, Vordemark and Baker presented their report, and the following constitution and by-laws were adopted:

CONSTITUTION AND BY-LAWS OF THE CENTRAL ELECTRIC ACCOUNTING CONFERENCE.

CONSTITUTION.

1. Name—The name of this Conference shall be The Central Electric Accounting Conference.
2. Object—The object of this Conference shall be to bring together those engaged in the accounting department of electric railways for the interchange of ideas, and to promote the adoption of a uniform system of accounts, and to encourage closer and more intimate personal relations.
3. Members—The membership of this Conference shall be composed of the authorized representatives of the accounting department of electric railways operating within the states of Ohio, Indiana, Illinois, Michigan, Kentucky and western Pennsylvania. All applications for membership must be presented to the Secretary, and by him referred to the Executive Committee for approval and shall bear the approval of the Executive Committee before being presented to the Conference.
4. Officers—The officers of this Conference shall consist of a president, vice-president, secretary and treasurer, and four other members, all of whom shall constitute the Executive Committee. The duties of the secretary and treasurer shall be performed by the same person.
5. Meetings—The regular stated meetings of the Conference shall be held on the first Saturday after the first Monday in March, June, September and December of each year, at such place as may be designated by a vote of the Conference at its next preceding meeting. Special meetings may be called by the president, with the approval of the Executive Committee. The December meeting shall be the annual meeting of the Conference. Eleven members shall constitute a quorum for the transaction of business at any meeting of the Conference.
6. Amendments—This Constitution may be amended by a two-thirds vote of the members present at a regular meeting, provided the proposed amendment shall have the approval of two-thirds of the Executive Committee, and provided a copy shall have been sent to each of the active members of the Central Electric Accounting Conference at least thirty days prior to the date of the meeting at which the proposed amendment is to be acted upon.

BY-LAWS.

1. Election of Officers—The officers shall be elected at each annual meeting of the Conference and shall hold office until their successors are elected. They shall assume their duties immediately after the close of the meeting at which they are elected.

In case of resignation or death of any of the officers, the vacancy may be filled for the remainder of the term by the Executive Committee.

2. President—The president shall be the chief executive officer of the Conference. He shall preside at all meetings of the Conference. He shall appoint all committees and designate the chairman of such. He shall be ex-officio a member of all committees. He shall watch over the interests of the Conference and see that its objects are carried out.

3. Vice-President—The vice-president shall perform all of the duties, and exercise the powers of the president, during his absence or disability.

4. Secretary and Treasurer—The secretary shall attend all meetings of the Conference, keep correct minutes of the proceedings thereof, a copy of which shall be furnished to each member of the Conference on request.

He shall send notices to each member of all regular and special meetings of the Conference, and shall refer to proper officers or committees, or keep and submit, at the next meeting of the Conference, all communications sent him for that purpose.

He shall notify all members of their appointment on committees, and keep proper record of all matters and action taken thereon.

Acting as treasurer, he shall have charge of all funds of the Conference, and shall pay such bills as bear the approval of the president, payment having first been authorized by the Conference.

In the absence of the secretary and treasurer, the president may designate a member of the conference to act as such. The report of such acting-secretary must be promptly forwarded to the secretary.

The secretary and treasurer shall receive such compensation as may be fixed by the Executive Committee, the same to be paid out of the funds of the Conference.

5. Executive Committee—The Executive Committee shall hold a regular meeting before each annual meeting of the Conference, and shall hold such special meetings as may be called by the president.

The secretary shall give such reasonable notice of all meetings of the Executive Committee, and all such notices shall, as far as practicable, specify the nature of the business to be brought to the attention of the committee at such meetings.

The Executive Committee shall present a written report to the Conference at each annual meeting, including in this report the work accomplished by the Conference during the year, together with its recommendations for the future work of the Conference.

The Executive Committee shall have charge and management of the affairs of the Conference while it is not in session, reporting any action taken at the next meeting of the Conference.

A majority of the members of the Executive Committee shall constitute a quorum for the transaction of business.

6. Voting—All votes except as herein otherwise provided shall be *viva voce* or by ballot upon the request of any member, and in case of a tie the presiding officer shall vote. In case of a vote by ballot each company represented shall be entitled to one vote only.

7. Rules of Order—The rules contained in "Roberts' Rules of Order" shall govern this Conference in all cases to which they are applicable and in which they are not inconsistent with the By-Laws of this Conference.

8. Order of Business—At each regular meeting of the Conference the order of business shall be as follows:

- (1) Reading of the minutes of last meeting.
- (2) Address of the president.
- (3) Report of the Executive Committee.
- (4) Report of the secretary and treasurer.
- (5) Reports of special committees.
- (6) Reading and discussion of papers.
- (7) General business.
- (8) Election of officers.

The order of business may be varied from as the wisdom of the president may dictate.

The question of compensation of the secretary and treasurer and the raising of funds for the conference was referred to the executive committee, with instructions to report at the next meeting of the conference.

The following officers were then elected:

President, M. W. Glover, auditor, The Ohio Electric Railway Company, Cincinnati, Ohio.

Vice-President, Wm. H. Forse, Jr., treasurer, Indiana Union Traction Company, Anderson, Ind.

Secretary and Treasurer, C. B. Baker, freight auditor, The Western Ohio Railway Company, Lima, Ohio.

The Executive Committee—The officers mentioned above and:

W. I. McLure, auditor, Toledo Urban & Interurban Railway, Findlay, Ohio.

R. J. Thompson, assistant secretary, Indianapolis & Louisville Traction Company, Seymour, Ind.

S. C. Rogers, treasurer, Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.

W. B. Wright, auditor, Indianapolis & Cincinnati Traction Company, Rushville, Ind.

The following letter from Robert N. Wallis, president, American Street & Interurban Railway Accountants' Association, was presented by Mr. Forse with a few appropriate remarks:

To the Members of the Central Electric Accounting Conference:

I am very much interested in the activities of the Central Electric Accounting Conference, and feel that the relations between this body and the Accountants' Association should be made as close as possible.

If I understand the personnel of the Accounting Conference correctly, it consists almost entirely of interurban railways, and was formed for the purpose largely of meet-

ing certain problems which apply to this class of railway exclusively. It so happens that the Middle West territory has developed interurban railways to a larger extent than any other portion of the United States.

As we recover from the effects of the panic and feel the impetus of returning prosperity, the interurban electric railway will undoubtedly continue its development, not only in the territory which your conference represents, but in the country at large. The position of the interurban railway, therefore, is bound to be one of increasing importance, both numerically and geographically. It seems to me, therefore, that the American Accountants' Association should make a special effort to keep abreast with this development.

It is my desire, and I know it to be the desire of all prominent in the work of the association, that the association may keep up with the needs of this important branch of our industry. In no better way can this be done than by keeping in close touch and upon most cordial relations with the Central Conference, representing very nearly the whole of this interurban branch.

In forming the program for another convention and in planning the work for another year, it is my desire to keep in sight the accounting problems of the interurban railways and to give them the importance which their prominence entitles them to. I shall be glad, therefore, for the suggestions of your individual members, or of the conference itself, as to what problems should be considered. I solicit such suggestions.

The Accountants' Association recognized the peculiar problems concerning the interurban railways at the Atlantic City convention, last October, and provided for a committee on interline accounting, consisting of Messrs. Forse, of Anderson; Fullerton, of Detroit, and Wight, of Des Moines.

The interest which this association feels in the problems peculiar to the interurban railway at the present time it wishes to continue and increase. To that end I ask the assistance of the Central Accounting Conference and its members. May I further say that I should be glad at some early meeting of your conference, if it be agreeable to all its members, to attend, in order that I might study at first hand how to make the relations between the association and the conference closer, and in order that I might meet and talk with the men who are responsible for the rapid development of the accounting end of the interurban business. I should be glad if you would express for me the sentiments which I voice herein to the conference.

(Signed) ROBERT N. WALLIS, President,
American Street & Interurban Railway Accountants' Association.

The following resolution was then unanimously adopted by the conference:

Resolved: That the Central Electric Accounting Conference appreciates the kindly expressions contained in the open letter received from President Wallis, of the American Street & Interurban Railway Accountants' Association, and extends a cordial invitation to Mr. Wallis personally, or in his official capacity, to attend the next meeting of the conference as its guest.

W. B. Wright, chairman of the committee on uniform blanks, then presented a report, with samples of the proposed blanks, which were fully discussed, and after a few minor changes were made, were recommended for adoption by the lines handling interline freight and passenger business. These forms were 14 in number, as follows:

Statement of interline tickets issued; size 8½ in. x 14 in.

Statement of interline ticket differences; size 14 in. x 8½ in.

Monthly statement of interchangeable mileage coupons, C. E. T. A.; size 8½ in. x 5½ in.

Standard straight bill of lading, three parts; size 8½ in. x 11 in.

Standard order bill of lading, three parts; size 8½ in. x 11 in.

Note.—These forms of bills of lading were recommended

for adoption with the understanding that lines in Indiana would continue to use the present form of bill of lading until the order issued by the Railroad Commission of Indiana concerning the uniform bill of lading is withdrawn.

Interline way-bill, five parts; size 8½ in. x 5½ in.

Interline way-bill, five parts; size 8½ in. x 5½ in.

Interline way-bill, steam railroad type; size 14 in. x 8½ in.

Note.—Owing to the local conditions existing on different lines, it was not considered advisable to recommend adoption of a single form of interline way-bill, and the types of bills submitted above were recommended for adoption, the local conditions of each line to determine the form of billing to be used, but all interline way-bills should follow the forms shown above.

Passing report of interline way-bill, in book form; size 8½ in. x 13 in.

Agents' way-bill correction; size 8½ in. x 11 in.

Note.—The general information shown on correction is given on the form submitted, but the instructions should be printed to agree with the local conditions on each line, it being understood that all lines will arrange to furnish a copy of the correction to the auditor as well as to the agent of the foreign line interested.

Abstract of interline way-bills received; size 8½ in. x 14 in.

Division of revenue on interline way-bills received; size 14 in. x 8½ in.

Statement of differences on interline freight accounts; size 14 in. x 8½ in.

Correction account, adjusting differences in settlement of interline freight accounts; size 14 in. x 8½ in.

A telegram was received from S. C. Rogers, chairman of committee on Interstate classification of accounts, regretting his inability to attend this meeting, and it was decided that at the next meeting all questions pertaining to the new classification of accounts would be discussed, and that all questions which had been submitted by any members to the Interstate Commerce Commission and rulings obtained on same would be furnished the other members of the conference for their information.

It was decided to hold the next meeting in Columbus, Ohio, on Saturday, June 12, 1909.

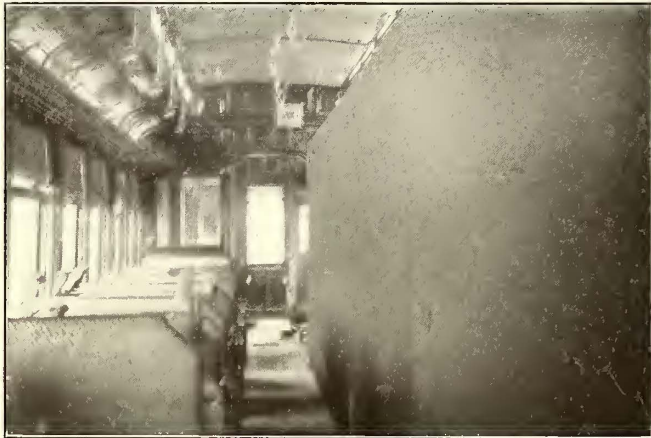
The conference then adjourned.

PROGRESS IN GASOLINE MOTOR CARS

A recent publication issued by the McKeen Motor Car Company, of Omaha, Neb., presents some interesting particulars of the increasing popularity of gasoline motor cars with mechanical transmission, as made by that company. This type is now in use on the Union Pacific Railroad, Central Pacific Railroad, San Diego, Cuyamaca & Eastern Railway, Illinois Central Railroad, Galveston, Houston & San Diego Railway, Erie Railroad, Chicago & Northwestern Railway, Los Angeles & San Diego Beach Railway and the Silver Peak (Nevada) Railway. McKeen cars have been in practical daily service for four years, during which time 36 have been built and are in operation. California heads the list with 15 cars, and another will shortly be sent to the Los Angeles & San Diego Beach Railway of that State. Sixty cars are now under way at the shops of the company. Five of these new cars are 70 ft. long, have a seating capacity of 105 passengers, and each is being built to take the place of a steam locomotive and two or three cars. The regular 55-ft. car, which seats 75 passengers, will generally accommodate the traffic usually handled by a steam locomotive and one or two cars.

EXAMINATIONS IN SERVICE RULES, SIGHT AND HEARING ON THE LAKE SHORE ELECTRIC RAILWAY

To ascertain the fitness of its motormen and conductors, the Lake Shore Electric Railway Company, of Cleveland, Ohio, has temporarily transformed one of its large passenger coaches into a testing car. Not only does the company desire that employees should be acquainted with the rules placed in their hands, but that they should also be able to approximate distances by the size of the switch and tail lights, distinguish colors both day and night, and read signs in letters of ordinary size. As arranged, this coach is a complete examination car, held long enough



Lake Shore Electric Examinations—Dark Room Provided on Examination Car

at the most convenient point on each division to examine all the men employed on the respective divisions. The smoking compartment is used for the examinations on operating rules. In all, 183 questions are asked on this subject, which is made to include a general acquaintance with the different equipments found on the several lines. Motormen are expected to be able to take care of minor troubles and bring cars in, even if they must do it with one motor. The total number of questions in the list for motormen alone is 101.

Conductors are required to acquaint themselves only with such matters as pertain to their own work. While the superintendents are glad to have them know something of the equipment and operation of cars, so that they may be able to aid the motormen in case of a breakdown or other trouble, they are not required to answer questions of this kind or study the rules relating to such points. As conductors are not allowed to operate cars, the responsibility in case of accident can be placed on the motorman.

Since the men have known that they would be subjected to severe tests, they have put in their spare time at study. It is said that at almost any time the book of rules could be found about the cabs or showing above the pockets of the employees. This was hard work for some, but merely "brushing up" for others. The net result was a good examination for all so far as the tests have proceeded. Most of the old men averaged around 98 per cent, but some had perfect marks. The younger ones in the service attained good percentages, but most of them did not quite equal the records of their elders.

All motormen and conductors are required to take an examination after completing their student work. This has always been a rule with the company, and the test must show a standing of at least 75 per cent. By this

method most of the applicants who would eventually prove poor employees are weeded out at once.

The men unanimously approve of this plan of testing their knowledge. They realize the necessity of exercising intelligence in the operation of the road, and feel that the certificates granted them are proof that they are trustworthy. As electric railroading grows and the use of fast trains increases, the necessity for expert work becomes more apparent, and shortly the trained and tried electric railway man may be as much of a necessity as the steam railroad engineer.

The examination on hearing is not formal. Ability to hear well is judged from the way the men catch the questions as they are asked in an ordinary tone of voice. Accuracy in understanding is also shown in this manner. Among all the men who have been examined so far none has been found defective in this sense.

For testing sight the large compartment of the coach is used. The seats on one side were removed and a dark room 30 ft. long was made by enclosing the space in black cloth. The window blinds on that side were drawn and the wall was lined with black. The entrance to this room is at the rear of the car. On the boarded-up window space between this compartment and the smoker was placed a small case containing a roll curtain, on which are lines of letters of various sizes to be read at 10 ft., 15 ft., 20 ft. and 30 ft. The larger letters are to be read at greater distances, but the superintendents are able to test ability to read at the greater distances from the small letters which extend in lines across the curtain about 15 in. in length. This case is lighted by a lamp placed in a reflector slightly above it. Current is taken off the lighting system of the car. A cord attached to the curtain mechanism is extended along the car to the rear, so that the examiner may stand at the opening with the applicant and operate the curtain as he desires.

Dr. C. H. Williams' lantern is used for the color test. It is placed in the same position as the chart and light is fur-



Lake Shore Electric Examinations—Illuminated Sign with Different Size Letters in Dark Room

nished from the same line. The lantern shows white, yellow, red, green and purple. The aperture for showing the lights is perhaps $\frac{3}{4}$ in. in diameter and the colors are obtained by revolving various colored disks over the opening. Employees are asked to name the colors immediately on seeing them and the changes are made rapidly, so that the test shows the aptness of the employee to distinguish them quickly and easily.

To test ability to approximate distances from the ap-

parent size of lights a slide is arranged so that openings of various sizes from 3/4 in. to 1/8 in. in diameter are shown in the various colors. These correspond to the varying distances from lights on cars or switches and good judgment on this point is expected in order to prevent collisions or passing danger signals. This test is perhaps more severe than any of the others, except where absolute color blindness exists. The latter has been found only in two cases and these cases were on local city lines.

Professor Holmgren's worsted colors, prepared by F. A. Hardy & Company, of Chicago, are used for testing colors

THE LAKE SHORE ELECTRIC RAILWAY CO.
CERTIFICATE OF EXAMINATION.

19

This is to Certify, That Mr. _____
has this day passed an examination in vision and hearing test and is in no manner disqualified for performing the duties of a railway employe, by reason of color blindness, defective sight or hearing.

Color _____ per cent., Vision _____ per cent.; Hearing _____ per cent.

Examiner

Signature of Holder:

Approved: _____
Gen. Superintendent.

Lake Shore Electric Examinations—Certificate of Physical Examination

in daylight. Very faint shades of yarn are included, as well as the more pronounced, to ascertain whether the men are able to distinguish the color of faded flags. The degree of ability is shown by the number of shades they are able to select from the conglomerated mass when the yarn is thrown out of the case.

One of the most important features about the whole plan is the fact that the employees are becoming acquainted with standardized rules of operation. All signals are made in the same way and there is no danger of mistaking them. Everything else has been brought to a standard and each

THE LAKE SHORE ELECTRIC RAILWAY CO.
CERTIFICATE OF EXAMINATION.

No. _____ 19

This is to Certify, That Mr. _____
has been examined upon the RULES AND REGULATIONS OF THE OPERATING DEPARTMENT, and is qualified to fill the position of _____

Rules _____ per cent. Equipment _____ per cent.

Examiner.

Signature of Holder

Approved: _____
Gen. Superintendent.

Lake Shore Electric Examinations—Certificate of Examination on Rules

employee learns it just as all the others do. As the result of such training they are able to work together with perfect intelligence and understanding at all times.

General Superintendent L. K. Burge planned the test car and he is aided in giving the tests by Warren Gregg, superintendent of the Cleveland division, and P. M. Truman, superintendent of the Toledo division.

Governor George W. Donaghey, of Arkansas, in his inaugural message to the Legislature of that State, suggests increasing the power of the Railroad Commission to include, in addition to the control of transportation of freight and passengers, control of the condition of roadbed, bridges, cars and other equipment of railroads operating in that State.

COMMUNICATION
ACCIDENT CLAIMS IN AUSTRALIA

THE BRISBANE TRAMWAYS COMPANY, LIMITED
BRISBANE, AUSTRALIA, Jan. 5, 1909.

To the Editors:

In the ELECTRIC RAILWAY JOURNAL for Nov. 14 I find very interesting reading under the head of "Claim Agents' Question Box." The following remarks from one company prompt me to give our own experience:

"There are so few cases occurring in the operation of a street railway company where there is no liability that it is always safer to prepare the case for the future, as there is a claim made in about 99 cases out of every 100 cases."

This is so different from our own experience that a few figures may possibly be of interest to your readers. That they may be intelligible and form a basis for comparison, I give you some data upon our business:

Population	130,000
Street mileage	35 1/2 miles
Cars in daily operation.....	60-90
Car-miles per annum	3,500,000
Passengers carried per annum.....	27,500,000

During the seven years 1901-1907 (both inclusive) we had a total of 5521 accidents, including the most trivial as well as serious. The total number of claims made was 312; the total amount claimed, \$8,400; the number of cases in which liability was admitted, 97; total amount paid, \$2,700. During the seven years we have had to defend only three suits, all of which the company won. We have only lost one suit since the company began operating by electricity, nearly 13 years ago. In that case a young woman alleged she had suffered from electric shock. She brought a suit for £1,000 and got a verdict for £150.

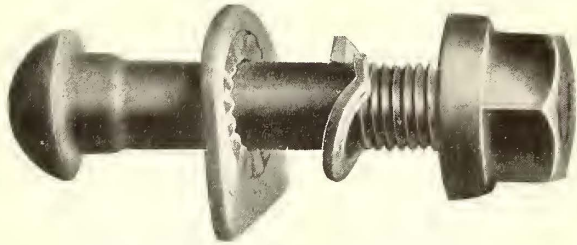
J. S. BADGER, Manager.

A NEW LOCK BOLT

The weakest portion of a railway track is, of course, the joint, and in spite of frequent inspection the track nuts will loosen or the bolts stretch in service, allowing the rails to get out of line. Various spring lock washers have been devised from time to time to prevent the nuts from slacking. The great fault with practically all of these is that the spring is flattened out by the tightening of the nut and the tension of the nut is transmitted through the spring to the angle plate. Therefore, any sudden blow from a passing wheel is very apt to break the spring, or if it is tough enough to stand this strain it will gradually lose its tension under the mechanical stress and serve merely as a plain washer. The spring is also exposed to the weather and sooner or later corrodes; as the greater part of the elasticity of the spring is in the skin of the metal, this rusting soon ruins the elasticity. The ordinary spring nut lock also depends for its grip on cutting a groove in the surface of the angle plate and in the surface of the nut which it touches. This disfigures both, and is quite apt to spoil the nut in case it is removed.

To avoid troubles of this kind Harold P. Brown, of New York, has brought out the "Stay-there" bolt and the "O. K." lock, which are sold by him especially in conjunction with the Plastic rail bond. It is stated that the bolt is made of a special high-grade steel fully 50 per cent stronger than the ordinary track bolt. The nut has a receptacle which completely shields the spring from the weather. The outer edge of this receptacle touches

the lock washer and thus prevents the bolt from getting askew as the nut is tightened. The depth of the receptacle is so proportioned that when the nut is screwed tight the entire mechanical strain is taken on its outer edges and the spring is still unflattened and has no more strain on it than is necessary to prevent the nut from turning backward. This locking of the nut is effected by a rounded ratchet surface on the inner side of the nut receptacle and on the corresponding surface of the lock washer.



Track Joint Bolt and Locking Plate

To prevent injury of these surfaces and of the spring the ends of the spring are given a peculiar curve so that a nut may be tightened and loosened again and again without injury to any of the parts. The manufacturer states that four years' severe service on the New York division of the Jersey Central and of the Pennsylvania Railroads has shown that when once set up no amount of mechanical motion or hammering can cause the nut to loosen.

The spring is made of a steel of extraordinary toughness and elasticity. It has sufficient strength in case of the stretching of the bolt still to keep the parts firmly together. A maintenance-of-way engineer on one of the roads mentioned is quoted as saying that the use of the bolts saved about \$21 a mile a year in the reduction of labor. Such a saving would more than compensate for the extra cost of these bolts. When desired the bolts and locks are made rust-proof.

COMBINED ANTI-CORROSION AND INSULATING PAINT

After three years' successful experimenting under a great variety of conditions, the Eldo Company, New York, has brought forward the Eldo anti-corrosion and insulating coating. This is made from a natural mineral product known as elaterite, and is said to owe its excellence to a process of manufacture which results in an absolutely uniform product without pigments. Numerous tests made for the manufacturer and results in service have shown that it resists the action of muriatic, nitric and sulphuric acids as well as chlorine. Its resistance to chlorine vapor would make it particularly valuable in painting fixtures in chloride accumulator plants. In general, the chemical qualities of this coating make it suitable for covering all classes of metal work subject to any kind of corrosion. Among the power plants where it is now in successful use is that of the Public Service Railway at Marion, N. J.

Because of its uniform composition, the standard product will cover anywhere from 800 sq. ft. to 1000 sq. ft., according to the character of the surface and the skill of the manipulator. The grade of Eldo used for high temperature conditions will cover even greater surfaces, as it is usually thinned with pure turpentine. The waterproof properties of both grades make this paint suitable for covering concrete, brick and wood. It may be employed, also, as a black, permanent enamel by baking it at a temperature from

40 deg. to 175 deg. C. for various periods, according to the hardness desired.

For large surfaces this paint is generally applied with a brush, but spraying is a desirable alternative when the parts to be covered are not readily accessible. Small objects are simply dipped into the compound. It has such a low freezing point that in one case a water gate was painted with it at an outside temperature of 25 deg. above zero, Fahr.

According to several tests made by the Electrical Testing Laboratories of New York, this material has splendid insulating qualities. Puncture tests of samples submitted showed a minimum break-down resistance of 1500 volts per mil and a maximum break-down resistance of 2100 volts per mil. Naturally, such insulating qualities as these, in combination with its chemico-physical properties, make this paint applicable for coil insulation of all kinds, for painting motor shells, controller parts and other electrical apparatus, and for protecting all metal subject to electrolysis.

HIGH-TENSION DROP-OUT SPAN PROTECTORS

Where high-tension lines cross over telephone or other circuits it is essential that some method be provided for protecting the lower circuits in case the transmission wires should break. To secure such protection some engineers require that where cross-overs occur extra high poles be placed close together, so that broken wires will not dangle

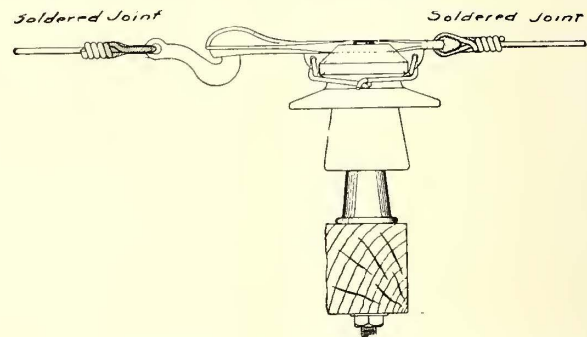


Fig. 1—Single Break Protector

low enough to touch the lower wires. In other cases the use of a grounded wire network or basket between the high-voltage and low-voltage wires has been required. However, there are many cases where it is not feasible to set two high poles close together, and the specifications for the grounded network often require a very heavy and

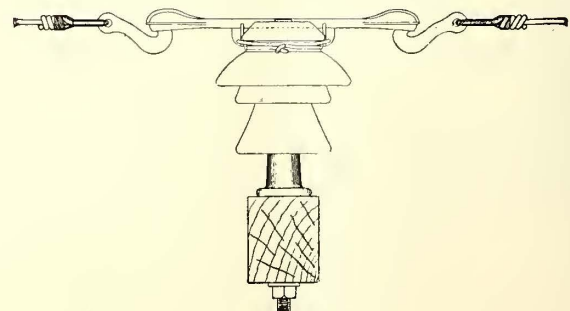


Fig. 2—Double Break Protector

impracticable device, especially where heavy wires are used on the transmission lines.

To meet the conditions actually found in commercial practice, the high-tension drop-out span protector shown in the accompanying cuts has been devised by the Central Electric Company, Chicago, Ill. The device consists of two parts, a fixed element secured to either the top or

side of a standard insulator and a movable element connected to the transmission line and so arranged that by means of a ground ball joint it makes positive contact with the fixed element. With a given span wire intact,

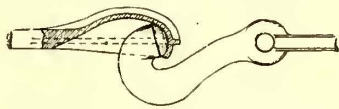
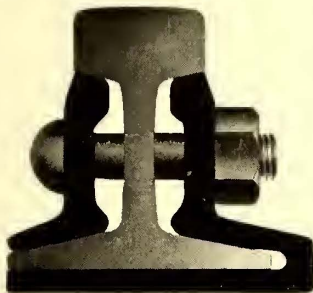


Fig. 3—Ground Ball Joint

heavy contact is maintained between the two elements of the connector, but upon the breaking of the span wire the movable element immediately drops and effectually disconnects, at the same time removing any danger of a live wire dropping across the telephone or other wires. The device is made in two types. Fig. 1 shows a single-break protector and Fig. 2 a double-break type. Fig. 3 shows the ground ball joint.

RECENT IMPROVEMENTS IN RAIL JOINTS

The Rail Joint Company has recently put on the market a modification of its Continuous rail joint, designed for the use of frogs and the heels of slip switches, and for other places where there is insufficient clearance for the use of the usual type of Continuous joints with extended



Section of Rail and Joint

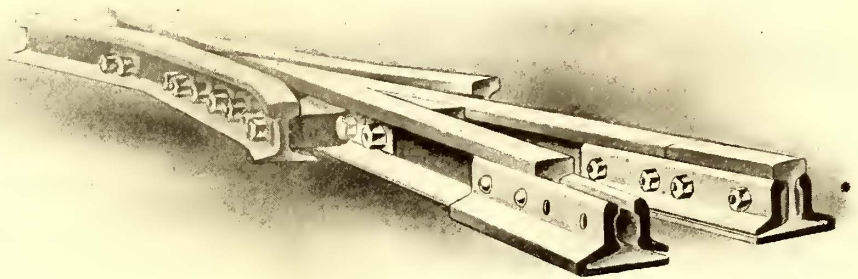
base. As will be seen from the accompanying section, the joint has two parts besides the bolts; one of these consists of a side and base member and the other of a side member only. The especial advantage of this construction is that on one side the joint members do not project beyond the base of the rail; hence by placing the plates so that this side of the joint is on the inside of the frog this joint can be used with perfect satisfaction in bolting up straight track with special work. In fact, it permits the use of as long joint plates as could be used with ordinary angle bar construction, yet provides the base support characteristic of the Continuous joint. Besides its application to frogs and switches, this joint is equally well adapted to cross-overs and rails with guards; in fact, to any positions where the bases of the rails abut. Considerable trouble was originally encountered by the Rail Joint Company in designing the rolls to produce this joint, but this problem was finally overcome at the works of the company at Troy.

Recent figures compiled by the company indicate that its three standard types of joints, Continuous, Weber and Wolhaupter, are in use on over 50,000 miles of steam and electric track. For electric railway service the Continuous and Weber have been most generally employed, but for steam service all three are used, about in the proportions of 75 per cent for the Continuous, 15 per cent for

the Weber and 10 per cent for the Wolhaupter. Each type gives three points of contact, under the head, over and under the base, thus providing the stiffness and eliminating the tendency to lateral and vertical motion. At the same time the base plate removes the necessity of the use of a tie plate, as where angle bars are employed, and adds greatly to the strength of the joint. The three joints mentioned are used either suspended or supported, according to the preference of the engineer in charge of the work, and seem to give equally satisfactory results in both ways.

Most of these joints are manufactured at the Rail Joint Company's plant at Troy, which has recently been enlarged. The rolling mill employed at this plant measures 430 ft. x 194 ft., and is equipped with two 20-in. three-high trains, which serve an 8-ton jib electric crane, for rapid roll changing, and 10 finishing machines. In the rolling shop, which is 136 ft. x 25 ft., there are five roll lathes of modern type and motor driven, for the manufacture of rolls to correspond with any new section of rail which may be on the market. The output of existing machinery in a single turn of 12 hours is 200 net tons per day of joints, or about 62,000 tons per annum.

In addition, the shops are equipped with heating furnaces and possess an electric plant of 500-kw capacity and a storage house adjoining the mill, 150 ft. x 79 ft.



Special Work with New Type of Joint

All the buildings are equipped with an electric traveling crane. The shipping facilities of the plant are by water and steam.

A NEW COMPANY TO MAKE BRAKE SHOES

A company to manufacture brake shoes for electric railways has been formed under the title of the United States Brake Shoe Company, with the following officers: President, Louis Streuber, a capitalist of Erie, Pa.; vice-president, Elmer P. Morris, the well-known electric railway supply dealer of New York; secretary and treasurer, J. F. Austin, postmaster of Corry, Pa.; general manager, J. J. Ressler, of Walton, N. Y., who has been making brake shoes at Corry for the past 22 years. The company purchased in February a large foundry and machine shop at Walton, N. Y., and will operate this in addition to the present Corry plant. Contracts have been let for new buildings at the junction of the Pennsylvania and Erie railroads at Corry, and the company expects to have this new plant in operation about June 1. It is intended to start another plant in the South and one in the West, and negotiations are now under way for sites for these additional plants. The fiscal office will be at Erie, Pa., and the general sales office will be in New York under the management of Elmer P. Morris.

HIGH-SPEED CHAIN HOIST

The Chisholm & Moore Manufacturing Company, Cleveland, Ohio, is building a chain hoist known as the "Cyclone High Speed," which appears particularly suitable for the winding rooms and the truck and machine shops of electric railways. This hoist embodies several valuable constructional and operating features, as described in the following paragraphs:

The lift or sprocket wheel which carries the lift chain is cast in one piece with the spur wheel driving it. This double wheel turns freely upon a hollow shaft rigidly supported at both ends in the frame. The spur wheel is encircled by a yoke having internal teeth meshing into the spur wheel teeth and driven with a gyrating movement about it by two eccentrics placed diametrically opposite. The hand-wheel shaft passes through the hollow main shaft and carries at the further end a pinion which drives two spur wheels, one on each of the two eccentric shafts as illustrated.

ticable to gear the hoists to a very high speed without increasing the hand wheel pull above that of slower hoists of other design. The 1-ton "Cyclone" overhauls only 29½ ft. of hand chain to raise the maximum load 1 ft. with a pull of 85 lb. The 2-ton hoist overhauls 29½ ft. of hand chain to raise the maximum load 1 ft. with a pull of 125 lb. On the other hand, the average speed of the best types of screw hoists in the 1-ton size is given as 60 ft. overhaul of hand chain with a pull of 88 lb., and in the 2-ton size 90 ft. overhaul of hand chain with a pull of 120 lb. to raise the load 1 ft. Hence, with the same power application the load can be raised with the described hoist more than twice as rapidly as with the best screw hoists.

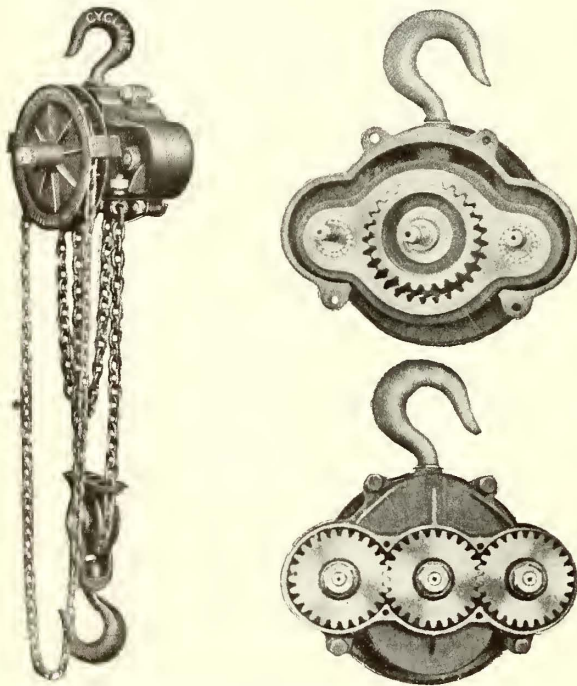
The automatic brake used with this high-speed hoist permits the spinning of the hand wheel in either direction when there is no load, locks the load with perfect safety, and yet permits its free lowering by a very slight reverse pull on the hand chain.

A NEW LINE OF INSULATING VARNISH

For years a demand has existed for a product so flexible as to lend itself to blending with varnishes, making them as nearly non-explosive as practicable. Heretofore benzine has been a big factor in the very few compounds on the market at all suitable for insulation, but fire underwriters do not regard this favorably, and anything which minimizes the fire risk is welcomed by them.

The latest contribution towards safety in insulating compounds is furnished by the John C. Dolph Company, of Long Island City, N. Y., in its "Wayahead" brand of varnishes. These are made up with the new "Polar" solvent, and are especially recommended for the insulation of armature and field coils. The compound is named "Polar" because it keeps cool. The announcement that it is now to be had will be of interest to those delegates who during the last convention of the American Street & Interurban Railway Association were interested in the discussions on insulating compounds and varnishes, because a strong point was made of the fact that the flash point of such materials should be considered from a fire insurance standpoint. The "Wayahead" polar solvent covers this point in particular.

Presiding at the half-yearly meeting of the Baker Street & Waterloo Railway, Sir George Gibb said that since the opening of the railway they had had a record of steady and continuous progress and improvement. In the past half-year they had carried 13,337,126 passengers, which was an increase of 25 per cent over the figures for the corresponding half of 1907. The principal increase had occurred in through passengers exchanged with other lines. The largest exchange had been with the Central London Company, the next largest being with the Piccadilly Tube. They had also had large exchanges with the Metropolitan and City and South London Companies, and it was to the development of this system that all the companies must look for increased profits in the future. Regarding the North-West London Railway Company, which held a concession for a line between Cricklewood and Victoria, that company had decided to modify its scheme, and build a line between Edgware Road and Brondesbury as an extension of the "Bakerloo." This company had entered into a working agreement with the North-West London Company, and probably this would cause it to modify its Paddington extension scheme.



Assembled View and Sections Through Gearing of High-Speed Chain Hoist

The number of the teeth in the spur wheel divided by the difference between the number of the spur teeth and the number of internal teeth of the yoke equals the number of revolutions of the eccentric necessary to turn the lift wheel once. In the one-ton size the spur wheel has 21 teeth, the yoke 24 internal teeth and the eccentrics turn seven times to each revolution of the lift wheel. Several teeth are always in contact, thus insuring great strength. The eccentric shafts have bearings at both ends and roller bushed connection with the yoke. All bearings have self-lubricating graphite bronze bushings, which require no oil and are said to run indefinitely without cutting. There are no overhanging bearings in the hoist, so that the frame will not spring and bind the working parts under full loads. The whole construction is extremely simple, and has been found as practicable for the 20-ton capacity as for the ½-ton hoist without undue increase in size or weight.

The friction loss of this movement is so slight (the efficiency is about 80 per cent) that it has been found prac-

News of Electric Railways

Subway Plans Outlined at Hearing in New York

The Public Service Commission of the First District of New York held a hearing on March 9 on the application of the Hudson & Manhattan Railroad for permission to extend its subway from Thirty-third Street and Sixth Avenue, New York, to the Grand Central Station, thus affording a connection between the Hudson & Manhattan Railroad and the New York Central & Hudson River Railroad and the New York, New Haven & Hartford Railroad, and making the Hudson & Manhattan Railroad a connecting link between these roads and the Delaware, Lackawanna & Western Railroad, the Erie Railroad and the Pennsylvania Railroad, with all of which the Hudson & Manhattan Railroad will eventually connect in New Jersey. William G. McAdoo, president of the Hudson & Manhattan Railroad, in urging the application of his company set forth the purpose of the extension as providing the facilities just mentioned by affording a connection between the New Jersey railroad terminals and the commercial center of New York. He said that the construction of the tunnel would not disturb the surface of Bryant Park at Sixth Avenue and Forty-second Street, or the present subway, which extends through Forty-second Street from Fourth Avenue to Broadway. Mr. McAdoo also said that it was proposed to connect with the Steinway tunnel to Long Island City. While the proposed extension is only about a mile long, it would eventually link Long Island, New York and New Jersey. Mr. McAdoo concluded by stating that the company would build the line with its own capital and that it would accept a franchise along the lines of the indeterminate grant it now holds for its present line under Sixth Avenue, New York, and its Ninth Street extension, which provides that the city may purchase the property at cost at the end of 25 years.

Theodore P. Shonts, president of the Interborough Rapid Transit Company, appeared for his company to point out certain objections to the engineering plan of the Hudson & Manhattan Railroad, and caused a sensation by formally announcing that the Interborough Rapid Transit Company had been quietly at work on plans for the immediate extension of the New York subway system which would probably meet the demands of the city for 10 or 15 years. He said that the work in mind would involve an expenditure of \$50,000,000. In replying to Commissioner Eustis, Mr. Shonts said that the new plan of his company would involve the necessity of a change in the Elsberg law, and that as he was well aware that the time for legislation at this session was growing short, he hoped to submit the plan for the new subway to the commission by March 17. Pending the formal presentation of the matter to the commission, Mr. Shonts refused absolutely to discuss the plans of his company. He said, however, that the Interborough Rapid Transit Company would not definitely oppose the application of the Hudson & Manhattan Railroad and added that it was not opposed to any enterprise that would benefit the city at large. His desire was to be assured that the building of the new line by the Hudson & Manhattan Company would not interfere with the present subway lines operated by the Interborough Company.

Still another subway plan was outlined on March 9, when a proposal was made to the Public Service Commission by William J. Wilgus and his associates in the Amsterdam Corporation. Briefly stated, if suitable legislation can be obtained the Inter-Terminal Belt Line will build a belt line elevated and subway for both passengers and freight as far up as Fifty-ninth Street, with crosstown connections under Fifty-eighth Street, and under Forty-third Street, Seventh or Eighth Avenue and Thirtieth Street. Mr. Wilgus has as associates Gustav H. Schwab, C. D. Halsey & Company, J. G. White & Company, Hodenpyl, Wallbridge & Company and C. C. Cuyler. The plan of the company proposes among other things the following conditions:

"It shall transport passengers over its lines for a full 5-cent cash fare.

"Its securities shall be so safeguarded that the investor will be made as secure, as to return of interest and principal, as is consistently and conservatively possible, and the authorized issue of bonds and stock shall be on terms that will be reasonably attractive to investors and to those who initiate and establish the project.

"After provision has been made for operating expenses, interest on bonds, and depreciation the city shall, in lieu of all State, city, county and franchise taxes and all other taxes except taxes on real estate, share with the company in the net profits.

"At the end of the franchise period the city is to have the right to purchase the property at a fair valuation, or the franchise is to be extended for a further period."

Cleveland Traction Situation

The report of the receivers for the Cleveland Railway shows gross earnings of \$451,211 and a surplus of \$28,979. It follows:

Gross earnings.....	\$451,211
Operating expenses.....	288,048
Net earnings.....	163,163
Miscellaneous income.....	3,210
Gross income.....	166,373
Taxes.....	23,564
Income less operating expenses and taxes.....	142,809
Interest and other deductions.....	40,452
Net income.....	102,357
Cleveland Railway, rental.....	73,378
Surplus.....	\$28,979

According to the estimates made by the receivers, the results are about the same as would have been obtained under a fare of six tickets for 25 cents, although the burden, under present conditions, is upon those who patronize the lines receiving 5-cent fare and those who must transfer from the low-fare lines. The total deficit under the Municipal Traction Company and under the receivers to Feb. 1, when the fare was increased, was \$229,678. The surplus for February reduces this to \$200,600.

Notwithstanding this, Mayor Johnson in an interview in a Detroit paper was quoted as saying that the 3-cent fare had not failed to pay all the legitimate expenses of the company and the interest on the stock. He was also quoted as saying that the old company would never get another franchise in Cleveland that did not contain a clause by which the property could be taken over by the city or some company designated by the city at any time at 110. From this, it would seem that only the defeat of Mr. Johnson at the polls this fall will make it possible for negotiations looking to a settlement of the question to be entered into with any prospect of their being concluded successfully.

Frequent complaints have been made to the City Council that certain of the 3-cent lines have been crowded since the fare on the other lines was increased and that not enough cars are operated over these lines to care for the traffic. At times the complaints have amounted to accusations of partiality on the part of the receivers, although the receivers have time and again asserted that they are giving all the lines, regardless of the rate of fare, all the cars that are in condition for operation. One of the local papers said a few days ago in an editorial that the receivers are perfectly impartial in the distribution of the cars, but that they would not be doing wrong if they did give the best service to the people who are paying the highest price for it.

Considerable evidence was introduced at the hearing of claims before Master Commissioner Belford relating to the bills for food consumed by the directors of the Municipal Traction Company at their noon-day luncheons. It was shown that between April 27 and Nov. 12, 1908, the bills at two restaurants amounted to \$1,576. Of this a balance of \$731 remains unpaid. J. J. Stanley, vice-president of the Cleveland Railway Company, testified that daily meetings of the directors had never been found necessary with the Cleveland Electric Railway and he did not believe they could find enough business for such frequent meetings. He said that the directors of the Cleveland Electric Railway always paid for their own lunches and that when he and President Andrews ate lunch in their offices they paid for it themselves. Attorneys for the claimants are endeavoring to show that these lunches were a necessary part of the expense of operating the street railway.

March Meeting of the Central Electric Railway Association

The secretary of the Central Electric Railway Association has just issued the following notice:

"The regular meeting of the Central Electric Railway Association will be held at the Hollenden Hotel, Cleveland, Ohio, on March 25, 1909, morning session commencing at 10 a. m. sharp. In view of the fact that our meetings are to be held once every two months, and also in view of the elaborate program that has been prepared, it is sincerely

hoped that every member of the association will be present to make this meeting one of intense interest. It is suggested to those members living at a distance that the trip be made in special interurban cars, which will tend to increase the interest and make the trip one of immense value by personal observation.

"As the morning session will commence promptly at 10 a. m. and the session of the association close on the same day, it is hoped all will be present at the opening of the meeting. Members have the privilege of inviting any friends they wish to have present at this meeting. It is also urged that all master mechanics be present."

Program

Morning Session

10:00 a. m.—Business.

11:00 a. m.—Little Things in Connection with Operation. Paper by W. A. Carson, general manager, Evansville Railways Company, Evansville, Ind.

12:00 m.—Adjournment for luncheon.

Afternoon Session

1:30 p. m.—The Preservative Treatment of Timbers Used by Electric Traction Companies. Paper by J. N. Nelson, Jr., of the United States Department of Agriculture, Washington, D. C. This paper will be illustrated with a series of stereopticon views covering the various conditions of the wood before and after the use of preservatives. It is expected that this paper will be of great benefit to traction lines in connection with the life of ties and bridge material used.

2:30 p. m.—The Loose Leaf Filing System of Matters in Periodicals. Paper by R. N. Hemming, assistant superintendent of the Ohio & Southern Traction Company, Columbus, Ohio.

Adjournment.

A. A. Anderson, president of the Central Electric Railway Association, announces that, owing to the withdrawal of C. C. Reynolds, as chairman of the subject committee, he has appointed H. U. Wallace, general manager of the Chicago, Lake Shore & South Bend Railway Company, as chairman, and G. S. Henry, traffic manager of the Indianapolis & Cincinnati Traction Company, as a member of that committee.

Why the History of the Minneapolis Street Railway was Published

C. G. Goodrich, vice-president, Twin City Rapid Transit Company, Minneapolis, has made public a short statement of the reasons of the company for publishing a history of the company in the daily papers. Briefly they were:

First. To comply with numerous requests for the publication of the history of the company.

Second. To present facts relating to the growth and development of the system and demonstrate that the present rate of fare is as low as can be made if the quality of service and present excellent physical condition of the property are to be maintained.

Continuing, Mr. Goodrich points out that the original grant to the Minneapolis Street Railway Company fixed the minimum fare at 5 cents for a ride of 3 miles without transfers. If the company was now operating under these conditions it would be receiving fares of from 5 cents to 25 cents instead of the 5-cent fare. But while fares have been thus virtually reduced, the purchasing value of the 5-cent piece, so far as supplies and wages are concerned, has also been reduced. On Feb. 8, 1907, an ordinance was passed by the Minneapolis City Council requiring the company to sell six tickets for 25 cents. The Federal Court, Judge Lochren presiding, held that the Council had no right to enforce such an ordinance, but the city appealed the case and it is now pending in the United States Supreme Court. Mr. Goodrich adds:

"The company is advised by its counsel, and believes, that Judge Lochren's decision was absolutely right and that it will be sustained by the Supreme Court, but the policy of the company has always been and is, if possible, to avoid controversy with the city in the courts and, therefore, knowing that anything less than a straight 5-cent fare, or the possibility of a less rate, would unquestionably have a retarding effect on the growth and development of the city as a whole, the company will, at the next meeting of the City Council, present a communication requesting the appointment of a committee before whom representatives of the company, as well as others interested, may appear to answer such questions and furnish such additional information as may be desired, with a further request that, if the committee should make a favorable report, the council will instruct the city attorney to dismiss the appeal now pending and accept the decision of the federal court.

"Favorable action on the part of the City Council will enable the company to continue its present policy of high-

grade improvements, which for the current year include a large number of new cars, a further increase in power equipment and a large expenditure of money for track and paving improvements which are necessary in anticipation of the city's extensive plans for improvements during the present year.

"We believe that the citizens of Minneapolis want a constantly improving service, with a straight 5-cent fare with transfer, rather than a continually depreciating service, which in other cities has invariably followed any reduction from a 5-cent fare."

Strike in Manila.—The employees of the Manila Electric Railroad & Light Company, Manila, P. I., went on strike on March 4. They demanded an increase in pay and a readjustment of the hours of labor. Non-union Filipinos and Americans were engaged at once to man the cars, under a strong force of police. Desertions from the ranks of the strikers were numerous as a result of the determination shown by the company in promptly manning its cars, and by March 6 the strike had petered out.

Chicago's Return from Street Railways a Sinking Fund.—Judge Thomas G. Windes, in the Circuit Court, has ruled that the moneys accumulating from the city's 55 per cent of the profits from the operation of the Chicago City Railway and the Chicago Railways cannot be used by the city for any purpose except to form a sinking fund for the purchase of the street railways when their franchises expire. Judge Windes also holds that even if it were proper for the city to draw on the fund, it could not be done without the approval of the voters.

Electrifying Long Island Railroad Branches.—It was reported in New York recently that the Long Island Railroad was making plans for beginning the work of electrifying its Port Washington branch at once. P. H. Woodward, secretary to Ralph Peters, president and general manager of the Long Island Railroad, who was asked for a statement regarding the matter, said that the plan of the company at present is not to begin electrifying the Port Washington branch until some time in 1910. He added, however, that "the plan might be changed by an improvement in financial conditions."

Petition in Minneapolis to Discuss Fare Appeal Case.—The following petition is being circulated in Minneapolis: "To the Honorable City Council, City of Minneapolis: Gentlemen—We, the undersigned citizens of Minneapolis, believing that the interests of the city as a whole, and the patrons of the street railway, will be best served and promoted by improved service and additions to the system rather than by a reduction in the fare, hereby respectfully petition your honorable body to take such action as may be necessary to authorize and instruct the city attorney to dismiss the appeal now pending in the Supreme Court of the United States on the so-called 'Six for a Quarter Ordinance,' and allow the decision of Judge Lochren to become final."

Decision in Steinway Tunnel Suit.—The Appellate Division of the Supreme Court, by a unanimous decision, holds that the franchise of the Steinway, or Belmont, tunnel under the East River from Forty-second Street to Long Island City did not lapse on Jan. 1, 1907, because the tunnel was not complete, and that it does pass to the trustees of the creditors, stockholders and members of the New York & Long Island Railroad, who were the defendants in the suit brought by the city. Those defendants are in lawful occupation of "the tunnels, tracks, structures and property of the company in the Borough of Manhattan and in the Borough of Queens," and the city "should be enjoined from interfering therewith." An offer to sell the property to the city for \$7,000,000 was rejected. It was contended by counsel for the company that while the company had ceased to exist as a corporate body, the tunnel and all of its property thereby passed in 1907 from the company to the directors as trustees for creditors and stockholders of the road. The decision sustains that contention.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Delaware.—February 19 was the last day fixed by the General Assembly for receiving new business. Up to the last moment nothing of import to street railways had transpired, but just before the close of the session Senator Drexler gave notice of a bill providing for a public service commission. The Senator said that the measure had not yet been drawn, but announced that his proposed bill would create a commission with authority over all public service corporations, the members of the commissions to be appointed by the Governor. The announcement is not taken very seriously as none of the street railway or electric light properties in the State is large, and there are no intrastate railroads in the strict sense.

The bill has been passed by the House which provides that the State may, after 10 miles of a freight and passenger railway have been built, invest in 3 per cent bonds of the company at the rate of \$1,000 a mile, the total investment not to exceed \$100,000. The supervision of this investment by the State is invested in a commission of five members to consist of the Governor and four others, to be appointed by him to serve without remuneration.

Maine.—The first really significant measure of this session, as far as the railroads are concerned, has reached the House. It is a public utilities bill, and provides for the extension of the power of the Railroad Commission and a change of name for that body to the Public Service Commission. Maine found its incentive in the similar measure in Vermont. The commission is given authority over the railroads, street railways, electric light and power companies, telephone companies, etc. One clause of the measure says that the commission shall have jurisdiction over "the manner of operating and conducting any business subject to supervision under this act so as to be reasonable and expedient, and to promote the safety, convenience and accommodation of the public." The tariffs of all companies are to be filed with the commission for public inspection.

Minnesota.—A measure by Representative Christensen places all city railways under the control of the State Railway and Warehouse Commission; another, by Johnson, does away with the present ad valorem basis of taxation and puts all street railways on a gross earning basis; another by Zelch covers interurban electric railways and designates them as common carriers, with all the rights now enjoyed by the steam roads. The Zelch bill as outlined by its author is for the purpose of bringing all suburban lines under the ruling of the Supreme Court which has held that they are common carriers and subject to the same laws and regulations as the steam roads. He asks that they pay 4 per cent on their gross earnings, which is what the steam roads pay. This tax, while collected by the State, is also returned to the localities in which the lines are located. The bill is still in committee, but it is expected that it will be sent to the House with a favorable report.

Missouri.—A bill creating a State utilities commission will be introduced by Representative Wade of Greene. It will provide that the commission have charge of all the public utilities in the State, including railroads, but it will in no wise interfere with the commissions in St. Louis and Kansas City. One feature will be the abolition of the Missouri Railroad and Warehouse Commission, the members of which are to be made members of the Missouri Public Utilities Commission and to serve for a term equal to that remaining in their present places. Besides these three members, there are to be two others. The salary of each of the five members is to be \$3,500, which is \$500 in excess of that paid to the present members of the Railroad and Warehouse Commission. The members of the commission are to be named by the Governor. In regard to the proposal to create a Public Service Commission in Missouri, Governor Hadley said: "I have been considering this question for some time and I have about reached the conclusion that we need a utilities commission to check corporate abuses and insure every corporation, great or small, a square deal. It is my idea that the commission be clothed with semi-judicial powers. It should have the right to investigate every phase bearing on the conduct of public service corporations, with respect both to their physical and financial condition."

New Jersey.—The joint special finance committee which has been considering means for recouping the State treasury has submitted its conclusions to the Legislature. A retrenchment of \$176,976 in the annual appropriation bill is recommended. Two recommendations are made affecting the railroads. One proposes a revaluation of the railroad property within the State; the other proposes "a fair revision of the franchise tax by a moderate increase in tax on the capital of corporations above \$5,000,000." This would result in an increase of revenue to the State each year of approximately \$500,000, in the opinion of the committee. The bill introduced in the Senate by Mr. Gaunt, to give electric railways the right to carry freight, and which has been referred to the committee on judiciary, follows: "Be it enacted by the Senate and General Assembly of the State of New Jersey: 1. It shall be lawful for any traction company or other company owning, leasing or operating any street railroad in this State to receive and carry over such street railroad freight and express matter for hire and to deliver the same to parties entitled thereto; provided that it shall be lawful for the governing body of any city having a population exceeding 12,000 to prescribe certain hours of the day during which freight may not be carried in such cities, and to prescribe reasonable regulations for the use and operation of cars in such cities used in carrying freight

and express matter. 2. All acts and parts of acts inconsistent with this act are hereby repealed, and this act shall take effect immediately."

New York.—The prospects are that the Legislature will adjourn during the first week in May. There is still a flood of business before it, however. The report of the New York City charter revision committee has at last been presented, and will be referred to the cities committees of the Senate and the Assembly. In this connection it is interesting to note that both houses have passed the resolution continuing the Cassidy commission until the end of the session. This commission investigated the financial condition of New York City, and the majority reported in opposition to the constitutional amendment exempting income-producing bonds from the city debt limit. Supporters of that amendment declare that it is the quickest and surest way of providing funds for transit requirements in New York City. The cities committees will have the benefit of the advice of the Cassidy committee in regard to fixing the debt limit of New York. Those interested in the new charter are anxious to have it passed at this session so that public officers may be elected to serve under its provisions at the November, 1909, election. As Mr. Shonts, president of the Interborough Rapid Transit Company, said at the hearing on the application of the Hudson & Manhattan Railroad for permission to extend its subway line, his company will desire a change in the Elsborg law, but the tenor of this modification will probably not be known until he presents his formal plans to the Public Service Commission of the First District, on March 17. The constitutional amendment to take the subway bonds out of the debt limit has been introduced in the Assembly, and Senator Travis has promised to introduce a correct copy of the measure at once. Both houses passed the amendment last year, but it must be passed again and then submitted to the voters. Amendments to the Public Service Commission law, placing telephone, telegraph, ferry and stage companies under the jurisdiction of the commission, have been prepared for introduction. The Public Service Commission of the First District of New York has replied to the resolutions adopted by the Assembly and the Senate of New York asking when the commission expects to render a decision in the Coney Island fare case. The reply of the commission appears elsewhere in this issue.

Ohio.—The Woods bill, providing for a commission to have charge of the appraisal of public utilities corporations, as amended, passed the House on March 3. In order to escape the criticism of its being a partisan measure, the bill was so changed that the commission will consist of a Republican and a Democrat, with the provision that the Supreme Court shall appoint an arbiter in case of disagreement over any point. The members are to be appointed by the Governor. The commission will take the place of about 12 boards composed of elective officials. A uniform system of bookkeeping is to be provided for the various classes of utilities. Provision is made that a corporation into which two or more other corporations are merged shall not have a greater capital stock than the aggregate capital stock of the companies affected. No utilities are affected except those which now come under the various boards, except boat lines between Ohio ports and points in other States. The members of the commission are to receive salaries of \$5,000 per year each and neither they nor their wives can hold stock in any of the corporations coming under their control. In the Senate the bill has been referred to a committee where it is believed it will remain until after adjournment. The following bills affecting street railways have been introduced in the House: Providing for a fine of from \$100 to \$1,000 for failure to equip cars with safety and power brakes; providing for a change in the law requiring the payment of 10 cents additional fare when tickets are purchased on cars, so that the act will apply only to steam roads; providing that when street paving is torn up for the purpose of laying new street railroad track, half of the original cost of the pavement shall be repaid to the property owners by the company; giving interurban railways the right of eminent domain in securing land for the purpose of straightening tracks or otherwise altering established lines; giving municipalities the power to require street railways to sprinkle streets where they have right of way; giving electric railways the same right to condemn property in municipalities that steam railway companies now have. The nomination of John E. Sullivan for member of the State Railroad Commission has been confirmed by the Senate. This was done with the consent of John C. Morris, who has held the place. The confirmation of both Mr. Morris and Mr. Sullivan to the office creates a situation that will result in an appeal to the courts.

Pennsylvania.—A time limit for the introduction of new bills at the present session of the State Legislature will

be fixed this week. Hearings on several important bills now in committee will be held next week, one of these being the Keiss bill increasing the power of the State Railroad Commission so that the commission may regulate capital stock increases. Railroad and railway interests are opposed to this measure. At the instance of the Pittsburgh Railways Company a hearing was given by the Senate committee on municipal affairs on March 9 on the bill amending the Pittsburgh city charter so that the municipality will have power to regulate street railway service. It is believed that the bill will be favorably reported by the committee. Stone & Webster have made an exhaustive report to the State Railroad Commission regarding street railway service in Pittsburgh, but it will not be given out for publication until it has been considered by the commission as a whole. Among the new measures presented in the House last week was the Hilton bill, which seeks to regulate the compensation or salary to be paid to directors, officers and superintendents of any corporation by permitting any stockholder or stockholders representing not less than 10 per cent of the capital stock of any corporation to present a bill or petition to the court of common pleas of the county in which the corporation has its principal office, calling for a review of the case, if, in their judgment, the compensation or salary paid any director is excessive or unreasonable. In direct contrast to the Sproul State road bill now in committee, the administration State road bill was introduced last week in the House by Mr. Ambler, and will probably be given the right of way over the Sproul measure. It prohibits the use of the State highway for railway purposes. Senator Sproul has also introduced an anti-spitting measure which has the endorsement of the State Health Department. It provides a fine of from \$5 to \$50 for spitting in public places or in cars. The judiciary general committee of the House is now considering the Foster bill, further amending the act entitled "An act concerning the sale of railroads, canals, turnpikes, bridges, and plank roads," approved April 8, 1909.

South Carolina.—The General Assembly has adjourned. The session this year was somewhat longer than usual, this being accounted for by the time given to the consideration of the liquor bills. Strictly speaking, the great bulk of the legislation is local, having to do with county affairs, provisions for the refunding of town and county bond issues and similar matters. Only one bill directly affecting the electric railways is before the Governor for approval. It requires electric railways to enclose the vestibules of their cars during the winter. A measure which includes the electric railways under its provisions provides that every corporation doing business in South Carolina, which is capitalized at more than \$25,000, shall make an annual itemized report to its stockholders, showing the assets and liabilities of the company.

Wisconsin.—The suggestions for legislation made by the Railroad Commission of Wisconsin in its second annual report covering the year ended June 30, 1908, are being discussed generally. The commission says that in several instances it has been obliged to place a somewhat liberal interpretation upon the public utilities law and adds that it will be assumed that the interpretation thus placed upon the law is in harmony with the spirit and intentions of the Legislature, unless the Legislature directs otherwise. The only amendment suggested to the law is one extending the period of time during which public utility companies, organized before the enactment of the law, can surrender their franchises and secure in lieu thereof indeterminate permits. The report says: "The utilities law limited the time during which a franchise could be surrendered to July 1, 1908. Since this date a number of companies have inquired of the commission as to the manner in which they could now surrender their franchises. In our judgment it is desirable that utilities still operating under franchises granted before the enactment of the law should have an opportunity to surrender the same at any time in the future. Possibly it is in the interest of the public to go a step further and under the reserve power of the constitution, by statute repeal all franchises still in existence and grant in lieu thereof indeterminate permits. The second suggestion is obviously a much larger proposition, but we are inclined to believe that it merits careful consideration. The public convenience and necessity law could to advantage be modified so as to permit the commission to consider the financial ability of the applicants in passing upon the application for such certificate, as some doubt exists at present of the right of the commission to inquire into such matter. The law might be further amended to authorize the commission to permit modifications of the certificate of public convenience and necessity at any time subsequent to its first issuance."

Financial and Corporate

New York Stock and Money Market

The stock market during the past week has been rather inactive, although prices have been well maintained. There have been few occurrences of interest to induce trading, beyond the inauguration of the new President and the discussion of Mr. Taft's inaugural address. Taken as a whole, the financial district is very well pleased with the expressions of the new head of the government. It believes that while he will pursue the policies of his predecessor, prosecutions of corporations will be conducted in a legal and orderly manner, and that the minds of the public will not be inflamed by violence, either of language or action. One point that is especially encouraging to the business world is Mr. Taft's demand that the new tariff bills shall be speedily adopted.

Interest in traction stocks has been mainly in the Interborough-Metropolitan issues and in Brooklyn Rapid Transit. The former have advanced during the week several points, due undoubtedly to the report for the quarter recently made public, which shows that the business of the Interborough-Metropolitan is steadily increasing and that the expense percentage is being kept within reasonable limits. The prevalent uncertainty regarding the course of Brooklyn Rapid Transit tends to keep it constantly more or less active.

The money market continues to be very easy and cash seems to be plentiful. Bonds are still in demand and are taken eagerly by all kinds of investors. Quotations to-day for money were 1½ to 2 per cent for call loans and 2½ to 2¾ per cent for 90-day paper.

Other Markets

Rapid Transit and Union Traction continue to be the leading traction issues in the Philadelphia stock market. Still, they have not been as active during the past week as during preceding weeks, because the entire market has been much duller. Prices for Union Traction have remained about stationary, while Rapid Transit has sold off a trifle.

In the Boston trading, traction securities have played but little part. A few scattering lots of Boston Elevated and Massachusetts Electric come into the market, but there is no definite trend to the trading. Prices are little changed from former quotations.

In the Chicago market, South Side Elevated has been selling to a limited degree and prices have shown an inclination to recede. Among the other elevated shares, Metropolitan and Northwestern have been traded in to some extent, but price changes have been only fractional. There has also been some renewed activity in all of the "Series" of the Chicago Railways Company, but changes in price have been unimportant.

In the Baltimore trading, the bonds of the United Railways continue to be the only issues that demand attention. The funding 5s are steady at about 80, and the incomes are selling from 53¼ to 53½. A few shares of United Railways stock have been sold at from 11⅞ to 11¾.

Among the securities sold at auction in New York last week were: Eight shares of Sixth Avenue Railroad Company at 118½; 507 shares Brooklyn City Railroad, \$10 each, at 191¼; 1000 shares of the same at 191½; 1975 shares at 191½.

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

	Mar. 6	Mar. 9.
American Railways Company, Philadelphia.....	46	*46
Boston Elevated Railway.....	127	127
Brooklyn Rapid Transit Company.....	73¾	*71½
Chicago City Railway.....	*185	*185
Cleveland Railway.....	—	—
Consolidated Traction Company of New Jersey.....	476	478
Consolidated Traction Company of New Jersey, 5 per cent bonds.....	106	107
Detroit United Railway.....	61¾	61
Interborough-Metropolitan Company.....	15¼	15¾
Interborough-Metropolitan Company (preferred).....	42¾	43¾
Manhattan Railway.....	*148½	144
Massachusetts Electric Companies (common).....	*14	14¾
Massachusetts Electric Companies (preferred).....	*68¾	72
Metropolitan West Side Elevated Railway, Chicago (common).....	*16	19
Metropolitan West Side Elevated Railway, Chicago (preferred).....	*48	*48
Metropolitan Street Railway.....	28	*28
North American Company.....	81¾	80½
Philadelphia Company, Pittsburg (common).....	*41¾	*41¾
Philadelphia Company, Pittsburg (preferred).....	42¾	*42¾
Philadelphia Rapid Transit Company.....	27¾	*27½
Philadelphia Traction Company.....	*93	93
Public Service Corporation, 5 per cent collateral notes.....	100¾	100¾
Public Service Corporation certificates.....	279½	280¾
Twin City Rapid Transit Company, Minneapolis (common).....	*103½	105
Union Traction Company, Philadelphia.....	53	53½

a Asked. *Last sale.

Annual Report of Georgia Railway & Electric Company

The pamphlet report of the Georgia Railway & Electric Company, Atlanta, Ga., for the year ended Dec. 31, 1908, contains a statement of earnings of that company and the Atlantic Gas Light Company, combined for the year, and a separate statement of the earnings of the Atlanta Northern Railway, the capital stock of which is owned by the Georgia Railway & Electric Company. The statement of the Georgia Railway & Electric Company and the Atlanta Gas Light Company follows:

Gross earnings.....	\$3,339,021	
Operating expenses.....	1,649,994	
Net earnings.....	\$1,689,027	
Taxes.....	231,662	
		\$1,457,365
Dividend treasury stock.....	\$29,604	
Dividend miscellaneous stock.....	4,222	
		33,826
		\$1,491,191
Interest on bonds.....	\$545,368	
Interest on notes.....	56,371	
		601,739
Dividend on preferred stock.....		\$889,452
		120,000
Surplus earnings.....		\$769,452
Dividend on common stock.....		510,876
		\$258,576
Profit and loss balance.....		1,016,348
Surplus Dec. 31, 1908.....		\$1,274,924

The consolidated balance sheet of the companies Dec. 31, 1908, follows:

ASSETS.		
Construction plant.....	\$21,035,556	
Supplies, fittings, etc.....	341,729	
Cash and accounts receivable.....	312,979	
Prepaid accounts.....	6,545	
Stocks and bonds.....	2,397,012	
Job and work orders.....	41,551	
Sinking fund bonds.....	112,000	
Sinking fund premium.....	5,211	
Sinking fund trustee.....	208	
Total.....	\$24,252,791	
LIABILITIES.		
Capital stock, preferred.....	\$2,400,000	
Capital stock, common.....	8,514,600	
Mortgage bonds.....	10,855,000	
Accounts and bills payable.....	1,046,631	
Interest payable.....	4,791	
Taxes payable.....	19,877	
Reserve accounts.....	110,627	
Sinking fund interest.....	26,340	
Profit and loss surplus Dec. 31, 1908.....	1,274,925	
Total.....	\$24,252,791	

The statement of earnings of the Atlanta Northern Railway, for the year ended Dec. 31, 1908, follows:

Gross earnings.....	\$1,12,821	
Operating expenses.....	83,749	
Net earnings.....	\$29,072	
Taxes.....	2,949	
Net income.....	\$26,123	
Interest on bonds and notes.....	22,022	
Surplus for year 1908.....	\$4,100	
Surplus at Dec. 31, 1908.....	52,283	
Total surplus at Dec. 31, 1907.....	\$56,383	

The balance sheet of the Atlanta & Northern Railway, as of Dec. 31, 1908, shows as follows:

ASSETS.		
Construction plant.....	\$597,719	
Supplies.....	2,748	
Cash and accounts receivable.....	3,335	
Prepaid accounts.....	623	
Total.....	\$604,425	
LIABILITIES.		
Capital stock.....	\$100,000	
Mortgage bonds.....	400,000	
Accounts payable.....	7,332	
Bills payable.....	34,000	
Reserve accounts.....	6,799	
Surplus Dec. 31, 1908.....	56,384	
Total.....	\$604,425	

P. S. Arkwright, president of the Georgia Railway & Electric Company, in presenting the report, said in part:

"The total mileage of railway track, on a single-track basis, owned and operated by the company on Feb. 15, 1909, was 166.2 miles. During the year, 5.4 miles of new track were built, 0.261 mile of track taken up and abandoned, and 4.07 miles of track were rebuilt. 159.7 miles of track out of the total mileage have been built or rebuilt since Jan. 1, 1899, with heavy rail of modern sections and on ballast. Of the total mileage only 4.4 miles of track are constructed of light rail not in good condition.

"During the year the sum of \$390,786 was expended on new construction and additions to the property of the company.

"There have been no increases in the capital stock of the company during the year and no bonds have been issued during the year. Underlying bonds of the Atlanta Consolidated Street Railway, of the par value of \$25,000, were redeemed in accordance with the sinking-fund provision in the mortgage securing these bonds, and \$10,000 par value, first consolidated mortgage bonds of Georgia Railway & Electric Company were retired in accordance with the sinking-fund provision of the first consolidated mortgage securing these bonds.

"In addition to the general effect on business, due to the financial depression, which affected the business of this company during the year 1908, there were special circumstances tending to decrease the company's revenues on the one hand and increase its expenses and fixed charges on the other, as compared with the year 1907. The year 1908 covers the first period of the operation of the State prohibition law. This tended to decrease the business of the company in every department.

"Beginning April 1, 1908, the new contract with the city of Atlanta became effective, resulting in a decrease of charges for public street lights from \$75 per arc per annum to \$60 per arc per annum, and reducing the prices to commercial customers for electric-light service from 12 cents to 10 cents per kw-hour maximum, and for power from 7 cents to 6 cents per kw-hour maximum.

Effective on Sept. 1, 1907, the wages of the motormen and conductors were increased, so that during the first eight months of 1908 the comparison of expenses was on the basis of a higher wage scale for motormen and conductors than for the corresponding period of the year 1907.

"During the year 1907 the taxes were very largely increased, the assessment of the physical property and franchises being increased 130 per cent over 1906. This increased assessment was maintained during the year 1908, and added to, to some extent, on account of additional property. That the company was able, notwithstanding these adverse conditions, to show an increase in both gross and net earnings for the year 1908 over the year 1907, demonstrates its stability.

"In the latter part of 1907 the powers of the Railroad Commission of Georgia were extended over electric railroad, electric light and power and gas companies, with the right, on the part of the commission, to regulate and control the service and rates of companies engaged in these lines of business. During the year 1908 petitions were filed with the Railroad Commission, asking for a reduction of the rates of the company in the matter of passenger fares upon its street and suburban railroads, and against the Atlanta Gas Light Company in the matter of rates charged for gas, and for various corrections of alleged improper service furnished by the company. After a full and complete hearing and a thorough investigation, these petitions were refused and the rates charged by the company and the Atlanta Gas Light Company were found reasonable and their service satisfactory.

"Similar complaints were made to the Railroad Commission as to the rates of fare and service of the Atlanta Northern Railway. These complaints were likewise dismissed by the commission after a hearing, and the rates pronounced reasonable and the service satisfactory.

"The company made, during the year, an exceptionally good record for carefulness and diligence in its transportation department. Approximately 46,000,000 passengers, including paid passengers, transfers and free passes, were handled on its lines of street railroad, and not one single passenger was killed or seriously injured."

Decision Against New Haven Company in Holding Case Confirmed

The full bench of the Supreme Court of Massachusetts has affirmed the decision of Justice Rugg of the Supreme Court, handed down in June, 1908, to the effect that the New York, New Haven & Hartford Railroad must relinquish before July 1, 1909, its interest in the Worcester & Southbridge Street Railway, Worcester & Blackstone Valley Street Railway, Worcester & Webster Street Railway, Webster & Dudley Street Railway, Springfield Street Railway and the Berkshire Street Railway, controlled by the New York, New Haven & Hartford Railroad through the New England Investment & Security Company. Action against the New York, New Haven & Hartford Railroad was brought by the Attorney-General of Massachusetts in May, 1908. In its appeal the company contended that Justice Rugg's decree was "vague and uncertain." On this point,

which is the principal subject treated in the decision of the full bench, the court says:

"The only relief asked for by the informant (Attorney-General Malone) was an injunction compelling the defendant to comply with its statute by ceasing to hold or control, directly or indirectly, the stock referred to in the information.

"Construing the decree in relation to the matters stated in the information and recited in the decree, it is difficult to see how the defendant can be in doubt in regard to the meaning of the order, or its own duty in the premises. It was entirely immaterial to designate and describe the defendant more particularly in the decree, either by calling it a corporation existing under laws of Massachusetts or by calling it a corporation existing under laws of Massachusetts, Connecticut and Rhode Island. We see no possibility of doubt on the part of the defendant in regard to the conditions that must come into existence to constitute a performance of its duty to cease to hold or control, either directly or indirectly, the stocks referred to in the information."

The decision is not regarded as changing the situation in any material aspect. The question which now arises is whether or not before and during the legal proceedings the controlling interest of the New York, New Haven & Hartford Railroad in the companies mentioned has been legally disposed of. Since October, 1908, the controlling common stock has been, with a single exception, sold to persons entirely disconnected with the company. The only official connection remaining, it is said, is in the fact that President Mellen of the New York, New Haven & Hartford Railroad remains one of the trustees of the Investment & Security Company. The New England Navigation Company holds as a creditor certain notes of the Investment & Security Company, but has no other relation to it. The 1000 shares of common stock are distributed among some 15 or 20 outside holders, while the 40,000 shares of preferred stock are distributed among 700 or 800 shareholders.

Pennsylvania Railroad Required to Dispose of a New Jersey Electric Railway

Chancellor Pitney, in the Court of Errors and Appeals of New Jersey, has delivered an opinion and ordered a judgment in the case of the State of New Jersey against the Atlantic City & Shore Railroad, which operates between Egg Harbor and Atlantic City, and has undertaken, through stock ownership and lease, to exercise the franchise rights of the Central Passenger Railway, operating an electric railway in Atlantic City, and several other contiguous lines which are considered feeders for the Atlantic City & Shore Railroad. The Atlantic City & Shore Railroad is controlled by the Pennsylvania Railroad, 51 per cent of its stock being deposited for purchase by the West Jersey & Seashore Railroad, which is owned by the Pennsylvania Railroad.

The State of New Jersey, in instituting the action, challenged the right of the Atlantic City & Shore Railroad to acquire and own the stock and bonds of the Central Passenger Railway, or to operate cars over its routes on the ground that such powers were not conferred upon it under the railroad act and cannot be derived from Section 51 of the general incorporation act referred to above. This position is upheld by Chancellor Pitney, and a judgment is ordered ousting the Atlantic City & Shore Railroad from the electric railway franchises it has acquired from the Central Passenger Railway, and requiring it to dispose of the stocks and bonds of the company.

Under the decision, the following general propositions are laid down as covering the holding company device or corporate control:

"Under the general railroad act a railroad company may not claim any general power that is not appropriate to and consistent with the construction, maintenance and operation of its railroad between the terminal declared by it pursuant to the railroad act.

"The power to purchase, hold, etc., stock and bonds of other corporations conferred by Section 51 of the general corporation act is to be exercised subject to the limitations imposed by Section 2 of the same act; that is to say, the power exists as a primary power only when the purpose to exercise it as such is expressed in the certificate of incorporation, and otherwise it exists as an incidental power only so far as necessary or convenient to the attainment of the objects that are set forth in the charter or certificate of incorporation.

"A railroad company incorporated under the act of 1903 for the purpose of constructing, maintaining and operating a line of railway with definite termini is without power to hold the stock and bonds of a street railway company operating beyond those termini and thereby to control its operations."

The Chancellor declares his belief that the opinion he expresses of the limitations of Section 51 of the New Jersey corporation law is held by the legal profession in general and that the articles of association of most holding companies are made to express in terms the purpose of holding stocks in other corporations.

Quarterly Report of the Interborough Rapid Transit Company

The report of the Interborough Rapid Transit Company, New York, N. Y., for the quarter ended Dec. 31, 1908, to the Public Service Commission of the First District of New York compares with the previous year as follows:

	1908.	1907.
Gross earnings	\$6,786,899	\$6,301,496
Operating expenses	2,691,804	2,602,095
Net earnings	\$4,095,095	\$3,699,401
Other income	341,989	306,941
Total income	\$4,437,084	\$4,006,342
Interest funded debt	499,208	275,000
Taxes	543,308	457,715
Rentals	2,007,254	1,993,036
Discount, etc.	3,033
Total deductions	\$3,052,803	\$2,725,751
Surplus	\$1,384,281	\$1,280,591

The report gives the net income previously reported for preceding quarters in the fiscal year 1908 as \$91,189, compared with \$207,091 in 1907.

The following table shows the proportion of the foregoing earnings furnished by the Manhattan Railway and the Subway divisions, respectively:

	Manhattan Railway.	Subway.
Gross earnings	\$3,606,800	\$3,180,098
Operating expenses	1,548,872	1,142,932
Net earnings	\$2,057,928	\$2,037,166
Other income	135,775	206,214
Total income	\$2,193,703	\$2,243,380
Interest funded debt	499,208
Taxes	527,712	15,595
Rentals	1,464,315	542,939
Discount, etc.	3,033
Total deductions	\$1,992,027	\$1,060,775
Surplus	\$201,676	\$1,182,605

Albany & Hudson Railroad, Hudson, N. Y.—The Albany & Hudson Railroad has applied to the Public Service Commission of the Second District of New York for permission to issue \$100,000 of bonds to defray the cost of work being done at its Stuyvesant Falls power plant.

Blue Ridge Traction Company, Danielsville, Pa.—The property of the Blue Ridge Traction Company, including Edgemont Park, has been sold to a syndicate at the head of which is J. K. Hower. New officers have been elected as follows: J. K. Hower, president; C. C. Marsh, treasurer and superintendent; H. H. Hower, secretary; J. K. Hower, C. C. Marsh, H. H. Hower, James L. Foote, G. T. Oplinger and Jay S. Moyer, directors.

Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.—The Public Service Commission of the Second District of New York has received an application from the Fonda, Johnstown & Gloversville Railroad for approval of an increase of stock from \$2,500,000 to \$3,500,000, and for consent to issue \$500,000 of such increase. The \$1,000,000 increase is proposed to be 6 per cent cumulative preferred stock. The petition also asks for approval of the classification of the present \$2,500,000 stock as common stock and the \$1,000,000 increase as preferred stock. The proceeds of the \$500,000 preferred stock are to be used to pay in part obligations incurred for betterments, and the remaining \$500,000 is to be held for future betterments.

Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind.—The new second mortgage of the Fort Wayne & Wabash Valley Traction Company, securing \$1,000,000 of 6 per cent, 25-year bonds, has been filed for record, the Guarantee Trust & Safe Deposit Company, Philadelphia, trustee. It is stated that the proceeds of the issue are to be used for the construction of the Logansport-Lafayette extension and for remodeling the power house at Lafayette.

Gainesville (Ga.) Electric Railway.—The property of the Gainesville Electric Railway was bought for \$180,000 by R. L. West, Atlanta, representing the bondholders at the foreclosure sale recently.

Interstate Railways Company, Philadelphia, Pa.—The bondholders' committee selected by the holders of the 4 per cent bonds of the Interstate Railways Company has organized by electing Holstein DeHaven chairman, Gerald Holzman secretary, and John C. Bell counsel. It has been

decided to extend the time for deposit of bonds with the Philadelphia Trust Company until March 31. Bonds to the amount of about \$7,000,000 have already been deposited. It is said that the report on the physical condition of the property, on which the reorganization plan will be based, will be ready about March 15.

Macon Railway & Light Company, Macon, Ga.—The Macon Railway & Light Company recently elected officers as follows: W. J. Massee, president; M. F. Hatcher, first vice-president; F. B. Stubbs, second vice-president; J. T. Nyhan, general manager; H. H. Hertz, secretary and treasurer; F. D. Bloodworth, assistant secretary and treasurer, and M. L. Corbett, superintendent of transportation.

New England Investment & Security Company, Springfield, Mass.—The following trustees have been elected to represent the preferred shares of the New England Investment & Security Company: H. L. Higginson, Boston; C. S. Mellen, New Haven; A. W. Damon, Springfield. The following trustees have been elected to represent the common shares: Lawrence Minto, Boston; A. G. Bullock, Worcester; Gordon Abbot, Boston, and Bennett W. Warren, Williamstown.

Newport News & Old Point Railway & Electric Company, Newport News, Va.—The hearing on the application of the Maryland Trust Company, trustee under the general mortgage of the Newport News & Old Point Railway & Electric Company, for the appointment of a receiver has been adjourned to March 12.

New York, New Haven & Hartford Railroad, New Haven, Conn.—The New York, New Haven & Hartford Railroad has applied to the Public Service Commission of the Second District of New York for permission to purchase the stock of the New York & Port Chester Railroad and the New York, Westchester & Boston Railway, now owned by the Millbrook Company, and also whatever remaining stock in the New York, Westchester & Boston Railway may be acquired from other parties. The Millbrook Company owns all of the \$250,000 stock of the New York & Port Chester Railroad except nine shares, and of the \$1,000,000 stock of the New York, Westchester & Boston Railway the Millbrook Company owns 75,829½ shares, and 32,580½ shares are owned by other parties. The New York, New Haven & Hartford says that it has advanced money for rights of way, construction work and disbursements of the Millbrook Company, and desires to eliminate the Millbrook Company as an unnecessary intermediary.

New York State Railways, Rochester, N. Y.—As a part of the plan of the Central Railway Syndicate for refinancing and reorganizing its electric railway properties as the New York State Railways the Rochester Railway and the Sodus Bay Railway have applied to the Public Service Commission of the Second District of New York for permission to consolidate.

New York & Stamford Railway, Port Chester, N. Y.—The New York & Stamford Railway was granted permission by the Public Service Commission of the Second District of New York on March 4 to make a mortgage in favor of the Union Trust Company, New Haven, Conn., as trustee, to secure an issue of \$2,000,000 of 5 per cent bonds and to issue thereunder \$701,000 for refunding and discharging note obligations and for other purposes. The New York & Stamford Railway is operated by the Consolidated Railway of Connecticut and has outstanding \$450,000 of 5 per cent bonds due October, 1931.

Second Avenue Railroad, New York, N. Y.—Holders of the first consolidated mortgage bonds of the Second Avenue Railroad asked Justice O'Gorman, in the Supreme Court, recently, to instruct George W. Linch, the receiver of the company, to take steps to enforce the lease entered into between the Second Avenue Railroad and the Metropolitan Street Railway. Counsel for the petitioners asked that Mr. Linch be instructed to observe, as far as possible, the obligations of free transfers imposed by the railroad law and to insist that the Metropolitan Street Railway permit the Second Avenue Railroad to carry its passengers over the lines of the Metropolitan Street Railway. The court reserved decision.

Third Avenue Railroad, New York, N. Y.—Judge Lacombe, in the United States Circuit Court on March 6, handed down an order granting permission to Frederick W. Whitridge, as receiver of the Third Avenue Railroad, to issue additional certificates to the amount of \$375,000 for the purchase of new cars.

Virginia Passenger & Power Company, Richmond, Va.—The United States Circuit Court of Appeals on March 4 affirmed the decree of foreclosure and sale of the property of the Virginia Passenger & Power Company, made by Judge Waddill. It is generally expected that the road will be sold within 60 days.

Traffic and Transportation

The Coney Island Fare Case

In reply to resolutions of the Senate and the Assembly of New York asking the Public Service Commission of the First District of New York when it expects to render a decision in the Coney Island 5-cent fare case, the commission, through Chairman Wilcox, made the following answer on March 4:

"The resolution specifically refers to the complaint made to the commission by Scott MacReynolds against companies comprised in the Brooklyn Rapid Transit Company. Another complaint by J. Monheimer against virtually the same companies, for the same cause, was received at the same time. Both issues against this company were heard and considered together. Both complainants also made separate complaints against the Coney Island & Brooklyn Railroad, a company independent of the Brooklyn Rapid Transit system.

"All of these complaints were to the effect that the charge of 10 cents for a continuous ride to Coney Island was excessive, unreasonable and unlawful, and they prayed that the commission order a reduction in the rate of fare to 5 cents.

"The commission assumes that the intent of your resolution would go to all of these companies, and I beg to submit the following statement including them:

"Under Section 49 of the Public Service Commissions law this commission has no authority to issue an order changing rates except upon complaint and after hearing. Such hearings were promptly held in the cases above referred to. Complainant Monheimer submitted no evidence. Complainant MacReynolds presented considerable evidence, but withdrew from the prosecution of the case before the hearings were ended. The companies affected submitted considerable testimony. Additional facts and figures were also prepared by the bureau of statistics of the commission.

"The companies affected by the complaint were the Coney Island & Brooklyn Railroad and the following, embraced in the Brooklyn Rapid Transit system, namely, Brooklyn Union Elevated Railroad, Brooklyn Heights Railroad, Nassau Electric Railroad, Brooklyn, Queens County & Suburban Railroad, Coney Island & Gravesend Railway, South Brooklyn Railway and the Sea Beach Railway. They include four elevated routes and six surface lines. It was maintained by the Brooklyn Rapid Transit Company that, although the several companies carried on a joint operation, they did so independently, and that, with two exceptions, each of the lines was operated by at least two different companies and under different franchises. It was contended, therefore, that the 10-cent fare now charged must be considered a joint rate, and that any lowering of the fare must be under the joint-rate clause of the Public Service Commissions law.

"After the hearings were held the commission proceeded carefully to consider the voluminous testimony which had been taken. That presented by the complainant was fragmentary and did not cover all the ground. Even the reports of the corporations, because of the method of accounting practised by the subsidiary companies of the Brooklyn Rapid Transit Company, were not in proper form to facilitate a prompt decision. The commission ordered a further investigation by its expert accountant of the companies' books, which were examined in connection with the figures presented in the testimony.

"After careful examination it was found that the evidence in its entirety did not offer sufficient grounds upon which this commission could arrive at a conclusive decision, either that a 10-cent rate was reasonable or that a reduction could be ordered. It was found that in order to rest a decision upon solid ground justice, both to the company and to the public, required that it would be necessary to make an appraisal of the tangible and intangible properties of the companies, and such an appraisal was decided upon. Prior to this time the commission had found it important to begin the appraisal of several of the Manhattan lines that were in the hands of receivers. The expert force of the office capable of doing this work was fully occupied in working under the urgent pressure of the unusual and acute situation in Manhattan. As soon as a part of this force could be put to work on the Brooklyn companies it was done, and for some time past an appraisal of the property of the Coney Island & Brooklyn Railroad has been proceeding, and is now nearly completed. When this has been done in the case of all the lines it will then be clearly shown what is the fair value upon which a reasonable profit must be allowed; for, of course, every rate of fare ordered by this commission must permit an equitable return to the companies after the payment of proper expenses, taxes and other charges of the city and State.

"An exact date cannot be fixed when this work will be completed and the decision rendered, but it will be continued as rapidly as possible.

"It may be added that the complex and complicate inter-company arrangements existing between the companies in the Brooklyn Rapid Transit system and their methods of keeping accounts of traffic returns have delayed a decision, owing to the time required for a thorough investigation. The commission, meantime, has prescribed a uniform system of accounts which hereafter will clearly show all the operations and the condition of the companies.

"It would also have been possible to have reached a decision at an earlier date if the case could have been decided upon the evidence presented at the hearings by the complainants and the companies affected, as the commission had hoped would be the case. This could not be done, however, and the commission has interpreted the law to require that while an order in a rate case may not be made except on complaint and after a hearing, the commission shall, of itself, make investigation of all essential facts and come to a decision only after such have been secured."

Lifeguard Being Tried in Chicago.—The Chicago (Ill.) City Railway has installed "H. B." lifeguards on one of its large pay-as-you-enter cars with a view to testing the merits of this device under operating conditions in Chicago. It is stated that the Chicago Railways will similarly install these guards on two of its cars.

Transfer Order in New York.—The Public Service Commission of the First District of New York issued an order on Feb. 26 directing the Central Park, North & East River Railroad, which operates the Fifty-ninth Street crosstown line, to issue transfers at the Fifty-ninth Street junction with the Third Avenue Railroad.

Temporary Reduction in Suburban Fare at Syracuse.—The Syracuse Rapid Transit Railway has offered voluntarily to put a 5-cent fare in effect on its line between Syracuse and Liverpool, instead of a 10-cent fare, for three months, to see what the effect would be upon the traffic and if a reasonable return could be made at the 5-cent rate.

Hearing on Vestibules on Albany, N. Y., Cars.—The Public Service Commission of the Second District of New York held a hearing on March 1 at Albany on the question of fully vestibuling the cars of the United Traction Company, Albany. Some of the cars of the company are vestibuled only at the front and one side. The company pointed out that it would be inadvisable from a traffic standpoint completely to vestibule the cars and filed a demurrer to the effect that its cars as now equipped comply with the vestibule law of 1903.

Express Earnings of the New York, New Haven & Hartford Railroad.—The net earnings from freight transported over the electric railways in Connecticut and Massachusetts controlled by the New York, New Haven & Hartford Railroad are said to have approximated \$60,000 for the Connecticut companies and \$49,400 for the Massachusetts companies for the six months just ended. It is also said unofficially that the company will take over the express business at Hartford now being done by a private company at the expiration of the lease a few months hence, and that plans are also under way for developing express business on the lines controlled by the company in Rhode Island.

Syracuse & Suburban Railroad Adopts New Fare Tariff.—The Syracuse & Suburban Railroad will adopt the following tariff of fares on its line on April 1: To Orville, 10 cents; return, 15 cents; present rate, 20 cents. To Country Club, 10 cents. To Jamesville, 15 cents; return, 25 cents; present rate, 30 cents. To Fayetteville, 15 cents; return, 25 cents; present rate, 30 cents. To Manlius or Edwards Falls, 20 cents; return, 35 cents; present rate, 40 cents. A special rate ticket book will also be issued on April 1 containing 275 coupons. Each coupon will equal one cash fare, and not less than two coupons will be accepted for any distance. These books have no expiration date and will be transferable and interchangeable on the various suburban roads running out of the city.

Unused Transfers Returned in Cincinnati.—On March 4, R. E. Lee, superintendent of the Cincinnati (Ohio) Traction Company, received by mail a bundle of 800 old transfers, accompanied by an unsigned letter stating that the adoption of a new system of transfers had made it impossible to use the old ones and the possessor had no further use for them. Formerly the company used transfers of six different colors, one for each day in the week, instead of having spaces for the date to be punched by the conductor. The transfers in the package had been sorted ready for use and neatly arranged, so that they could be used with little trouble. A transfer recently adopted is punched by the conductor for the day and the hour, and has the year printed on it.

Personal Mention

Mr. George L. King has been elected secretary of the Northwestern Pacific Railroad, San Francisco, Cal., to succeed Mr. J. L. Willcutt.

Mr. Malcolm Baxter, master mechanic and superintendent of motive power of the Western Ohio Railway Company, Lima, Ohio, for four years, has resigned, effective April 1.

Mr. A. E. Roome, superintendent of telephones, telegraphs and signals, of the Pacific Electric Railway, Los Angeles, Cal., has been appointed to have entire charge of that department. Mr. S. H. Anderson, electrical engineer of the company, has assumed charge of the bonding and thermit welding for the company.

Mr. Garrett T. Seeley, engineer of maintenance of the South Side Elevated Railroad, Chicago, Ill., has had assigned to him in addition to his present duties, those as assistant to the general manager. The heads of departments of the operating organization will report to Mr. Seeley as the representative of the general manager.

Mr. George F. Faber has been appointed traffic manager of the Chicago, Lake Shore & South Bend Railway, South Bend, Ind. Mr. Faber was formerly general superintendent of the Western Ohio Railway, Lima, Ohio. He has also been superintendent of the Elgin & Belvidere Electric Railway, Elgin, Ill., and superintendent of the Central Market Street Railway, Columbus, Ohio.

Mr. J. W. Waggener, formerly superintendent of the Atchison Railway, Light & Power Company, Atchison, Kan., has been appointed general manager of the company. Mr. Harry Askin, who rebuilt the lighting plant in 1908, succeeds Mr. Waggener as superintendent. Mr. Askin has advanced in the last six months from chief electrician to assistant superintendent, and now to superintendent.

Mr. T. Ely has been appointed superintendent of transportation of the Beaumont (Tex.) Traction Company. Mr. Ely has had an extended experience in street railway work. He began his career as a conductor in St. Louis and served with the St. Louis Transit Company and its successors for 10 years in various capacities. Mr. Ely at different times has also been in the employ of the United Railroads of San Francisco, the Public Service Corporation of New Jersey, and the Boston Elevated Railway.

Mr. A. H. Mann has been appointed superintendent of the Lansing, Lansing and St. Johns and the Lansing and Jackson lines of the Michigan United Railways, Lansing, Mich., in complete charge of the operating and mechanical departments. Mr. Mann was formerly general master mechanic of the Michigan United Railways, and previous to becoming connected with the Michigan United Railways he was superintendent of motive power of the Evansville & Southern Indiana Traction Company.

Mr. Henry Procter Waugh has been appointed publicity manager of the Interborough Rapid Transit Company, New York. Mr. Waugh, after graduating from college, became connected with the New York *World* and served with it as reporter and in various editorial positions for 12 years, finally becoming assistant city editor. He has a wide acquaintance with newspaper men in New York and the Metropolitan District and is familiar with the local traffic situation in New York.

Mr. R. B. Stichter has been appointed general manager of the Texas Traction Company, Dallas, Tex., to succeed Mr. Theodore Stebbins, who has resigned, but who will continue to serve the company in an advisory capacity. Mr. Stichter is a resident of Dallas and is a well-known gas and electrical expert. He is at present president of the Southwestern Gas & Electrical Association. Mr. Stichter has been general manager of the Bonham Electric & Gas Company, Cleburne Electric & Gas Company, Dublin Electric & Gas Company, Hillsboro Electric & Gas Company, Sherman Electric & Gas Company and Waxahachie Electric & Gas Company. The Texas Traction Company operates an interurban electric railway between Sherman and Dallas, 66 miles distant, and has leased the Denison & Sherman Railway, which operates between Denison and Sherman.

OBITUARY

Col. Henry Bramble Wilson, a member of the firm of Emerson McMillan & Company, New York, bankers, a director of the American Light & Traction Company, New York, the Southern Light & Traction Company, San Antonio, Tex., and many public service corporations, is dead. Mr. Wilson was born in Ironton, Ohio, in 1837, and came to New York in 1890 to become connected with Emerson McMillan & Company.

Construction News

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

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

RECENT INCORPORATIONS

***California Electric Railways, San Francisco, Cal.**—This company has been incorporated to construct a crosstown street railway, 2½ miles long, in San Francisco. The company is capitalized at \$10,000,000, and it is understood that it is really to become the holding corporation for the Stanislaus Electric Power Company and the Tuolumne Water Power Company, both of which were thrown into the hands of a receiver a few weeks ago as an initiatory proceeding, it has been reported, for turning the property over to the United Railroads of San Francisco. Incorporators: Lewis F. Byington, Frederick V. Scott, John R. Tyrrell, John F. Forbes and W. H. Orrick.

***Port Jervis & Delaware Valley Railroad, Port Jervis, N. Y.**—This company has been incorporated in New York to operate an electric railway 1 mile long, from a point in Port Jervis to a connection with the Port Jervis, Monticello & Summitville Railroad. Capital stock, \$10,000. Directors: F. A. Sawyer, New York; E. P. Emerson, and Dr. W. F. Cuddeback, Port Jervis.

***Fort Wayne & Toledo Traction Company, Hicksville, Ohio.**—This company has been incorporated for the purpose of building an electric railway from Bryan to Fort Wayne and from Bryan to Montpelier. Capital stock, \$100,000. Incorporators: R. L. Bastress, C. A. Bastress, W. Behne, R. L. Starr and W. S. Tomlinson.

Duquesne & Dravosburg Street Railway, Duquesne, Pa.—This company will apply to the State on March 29 for a charter to construct a street railway in the borough of Duquesne and Mislin township. It is also proposed to build to Dravosburg and West Elizabeth. Directors: A. J. Krill, John C. Cato, T. F. Vankirk and Charles McGinley. [E. R. J., Aug. 29, '08.]

Inter-City Electric Company, Reading, Pa.—Application will be made to the State on March 22 for a charter for this company, which proposes to construct an electric railway from Reading to Allentown, via Lyons and Tipton, 35 miles long. Capital stock, \$500,000. Directors: Maxwell H. Bochow, George F. Souwers, Bateman Saddington, Josiah H. Fisher and Frederick R. Perry. [E. R. J., Feb. 6, '09.]

***Morrisdale Railway, Morris, Pa.**—This company has been chartered to build an electric railway, 4 miles in length, in Clearfield County, its location being in the vicinity of Morris. Capital stock, \$40,000. Charles Steele, Northumberland, president.

***Dakota Western Railway, Whitewood, S. D.**—This company has been incorporated in South Dakota to build a 30-mile electric railway from Whitewood to Attainment. Incorporators: H. E. Cooper, P. W. Benniwell, T. W. Thompson, Whitewood; Samuel R. Cleaver, Fred A. Robinson, Empire.

***Rockport & Aransas Pass Railroad, Austin, Tex.**—This company has been chartered to construct an electric railway from Rockport to the jetties at Aransas Pass, a distance of 11.5 miles. Capital stock, \$11,500. Incorporators: C. G. Johnson, Harry Traylor, D. R. Scrivener and W. H. Baldwin.

FRANCHISES

***Santa Rosa, Cal.**—The City Council has granted a franchise to the Santa Rosa & Clear Lake Railroad for the part of its system which will be built within the limits of Santa Rosa in the construction of a railway between Santa Rosa and Lakeport, on Clear Lake. By the terms of the franchise it is provided that the work in the city must be finished in six months from the time construction work is started. Gasoline motor cars will be operated.

Atlanta, Ga.—The Atlanta Northeastern Railroad, which was chartered to build an electric railway from Atlanta to Cumming, Ga., through Roswell and Alpharetta, has applied to the Fulton County Commissioners for a franchise to lay tracks through certain streets of Atlanta. J. L. Murphy, secretary. [E. R. J., Oct. 17, '08.]

East St. Louis, Ill.—The East St. Louis, Columbia & Waterloo Electric Railway has applied to the City Council for a franchise to build an electric railway on Nineteenth Street from the southern city limits to Bond Avenue. E. F. Schoening, Waterloo, president. [E. R. J., Dec. 12, '08.]

Rock Island, Ill.—The Galesburg & Rock Island Traction Company has applied to the City Council for a franchise to construct an electric railway on Fifth Avenue from Seventeenth Street to Second Street, south, to the Rock

River. From Rock Island the railway will extend west to Andalusia, through Edgington, Buffalo Prairie, Marston, Millesburg, Alcido and Alexis to Galesburg. [E. R. J., Feb. 20, '09.]

LaPorte, Ind.—The Indiana Union Traction Company has filed a petition with the County Commissioners of LaPorte, Starke, Pulaski and Cass Counties for a franchise for the construction and operation of an interurban railway through the counties to connect Logansport, Winamac, Bass Lake, Knox, LaPorte and intermediate towns.

***Des Moines, Ia.**—Application has been made to the City Council by C. R. Keyes, representing the Des Moines Elevated & Interurban Railroad, for a franchise to operate an electric railway through the streets of Des Moines.

Springfield, Mo.—Application has been made to the City Council by the Springfield Traction Company for a franchise to construct a street railway from the city limits on Nicholas Street west, to the site of the new Frisco shops. The extension will be about 1½ miles in length.

Mineola, N. Y.—The Nassau County Board of Supervisors has granted an extension of one year to the South Shore Traction Company in which to complete the building of its electric railway.

New York, N. Y.—The Coney Island & Brooklyn Railroad has applied to the Board of Estimate and Apportionment for permission to lay tracks for a line through the Flatbush Avenue extension to the Manhattan Bridge, now under construction, and over which it proposes to operate its cars.

Owego, N. Y.—The City Council has granted the Waverly, Sayre & Athens Traction Company, Waverly, N. Y., an extension of one year on the franchise given to it to extend its railway in Owego.

Clifton Heights, Pa.—The Delaware County & Philadelphia Electric Railway has closed negotiations for the purchase of the Terminal Railway Company's franchise between Fernwood and Sixty-ninth Street. This will give the Delaware County Company, whose system is subsidiary to the Interstate Street Railway, a direct line from Lansdowne to the Sixty-ninth Street terminal.

Pittsburg, Pa.—The Committee on Surveys, of the City Council, has approved a resolution and ordinance granting the Pittsburg Railways an extension of nine months on its franchise obligation to lay tracks on Second Avenue and Greenfield Avenue. The original franchise ordinance provides that the work should be completed in one year.

Salt Lake City, Utah.—The County Commissioners have granted the Utah Light & Railway Company a 50-year franchise to extend its railway from Murray to Sandy and Bingham Junction. The franchise must be accepted by the company in 60 days, and in 60 days thereafter work must be begun. The work must be completed and the lines in operation by Aug. 1, 1910.

TRACK AND ROADWAY

Calgary (Alta.) Municipal Railway.—The City Council has awarded the following contracts for material to be used in the construction of the proposed street railway: 1110 tons of steel rails, 400 tons of which will be 80-lb. and 710 tons 60-lb., to Lorain Steel Company, represented by Gorman, Clancey & Grindley, Calgary, for \$70,000; the contract for ties was let to the East Kootenay Lumber Company, who will supply them at 56 cents apiece.

Los Angeles (Cal.) Railway.—This company has begun the construction of an extension of its Washington Street line, due west along that thoroughfare from La Salle Street, thence 1½ miles into the country.

Georgia Railway & Electric Company, Atlanta, Ga.—This company has received permission by the County Commissioners to extend its line 1½ miles into the Inman yards from its present terminus at Longley Street.

***Paris & Northern Interurban Company, Danville, Ill.**—This company is said to have begun making the surveys for its proposed electric railway between Paris and Ridgefarm, a distance of about 26 miles. W. M. Bridgett, president.

Springfield (Ill.) Consolidated Railway.—This company, it is said, expects to begin construction work next month on the extension of its Eighth Avenue line to Harvard Park, a distance of about half a mile.

Evansville & Southern Indiana Traction Company, Princeton, Ind.—It is said that this company has decided to extend its railway from Patoka to Hazleton, work to begin early in the spring. The survey was made last fall.

Fort Wayne & Springfield Railway, Decatur, Ind.—This company expects to place, during the next three weeks, contracts for 12 miles of 70-lb. T-rails and 1 mile of 70-lb. high T-rails.

Wabash & Rochester Electric Railway, Wabash, Ind.—The Circuit Court has appointed Robert R. Carr receiver for this company on complaint of the Stanley Contracting Company, which holds a claim of \$7,000 for work done on the railway projected between Wabash and Rochester, a distance of 37 miles. The section of the railway between Akron and Gilead, 8 miles, has been partly completed.

***Sioux City, Climbing Hill & Ida Grove Electric Railroad, Sioux City, Ia.**—This company is said to have been organized for the purpose of building an electric railway from Sioux City through Climbing Hill and Anthon to Ida Grove. Officers: C. S. Malcomb, Climbing Hill, president; Payne Sargison, Luton, treasurer; W. H. Steinhauer, Climbing Hill, secretary.

Tri-City Railway, Davenport, Ia.—J. F. Porter, president of this company, advises that contracts will be placed during the next few weeks for material for the construction of about 8 miles of new track.

Electric Railway, Light & Ice Company, Junction City, Kan.—This company expects to place contracts during the next 60 days for about 2 miles of catenary construction with 000 groove trolley.

Boston, Mass.—Bids will be received until March 30 by the Boston Transit Commission, B. Leighton Beal, secretary, for constructing Section 1 of the tunnel under Beacon Hill, for the Cambridge connection. The structure will be mainly of concrete.

Twin City & Lake Superior Railway, Minneapolis, Minn.—Announcement is made that additional contracts are to be let about April 1 by this company for building a double-track, third-rail line from Minneapolis, Minn., northeast via St. Paul, Minn., and Superior, Wis., to Duluth, Minn., 130 miles. Contracts have been let as follows: From the lower St. Croix River to upper St. Croix, 33 miles, to Westerdahl & Carlson, and from upper St. Croix to Superior, Wis., 60 miles, to Smith & Jones. Track has already been laid from Minneapolis to Coon Lake, 25 miles. Two bridges will be constructed. J. H. Thomas, chief engineer, 440 Railway building, Minneapolis.

Cape Girardeau-Jackson Interurban Railway, Cape Girardeau, Mo.—Samuel Barnes, general manager of this company, advises that during the next month contracts will be let for material for the reconstruction of a considerable amount of track. A number of new turnouts will also be built.

***St. Louis, Mo.**—An ordinance is being prepared for introduction into the Council granting a company a franchise to construct a passenger and express subway from near the Eads Bridge downtown to Taylor Avenue in the west end of St. Louis. An organization has been effected, and it is said that plans and estimates have been practically completed. Four branch lines are also planned. William J. Gates is in charge of the company's affairs in St. Louis. The cost of the subway is estimated at \$40,000,000.

Missoula (Mont.) Street Railway.—S. R. Inch writes that this company has recently been granted a franchise to build an electric street railway in Missoula. The officers and operating staff of the company have not yet been selected. The company proposes to begin construction work in about 6 months. Contracts have not yet been placed. Current will be rented from the Missoula Light & Water Company, which is controlled by W. A. Clark, who also owns the Missoula Street Railway. The repair shops will be located in Missoula. Capital stock, authorized and issued, \$100,000. [E. R. J., Feb. 27, '09.]

Piedmont Railway, Thomasville, N. C.—This company is reported to have been organized to take over the Carolina Valley Railroad, which proposed to build an electric railway from Thomasville to Denton, a distance of 30 miles. Milton L. Jones, of Thomasville, president; Thomas J. Jerome, Salisbury, N. C., vice-president, and J. L. Armfield, secretary and treasurer. Capital stock, \$500,000. It is the intention of the present company to extend the railway into the timber region. [E. R. J., Dec. 5, '08.]

Sydney, N. S.—W. Crowe advises that the project for building an electric railway from Sydney to East Bay is at present only in the preliminary stages. No company has been chartered for the purpose, and all that has been done is to apply on behalf of the promoters to the Cape Breton County Council for municipal assistance. The County has voted about \$50,000 in aid, provided certain conditions are complied with. Mr. Crowe states that application will be made to the House of Assembly, at Halifax, during the present season for a charter. The proposed railway will be about 17 miles in length. [E. R. J., Feb. 20, '09.]

Geneva, Waterloo, Seneca Falls & Cayuga Lake Traction Company, Seneca Falls, N. Y.—It is stated that this com-

pany will soon begin the construction of a viaduct across the shallow portion of Cayuga Lake. It will have several 60-ft. openings; it is estimated that it will cost \$180,000.

Rochester & Manitou Railroad, Charlotte, N. Y.—This company expects to place contracts during the next month for the construction of 1800 ft. of concrete viaduct and 600 ft. of wood-piled trestle, across Braddocks Bay. Contracts have been recently placed by the company for the following material: 14 frogs, 11 switch points, targets, etc., with the Ramapo Iron Works, Niagara Falls; 31 miles No. 12 iron wire; 1/3 mile guy wire, and 1000 lb. 5/16-in. strand span wire with J. A. Roebbling's Sons Company, Trenton, N. J.

Sapulpa & Interurban Railway, Sapulpa, Okla.—Announcement is made that this company proposes to build an electric railway from Sapulpa to Glen Pool to connect with the Midland Valley Railroad, a distance of 10 miles. This line is to run via Kiefer and directly through the Glen Pool oil fields. In addition to this, the company expects to build 5 miles in and around Sapulpa, and a line 3 miles north-east, to Tanneha. Contracts will be let for grading, bridges and culverts, but the company will build the overhead work. The line traverses a hill district with a maximum grade of 2 per cent and a maximum curvature of 10 deg. H. E. Clark, Glen Campbell, Pa., president; B. B. Burnett, vice-president and H. H. McFann, general manager, both of Sapulpa.

Springfield & Washington Railway, South Charleston, Ohio.—It is stated that this company is considering the construction of an extension of its railway from Springfield to Clifton, Cedarville and probably on to Jamestown. George W. Baker, Washington, C. H., president.

***Philadelphia, Pa.**—It is stated that a company will be organized at once for the construction of an electric street railway between Bridge Street, Frankford, and Bustleton and Somerton. Application for a franchise will be filed at Harrisburg, probably this month, and at the same time the City Councils will be asked to pass the necessary legislation. The cost of the road, which will be about 4½ miles in length, is estimated at from \$75,000 to \$150,000. T. C. Pearson, John T. Sale, Barclay Twining, Horace Shallcross and Dr. John C. Tustin are said to be interested in this project.

Knoxville Railway & Light Company, Knoxville, Tenn.—The Knox County Commission has granted this company permission to double-track its railway from Knoxville to Fountain City.

***Brady, Tex.**—Col. J. H. Ransom, of San Angelo, is reported to have made a proposition to citizens of Brady for an electric railway from Brady to Eden, Tex., 50 miles, the line to connect at San Angelo with the Kansas City, Mexico & Orient Railway and with the Houston & Texas Central Railroad at Llano, Tex. Mr. Ransom is also stated to have projected an electric railway from Ballinger south to San Antonio.

Galveston-Houston Railway, Houston, Tex.—The Stone & Webster Engineering Corporation has been authorized to proceed with the construction of track in the cities of Galveston and Houston to provide the terminal connections for the Galveston-Houston Railway. [E. R. J., Jan. 23, '09.]

***Palestine, Tex.**—George W. Burkett, owner of the Palestine Electric & Ice Company, is reported to be interested in a plan to construct a street railway in Palestine, which, eventually, is to be extended to Dallas. It is said that a company will soon be organized and franchises applied for.

***Port Arthur, Tex.**—It is stated that H. J. Meyers and H. J. Pierce are considering a plan to construct a street railway in Port Arthur. An application for a franchise will be made to the City Council at once.

Texas Interurban Company, Austin, Tex.—It is announced that this company has completed three surveys and prepared maps, profiles and estimates for its proposed electric railway from Austin to Lockhart, 30 miles. A proposition has been made to promptly construct the railway, providing donations or subscriptions are secured sufficient to insure the placing of securities. An extension of time until May 19 has just been granted the company as the date on which construction must be begun. [E. R. J., March 6, '09.]

***Wichita Falls, Tex.**—It is stated that J. A. Kemp and I. H. Kempner have purchased the Wichita Falls Water & Light Company and will build their proposed electric railway from Wichita Falls to Lake Wichita, 5 miles south.

Rutland (Vt.) Railway, Light & Power Company.—It is stated that this company has under consideration a plan for extending its electric railway from Castleton to Poultney, a distance of 6 miles.

Priest Rapids Railway, Seattle, Wash.—This company, which was incorporated for the purpose of building an

electric railway from Waterville to Kennewick, a distance of 136 miles, has been purchased by the Chicago, Milwaukee & St. Paul Railway. [S. R. J., Jan. 11, '08.]

Whatcom County Railway & Light Company, Bellingham, Wash.—It is stated that this company will soon begin the building of its North Street line extension from Dock Street to St. Clair Street, a distance of about 1½ miles.

Wheeling & Elm Grove Railway, Wheeling, W. Va.—It is announced that this company is planning to extend its electric railway from the present terminus at West Alexander to Claysville. This company and the Pittsburgh Railways, which has just completed its line from Pittsburgh to Washington, are said to have entered into an agreement whereby the latter company will extend its railway to Claysville to connect with the West Virginia system.

Milwaukee Western Electric Railway, Milwaukee, Wis.—Surveys are being made for a proposed electric railway running northwest from Milwaukee through Hustisford, Juneau and other towns to Beaver Dam, a distance of 70 to 75 miles, according to the route finally selected. About two-thirds of the route has been surveyed, and maps have been filed with the State Railroad Commission. The contract has been awarded to C. A. Chapman, Inc., engineers, Marquette Building, Chicago. J. W. Barber, Majestic Building, Milwaukee, secretary.

POWER HOUSES AND SUBSTATIONS

Sheffield (Ala.) Company.—J. B. McClary, manager, writes that this company expects to place within the next few weeks, contracts for mechanical stokers for 1200-hp boilers, also feed-water heater for same and a coal crusher.

Calgary (Alta.) Municipal Railway.—The following contracts have been awarded by the city in connection with the construction of the proposed municipal street railway: Allis-Chalmers-Bullock Company, Montreal, generator set and switchboard, \$15,950; Robb Engineering Company, Amherst, N. S., 750-hp 3-cylinder compound engine, \$14,300.

Citizens Electric Company, Eureka Springs, Ark.—This company is considering the purchase of a 300-kw d. c. turbo-generator and a 300-kw a. c. turbo-generator.

Havana (Cuba) Electric Railway.—F. Steinhart, general manager, in transmitting the report of that company to the president and directors of the company, under date of Feb. 1, said: "The service at the power station has now reached a point where it becomes necessary to purchase additional generating equipment. Plans for this are well under way for the ensuing year."

Quincy Horse Railway & Carrying Company, Quincy, Ill.—This company will install in its power station one 800-kw d. c. 500-volt railway generator. The contract has already been placed.

Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind.—This company has begun excavating for a new 5000-hp plant as an addition to the Water Street power station and has started the repairs on the Ninth Street station. The new plant will be equipped with a battery of four boilers and will have a 5000-hp capacity. A 3000-kw turbine will also be installed. A brick stack 175 ft. high will be built and coal and ash handling apparatus for the entire plant will be installed.

Electric Railway, Light & Ice Company, Junction City, Kan.—This company has placed an order with the Kennicott Water Softener Company, Chicago, Ill., for one 200-hp and one 400-hp water-tube boiler.

Cape Girardeau-Jackson Interurban Railway, Cape Girardeau, Mo.—This company has under consideration the purchase of a new switchboard.

New Jersey & Hudson River Railway & Ferry Company, Edgewater, N. J.—This company has placed an order with the General Electric Company for a 300-kw rotary converter with transformer and switchboard complete.

Public Service Railway, Newark, N. J.—This company expects to purchase during the next three weeks miscellaneous apparatus for its various substations, consisting of rotary converters, transformers and switchboard apparatus, and also one 2000-kw turbo-generator for its Camden station.

Conestoga Traction Company, Lancaster, Pa.—This company has placed a contract with the Westinghouse Machine Company for the turbines for which it was reported to be in the market in a recent issue of the ELECTRIC RAILWAY JOURNAL. The company also has a contract with the Western Electric Company for the bulk of the wire for which it was reported to have asked bids.

SHOPS AND BUILDINGS

Tri-City Railway, Davenport, Ia.—This company announces that it will soon award contracts for the construction of a storage shed. J. F. Porter, president.

Manufactures & Supplies

ROLLING STOCK

Port Arthur (Ont.) Electric Street Railway, it is reported, is in the market for four pay-as-you-enter cars.

Washington, Baltimore & Annapolis Electric Railway, Baltimore, Md., is in the market for 25 interurban cars.

Cape Girardeau-Jackson Interurban Railway, Cape Girardeau, Mo., reports that it will purchase some car equipments in the near future.

Grand Rapids (Mich.) Railway is in the market for 12 pay-as-you-enter cars. It is reported the order for these cars will be placed at once.

Aurora, Elgin & Chicago Railway, Chicago, Ill., has increased its original order for 25 sets of trucks, placed with the Pullman Company last fall, to 28 sets.

New Hampshire Electric Railways, Haverhill, Mass., has ordered from the National Brake & Electric Company, 12 straight-air equipments of the latest type.

The Electric Railway, Light & Ice Company, Junction City, Kan., will purchase during the next three months, one double-truck, four-motor closed car, about 44 ft. over all.

Montreal (Que.) Street Railway, mentioned in the ELECTRIC RAILWAY JOURNAL of March 6, 1909, as being in the market for 10 all-steel pay-as-you-enter cars, reports that it intends purchasing 25 cars of this type.

Milwaukee Northern Railway, Cedarburg, Wis., expects to be in the market for interurban cars, but has not reached a decision as to the number of cars to be ordered or the date when bids will be received.

Conestoga Traction Company, Lancaster, Pa., has placed with The J. G. Brill Company, Philadelphia, Pa., the order for 18 interurban cars for which it was reported to be in the market in the issue of the ELECTRIC RAILWAY JOURNAL of Feb. 6, 1909.

Charleston Consolidated Railway, Gas & Electric Company, Charleston, S. C., has ordered from The J. G. Brill Company, of Philadelphia, Pa., two 14-bench, center-aisle open cars, to be mounted on No. 27 G-1 trucks, for May, 1909, delivery. The car bodies will be 34 ft. in length, over dashers, 43 ft., and will each be equipped with two GE-57 motors. The company has also placed an order with The J. G. Brill Company for four 20-ft. 8-in. Brill patented semi-convertible motor car bodies, vestibuled, with a length over all of 30 ft. They are for October, 1909, delivery.

Chicago, Blue Island & Joliet Traction Company, Chicago, Ill., has placed an order for one combination baggage and passenger car with the McGuire-Cummings Manufacturing Company, Chicago. The car, which is to be delivered on June 1, is to have an over-all length of 56 ft. and is to be mounted on McGuire-Cummings 20-A trucks and rolled steel wheels. M. C. B. type of draw-bars and longitudinal seats have been specified. The interior of the car is to be finished in mahogany. The order was placed through W. H. Conrad, First National Bank Building, Chicago.

Third Avenue Railroad, New York, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of March 6, 1909, as being in the market for an additional 100 pay-as-you-enter cars, has placed the order for these cars with The J. G. Brill Company, of Philadelphia, Pa. Westinghouse motors were specified for 50 of the cars, and General Electric motors for the remaining 50. The Westinghouse Air Brake Company received an order for 75 of the air-brake equipments. The Consolidated Car Heating Company closed a contract for equipping with heaters the entire 300 cars included in this and previous orders.

Rochester & Manitou Railroad, Charlotte, N. Y., reported in the ELECTRIC RAILWAY JOURNAL of Jan. 16, 1909, as having ordered from the G. C. Kuhlman Car Company, Cleveland, Ohio, three semi-convertible cars, states that the cars will be double truck and have a seating capacity of 44. The company has ordered from the National Brake & Electric Company, Milwaukee, Wis., three compressor straight-air brake equipments and also six of the same type for trail cars. Mention of the intended purchase of these equipments was made in the ELECTRIC RAILWAY JOURNAL of Dec. 12, 1908. It has also purchased from the Recording Fare Register Company the 20 registers, the intended purchase of which was noted in the ELECTRIC RAILWAY JOURNAL of Feb. 13, 1909.

Wausau Street Railway, Wausau, Wis., mentioned in the ELECTRIC RAILWAY JOURNAL of Feb. 27, 1909, as being in the market for one car, has ordered through the Knox Engineering Company, Chicago, one semi-convertible passenger

car from the Niles Car & Manufacturing Company, Niles, Ohio. The car will have an over-all length of 42 ft.; wheel base, 6 ft. 3 in.; weight, 18 or 19 tons; seating capacity, 44. The special equipment specified follows: Type K control, Standard couplers, Pantasote curtain material, Forsyth curtain fixtures, Ohmer registers, Crouse-Hinds headlights, Taylor journal boxes, four 101-B2 Westinghouse motors, Keystone sanders, Hale & Kilburn seats, Niles Car & Manufacturing Company's steps, Westinghouse trolley poles and attachments, Taylor trucks. The car is to be delivered on April 24, 1909.

Municipal Tramways, of Calgary, Alta., mentioned in the *ELECTRIC RAILWAY JOURNAL* of March 6, 1909, as having placed an order for 6 pay-as-you-enter cars with the Preston Car & Coach Company, and 6 of the same type with the Ottawa Car Company, has placed an order for only 4 cars with the former company and the remaining 8 cars of the total order for 12 with the latter company. The cars to be built by the Ottawa Car Company will be of the semi-convertible type with pay-as-you-enter platforms, and will have a seating capacity of 38. The principal specifications follow:

Weight of car body.....	19,800 lb.	Couplers.....	Standard
Length of body.....	28 ft.	Curtain fixtures.....	Forsyth
Length over vestibules.....	40 ft.	Curtain material.....	Pantasote
Length over all.....	41 ft.	Fenders.....	Jenkins
Width inside.....	7 ft. 8 in.	Hand Brakes.....	Peacock
Width over all.....	8 ft. 6 in.	Motors.....	4 Westinghouse
Height inside.....	7 ft. 11 in.		101-B.
Height, top of rail to		Sanders.....	Ottana
sills.....	32 in.	Seats.....	Ottana No. 2
Body.....	Wood construction	Seating.....	Rattan
Underframe.....	Wood, reinforced with steel.	Trucks.....	Brill 27-G1

TRADE NOTES

Perry Ventilator Corporation, New Bedford, Mass., advises that it is furnishing the ventilators for the new cars being built for the Denver City Tramway.

Harry De Steese, representing the Frank Ridlon Company, of Boston, Mass., has moved his office to 26 Cortlandt Street, New York, where he will have larger facilities at his command.

Darley Engineering Company, Singer Building, New York, has received orders to install its suction ash conveyors in the plants of the Boston Elevated Railway Company, Boston, Mass., and Nelson Morris & Company, Chicago, Ill.

The Dorner Railway Equipment Company, Chicago, Ill., has been incorporated to buy and sell new and second-hand railway equipment. The company has a capitalization of \$2,500. Otto G. Knecht, John W. Tibbitts and Ralph J. Taylor are named as the incorporators.

Strauss Self-Balancing Window Company, Ft. Dearborn Building, Chicago, Ill., which recently placed on the market a self-balancing window frame, reports that it has made extensive experiments with a new frame and has found it especially practicable for use on steam and electric passenger cars and in office buildings.

Stewart Speedometer Company, Chicago, Ill., reports that it is making some changes in the driving mechanism of its apparatus, and that as soon as this is accomplished the company will make more demonstrations of the value of the speedometer for use on electric cars operated in interurban service.

Charles F. Johnson, Cleveland, Ohio, has returned from a trip to the Pacific Coast and reports an active demand throughout the Western States for all kinds of electric railway equipment. He is offering a large stock of new and second-hand railway motors, generators, cars and other equipment, and is also constantly in the market for the purchase of electric railway apparatus.

Interstate Engineering & Supply Company, Philadelphia, Pa., reports that the lighting and power station of the Metropolitan Electric Company, Reading, Pa., which it is about to build, will be equipped with three 4500-kw Allis-Chalmers turbo-generators, and not 2500-kw generators, as printed last week. S. S. Neff, president of the Interstate Engineering & Supply Company, also states that other contracts will be announced soon.

T. H. Symington Company, Baltimore, Md., has received the order for the journal boxes and ball bearings used on the 15 cars recently ordered by the Buffalo, Lockport & Rochester Railway, and the boxes for the new lot of open and closed cars recently purchased by the Indianapolis Traction & Terminal Company. Other orders from electric railway companies upon which the Symington Company is engaged are journal boxes for cars to be built for the Michigan United Railways, Lansing, Mich., and the Citizens' Traction Company, Oil City, Pa. The Symington

Company will also furnish center bearings for the Lansing cars and also for 50 new cars which are under construction at the Brill Works for the Washington Railway & Electric Company.

Farrington Company, Boston, Mass., has been organized to manufacture insulating compounds, following the return of C. E. Farrington to the field of insulating compound manufacture. As is generally known, Mr. Farrington was one of the first chemists to devote serious attention to the problems of coil insulation. Since 1892 his work has been followed with great interest by machine designers in America and Europe, where he is well known. Turner & Hobart's "Machine Insulation" devotes some 16 pages to his conclusions, which have become generally accepted. He was chief chemist of the Massachusetts Chemical Company until 1907, when he resigned to enter the broader field of consultation work. The new plant of the Farrington Company at Jamaica Plain, Mass., is finely equipped with machinery designed for the work.

Westinghouse Electric & Manufacturing Company, and the Westinghouse Machine Company, Pittsburg, Pa., are now working on the first apparatus represented by the \$5,000,000 contract which the Pennsylvania Railroad placed with the Westinghouse companies some time ago. All of this machinery will be used in the electrification of the Pennsylvania terminals and tunnels in New Jersey, New York City and Long Island. The initial order calls for two 12,000-hp turbo-generators, two 4000-hp equipments of the same type, and 100 200-hp electric railway motors. The turbines will be constructed in the shops of the Westinghouse Machine Company, and the generators will be made at the factory of the Westinghouse Electric & Manufacturing Company. When they are completed, they will be installed in the power-houses of the Pennsylvania Railroad at Long Island City. The two large machines will furnish the power for some of the locomotives and the smaller ones will generate current for lighting the New York terminal station and the railway tunnels under the North and East rivers. The 200 electric railway motors will be mounted on cars which will be used in hauling passengers on the Long Island Division of the Pennsylvania Railroad. The Pennsylvania Railroad engineers and the electric railway experts of the Westinghouse companies have about completed the design of the electric locomotive which will be used in this installation, and it is expected that work on the first locomotive will be started in the very near future. The steam turbines for the Pennsylvania terminal and tunnel work in New York City are especially noteworthy. The two largest of a normal capacity of 12,000 hp, will be constructed so as to carry, when necessity demands it, an overload of 100 per cent.

ADVERTISING LITERATURE

John C. Dolph Company, Long Island City, N. Y., announces the publication of its new insulating-varnish catalog, issued in American, German, French and Italian editions.

John A. Roebling's Sons Company, Trenton, N. J., has printed a pamphlet entitled "Wire—Its Manufacture and Uses." The contents are partly historical and partly descriptive.

Pettingell-Andrews Company, Boston, Mass., publish in the March issue of *Juice*, a number of interesting items on Pittsburg transformers, high-tension fuses and insulated wires and cables.

Norton Company, Worcester, Mass., has issued a catalog describing the process of making Alundum and giving data on grinding wheels, grinding machines and other abrasive specialties which it manufactures.

Farrington Company, Boston, Mass., is sending out return post-cards regarding the supply of samples of its armature and field-coil liquid insulation, known as "Collisol." It is asserted that if this material is used for insulation, it is impossible for moisture to get into the armature or field coils.

Arthur S. Partridge, St. Louis, Mo., is sending out a list of steam and electrical equipment for sale. Among the items listed are four interurban cars, four closed motor cars and six 12-bench open motor cars. The list also contains a number of generators, rotary converters and motors for railway purposes.

Rail Joint Company, New York, N. Y., has issued a folder of its three standard types of rail joints, in which a statement is given of the engineering features of each joint. The circular is accompanied by views of the company's new rolling mills at Troy, and contains the significant statement that the output of the company, as shown by its records at the close of September, 1908, has been more than sufficient to equip a double-track railway around the globe.