

Electric Railway Journal

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TIME PROPITIOUS TO SELL SCRAP

The last few months have been particularly propitious for railway companies to dispose of all kinds of scrap metals and waste paper. According to prices quoted in the *Journal of Commerce* for May 4, light and heavy brass is now being sold at 13 and 15¼ cents per pound, respectively; light and heavy scrap copper at 22 and 26 cents per pound, respectively, and heavy steel scrap, No. 1 wrought railroad scrap and heavy cast scrap at \$15.50, \$21.50 and \$17.00, respectively, per ton of 2240 lb. Mixed paper, which is the kind collected by railway companies, has advanced from 15 cents per 100 lb. last year to 30 cents at the present time. War conditions have brought about this unusual condition in the scrap market, because in the past a large portion of these materials has been obtained from Europe. Now the situation is reversed, and Europe is bidding for these various scrap materials. To intensify this situation, importations of wood pulp have been greatly curtailed, owing to the demand for bottoms for commodities bearing higher rates. The prices of the different kinds of railroad metal scrap have made enormous advances within the last year, increases in some cases ranging in the neighborhood of 100 per cent. While the time is propitious to sell all classes of scrap materials, it is necessary to keep in touch with the widely fluctuating market to take advantage of the high prices.

MEETING THE PUBLIC

"Men occupying conspicuous and leading places in finance, as in every other calling touching the people's interests, are legitimate objects for public scrutiny in the exercise of their functions." Though the author of this statement, Otto Kahn, in speaking before the American Newspaper Publishers' Association, was concerned primarily with so-called "high finance" in America, his remarks are worthy of careful consideration in the electric railway field. In fact, in Mr. Kahn's portrayal of the financier who "meets attacks with dignified silence, maintains an austere demeanor and cultivates an etiquette of reticence," it is possible to recognize a certain class of electric railway officials whose attitude of secrecy, aloofness and contempt for public criticism is decidedly irritating to democratic minds. Happily this sort of official is to-day much more rare than formerly, but there are still some operators who have to learn that the only result of trying to avoid publicity is to obtain an undesirable notoriety. As Mr. Kahn says, if inquiring or critical citizens are met with silence, impatience or resentment,

the public mind naturally becomes more infested with suspicion and more inclined to credit all sorts of rumors. In the plans for one of the new bank buildings which is being erected in New York the space reserved for the chief executive officers is within a low-railed inclosure in the center of the bank, with passageways on each side and the windows of the paying and receiving tellers and similar officials against the walls. The object is, of course, to have the executive officers where they can be easily accessible to customers. We shall not here enter into a discussion of whether this arrangement of office is well adapted to the needs of a public utility company, but the thought is at least worthy of consideration. We admit that it would be a direct reversal of the idea that the rank of an officer in a public utility varies directly with the number of guards which have to be passed to secure admittance to his presence, but we wonder what the effect would be on the public—and even on the officers themselves—of such an arrangement.

ELECTRIC RAILWAY SECURITIES

In last week's issue we described at length the belief of representative investment bankers that at present electric railway securities, while not discredited, are not enjoying the same degree of popularity as the securities of other utilities, notably the lighting companies. Owing partly to natural economic forces and partly to special burdens for whose imposition the public is directly responsible, electric railways have to-day reached the point where the average investor approaches their securities with a prejudice against their relative worth. He can be easily convinced as to the merits of particular issues, it is true, but the tinge of distrust against the class is apparent. This is a condition the full meaning of which must be impressed upon the public mind. Electric railways must grow with the communities they serve, but the necessary money will not be forthcoming from the investors if the public continues to make unreasonable demands upon the capital invested or required in such utilities and upon their income-producing power. The public has as vital an interest as anyone, if not more, in the development of the electric railway industry, and it should do its part toward the restraining of unfair regulatory and legislative demands. If the railways, by virtue of their more intimate connection with the public, are more often subject to ignorant or malevolent attacks than are other utilities, then they deserve the greater protection from broad-minded and far-sighted citizens. If the public does not realize its responsibility

in this matter, electric railway securities will not be readily salable in the amount needed for the expansion of the industry, and the public itself will be the worst sufferer.

THE TIME IS OPPORTUNE FOR PUBLICITY

We urged last week the adoption of a definite policy of national publicity by the electric railway companies of the country. The need for such a campaign was shown by the statistics published in last week's issue of the financing of electric railways during 1915 as compared with 1914, and the statements from investment bankers that electric railway issues are decreasing in popularity both actually and relatively as compared with other public utilities. There is no doubt that the situation is one requiring relief, but how about the opportunity? Is the public as a whole sufficiently interested in economic and corporate matters to pay attention to what may be said? In short, is this an appropriate time for undertaking this work? We believe that it is, in spite of the fact that foreign affairs and preparedness are the questions which are probably uppermost in the minds of most citizens at present. Indeed, this condition probably strengthens the situation rather than otherwise, because it emphasizes in the minds of everyone the need of cohesion among all of the elements in the country, as well as the important part in the economic and military life of the country which the railways perform or may be called upon to perform.

There is also another and perhaps an even stronger indication that the times are propitious for a fair presentation of the railway case to the public with assurance that it will receive attention. This evidence is furnished by an examination of the kind of articles which is now appearing in most of the popular magazines, and even in the daily papers. It was not many years ago that the magazines of general circulation devoted a considerable proportion of their pages to articles of a "muck-raking" character. These contributions were extensively advertised and widely read, and the sensational attacks on business enterprise contained in them provided the public with plenty of "interesting" reading. For a time this class of story brought many purchasers to the newsstands for those magazines which dealt in the exposé of business corruption. But for some considerable time there has been a cessation of "muck-raking" articles. The public got tired of them. People began to realize that a few instances of unprincipled business administration did not prove that the entire corporate interests of the country were corrupt. It is possible also that the articles have helped in the widespread movement among corporations, which has since taken place, in favor of more publicity of their affairs, especially among those of a quasi-public nature, of whose business the public has a special right to know about.

After the "muck-raking" class of article had begun to pall on the reading public, a period followed in which some of the more sensational magazines thought to retain their circulations by the publication

of salacious stories, but while these attracted morbid interest for a time, the public as a whole soon began to demand decency in its reading.

Latterly, the observer of current magazine literature has seen a change in the character of articles published. It is the trade story, the article which tells how the business man of the day is developing his business and conducting it at a profit, which finds a ready sale in the publication offices of the popular magazines now. This is a good sign, but the movement of which we are now speaking is not confined purely to the magazine. An examination of the daily papers also shows that much more space is being devoted to-day to business affairs than formerly. It is possible that this may be due partly to the present prosperity of the country, through which more people have become stockholders than formerly and so are more interested in the trend of the markets and the news about corporation securities. Whatever the cause, the fact is noticeable. Five or ten years ago special columns in the daily papers devoted to export trade, public utility affairs or reviews of business conditions in various lines were a rarity, except perhaps in the largest metropolitan dailies. Now they are common in many daily papers. The public as a whole is getting to understand the fundamental principles of business and to take an interest in them. It is learning better the intimate relation of the prosperity of the transportation systems to that of other lines of business, the close connection between the welfare of the employee and that of his employer, the problems of the railroad business. It should equally understand the problems of the electric railway industry, and it is the task of the industry to make them clear.

COSTLY SERVICE IN THE RUSH HOUR

It is generally conceded that service given during the rush hours costs much more than that operated during the remainder of the day. The difference in cost, which is obviously due to the extremely low "service factor" of cars that are used only for one or two hours a day, depends upon the sharpness of the daily peak, and in cases where the evening rush lasts for an hour, or but little more, it is possible for the service at that time to involve actually double the normal expense of operation. Such cases, as a matter of fact, are by no means uncommon.

For an example there may be taken a city run on a line 7 miles long, which is covered in 45 min. If the peak is sharp and lasts for only 1½ hr., most of the cars sent out to handle the rush-hour load will make only one round trip, or 14 miles daily. Under average conditions, as displayed in the figures of the last electric railway census, if each car bears its share of the indirect expense of operation in proportion to its mileage, the indirect cost of operating one of the trippers will involve the following approximate items: Maintenance of way and line, 2.4 cents per car-mile; traffic, 0.2 cent per car-mile; general expense, 2.8 cents per car-mile, and miscellaneous transportation costs, ex-

clusive of platform labor, 1.6 cents per car-mile. The total is 7 cents per car-mile.

Of the direct expenses the most important is platform labor. Motormen and conductors cannot be kept on a job that brings only $1\frac{1}{2}$ hr. pay, and to hold in service the extra men that are used for tripper service, such as that under consideration, it has become customary to provide a minimum wage payment whether a full day is worked or not. The minimum may range from \$1 for each call for service to a flat rate of \$12 per week, and for an average the figure of \$1.25 may be taken as typical. In the case under consideration, therefore, the platform expense will be \$2.50 per trip, or 17.9 cents per mile.

The cost of power also is a large item of direct expense. During the peak this unit-cost increases for exactly the reason that applies to car operation in general, and the best demonstration of this fact may be made by considering the effect in the case of power that is purchased by the railway from a local power company. Such contracts for large amounts of energy have invariably come to the basis of a "demand charge" of about \$1 per kilowatt per month, plus 0.4 cent per kilowatt-hour for energy actually furnished. The principle of the demand charge is that this sum just about covers the fixed charges on the equipment required to supply 1 kw., while the energy charge covers the direct cost of coal, water, labor and other items, including profit, involved in the actual delivery of 1 kw. for one hour's time, or 1 kw.-hr. The cost to the consumer is thus quite comparable to that involved in case the power is generated and not purchased.

Then for each kilowatt added to the peak by the operation of tripper cars, there will be a charge of \$1 per month, and since in the case under consideration the peak lasts for only $1\frac{1}{2}$ hr. daily, each peak-load kilowatt that is required will be used only for 45 hr. per month, and will represent the consumption of only 45 kw.-hr. per month. Each of these kilowatt-hours will thus cost 2.2 cents for demand charge alone and, with 0.4 cent added for the energy charge, will cost 2.6 cents at the switchboard. Imposed upon this cost is an overhead charge for substations and line, for which a conservatively low estimate would be one-third of the overhead charge for generation, amounting to, say, 0.7 cent, and bringing the cost of the power to 3.3 cents per kilowatt-hour at the substation. The census figures indicate that 3.8 kw.-hr. per car-mile is the approximate average power consumption measured at this point, so that the peak-load power cost becomes 12.6 cents per car-mile.

Maintenance of car equipment, the last item of direct expense, appears almost negligible after the two foregoing figures, amounting to 1.7 cents per car-mile as an average throughout the country. In the case under consideration, however, the tripper cars will make only one-quarter of the daily mileage that might be expected from the average car, and as a number of the factors involved in the item vary in accordance with the car-years rather than with the car-miles, the cost

of maintenance per mile for the trippers should be considerably higher than for the cars in regular service. The increase may be approximated at 50 per cent, giving a total maintenance cost of 2.5 cents per car-mile. This, added to all of the foregoing items, makes a total of 40 cents per car-mile, yet the census figures on which this estimate is based show that the average normal operating expense throughout the day is only 17.3 cents per car-mile, actually less than half of the calculated rush-hour cost.

ALLOCATION AN ENGINEERING PROBLEM

A study of the Boston street lighting rate case and of the Bay State Street Railway fare case, now being heard by the Massachusetts commission, emphasizes the great importance of skillful allocation by the engineering experts called to the stand to support the cost theories set forth by the companies. In seeking to derive the cost of installation and operation per lamp, and to get at the cost of building the railway property per route, it has been found necessary to make various sharp distinctions in plant investment, and these distinctions are so technical that it is scarcely an exaggeration to say that the engineers have blazed new trails through the wilderness of figures wherein the expert accountant is normally supposed to dwell. Without attempting the rather presumptuous task of commenting upon the cost theories involved in these cases while they are still in process of presentation, it is none the less interesting to note the very high grade of engineering ability required in any allocation of costs designed to stand the analysis of hostile technical opponents and to meet the test of the specialist accountant.

Certainly the engineer must be the final arbiter in the selection of pro-ratings, for he unquestionably has the most accurate knowledge of the inter-relations of complex equipment. For instance, in the street lighting cost determination he can follow the subdivision of energy from the turbo-generator through the transmission and translating apparatus to the distribution lines and lamp terminals as few accountants find possible without special engineering training. The same thing is true in the allocation of investment costs according to certain specified routes on a great electric railway system, although the accountant must receive great credit for the actual records and also for the co-operative suggestions which he makes in the course of such an analysis. A broad grasp of the meaning of every essential equipment function is absolutely necessary for the engineer who occupies himself with any of the problems of valuation, and it is both interesting and significant that such qualifications are demanded for engineering service of the first rank in the field of commission regulation. These qualifications, while too technical to be appreciated by the general public, are powerful factors in leading the engineer upward to a plane of recognition by high judicial authority which is bound in time to enhance the reputation of the expert witness of the right sort more than easily can be realized to-day.

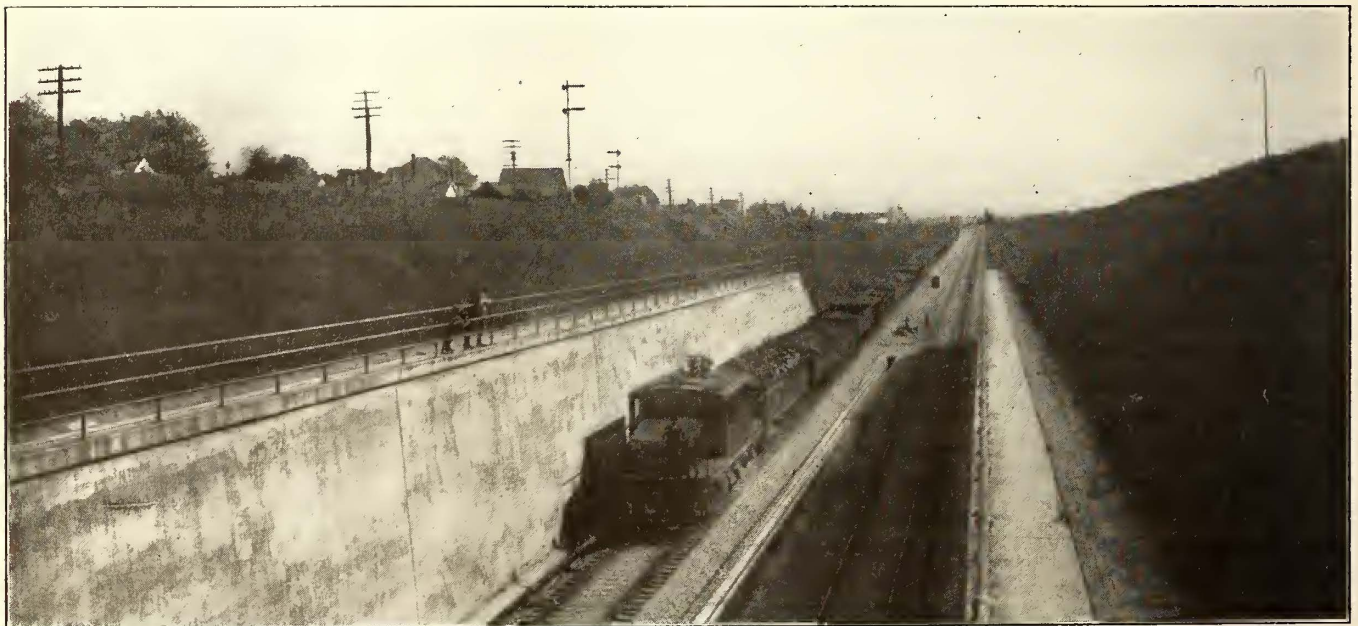
Detroit River Tunnel Operation

An Analysis of the Record of Train Detentions on This Electrification, Which Handles 50,000 Tons Daily, Shows a Remarkable Degree of Reliability Notwithstanding the Severe Operating Conditions, the Mileage per Locomotive Failure Being 26,600

THE Detroit River Tunnel electrification of the Michigan Central Railroad, which was briefly described in connection with an article on maintenance practice published in the *ELECTRIC RAILWAY JOURNAL* of March 18, presents an unusually successful example of third-rail installation. Since the electric equipment was placed in operation, its reliability has been most satisfactory, notwithstanding the inherent difficulties with which it has had to contend, and the operating records of the electric zone are well worthy of analysis. In consequence, the record for the past year showing train detentions that were traceable to the electric rolling stock and to the contact system is presented in detail in the accompanying paragraphs, the various causes of failure being outlined in each case.

them on sand considerably beyond rating, the idea being to get the train up the grade practically regardless of the draft of current. This brings about a rather peculiar situation in that when one engine loses power temporarily because of poor contact at the third-rail, or other cause, the whole train is quite likely to be stalled. No circuit breakers are installed on the engines, the equipment being protected by 600-amp. motor fuses and 2000-amp. shoe fuses.

Power is furnished by a substation which supplies also current for lighting in the yard and for industrial uses in the large passenger station at Detroit. It contains two 1000-kw. motor-generator sets and a storage battery, but the latter, it may be said, is carrying a continually decreasing share of the load, the discharge



DETROIT RIVER TUNNEL OPERATION—FREIGHT TRAIN DESCENDING 1½ PER CENT TUNNEL-APPROACH GRADE

The installation, it may be said, includes at the present time about 5 route-miles and 23 miles of third-rail, together with ten electric locomotives, of which seven are regularly in active service. Both freight and passenger trains are handled, the former running as high as 2000 tons westbound up the 2 per cent grade in the west approach tunnel, and about 2500 tons eastbound on a 1½ per cent grade at the opposite side of the river, the eastbound trains having mainly loaded cars, while the westbound trains have many empties. About 17,000,000 gross tons are normally handled in the course of a year, or, say, 50,000 tons daily in both directions. Locomotive mileage for a year approximates 185,000 for all engines.

The heaviest work done by the locomotives is on freight trains, it being customary to use three engines per train and to load these up to the limit of their rating. The engines are of the eight-wheel, double-truck type having 600-volt ventilated motors with a high gear-ratio, and on heavy pulls it is not unusual to work

being 24 per cent of the total output in 1912 and 15.6 per cent in 1915. The storage-battery capacity was originally 630 amp. for eight hours, but now this has been reduced to about two-thirds of the original figure by removing plates, because greater swings are allowed by the power company which furnishes the alternating current. The regulating booster for the battery has even been cut out of service except for one hour of the day so as to decrease the battery discharge.

TRAIN DETENTION RECORDS

The most prolific cause of train detention chargeable to the electric installation appears to be that of foreign cars which fail to clear the third-rail. This is shown in the table on page 852, which covers train detentions and other equipment failures for which the electrical installation is responsible either directly or indirectly. From the table it may be seen that during the year seven detentions were charged to cars which fouled the contact rail. Two of these resulted from hopper-



DETROIT RIVER TUNNEL OPERATION—ELECTRIC PICK-UP YARD IN WINDSOR

bottom cars with the hoppers down, which struck and damaged the third-rail. One of the detentions coming under this head was caused by a projecting piece from the roof of a sleeping car which touched the overhead contact rail in the station. Two others resulted from crippled foreign cars and one more was caused by some loose object, such as a brakebeam, dragging from a train and breaking a number of insulators. Still another was due to a projecting step on a steam locomotive tender.

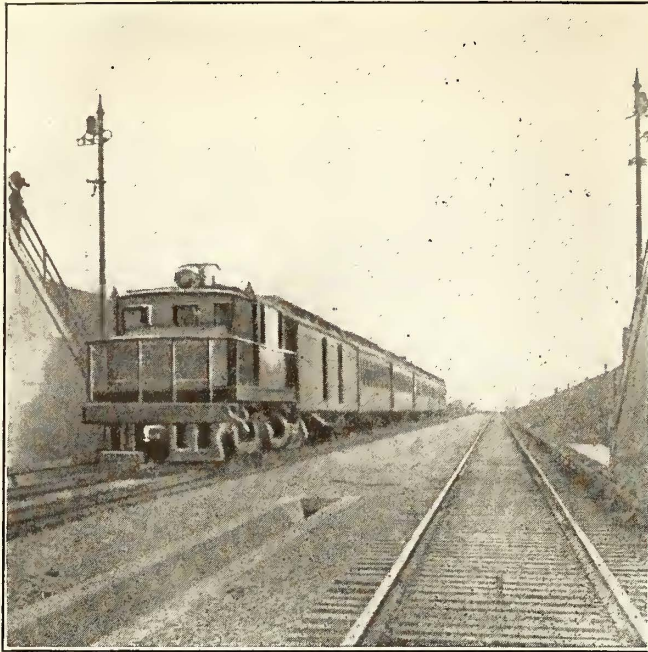
Naturally, the presence of the third-rail beside the running rail makes it practically certain that damage will result from a derailment even of minor character, and in the list there are six detentions chargeable to this cause. In each case the derailed car or cars knocked down lengths of rail sufficient to interfere with traffic. Of a somewhat similar character are the delays charged

to cars which were pushed off a derail into the third-rail, knocking it down. In connection with this it may be said that all of these detentions were brought about at a group of derails which are located at the tunnel end of the Detroit station yard where there are frequent train movements. The derails protect against runaway cars going into the tunnel. The presence of the station platform prevents the location of the third-rail on the opposite side of the track from that toward which the derails are faced, and it is undesirable to face the derail away from the third-rail and toward the station platform because more damage would be done if a car hit the platform than if it knocked over the third-rail.

Also, the location of the crossovers protected by the derails is fixed by topographical conditions so that, in turn, the derail cannot be moved along the track.



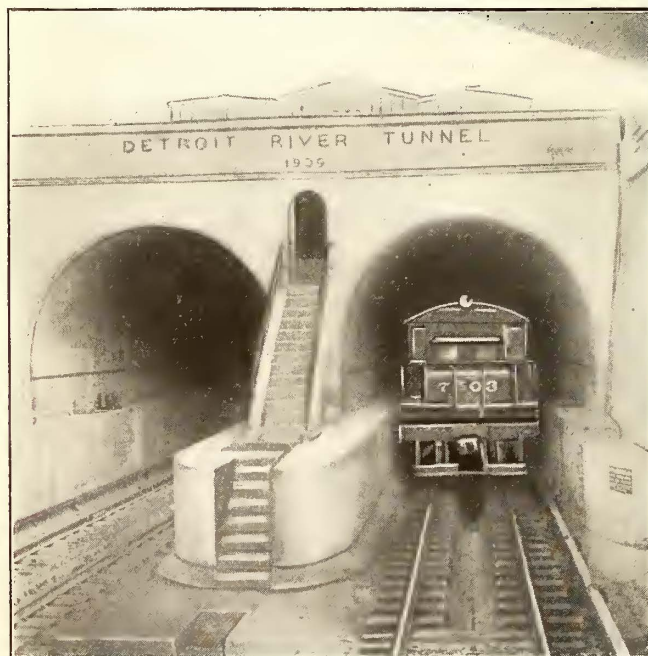
DETROIT RIVER TUNNEL OPERATION—CAR FERRIES ON DETROIT RIVER DISPLACED BY ELECTRIFIED TUNNEL



DETROIT RIVER TUNNEL OPERATION — PASSENGER TRAIN AND ELECTRIC LOCOMOTIVE

The situation, therefore, is a peculiar one and entirely local in its characteristics.

Under the general heading of failures due to the power supply there appear five detentions charged to temporary loss of power which resulted in the stalling of trains on the tunnel grades. One of these detentions was brought about by the fact that the substation circuit breakers were set too low when a heavy train was taken for the first time across a newly-built crossover on the Detroit side near the new passenger station. As the crossover was on a heavy grade, a much greater draft of current was demanded than had been normally the case in the past, and in consequence, the setting of the circuit breakers had to be raised. Some months later, two heavy trains lost power, one of them for only one and one-half car length, because of attempting to operate against traffic on a 2 per cent grade where the



DETROIT RIVER TUNNEL OPERATION—LOCOMOTIVE AT TUNNEL PORTAL

third-rail had become coated with a high-resistance film caused by corrosion from brine dropping from refrigerator cars. Drawbars were pulled out here also.

The two remaining detentions chargeable to this cause were due to too-heavy tonnage which opened the circuit breakers and allowed the trains to stall. In each case the attempt to start the train again on the heavy grade resulted in a broken drawbar. Under the same general heading in the table, there appear two detentions chargeable to permanent short-circuits, the power failures in these cases being due to persistent shorts caused by the careless handling of tools by the construction gangs that were working about the passenger station in Detroit during the early part of the year.

Failures chargeable to the third-rail equipment, aside from the times when it was knocked down by crippled or derailed cars, were but three in number during the year. In two of these failures the third-rail shoe of the locomotive caught on a faulty rail, one being brought about by a low rail which resulted in broken shoes and beams on the locomotive. The other was also due to a shoe that was knocked off the locomotive by a low rail, this causing the other shoe on the locomotive to blow its fuse, thereby delaying the train. Another delay that was charged to a shoe catching on temporary construc-

TABLE SHOWING TRAIN DETENTIONS FOR 1915, DETROIT RIVER TUNNEL ELECTRIC ZONE

Operation:	
Car fouling contact rail.....	7
Deraillment	6
Car pushed off derail.....	7
Power supply:	
Power off temporarily, train stalled on grade.....	5
Power off, permanent short-circuit.....	2
Third-rail:	
Shoe caught on faulty rail.....	2
Shoe caught on temporary construction.....	1
Man failures:	
Tonnage rating exceeded, power not off.....	2
Stalled on gap in third-rail at crossover.....	1
Sanders plugged up, stalled on wet rail.....	1
Contacto burnt up, train brakes sticking caused abnormal draft of current.....	1
Locomotive failures, electrical:	
Short-circuit on commutator.....	1
Contacto burnt up, arc to ground.....	1
Locomotive failures, mechanical:	
Shoe spring lost, other shoe-fuse blown.....	1
Shoe broken, high shoe.....	2
Pantograph caught on overhead rail.....	1
Broken knuckle on locomotive.....	1

Operating Data

Annual locomotive mileage.....	185,470
Miles per locomotive failure.....	26,600

tion was brought about by a broken shoe and shoe beam, the shoe catching on a temporary wooden incline installed for construction purposes at the end of a length of third-rail.

The table shows a total of five detentions charged against "man failures" in connection with the locomotives, this heading including delays that might not have occurred had the electric equipment not been installed, yet which were not chargeable to any inability of the electric equipment to do the work for which it was designed. Two of the detentions were chargeable to excessive tonnage on freight trains, an error on the part of the car checker, and owing to traffic conditions or other circumstances surrounding the movement the locomotives were unable to take the train up the grade although the power supply did not fail during the attempt. Another cause of delay was brought about by a train which stalled on a gap in the third-rail at a crossover. This was a part of the new construction work that was completed during the year, and the fact that the engine stalled was due entirely to lack of experience with the new conditions on the part of the motorman. A third detention was brought about by an engine which stalled on a wet rail because the sanders were plugged up, the engine without the sand being incapable of handling its normal rating because of excessive slipping. Another case somewhat similar to this

were brought about by the burning up of a contactor because sticking air brakes on the train put an enormous load upon the engine, and the contactor was unable to break the resulting heavy current, holding the arc and finally opening the substation circuit breakers.

LOCOMOTIVE FAILURES

The real locomotive failures have been divided in the table between electrical troubles and mechanical troubles. Of the former, one was caused by a temporary short-circuit on a commutator, the resulting high current causing the motor fuse to blow. The other detention chargeable to electrical failures on the locomotives was due to a contactor burn-out in which the arc that was produced when the current was broken at the contact tips flashed over to ground and held on between the contactor and the ground until the contactor was completely burnt out.

Of the locomotive failures chargeable to mechanical defects, two were caused by broken shoes that were too high. In another case an engine under heavy load lost contact at one of its third-rail shoes, and the excessive draft of current taken by the other shoe caused that shoe fuse to blow. The loss of contact was due to a twisted shoe which finally caught on the third-rail and broke the shoe bracket, the original cause of the trouble being a weak shoe spring. Another failure was due to a pantograph shoe of a type not now in use, which caught upon the overhead contact rail in the passenger station. A third was due to a broken knuckle on a locomotive.

The operating record of the electric locomotives, made up on the basis proposed last year by the committee on electrical equipment of the American Railway Master Mechanics' Association, is 26,600 engine-miles per detention due to locomotive failure. In this only locomotive failures chargeable to electrical and mechanical defects have been considered. Man failures are not included, and, of course, the detentions chargeable to operation, power supply and to the third-rail system have been omitted also.

Columbus Safety Poster

Vehicle Owners Also Urged by Letter to Help Promote Safety

THE latest step in the safety campaign of the Columbus Railway, Power & Light Company, of which an outline was published in the issue of this paper for April 22, is the display in all car windows of the poster illustrated herewith. In addition copies of this poster were mailed to some 400 persons operating vehicles of different kinds in Columbus. Accompanying the poster was a letter signed by Harold W. Clapp, general superintendent of the company, which said, in part:

"In January we posted in the cars a statement of our 1915 record as compared with that of the year 1914, which gave these facts concerning public accidents:

- 1. Collisions—Cars and automobiles 3 per cent increase (Nearly 50 per cent more machines in the streets in 1915 than in 1914.)
- 2. Collisions—Cars and wagons 20.6 per cent decrease
- 3. Leaving moving cars 21.7 per cent decrease
- 4. Boarding moving cars 4.6 per cent increase

"At that time, we believed a much greater improvement could be made, but we realized that, even though our men were being constantly drilled in the careful handling of their cars, we could not hope to bring about the best results in this work unless we had the support of the public. We made a strong appeal for help. The quick and effective response accorded us is reflected in the record for the past three months.

"Accidents mean losses of various kinds; loss of earn-

ing power to the injured, loss in damaged property, physical disability with attendant suffering, etc. Statistics prove that 75 per cent of all accidents result from carelessness and thoughtlessness. If we can educate ourselves to the point where we will pause for a moment to think before acting as we daily use the streets—walking or driving—or as we ride the street cars, we will, as a community, produce savings the mere money

To Our Patrons:

Our Accident Prevention Record

FOR JANUARY, FEBRUARY AND MARCH, 1916,
as compared with the same period of 1915, is as follows:

1. Collisions—Cars and Automobiles . . . 2.3% Decrease
2. Collisions—Cars and Wagons 20.2% Decrease
3. Leaving Moving Cars 53.4% Decrease
4. Boarding Moving Cars 25.3% Decrease

The employes of this Company are taking extra precautions to avoid accidents in handling cars, but they must have

YOUR HELP

to attain the high degree of success possible in this work.

On March 31st, this year, there were 508 more automobiles on the streets than on the same day last year, an increase of 8%. More careful driving has reduced collisions between cars and automobiles.

During the year 1915 as compared with 1914 there was an increase of 4.6% in Boarding Moving Car Accidents. When we published this fact at the beginning of the year, we pointed out particularly the danger in boarding moving cars, and asked for the help of all citizens in an effort to reduce such accidents:

YOU CAME BACK

and chalked up the splendid record indicated above. You proved your interest in Accident Prevention Work. There are too many accidents; they are unnecessary and wasteful. It is your duty, and ours, to give enthusiastic support to this, the greatest economic movement of the times.

ENLIST IN THE CAUSE! CAR MEN, DRIVERS, EVERYBODY!

THE COLUMBUS RAILWAY, POWER & LIGHT CO.

COLUMBUS SAFETY POSTER

equivalent of which would be astounding, and teach safety habits the future effects of which could not be estimated.

"I am taking the liberty of writing you at length because I feel that you must be greatly interested in this work, both as a business man—an employer of persons in whom you place trust for the safe operation of your vehicles—and as a citizen desirous of lending your aid to the end that Columbus may live up to its opportunities by adding the qualification of Public Safety to the other splendid advantages it offers.

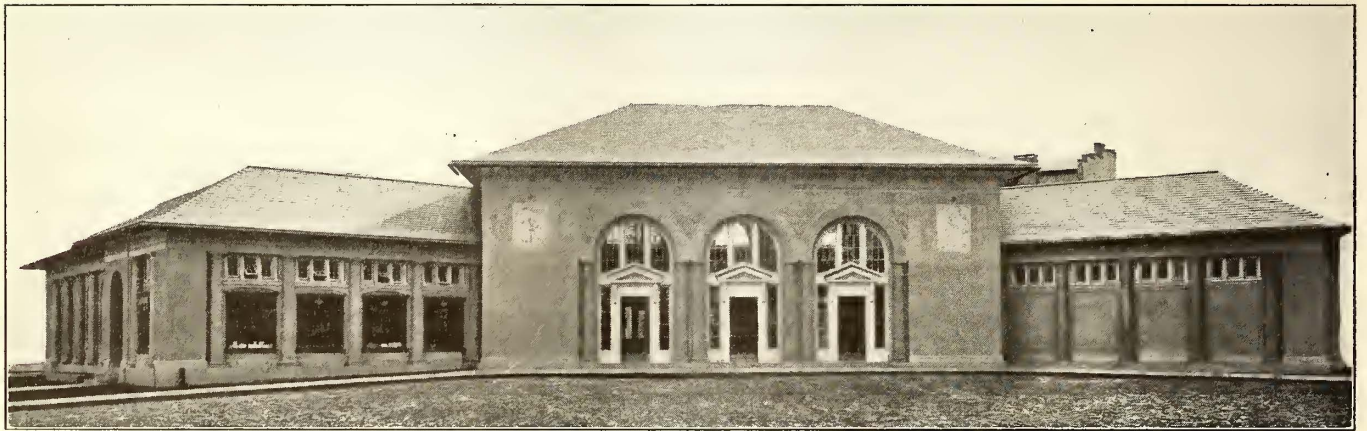
"I would appreciate very much your calling this record to the attention of your employees and others. If you should desire additional posters, they may be obtained by a telephone call to our safety department."

Foreign Specifications for Railway Material

With the object of placing in convenient and accessible form before those in the United States interested in or responsible for railway materials, the Bureau of Standards, Department of Commerce, in connection with its investigation of failures of railway material, has obtained, through the courtesy of the State Department, copies of specifications for railway material—rails, axles, wheels and tires—used in several European countries. These specifications are given in full, together with a digest and discussion, in Technologic Paper No. 61, just issued. The available data concerning the types and weights of foreign railway equipment, together with those concerning derailments and accidents abroad, are also included in the publication. Persons interested may obtain copies of the paper, which is entitled "Foreign Specifications for Railway Material," without charge upon application to the Bureau of Standards, Washington, D. C.



VIEW OF TERMINAL, SHOWING CARS, PLATFORMS, AND TRAIN SHEDS



FRONT VIEW OF STATION, SHOWING APPROACHES



VIEW OF INTERIOR, SHOWING DESIGN OF FIXTURES AND ARCHITECTURE

Exterior and Interior Views of New Electric Railway Terminal in Saratoga

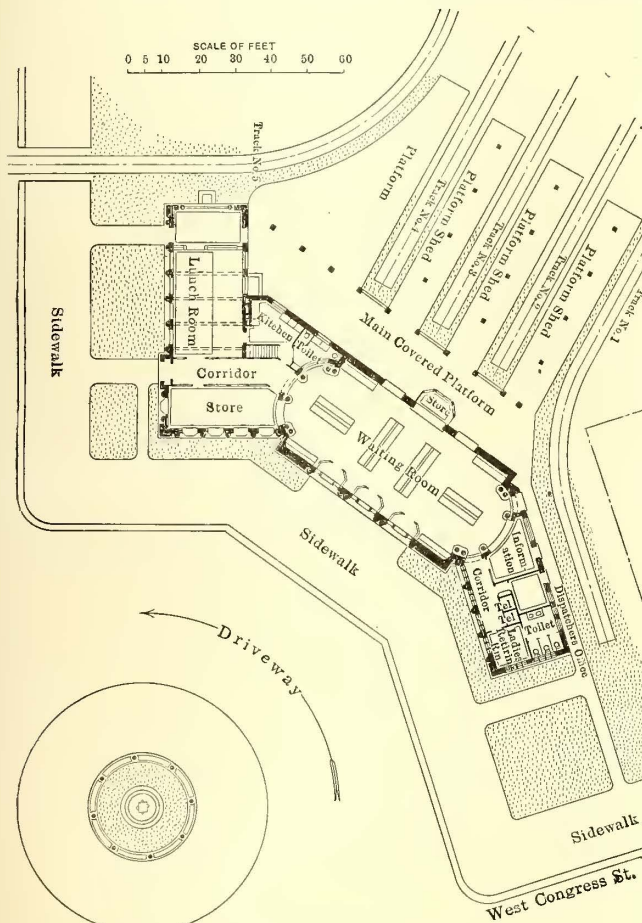
Saratoga Terminal Completed

Imposing Structure Designed to Accommodate Increasing Traffic for Many Years to Come

ON Thursday, April 20, the Hudson Valley Railway of Glens Falls, N. Y., opened a handsome station at Saratoga with appropriate ceremonies, which were presided over by Mayor Walter T. Butler.

Many prominent State officials and railroad men were present, including a large delegation from Glens Falls who journeyed to Saratoga in the official car of A. E. Reynolds, general manager of the Hudson Valley Railway. Speeches were made by C. S. Sims, vice-president and general manager Delaware & Hudson Company; George D. Pratt, chairman State Conservation Commission, and George Foster Peabody, State Reservation Commission.

The station, which is located within a short distance of Broadway and close to the Grand Union Hotel, is laid



SARATOGA STATION—PLAN OF STATION AND GROUNDS

out to secure a plaza effect on the side toward Broadway. For this reason the building is set diagonally on the lot 50 ft. to 60 ft. back from the street with the front facing northeast. The land was leased to the railway by the State of New York, the municipal authorities having granted the company the right to cross Broadway, thereby considerably shortening the run to Glens Falls.

To harmonize with a large memorial fountain opposite, the architects, Ludlow & Peabody, New York, made the general design of the station conform to the Italian classic school. It is constructed with concrete foundation, concrete floor and hollow terra-cotta tile wall. The roof is of mottled slate. The interior is of cream colored cement stucco trimmed with cast stone. The exterior walls contain a number of ornamental panels.

Two of these represent in bas-relief historical events associated with Saratoga, such as General Burgoyne surrendering at Schuylerville and Sir William Johnson drinking the water of life at High Rock Springs.

The building consists of a main central motif containing the waiting room and office and two wings, one extending south and the other north. In the south wing is a large lunch room, with kitchen, and a store with show windows opening on Broadway. The south wing also contains the men's room. In the basement of the south wing are the boiler plant and coal rooms. In the north wing is the ladies' room, the agent's office, the parcel room, the telephone booth and the dispatcher's office.

At the rear of the building are the concrete track platforms with protected wood construction track sheds.

The waiting room has a colored cement floor with Moravian tile border, wood paneled wainscot about 7 ft. high and above this point a vaulted ceiling of cement plaster, jointed and treated to represent stone. The interior woodwork of the entire building is chestnut, with the walls and ceilings plastered. The building as arranged will take care of the traveling public in and out of Saratoga for many years to come.

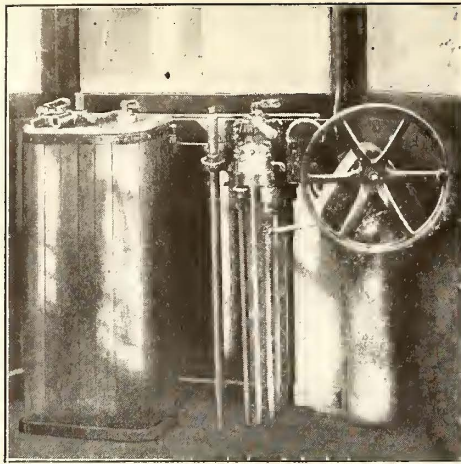
The cars of the Schenectady Railway operate to Ballston, Schenectady and Albany, and run on an hourly schedule. In addition to this the Troy line of the Hudson Valley Railway also leaves this station hourly, and the local Belt Line service car arrives and departs from the station every thirty minutes.

The service to Glens Falls on the north is operated hourly, so that in the aggregate hundreds of passengers will daily use the new station.

Franchise Extension Rejected in Valparaiso, Chile

The municipality of Valparaiso, Chile, has refused to accept the proposition made by the street railway of Valparaiso for an extension of the franchise for ninety-nine years. The propositions made by the Compañia de Tranvías Electricos de Valparaiso, which is the company now operating the electric street railways and furnishing the electric lighting of the city, were in substance as follows: The rate of fare within the city to be 20 centavos, first class, and 10 centavos, second class (with exchange at 9 pence, equal to \$0.036 and \$0.018 United States currency, respectively). This rate is to remain unchanged unless the exchange value of the peso should fall below 6 pence. The franchise of the company to be extended by seventy-nine years, making the total life of the franchise, from date, ninety-nine years. The company was to give the city of Valparaiso 8 per cent of its gross receipts from the traction lines, this percentage of gross receipts to be applied principally on the city debt and secondarily on the indebtedness of the city to the traction company for municipal lighting (in June, 1915, the balance due for municipal lighting amounted to \$383,045 United States currency.) The company was also to double-track several of what are at present single-track lines; to do all necessary paving in that part of the streets covered by its lines, and to have the responsibility and cost of the cleaning, repair, etc., of such paving. The company was to deed to the city on certain conditions and in return for certain payments on part of its equipment, all its equipment, plants, lines, etc., on the expiration of its franchise.

The Puget Sound Electric Railway is converting its station grounds in Auburn, Wash., into a park, and is planting flowers and laying out lawns.



CONNECTICUT CARS—INTERIOR AND EXTERIOR OF NEW CARS WITH LIFTING SASH

Latest Connecticut City Cars

Ninety-two New Semi-Convertible Cars Now in Service Are Fitted with Many Safety Promoting and Traffic Accelerating Features

THE Connecticut Company has just placed in service ninety-two prepayment arch-roof cars, forty-six of which are used at New Haven, twenty-six at Hartford and twenty at Bridgeport.

While the cars are much alike in appearance, they are really of two designs, forty-six being of Brill semi-convertible type built by Wason and the others being of Osgood-Bradley construction. The cars have steel underframes, steel side frames and a 3/4-in. roof covered with No. 8 duck. The fittings and equipment are exactly alike except that the Wason cars, numbering 1700 to 1745, have Agasote head and side lining, Peacock staffless brakes and EMB resistors, while the Osgood-Bradley cars, numbering 1746 to 1791, have Nevasplit head and side lining and Lord staffless brakes and GE

resistors. The dimensions of these cars are as shown in the accompanying table.

OPERATING FEATURES

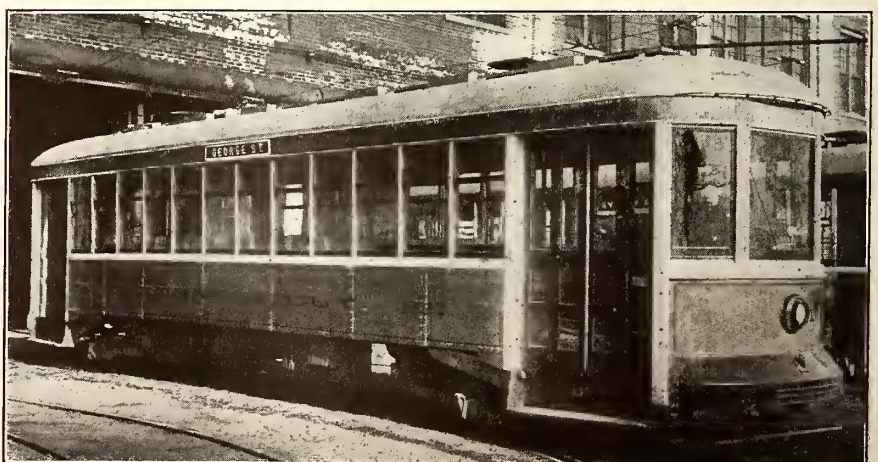
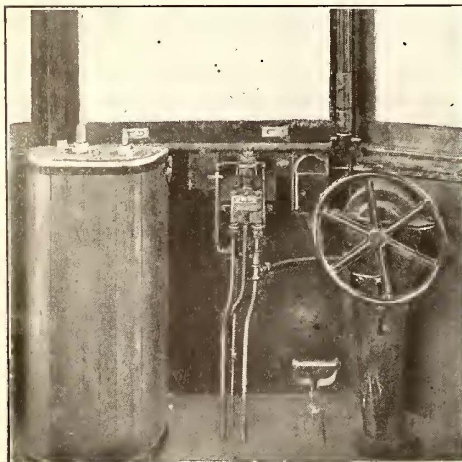
These cars are operated on the pay-within plan with manually-operated outwardly folding vestibule doors of clear glass. The doors are operated in connection with the National Pneumatic Company's safety interlocking door signals whereby the motorman can start with the first control point on as soon as the closing of the doors operates the starting signal. Both the steps and platform thresholds are fitted with 3-in. strips of Mason carborundum safety tread. The use of a fixed step has worked out very satisfactorily. The Consolidated buzzer push-button system is installed with buttons only near the vestibules. These were placed there, of course, to cut down the loss of time when a passenger signals from his seat and then proceeds out leisurely.

The liberal platform length and the provision of 6-ft., longitudinal seats at each end do much to facilitate quick passenger movement. Fares are collected by means of Johnson fare boxes and counterchecked on Sterling-Meaker registers.

The exterior of these cars is in the Connecticut Company's standard yellow, while the interior is in mahogany with bronze trim. Air pockets are provided between the 3/16-in. wainscoting and steel side plates. All seats are Heywood Brothers & Wakefield rattan, the cross seats having corner grab-handles so that the ceiling is free of straps except at the ends. Pantasote curtains on No. 86 ring fixtures are also used.

The efficient use of motive equipment is shown by the fact that these cars require only two 50-hp. motors

	Nos. 1700-1745	Nos. 1746-1791
Length of car body.....	30 ft. 0 1/2 in.	29 ft. 11 in.
Length of platform.....	5 ft. 7 in.	5 ft. 11 1/2 in.
Total length.....	43 ft. 10 in.	44 ft. 6 in. (over buffers)
Height from top of rail to top of roof.....	11 ft. 2 1/2 in.	11 ft. 4 in.
Height from top of rail to top of trolley board.....	11 ft. 8 1/4 in.	11 ft. 8 1/4 in.
Height to center of drawhead....	20 1/2 in.	20 1/2 in.
Height from top of rail to underside of bolster.....	29 1/2 in.	29 1/2 in.
Width over step.....	8 ft. 5 in.	8 ft. 5 in.
Width over eaves.....	8 ft. 4 in.	8 ft. 5 1/2 in.
Total width.....	8 ft. 5 in.	8 ft. 5 in.
Center to center of king bolt....	22 ft. 1 in.	22 ft. 1 1/2 in.
Number of seats.....	12 cross, 4 long	12 cross, 4 long
Seating capacity.....	44	44
Weight ready for service.....	36,000 lb.	36,000 lb.



CONNECTICUT CARS— VIEWS OF CAR EQUIPPED WITH REMOVABLE SASH

geared 15:69 for a schedule speed of 9 miles per hour with six stops per mile. These motors are of GE-203 L type rated 50-hp. on 600 volts and are outside-hung through end-bar suspension on Standard 0-36 maximum traction 5250-lb. trucks of 4-ft. 6-in. wheelbase. These trucks have steel drivers of 33 in. and cast-iron ponies of 21-in. diameter. The journal boxes are Symington.

The control is of K-6 type supplemented by contactors. The vagaries of the 4½-in. diameter trolley wheels are controlled by means of Ohio Brass catchers.

As previously noted, these cars have hand brakes of staffless type. However, the chief braking is left to GE air brakes including the C-P 27-B compressor and a 16-in. x 48-in. air tank. Brake-shoe wear adjustment is eliminated by the use of Smith-Ward slack adjusters. The reliability of braking is further increased by the use of air-operated sanders, insuring relief from troubles with clogging sand. Other safety equipment comprises Rico anti-climbers and H-B life guards.

Lighting for each car is afforded by seven 56-watt lamps, ranged along the center line of the car, five inside and one on each platform. Other specialties are Gold heaters and Railway Utility honeycomb ventilators, incandescent headlights and illuminated signs.

NEW CARS

Since these cars were put in operation, orders for 100 additional cars have been placed by the Connecticut Company. Thirty, the exact duplicates of those built by the Wason Company, have been ordered from that company; sixty others, practically the same as these cars only longer, are to be built by the Osgood Bradley Company, and ten of the newer type of interurban cars are to be built at the Wason works.

Railway Exhibit Educates Public

The Exhibit Demonstrates the Various Developments and Improvements in Equipment and Emphasizes the Company's Record in Accident Prevention

BY HENRY GEBHART

General Manager Oakwood Street Railway, Dayton, Ohio

WHILE a direct increase in revenue is not to be expected as the return from an exhibit in an industrial exposition, such an exhibit does demonstrate that the railway company has the right public spirit and the exhibit may be employed to educate the public and impress the fact that the service has improved greatly while the fare has remained the same. Recently the Oakwood Street Railway, Dayton, Ohio, exhibited at an industrial exposition, and it feels well paid for the expenditure of time and money. The general character of the exhibit is shown in the accompanying illustration.

A booth, 25 ft. square, was selected near the entrance to the show so that it would attract the attention of visitors before their interest lagged.

In the center and to the rear of the booth, a full-sized standard car vestibule was exhibited. This was used first to attract attention, and second, to demonstrate the several devices which the company has invented to aid in safeguarding the public. A man was in charge of this exhibit continuously in order to demonstrate and explain the details of the safety door, signal light, door operating mechanism, illuminated signs, fare boxes, etc., all of which were designed and manufactured in the railway company's shops.

A case with twenty-four 8-in. x 10-in. colored transparencies occupied space at the right front of the exhibit. These transparencies were of two kinds, and they were intended to contrast the past with the present, as well as to illustrate some of the equipment de-

signed and built in the railway company's shops. The old shed for horse cars was contrasted with the company's new reinforced-concrete structure. The first car-building shop was shown beside the six present shops. An old horse car with all of the employees in the service in 1895 was contrasted with two views of double-truck modern cars with the day and night shifts of trainmen. The old horsedrawn snowplow was illustrated beside the modern snow sweeper. Similarly, the old power-house equipment was contrasted with the modern generating equipment; the first line wagon with the modern Packard truck, and the first single truck with the modern single truck. The remainder of the case contained transparencies of various equipment parts, simply for their illustrative and educational value. A sign placed over this transparency case read as follows: "Observe these contrasts of the past with the present and remember this—your fare has not increased." Just back of the transparency case, and on the same side of the booth, a large table with sample parts of signs, fare boxes, door signals, door mechanisms, etc., was placed to show the intricacy of the mechanical parts of these various devices.

At the left front of the booth a full-size section of modern track construction, including the sub-grade, concrete ballast, steel ties, joint construction, rails and



OAKWOOD STREET RAILWAY'S INDUSTRIAL EXHIBIT

paving, was exhibited. A placard was placed on this giving details and cost, and again reminding the public that "The fare had not increased." Alongside this track construction exhibit the various sections of rail used by the company from 1871 to 1916 were shown, beginning with the old strap rail on a wooden stringer and passing through the various stages of evolution to the modern T-rail.

Other features of the exhibit included an architect's water color of the new offices and shop buildings, a framed portrait of Maj. Charles B. Clegg, president of the company, and a number of placards of which the following are samples: "We build cars, door signals, door mechanisms, illuminated signs, fare boxes, etc. Safety First."

"Five Years' Progress, Records of 1915 and 1910:

All accidents to passengers including boarding and alighting	89.4 per cent decrease
All accidents to pedestrians	55.6 per cent decrease
All accidents to horse-drawn vehicles	34.4 per cent decrease
All accidents to automobiles and motorcycles	112.5 per cent increase
All other accidents	56.5 per cent decrease

"We are doing our part to decrease accidents. Give us your help by attention to Safety First."

Other placards called attention to delays as to grade crossings, the employees' aid association and a list of improvements which the Oakwood Street Railway was the first to adopt in Dayton.

Needed Reforms in Regulation

Dangers from Over-Regulation Discussed at Meeting in Boston—Proper Qualifications of Commissioner Defined

PRESIDENT Alexander C. Humphreys of Stevens Institute of Technology discussed necessary reforms in public utility regulation on April 21 at a meeting of the Boston Society of Civil Engineers. Having served as an expert witness in a large number of cases before public service commissions, Dr. Humphreys called to mind a number of instances in which the conduct of public hearings by legislative committees and by State commissions was not in harmony with a judicial determination of the facts at issue. The speaker pointed out that no real co-operation can be obtained where there is antagonism between the parties in interest. He held that it is not improbable that the country has suffered as much from the ill-directed zeal of honest but self-sufficient enthusiasts as from the cunningly directed activities of the reformers for personal profit.

After emphasizing the volume of superfluous or harmful legislation produced in the country under present conditions, touching upon the great cost of the federal valuation of railroads now under way, questioning the general policies of the government toward the carriers and urging a fairer attitude toward the transportation security-holder, Dr. Humphreys said that there are many engineers who might profitably give more attention to the subject of overhead charges, including such items as preliminary expenses, legal and other organization expenses, engineering, superintendence, contractor's expense, interest and taxes during construction, liability and other insurance, omissions, contingencies, etc. If the engineer's estimate is not inclusive and final, he should place the fact on record. Engineers have been responsible for much misapprehension because of their failures in this respect. Various public utility cases in which the presiding commissioner had conducted hearings without the proper judicial attitude or in which the presentation of incomplete evidence or the unfair interpretation of testimony had been allowed were touched upon. The development of a complete record is absolutely essential to just regulation.

"Under commission control," said Dr. Humphreys, "over-regulation and unnecessary interference with individual enterprise has been gaining headway year by year. The tendency to allow this one authority to exercise the three functions of government has been more in evidence year by year. The regulation of business in many cases has developed or, more correctly, degenerated into persecution, and this also applies to other business than that of public utilities. Perhaps the burden of over-regulation has rested most heavily upon our railroads. The sooner the people as a whole come to understand that upon the prosperity and efficiency of our railroads depends in large measure their own prosperity, the better for all concerned. Sooner or later they will learn whose ox is being gored, but they may not be able to distinguish the aggressor. The tendency of these commissions, both federal and State, is to get deeper and deeper into the details of management, to become more and more active in legislation and the framing of major and even minor rules, and to be more and more keen to sit as judges in trials of public service corporations. . . . Thus they exercise the authority while avoiding responsibility for final results—a most inefficient and dangerous system."

By failing to protest in many commission cases through appeal to the courts, either for reasons of policy, timidity or general lack of backbone, many cor-

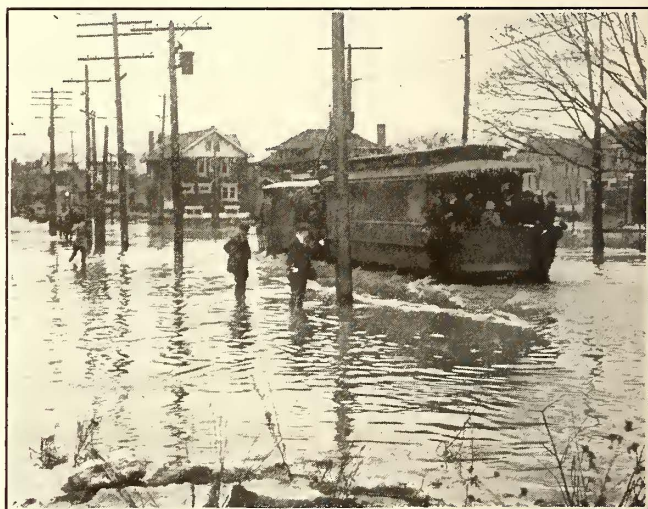
porations have suffered material loss and loss of prestige. Unless the public utility is willing to fight for its just dues, it is charged with being found in the wrong. Many of the minor troubles and injustices could be eliminated from commission control if thoroughly qualified engineers were put upon the boards. Every commission should have at least one properly qualified engineer as a member. He should be a man of high character, of sound training in theory and practice, and of wide experience in design, construction and administration.

In general, all our public service commissioners should be broadly trained, broad-minded, fair and competent as investigators (an unusual qualification), and in each commission there should be men fully qualified in the theory and practice of the professions of engineering, law, business finance and accountancy. How to get enough such men in view of the small inducements offered and the political pressure to which they are submitted is indeed a problem. In conclusion, Dr. Humphreys declared that no longer should lawyers and economists be permitted to make the laws and say how, when and where they are to be enforced.

Operation in Flooded Streets, Buffalo

International Railway, Buffalo, N. Y., Maintains Car Service in Deeply Flooded Streets

GREAT difficulties were encountered by the International Railway, Buffalo, N. Y., in handling traffic through the flood waters in the South Buffalo and Kensington sections of the city during the last week of March. More than 20 miles of streets were under water from a few inches to 4 ft. and 5 ft. deep. Service on several lines was suspended for three days, and cars



SNOWPLOW (WITH TRAILER) IN FLOODED STREET, BUFFALO

on two lines are still being re-routed because of the destruction of approaches to the Bailey Avenue bridge over the Buffalo River.

The accompanying engraving shows a view on the Seneca-Hoyt line where, in places, the water was 5 ft. deep, yet the service was never abandoned. A snowplow with a trailer attached was pressed into service, and passengers were carried for almost a mile through the flooded area. Although thousands of passengers were carried through the floods during the five days, there were no accidents. The Seneca Street carhouse of the International Railway, which adjoins the river, was not damaged because it is on high ground, but it was almost entirely surrounded by water.

Electrical Conference in Atlanta

The Standard Safety Code and Electrolysis Were the Principal Subjects Discussed

THE conference held this week in Atlanta, Ga., by the Bureau of Standards under the auspices of the Affiliated Technical Societies was opened on May 2. The meetings were held at the Georgian Terrace Hotel, and were attended by some 200 prominent corporation and municipal engineers and public utility officials. The opening talk on May 2 was by A. M. Schoen, chief engineer Southeastern Fire Underwriters' Association, who was followed by Dr. E. B. Rosa, chief physicist Bureau of Standards, who described the purposes of the National Electrical Safety Code. W. J. Canada, electrical engineer of the bureau, then presented a summary of the code. The portion of the code which attracted the most discussion was that relating to transmission and distribution lines at high voltage. Those taking part in the discussion were W. G. Claytor, Roanoke, Va.; P. A. Tillery, Raleigh, N. C.; H. A. Palmer, Richmond, Va.; L. V. Sutton, Raleigh, N. C.; E. P. Peck, Atlanta, Ga., and Mr. Cummins, Birmingham, Ala.

In the evening the delegates took a trip to the Atlanta outdoor high-tension substation of the Georgia Railway & Power Company, where a demonstration by the engineers of the company was given of changing insulators and other operations on 110,000-volt lines, and the tagging of circuits. All operations were in accordance with the requirements of the safety code.

On Wednesday, Burton McCollum of the Bureau of Standards read a paper on "Electrolysis and Its Mitigation," describing the work done by the Bureau of Standards in studying the question of electrolysis from railway return circuits. An abstract of this paper is given below. The paper was illustrated with slides, and a discussion followed. Later the confrères visited the testing laboratory of the Georgia Railway & Power Company, and in the evening a meeting of the transmission engineers in attendance was held. It was devoted to experience talks.

On May 4, the last day of the meeting, the discussion was on the subject of grounding low-voltage light and power circuits.

Need for Reducing Electrolysis

Bureau of Standards Recommends Improvement of Return Circuits—Three-Wire System Under Test

AT a conference held at Atlanta May 2 to 4 under the auspices of the technical committee of the Affiliated Engineering Societies of that city, one day, May 3, was devoted to a consideration of the work of the Bureau of Standards at Washington in studying the causes and methods of relief of electrolysis of underground pipe from railway circuits.

In the paper which was presented on the work of the bureau, reference was made to the publications issued by it on the subject and to the methods which had hitherto been followed for mitigation of electrolysis. It was said that these methods may be grouped broadly under two heads: First, those that may be applied to the pipe or cable system, and second those which may be applied to the negative return and have for their object the prevention of leakage of electric currents into the earth or its reduction to so low a value that it will do practically no harm. The second method is by far the one to be preferred. Some of the methods under the second group, including the double trolley system and the use of uninsulated negative feeders in parallel with the rails, are either impracticable or else open to the objection that the expense or operating difficulties at-

tending their applications are rendered unnecessary because of the fact that there are other adequate methods available for general application which are comparatively cheap to install and which introduce but slight complications into the operation of the system. The three-wire system is mentioned as possessing large possibilities, but attention is called to the fact that up to the present sufficient experience has not been had with it to show whether it is practicable from the operating standpoint under average conditions of service. A very complete sectionalized three-wire system is now being installed in one American city under the general direction of the Bureau of Standards, and it will be used as the basis of a thorough investigation of the practicability of this system both from the standpoint of practical operation and electrolysis mitigation.

The most effective methods that have been thoroughly tried out in practice over long periods are the use of insulated negative feeders. In some cases it is also desirable to use a moderate number of insulating joints in the pipes, or a very limited amount of pipe drainage, but as a rule an increase in the carrying capacity of the insulated return is all that is necessary.

The paper also points out that the owners of the underground utility have certain responsibilities as well in this matter, particularly if new construction is undertaken in territory already occupied by the electric railways. There are a number of things that pipe and cable owning companies can do at a very slight additional expense if such measures are taken at the time the pipes or cables are installed. Thus, in new work or repairs, pipe lines should be laid as far as practicable from the railway tracks. Where the density of service connections is sufficient to justify the use of two mains, one on each side of the street, these should be laid, in order to eliminate the necessity for running services across under the railway tracks. Wherever it is necessary to run service pipes across the street under railway tracks, care should be taken either to lay them as far as practicable below the tracks, or else to provide substantial insulation between the service pipe and the track, or between the surface and the main, by means of insulating joints. The latter plan will generally be found cheapest and most effective.

In conclusion, the paper recommends earnest co-operation between the railways and underground utilities in order that the problem should be dealt with in the most effective way. Until the reduction of electrolysis comes to be considered an engineering question, it cannot properly be solved.

Examination for Special Agent

The bureau of foreign and domestic commerce of the Department of Commerce of the United States plans to hold an examination during May for the position of special agent to investigate the markets of Africa, Australasia and the Far East for railway supplies. The salary of an appointee to this position will not exceed \$10 a day for each day in the year; actual transportation expenses and an allowance for actual subsistence expenses not to exceed \$5 a day will be paid. Application to take this examination should be made direct to the Bureau of Foreign and Domestic Commerce, Washington, D. C., and should set forth the applicant's education and his experience in the subject of the investigation.

Spanish engineers have completed surveys for a direct electric railway from Madrid to Valencia, with the exception of that portion of the line terminating in Madrid.

Mechanics of Railway Motors

The Author Discusses Mechanical Considerations in Railway Motor Design Which Affect Reliability of Operation and Facility of Maintenance

BY R. E. HELLMUND

Railway Engineering Department, Westinghouse Electric & Manufacturing Company

A MOST important consideration in the mechanical design of a railway motor armature is that the punchings that form the core must not be subject to loosening under vibration, and in an approved construction which has never given any trouble of this kind the punchings are pressed onto a spider and tightened with a powerful hydraulic press, being subsequently held in place by a ring nut which has practically no chance to get loose. The spider is pressed onto the shaft, which thus is made easily removable if broken. Large teeth in the armature core are desirable because they will not bend over easily in case the armature rubs against the poles, and this condition naturally leads to armatures with rather few large slots and teeth. The latter feature is also desirable because with few coils the chances of breakdown are reduced, and because larger coils are naturally stiffer and less liable to move under service conditions. On the other hand, excessively large coils are not as favorable for commutation, and it is possible for large coils to be so stiff as to make the rewinding of the armature difficult.

With regard to insulation, it may be said that the introduction of U-shaped pieces of insulation to reinforce the coils where they leave the armature core has been found of great value in avoiding coil breakdowns. To avoid shrinkage of the insulation and loosening of the coils, it is desirable to have them compressed as much as possible before they are put into the armature. For this reason the practice of pressing the straight part of the armature core is very desirable. Coils wound of cotton-covered wire and with a wire covering of fibrous material should be pressed before the outer layer of insulation is put on, but strap-wound coils with mica wrappings may be pressed after completion.

With regard to banding, it may be said that too wide bands and too many of them involve certain losses from eddy currents. The use of a strip of tin under the band wire with clips to hold the wires together has been found to increase their life considerably. When an armature is banded, a sufficient number of fillers should be put into the slot so that the coil sticks out of the slot just enough so that the pressure from the band forces the coil down until its top is flush with the top of the teeth in the core. It is very desirable to do the binding while the armature is hot, because the insulating material is most pliable in a hot condition. The use of temporary bands on the armature before putting on the final banding is considered good practice.

With very large commutators the bolted construction is still the only safe method of holding the commutator together, because the proper tightening of a large ring nut is rather difficult. The methods of manufacturing the mica V-rings and of aging the commutators under heat have, however, improved so much in recent years that the use of a ring nut in small and medium size commutators has become fully as safe as the bolted construction. Following the practice of undercutting that has become common in the last few years, the difficulties of commutator maintenance have become almost negligible. Small irregularities in the commutator surface should not cause a properly designed brush to jump, and therefore the masses that are moved up and down with the brush must be kept small, many brush-holder designs including a small vibration spring between the harness and the hammer so that the carbon can move

without moving the harness. The shape of the brush-holder hammer may have a considerable influence upon brush wear. Although small sizes of hammer have less contact surface, they do not wear into the carbon any more than the larger sizes and have, moreover, the advantage of less weight.

The hammer wear, and also the wear of the carbon in the sides of the brush-holder box, are caused by small arcs forming between the carbon and the hammer and between the carbon and the brush-holder. Such arcs are formed by the vibration of the carbon in the box and by sand particles between the box and the carbon. It has been found in localities where the cars stop on the near side of the street, and where the motors carry heavy accelerating currents while the car is crossing other tracks, that the side wear of the carbon is excessive. Since the side wear will be larger if less current is carried by the hammer on top of the carbon, it is essential that the shunt between the hammer and the brush-holder be maintained in first-class condition. Also, poorly-made or broken shunts will lead to excessive wear of the pins supporting the ratchet and wheel and the inside of the ratchet wheel.

Usually it is desirable not to have the brushes too thin, as they are then more subject to breakage. A thickness of $\frac{3}{4}$ in., or for small motors $\frac{1}{2}$ in., gives best results. Very high graphite and low-resistance carbons are often not best for railway motors. On the other hand, care should be taken to avoid very hard carbons, and especially those with certain abrasive qualities intended for non-undercut commutators. While such brushes may show up very well in comparative tests on carbon wear, they will prove to be expensive on account of excessive commutator wear. Usually it is better to take out the armature and turn and undercut the commutators than to use abrasive brushes.

In field coils flat copper straps with asbestos tape insulation between the straps have given such excellent results that the use of wire or ribbon-wound coils has practically been abandoned except in very small motors, the insulation between various layers of the field coils usually being made of mica discs. To avoid vibration of field coils, a most important consideration, it is absolutely necessary to introduce a heavy spring underneath the coil, this taking up the inevitable shrinkage of the insulation. To bring the cables out of the core, the best practice seems to attach the cables permanently to a strap inside of the coil with a well-soldered joint and to connect the two cables between the field coils by a similar simple and rugged joint of the sleeve type, this being preferable to the frequently-used arrangement of cable terminals into which the cables are fastened by screws.

Bulletin on Credits to Foreign Buyers

The insistent demand for information on foreign trade subjects has led to the publication of a book of practical suggestions by the Bureau of Foreign and Domestic Commerce, Department of Commerce. These suggestions are not concerned with the sale of any particular lines of goods in foreign markets, but with the vexing problems which sooner or later confront exporters in every line, such as questions of credit, agencies and packing. The much-discussed question of extending credits to foreign buyers is gone into at considerable length in the bulletin, as there seems to be a disposition on the part of American exporters to regard as permanent the present short-term and cash business with countries that previously demanded long credits. Copies of the bulletin may be purchased at 15 cents each from the Superintendent of Documents, Washington, D. C., or from the district offices of the bureau.

Extensive Fire at Paris, Tex.

Damaged Area Covers Twenty-seven City Blocks and 1440 Buildings—Electric Properties Suffer Temporary Shutdown

ON March 21, a fire, which ranks as one of the largest in the history of Texas, destroyed twenty-seven blocks at Paris, in that State, including practically all the business section of the town and many residences. Starting from causes unknown near the south end of the town, the fire spread to the Public Square, a distance of eighteen blocks, in less than a half an hour, leaving behind a path of ruins from one to three blocks in width.

The Paris Transit Company's carhouse and offices were totally destroyed, as shown in an accompanying illustration. In addition to all the tools and repair equipment, six trolley cars which were in the carhouse were consumed. The offices and the stand-by plant of the Texas Power & Light Company, together with several miles of transmission and trolley lines, were also destroyed. The financial loss to the two electric companies resulting from this destruction was not particularly serious, due to the fact that the buildings and equipment were to a great extent covered by insurance.

The power plant, the ruins of which are illustrated, was used only during the cotton gin season to carry the peak load. It had a capacity of about 800 kw., and its equipment included two motor-generator sets of 75 kw. and 90 kw. The power and light company had a triple-feeder system arranged so that in case one feeder was burned, the load would be taken care of by either of the remaining feeders. This fire covered such an area, however, that all three feeders were burned.

The work of restoring service by the transit company and the power and light company was well started before the flames died down. Large crews of men with electrical equipment were immediately rushed from Dallas by express trains in answer to telegrams sent before telegraphic connections were cut. Practically every line and trolley pole in the burned area was destroyed and most of the trolley wire was damaged. Service was restored to a portion of the town not in the path of the fire by 10.40 p. m. on the 21st, and by 10.30 a. m. on the 22nd, six hours after the fire had passed, the south end of town was again on the line. At noon on the same day the north part of town was receiving power, and by evening 75 per cent of the town was connected for lighting. Car service was restored on the Barnum line on the 23rd, but on account of a shortage of equipment four single-truck cars were borrowed from the Southern Traction Company of Waco. Construction of a transmission line to connect with the Dallas line will be started within three weeks, and it is expected the work will be completed and the line in



RUINS OF OFFICE AND POWER PLANT OF TEXAS POWER & LIGHT COMPANY

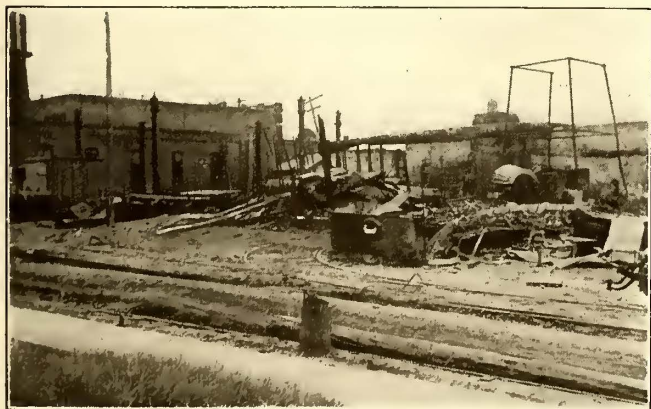
service by Aug. 1. The Diesel plant of the lighting company is furnishing all power for both the Texas Power & Light Company and the Paris Transit Company.

No plans have been perfected as yet for the location of new offices of the companies, but it is expected that these will be located in some office building as soon as such is available for use. Temporary quarters are maintained in a local store which escaped the conflagration. Temporary quarters for the storage of cars have been selected at the amusement park of the company, about 1 mile from town. The shops are located in the basement of a dance pavilion, and several ingenious machines to take the place of the destroyed equipment have been provided. There is a shallow, sandy creek flowing under the tracks on the park grounds, and by removing a few ties and building a floating platform in the bottom this has been turned into a temporary pit. It serves very well, and has already been used for the changing of armatures on a car.

Intensive Safety Work Produces Results

A reduction of 66 per cent in five years in the total number of accidents chargeable to the transportation department is a record of which the Springfield Consolidated Railway Company, Springfield, Ill., may well feel proud. This result is largely attributed to what may be termed intensive safety work among the car crews. The transportation department of this company, after careful consideration, decided that a general safety campaign among the employees and the public through placards, buttons and signs, would not produce results in proportion to the cost of conducting the campaign. It therefore concluded to devote its energies to its employees, and particularly to the car crews. The men were informed of the number of accidents occurring annually and what they cost the company. The men were then urged to be more careful and to caution the public wherever and whenever a person did a dangerous act. At monthly meetings the men were informed of the progress being made, and at all times the service inspectors and the superintendent of transportation gave much attention to the question of safe operation. In addition the spirit of contest was created by posting the monthly accident records made by the various lines.

The results for the past five years of this plan of urging safer operation among the trainmen are as follows: 1269 accidents in 1911; 921 in 1912; 718 in 1913; 565 in 1914, and 430 in 1915. Moreover, the results for the first two months during 1916 indicate that the total number of accidents for this year will be less than those for last year.



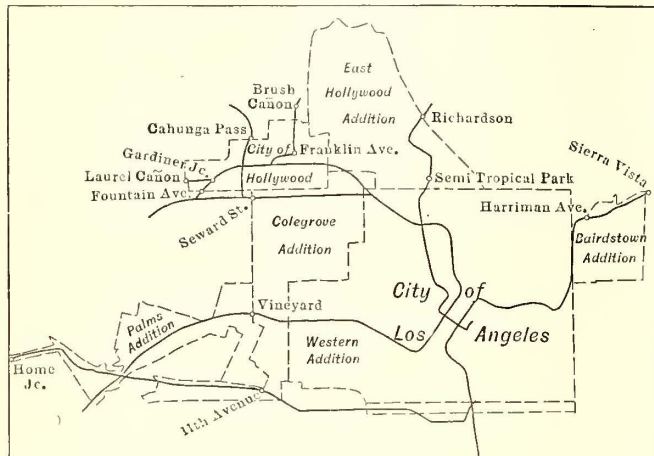
RUINS OF CARHOUSE, PARIS TRANSIT COMPANY

Los Angeles Rate Case

Pacific Electric Railway Protests Against Extension of Five-Cent Limits

ON May 16 the Pacific Electric Railway of Los Angeles will start to put in its defense to the California State Railroad Commission against the contentions of the city for the extension of 5-cent fares to the city limits of annexed districts in Los Angeles. The principle underlying this group of rate cases, which may lead to still further action before the commission, is that the Pacific Electric is not making an adequate return on its investment.

The lines of which the Pacific Electric system is a consolidation were started by individual companies, and their fares were established by different men on different bases. This resulted in inequalities and complaints from residents of communities who thought



MAP OF LOS ANGELES, SHOWING FARE ZONES UNDER DEBATE

they were being discriminated against. The present four cases, combined into one for hearing, were all brought by the city of Los Angeles to compel the company to extend 5-cent fares to the remote boundaries of districts annexed to the city since the fares were originally established. The lines involved are as follows:

Bairdstown line, present 5-cent fare limit, Harriman Avenue, 5.76 miles; limit asked, Sierra Vista, 6.75 miles.

Edendale line, present 5-cent limit, Semi-Tropical Park, 4.23 miles; limit asked, Richardson, 6.40 miles.

Hollywood case: Boulevard line, present 5-cent fare limit, Gardiner Junction, 8.7 miles; limits asked, Fountain Avenue, 9.05 miles, and Laurel Canyon, 9.20 miles; Brush Canyon line, present 5-cent fare limit Franklin Avenue, 7.47 miles; limit asked, Brush Canyon 8.70 miles; Colegrove Cahuenga Pass line, present 5-cent limit, Seward Avenue, 7.35 miles; limit asked, Cahuenga Pass, 9.16 miles.

In the case of Palms the present fares vary from 15 to 25 cents single trip to various parts of the extended district involved. There are offered, however, lower round-trip and very low commutation rates for family and individual tickets. In the Edendale and Palms cases the extended fare limits requested are beyond the present terminus of the local cars.

These figures show that the distances to Gardiner Junction and to Seward Street to which 5-cent fares are at present allowed are greater than other 5-cent fare limits. These distances came through fare extensions not voluntarily made by the company. Under an old charter provision in California a fare greater than 5 cents could not be charged for one continuous trip within a city of 100,000 population or over. When

Hollywood was annexed to Los Angeles, suits were filed for charging more than a 5-cent fare, decision adverse to the company was rendered in the courts and \$250 damages awarded in each case. The company then reduced the fare to 5 cents. Later another district, then outside the city and served for a 10-cent fare, was annexed and similar suits were filed, but the same justice who presided in the former case ruled that the charter provision had been nullified by the later enactment of the State public utilities act. The Pacific Electric possibly could then have restored the former 10-cent fare to Hollywood, but conditions with the company were looking favorable, and in view of the protests which a change would have made the lower rate was allowed to stand. Since then, this has been taken as a basis of comparison to provoke complaints of discrimination in other rates, and if such comparison is made before the commission it will have a tendency to throw the whole system before the commission for a comprehensive rate adjustment and claim for increased fares sufficient to allow a fair return on the investment.

A pertinent point in connection with these matters is that the Pacific Electric Railway Company was incorporated as a railroad and does a general railroad business, passenger and freight. The only difference is that its lines are operated by electricity. While the principal business of the company is suburban business, it also renders a local service over the city portions of its suburban lines. As practically all its traffic is for long hauls the full distance from a suburban point into or out of Los Angeles, it cannot, like the ordinary street railway system, afford to carry the maximum-haul passenger a long distance for the reason that it has not very large numbers of extremely short-haul downtown passengers to balance the revenue expended in hauling passengers to outer terminals.

The transfer matter is involved in this case, as within the 5-cent district of Los Angeles the lines involved issue transfers to other Pacific Electric lines when requested. From the points where the fare is now 10 cents, transfers are not issued. The complaint asks for the transfer privilege along with the 5-cent fare.

Should the matter of discrimination be urged vigorously by the complainants on the basis of comparison of some of the present extended fare limits, it is very much a possibility that the whole Pacific Electric fare situation will go before the Railroad Commission for adjustment, possibly on a mileage basis.

Safety Work in Brooklyn

During the month ended March 31, 1916, which comprised twenty-three school days, Mrs. Katherine D. Larrabee, lecturer for the Bureau of Public Safety, Brooklyn (N. Y.) Rapid Transit System, delivered forty-seven lectures on public safety, six with motion pictures, including the "Cost of Carelessness," and held two conference talks with members of safety patrols and careful clubs. Two night lectures were delivered, one to the children of the Industrial School Association and one under the auspices of the board of education. Lectures were attended by 21,590 children and 883 adults. One new safety patrol and three new careful clubs, consisting respectively of twenty boys and thirty-eight girls, were formed. Thirty-eight patrols and twenty-nine clubs, formed since October, 1915, now have an active membership respectively of 936 boys and 658 girls. One new bulletin board was installed, making a total of 353 boards for which weekly safety material was supplied. Seventy-seven schools, public and parochial, participating in the third annual safety prize essay competition, have submitted essays.

1916 CONVENTION
ATLANTIC CITY
OCTOBER 9 TO 13

ASSOCIATION NEWS

1916 CONVENTION
ATLANTIC CITY
OCTOBER 9 TO 13

Capital Traction Company Section Discusses Paper Making—At Hampton Section Meeting H. H. Norris Discussed "How the Employee Can Help Solve Railway Problems"—Meeting in New Haven

CAPITAL TRACTION SECTION AT WASHINGTON, D. C.

At the meeting of the Capital Traction Company Section No. 8, held in its new quarters in the General Office Building on April 13, the members were initiated into the mysteries of paper making. Through the courtesy of the District of Columbia Paper Manufacturing Company a number of slides and motion pictures were displayed, showing the different steps in the manufacture of paper from the time the stock enters the mill in the shape of wood pulp and old rags until the finished product is turned over to the shipping department. W. W. Langtry of the paper company explained, in a most interesting manner, the process of manufacture, and had on hand a number of exhibits of the stock in the various stages.

Vocal and instrumental numbers for the further entertainment of the section were given by Messrs. Proctor, Wilkinson and Claude. The meeting drew the usual large attendance.

HAMPTON SECTION

The second regular meeting of company section No. 10 was held in Newport News, Va., on April 28, with an attendance of fifty. The speaker was H. H. Norris, associate editor *ELECTRIC RAILWAY JOURNAL*, his topic being "How the Employee Can Help Solve Railway Problems." The problems were outlined and illustrated, the speaker first mentioning some of the reasons for the difficulties encountered in conducting the transportation business. These were that the public does not understand the transportation business, that public and employees are apt to believe that large capital necessarily produces large profits, and that employees do not fully realize the nature of the problems which the management has to solve. The difficulties involved in the business require administrative and technical talent of a high order. Mr. Norris divided railway problems into two classes, external and internal. Among external problems were: Getting the public to understand what good service is and what it owes to the railways, getting capital for extensions and securing franchises for the use of the streets under reasonable terms. Among internal problems the increasing difficulty of giving good service with the available resources was stated to be the real problem. To illustrate what this means, the speaker contrasted street railway service with what it was twenty-five years ago. During this period the nickel has lost purchasing power in most of the necessities of life, but has gained it as regards transportation. The better transportation which the nickel can now purchase involves heavier cars with more power, better lighting and heating, better sanitation, etc.

In meeting external and internal problems it is necessary that the employee should have first an intelligent grasp of the facts. Then as he comes in contact with the public he is prepared to explain circumstances which seem to require explanation. In the second place, by courteous treatment of the public he can cultivate a reasonable attitude toward the corporation. Finally, by co-operation with the management he can save money for his employer by careful use of materials, energy and time, and by suggesting improvements in details of construction and operation.

After the address, which was designed to stimulate discussion, the members of the section discussed for an hour the points raised and applied them to local conditions. The secretary read a letter from President Charles L. Henry, tentatively accepting an invitation to address the section and suggesting the date May 12. He also reported for the program committee that a list of topics had been compiled for circulation among the members, who are to check off their choices. The popular topics will be assigned to experts for consideration and report. At an early meeting R. M. Booker, secretary Newport News & Hampton Railway, Gas & Electric Company, will explain the history of the local company and furnish the members of the section with data regarding its operation.

CONNECTICUT SECTION

A meeting of the section of the Connecticut Company was held in New Haven on May 2. A talk was given by C. W. Stocks of the New York office of the association, on the development of generating systems for electric railways.

Life-Testing of Incandescent Lamps at Bureau of Standards

The lamps purchased by the federal government, amounting to about 1,250,000 annually, are inspected and tested by the Bureau of Standards, Department of Commerce. The specifications under which these lamps are tested are published by the bureau and are recognized as standard by the manufacturers as well as by the government. They are used also by many other purchasers of lamps. The lamps are first inspected for mechanical and physical defects, this being done at the factory by bureau inspectors. Representative samples are selected and sent to the bureau, where they are burned on life-test at a specified efficiency at which they must give a certain number of hours life, depending upon the kind of lamp. About 5000 lamps are thus burned on test each year. For this test great care must be taken in the measurement of the lamps and in the adjustment and regulation of the life-test voltage.

Scientific Paper No. 265, just issued by the bureau, gives a complete description of the special apparatus and of the methods used in these inspections and tests. Copies of the publication may be obtained free upon application to the Bureau of Standards, Washington, D. C.

The *New York Journal of Commerce* has prepared a tabulation showing that electric railways in the United States will have to take care of \$215,353,600 of maturing securities during 1916, 1917 and 1918. This total is divided \$56,175,000 for bonds and \$159,178,600 for notes. The maturities for each of these three years are as follows: 1916—bonds, \$20,616,000; notes, \$59,959,100; 1917—bonds, \$8,872,000; notes, \$27,091,000; 1918—bonds, \$26,687,000; notes, \$72,128,500. In view of the large amount of notes maturing in 1916, the amount of maturities in the last two years may be appreciably increased on account of further short-term financing during 1916.

EQUIPMENT AND ITS MAINTENANCE

Short Descriptions of Labor, Mechanical and Electrical Practices
in Every Department of Electric Railroading

Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.

Special Track Layouts Made Interchangeable

BY BURR S. WATTERS

Assistant Engineer of Way Columbus Railway, Power & Light
Company, Columbus, Ohio

Special track layouts have been standardized by the Columbus Railway, Power & Light Company, Columbus, Ohio, so that pieces may be interchangeable. At the same time, the work of designing a layout has been greatly simplified. In 1909 the writer, under the direction of E. O. Ackerman, engineer of way, worked out a system of proposed standard track layouts. The widths of the various streets at which the company might be required at some time to lay grand unions were measured, and with these data satisfactory layouts for the various locations were designed.

On account of the differences in street widths it was found that at least four layouts would be required. These four layouts were made by using the William Wharton, Jr., & Company's standard tongue-switch transitions, with a switch of 100-ft. inside radius. They were so designed that by using a 12-ft. switch piece, the toe of the switch piece for the inside curve came at the heel of the switch for the outside curve. These layouts were used until, in 1911, the American Electric Railway Engineering Association adopted, as recommended practice, fixed lengths and radii for switch pieces. In order to conform to the association standard we redrafted our designs for grand unions and used switches of standard recommended length but with a 97-ft. 7½-in. radius. These were so designed that the tangent point of the inside curve was 12 ft. from the tangent point of the outside curve. This fixed the toe of the switch for the inside curve at the heel of the switch for the outside curve, which conformed to our original proposed standards.

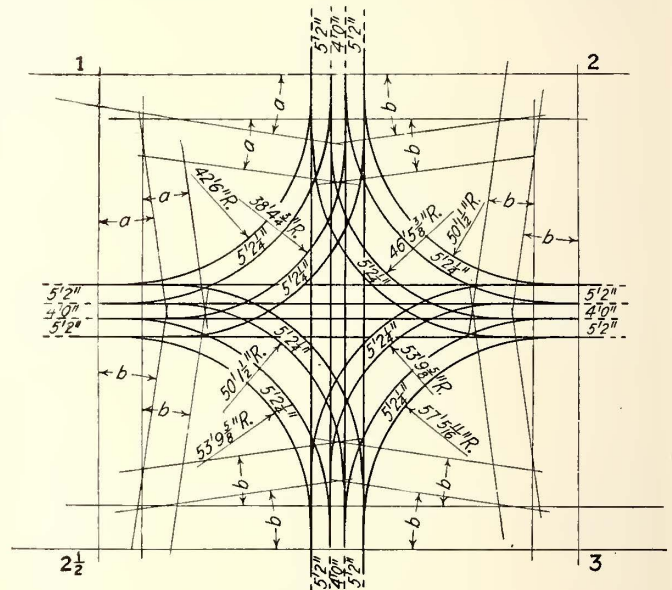
Engineering data for these are shown in the four quadrants of the accompanying layout. The grand unions were all calculated by assuming that the intersection angle was 90 deg., but of course when the angle was different some modification was required. When changes are necessary it is our practice to hold to the standard designs through the frog arms as far as possible, and to meet any condition by compounding the remainder of the curve.

These four standard plans include six layouts for a single-track curve, four layouts for a double-track curve, six layouts for a single-track left-hand or right-hand turnout, four layouts for a double-track left-hand or right-hand turnout, four layouts for a double-track Y, four layouts for a double-track through Y, and many others. We have found that these layouts will fit practically all of the conditions that have been encountered in Columbus. We have made the external arms of all frogs 4 ft., and the lengths of the internal arms of all frogs are fixed, as far as possible, at the length they would have in a grand union of the same design.

Owing to the fact that the track gage in Columbus is 5 ft. 2 in. and the width of the devil strip is 4 ft., we have not been able to adopt, to any great extent, the recommended frogs of the A. E. R. E. A. In the

design of the layouts, car clearance has not been considered because there were a number of places on the system where it was practically impossible to obtain sufficient clearance. Moreover, car designs are constantly changing so that the curve that gives car clearance to-day will not take care of the car of to-morrow.

It will be noted that the radius of the inside curve indicated as layout No. 2 is the same as that of the outside curve in layout No. 2½. The radius of the inside curve in layout No. 2½ is also the same as the radius of the outside curve in layout No. 3. This, of course, materially cuts down the number of standard frogs. All switches and mates in these layouts are either right-hand or left-hand, of 100-ft. radius and 12 ft. long. All crossovers are made of a standard design by using switch pieces of 97-ft. 7½-in. radius and a frog angle of 12 deg. 45 min. Equilateral turn-



COLUMBUS RAILWAY STANDARD GRAND UNION

outs have been separated into two classes, one for a running switch, which has switch pieces of 347-ft. 7½-in. radius and a frog angle of 4 deg. 46 min., and one for a turnout at the end of the line, which has switch pieces of 197-ft. 7½-in. radius and a frog angle of 5 deg. 42 min. and 30 sec.

As to the value of these standards, we cannot say that we have been able to obtain a better price from the special-work manufacturers, but we do not see why we should not receive a reduction for pattern charges. We have, however, been able to obtain much better deliveries. For instance, we were able to obtain three complete double-track through Y's, with solid manganese switch pieces, in four weeks. This delivery was made possible owing, in part, to the fact that the general features of this layout were very much the same as a double-track Y, which we had previously ordered from the same manufacturer. Furthermore, these standards greatly facilitate the laying out of special work for a new location. Instead of spending much time in trying to obtain the best possible design, the

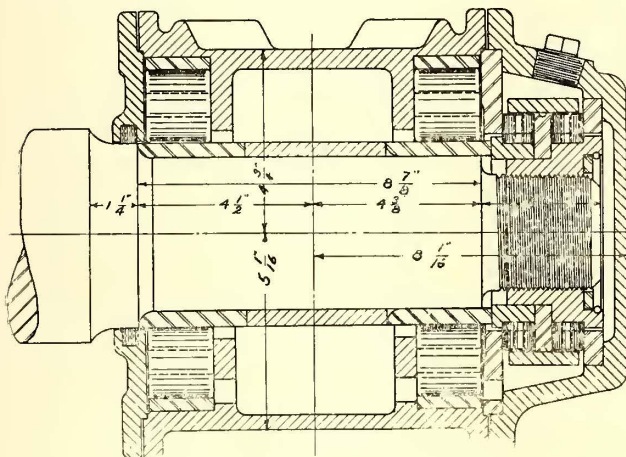
problem simplifies itself into determining which of the standard designs best fits the conditions imposed. These standards are also valuable because most of the pieces are interchangeable. This permits a certain number of pieces to be carried in stock, thus eliminating delays that occasionally occur in emergencies. After all these advantages are taken into consideration and our experience with these standard layouts during the past five years, we feel very well repaid for our work in preparing standards, and we know that we are in a much better position for making original layouts or renewals than we were before their adoption.

Results Obtained with Roller Bearings on Interurban Cars

BY W. B. VOTH AND A. C. METCALFE

Respectively Chief Engineer and Master Mechanic Empire United Railways, Inc., Syracuse, N. Y.

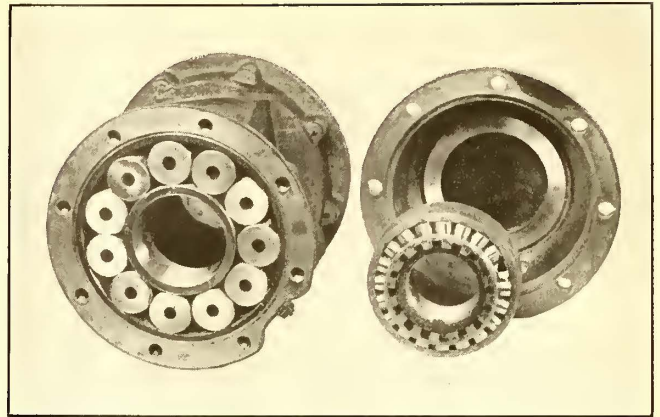
Never in the history of the electric railway industry has the necessity for economy been emphasized as it has been within the past year or two, when gross receipts have been falling off at an alarming rate and material and labor costs have continually increased. That the need for economy is realized is indicated by the numerous and heroic efforts which are being made to introduce economies in directions where it has hereto-



CROSS-SECTION OF ROLLER BEARING

fore been thought impossible to improve. Evidence of this is shown by the increasing use of very light equipment, and by the very rapid adoption of every device known to decrease operating expenses. As a matter of fact, there is not a single item tending to produce lower cost which will not get instant and respectful hearing by any electric railway manager, a situation which did not prevail a year or two ago. The revival of general business and the easing of money credits have made it possible for electric railways to finance improvements which could not have been thought of until very recently.

There have now been commercially developed several makes of roller and ball bearings, and it is most likely that these devices will do more to introduce economy in the costs of electric railway operation than almost any other device. There are many operating officials who have been surprised to find that the elimination of journal friction has not only saved power, but has resulted in increased speed and greater safety, and has almost wiped out journal bearing and maintenance charges. These anti-friction bearings have been improved greatly since they were first brought out five or six years ago, and our experience has convinced us that if they are as reliable and economical as found so far, it will be profitable to continue their use.



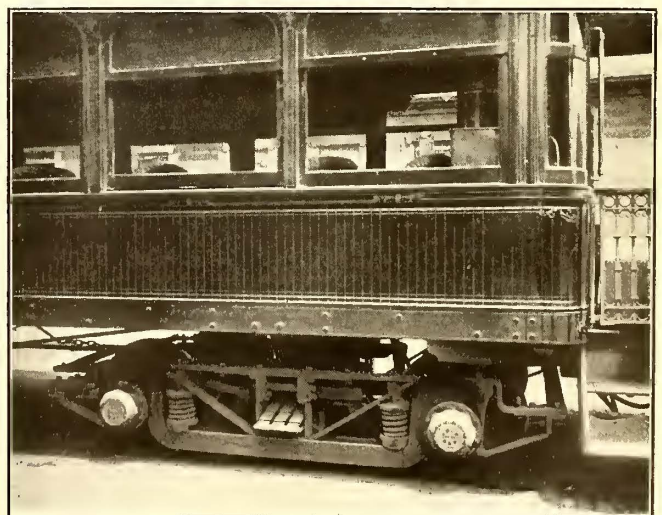
PARTS OF ROLLER BEARING

This company has recently been conducting tests of roller bearings, made by the Railway Roller Bearing Company of Syracuse, N. Y., on motor and trail cars. The results are given in the following paragraphs:

The motor car tested was of the double-truck type, weighing about 70,000 lb. It was equipped with four motors, the length over bumpers was 49 ft. 5 1/2 in., and the diameter of axle was 5 1/2 in. The trailers were 49 ft. over couplers, were equipped with Peckham Type-36-B trucks, and also had axles 5 1/2 in. in diameter.

The two trailers were parlor cars, known as the "Syracuse" and "Newark." The "Syracuse" is used in limited service seven days of the week between Syracuse and Rochester, and makes a little more than 100,000 miles per year. The total distance between terminals is 86.29 miles and the scheduled time is two hours and forty minutes. The schedule allows approximately fifteen stops, and necessitates a free running speed of between 62 and 65 m.p.h. The bearings are oiled about every 40,000 car-miles with car oil, one quart of oil being used for each bearing. With oil at 20 cents per gallon and labor at 20 cents per hour, the cost of labor and oil is 1 1/2 cents per 1000 car-miles.

The "Syracuse" has caused no trouble since it was put in operation, but has had several pull-ins on account of snow or weather conditions. When this car was operated with the plain journal bearings it was not possible to make the scheduled time. However, since the roller bearings have been installed the car has been able to make the running time. The "Newark" has had one pull-in on account of a broken drawhead, but at no time has this or the other car been pulled in on account of bearing trouble.



VIEW OF TRUCK EQUIPPED WITH ROLLER BEARINGS

TABLE I.—ENERGY AND LUBRICATION COSTS—PLAIN AND ROLLER BEARINGS, CAR WEIGHT, 70,000 LB.

	Plain Bearings	Roller Bearings
Annual mileage	103,446	103,446
Energy consumption, kilowatt-hours	372,405	327,717
Energy cost, at 1 cent per kilowatt-hour	\$3,724.05	\$3,277.17
Cost of oil	10.35	1.04
Cost of waste	4.14	....
Cost of reababbiting, labor and material	10.36	....
Cost of labor for oiling	8.27	0.52
Cost of labor replacing oil every 1000 miles	3.11	....
Total annual cost	\$3,760.28	\$3,278.73
Difference in annual saving, \$481.45 or 12.8 per cent.		

TABLE II.—TOTAL ANNUAL EXPENSE, PLAIN AND ROLLER BEARINGS

	Plain Bearings	Roller Bearings
Total cost of bearing equipment	\$96.00	\$434.00
Interest at 5 per cent	4.80	21.70
Depreciation based on life of ten years	0.96	43.40
Cost of lubrication	10.25	0.96
Maintenance, including renewals	25.88	....
Maintenance	....	0.32
Total annual cost	\$41.99	\$66.66

In testing the operation of the above cars, the readings of energy consumed were taken on the car with a watt-hour meter read weekly over a long period. The car was run over the same road, and with the same schedule as another car of the same weight equipped with plain bearings. Starting tests were also made with a dynamometer connected between two cars of similar type and weight. The results of the tests are given in Tables I and II, which also contain the results reduced to total annual expense for operation, including all factors necessary for comparison between roller and plain bearings.

The average results for all service and weather conditions showed that the car equipped with roller bearings consumed 11.8 per cent less power than the one equipped with plain bearings. The starting test showed that the car equipped with plain bearings required 612.3 lb. to start it, while the one equipped with roller bearings required 408.1 lb. That is, the lower starting effort reduced the demand from friction approximately 33 1/3 per cent.

Since our power as paid for is measured at the a.c. high-tension side of the substation, we really should calculate the saving on the a.c. side. Our tests, however, were made with the meter on the car. To allow for the losses between the a.c. side of the substation and car we estimated the cost at the car to be 1 cent per kilowatt-hour corresponding to 7 mills on the a.c. side.

From the tables it is evident that the total annual expense of roller bearing equipment exceeds that for plain bearings by \$66.66—\$41.99, or \$24.67. As the annual saving in energy with roller bearings is \$446.88, the total net annual saving is \$422.21. Capitalizing the saving on a 5-per cent basis shows that it is equivalent to a capital charge of \$8,444.20. From this it can be seen that the roller bearings, in this case, will pay for themselves in about one and a half years with the mileage as operated. If the general adoption of roller bearings is contemplated, it will require a somewhat greater investment for extra axles, if such are kept for making

axle changes, because equipments with roller bearings are not interchangeable with plain axles. This additional investment, however, can be kept very small.

Summing up the situation in regard to roller bearings, some of the advantages of their use may be enumerated as follows: Decrease of power, especially at peaks and during acceleration; more coasting; low lubrication and maintenance costs; reduced axle fractures; reduced pull-ins; fewer cars needed, reducing the investment, and possible adoption of smaller motors and, therefore, less waste.

The reduced energy demand means, in addition, less wear on trolley wire and trolley wheels. With bearings of the anti-friction type, the axles are kept in the exact alignment, while with plain bearings there is considerable lost motion due to journal brass movement in the journal boxes, and to the ends of the journal being pushed to one side of the journal brass. With the anti-friction bearings there is also a reduction in brakeshoe and wheel wear. A car equipped with these bearings will coast further than one with plain bearings and will accelerate at a higher rate with the same current.

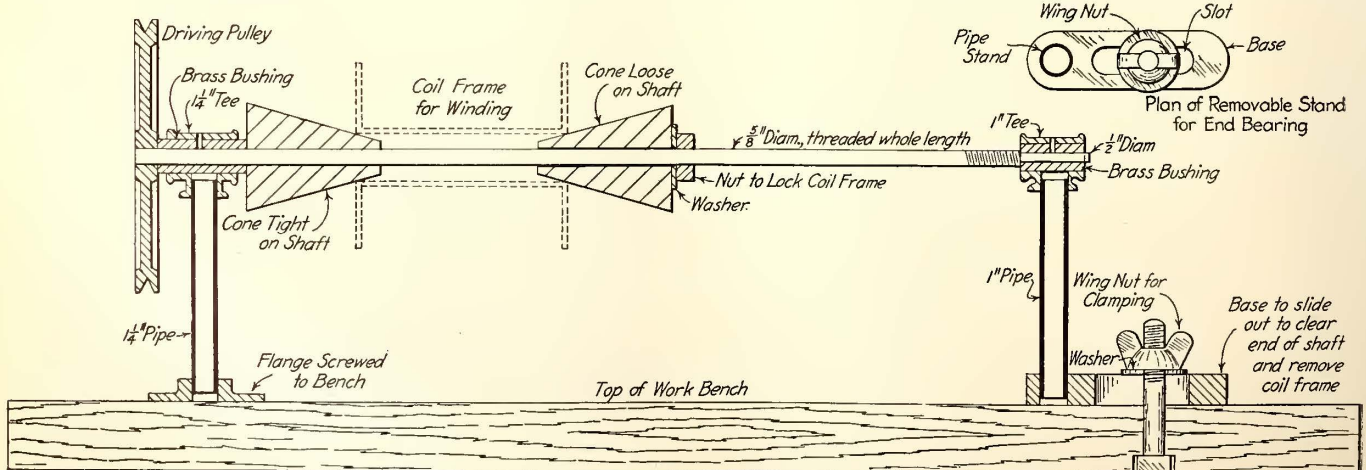
In a recent paper there was a statement that a certain automobile touring car was driven 260,000 miles, and that after this mileage had been made the roller bearings with which it was equipped were still in good condition. It would seem, therefore, that an electric car should have at least three or four times the life of an automobile, and since the average life of an automobile to-day is estimated at three years, roller bearings on an interurban car should last until the end of the useful life of the car.

Universal Coil Winding Machine

BY G. R. W. ROBERTS

General Foreman Electric Car Equipment Southern Pacific Company, Beaverton, Ore.

Many electric roads use a great number of straight wound coils in their multiple unit equipment for relays and other apparatus. As these are at all times liable to be burned out, means must be provided to rewind them quickly and cheaply. A supply of the various sizes of wire with which they are wound can always

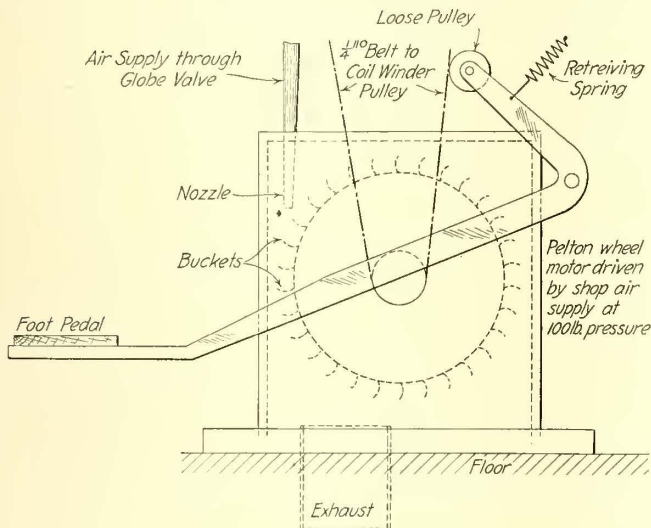


UNIVERSAL COIL-WINDING MACHINE—SHAFT, BEARINGS, SUPPORTING CONES, ETC.

be kept in stock, and whenever one burns out it is a matter of only a few hours to make repairs with a machine like the one illustrated herewith. The construction is very simple and the device can be made from fittings and other material to be found around any car shops.

The shaft of the machine is $\frac{5}{8}$ in. in diameter by 24 in. long. It is threaded for two-thirds of its length and turned down at one end to $\frac{1}{2}$ -in. in diameter for the end bearing. A $1\frac{1}{4}$ -in. T can be used for the main bearing by boring it out and bushing it with brass. On the driving end of the shaft is mounted a grooved pulley for a $\frac{1}{4}$ -in. round belt. Two cones, with about 30 per cent taper, the big ends being about 2 in. in diameter, are provided to hold the coil frames or spools. The cone next the driving wheel is solid on the shaft, while the other slides easily over its threaded portion. By tightening the nut the coil spool is held secured for winding. The end bearing is made so that the stand for it can be slipped off the end of the shaft to clear the spools when they are to be put on or removed.

With this machine the smallest relay coil can be wound and it is adaptable for any of the straight-wound



UNIVERSAL COIL-WINDING MACHINE—AIR MOTOR AND AUXILIARIES

coils used for contactors, reversers or circuit breakers. It will also take the long porcelain tubes used on head-light resistances. For driving it, a Pelton water wheel about 9 in. in diameter using air instead of water from the shop air system, furnishes a cheap and efficient motor, and it is easily constructed. A hardwood box, large enough to contain the wheel and having two bearings mounted at each side, a regular nozzle and an exhaust pipe, is all that is required. The air is controlled by a globe valve handy for the operator. For stopping and starting the winder an idler pulley mounted on a bracket and having a foot pedal retrieved by a spring bears on the belt and makes the machine easy of control. We have found that this machine has saved us many times over its cost in reducing the time required to rewind our exceptionally great number of coils, owing to our double operation on 1500 and 600 volts.

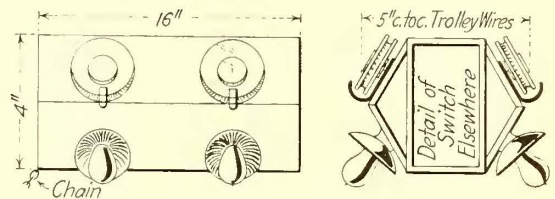
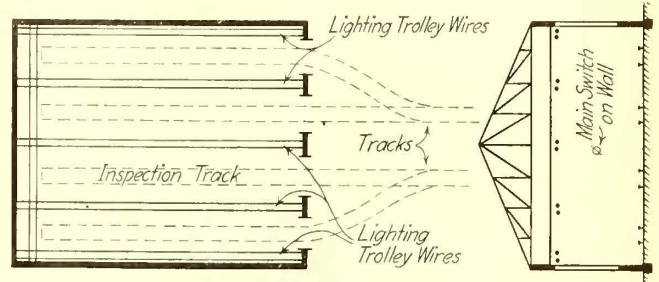
According to the *Tramway and Railway World*, the Moscow (Russia) Council will shortly consider a proposal to add to Moscow Tramway's rolling stock and to make an extension of the systems. New workshops are to be built, and the total cost is expected to exceed \$515,000. The town executive committee proposes that the Council should buy American cars on the instalment plan, to the extent of 100 motor cars and 150 trailers.

A Lamp Trolley for the Inspection Shop

BY A. OTTO REINKE
East St. Louis, Ill.

In the issue of the *ELECTRIC RAILWAY JOURNAL* for Feb. 26, 1916, appeared an article on "A Trolley Lighting Scheme for the Paint Shop," which brought to the mind of the writer a similar installation made several years ago in an inspection shop of a small interurban road in southern France.

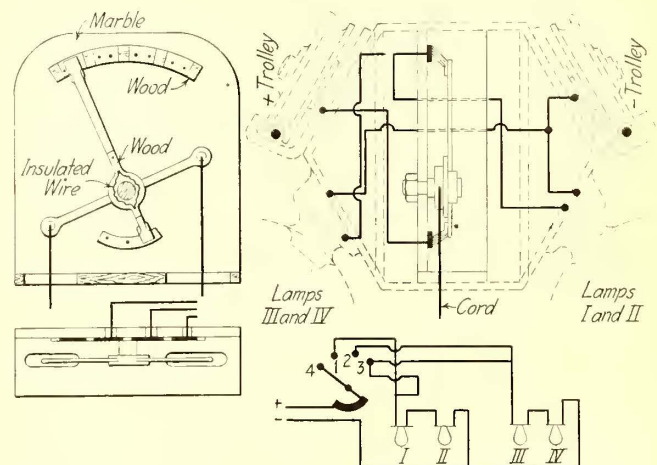
The inspection shop was used for repairing large interurban cars of the 600-volt d.c. type, and contained



PLAN AND ELEVATION OF INSPECTION SHOP AND LAMP TROLLEY

four tracks, having a total capacity of sixteen cars. Between adjacent tracks and along the side walls were spanned two No. 4 steel trolley wires, used for the positive and negative leads of the lamp circuit, a total of five pairs of wires. In order to get a good lighting arrangement of the car platform, an additional span of wires was strung parallel to the rear wall, while in the front of the building two ordinary lamps were mounted on each door post. A switch on the rear wall controlled all the lights.

The lamp trolley, as shown, was hexagonal in form



SERIAL SWITCH, DETAIL AND DIAGRAM OF LAMP TROLLEY

and constructed of $\frac{1}{2}$ -in. boards. The wheels which engaged the trolley wires were attached on the upper sides, and four lamps, two on each side, were mounted below.

Inside of the lamp trolley and operated by two cords from the ground was a serial switch with four contacts

which functioned as follows: Steps 1, 2 and 3 closed circuits respectively through the two lamps on the left side, two lamps on the right side and all four lamps on both sides, while the step 4 cut out all of the lamps. The voltage on the lighting circuits was 220, and the lamps were of the 60-watt, 110-volt type arranged as above. By means of the serial switch either side of the track or shops could be lighted if necessary. The construction of all the lamp trolleys were the same, with the exception of the two along the wall, which were equipped with lamps only on the track side. An insulated chain was attached to the lamp trolley so that the car could be pulled along and used wherever needed.

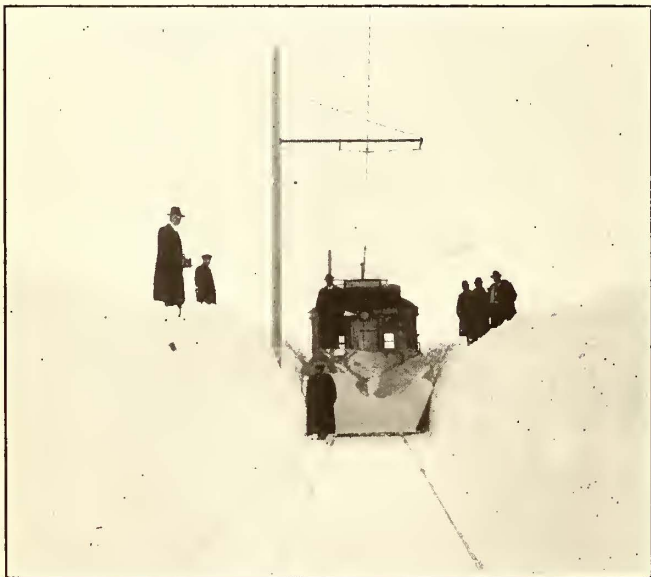
Emergency Snow-Fighting Equipment in Western Canada

BY F. D. ARCHIBALD

Superintendent Saskatoon Municipal Railway, Saskatchewan, Canada

The accompanying illustration shows the snowplow hastily devised by the Saskatoon Municipal Railway to clear its tracks after a recent snowstorm.

During the month of March, western Canada was visited by snowstorms of exceptional severity with continuous high winds. During the week ending March 25 the high wind, which did not diminish for four days, kept the snow sweeper of the railway working day and night, and the snowdrifts on the suburban line 5 miles across



EMERGENCY DETACHABLE SNOWPLOW ON SASKATOON MUNICIPAL RAILWAY

the prairie to Sutherland formed so quickly that the sweeper could not contend with them. As an experiment a snowplow was hastily constructed in the railway repair shop, to be attached to the front of a double-track car, and this was finished by three men in eighteen hours.

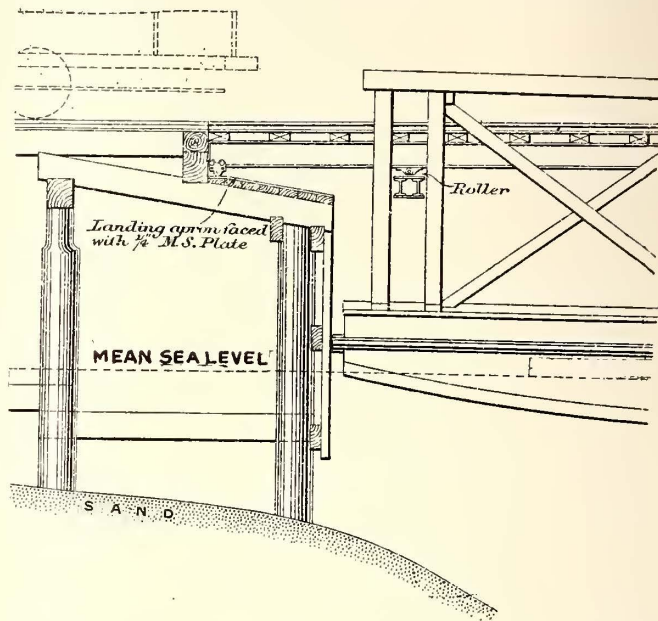
Owing to a dip in a subway the plow had to be taken out on a handcar and attached to the double-track car on the road. It plowed through about 1 mile of snowdrifts ranging from 3 ft. to 12 ft. high between the hours of 9 p. m. and 6 a. m. the next morning, at which time service was resumed.

The Genoa (Italy) City Council has approved of a plan for the electrification of the Genoa-Ovada Railway, at present operated by steam. The electrification is made necessary by congestion of traffic from Genoa.

Car Ferry in New South Wales

A ferryboat, built especially to carry trolley cars, is now in service in the harbor of Sydney, New South Wales. The following short account and illustrations are taken from a paper presented before the Institution of Civil Engineers, London, by John Job Crew Bradfield, M.E., M.I.C.E.

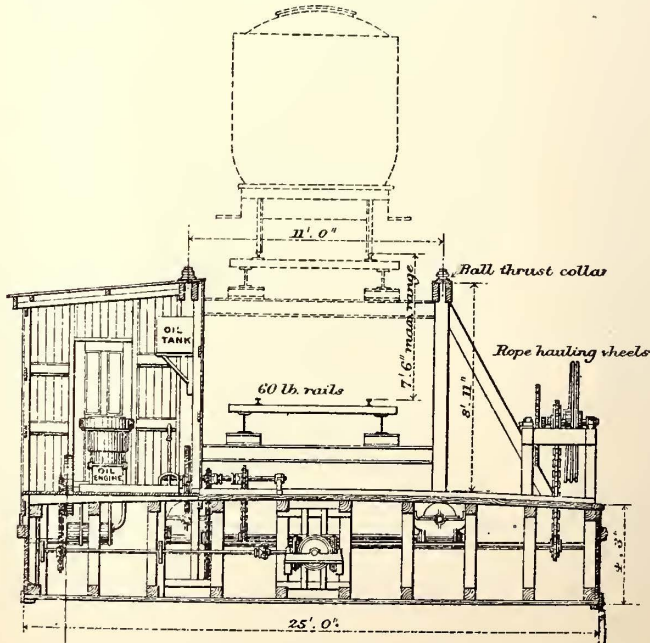
The boat, which is capable of carrying two tramcars or two loaded trucks, is 75 ft. long over perpendiculars,



LONGITUDINAL SECTION OF WHARF AND FRONT OF BOAT

or 86 ft. long over ends of movable platforms. The beam is 25 ft., the depth is 4 ft. 3 in., and the draft, light, is 1 ft. 8½ in., and with 42 tons is about 2 ft. 6 in. The movable platform has a vertical range of 7 ft. 6 in., which is sufficient to provide for tidal variations.

The width of the water crossed is 800 ft. A 20-hp. oil engine operates the boat, which is hauled across this distance at a rate of 3 m.p.h. by a 2½-in. galvanized crucible steel wire rope. The oil engine drives a countershaft 2½ in. in diameter through a Morse chain re-



CROSS-SECTION OF FERRYBOAT

duction gearing, and by use of similar gears drives a rope wheel 5 ft. in diameter.

The platform which carries the tracks is adjustable in height by twelve screws, six on each side. It is constructed of steel rolled joists. The ties and rails are supported by these joists, which are spaced every 6 ft. The end of the platform projects beyond the end of the boat, so as to rest on the wharf when rolling stock is being run on or off, and at a distance of 22 ft. from each end the platform is hinged. The countershaft which is 2½ in. in diameter, through a Hercules chain gear drives a cross-shaft 2 in. in diameter with worm gearing, placed amidship. The worm gearing drives two longitudinal shafts 2½ in. in diameter, one under each set of lifting screws. These shafts drive the screws by beveled gearing. The shaft and lifting screws each have two jaw clutches, which can be operated independently by means of which the end portion of the shaft operating the end screws can be disengaged from the central portions of the shafts.

When the ferryboat is nearing the wharf, the hinged end of the platform, which is provided with end rollers, lands upon the apron of the wharf. The alignment of the platform rails and wharf rails is made automatically. An automatic locking lever is also provided, which drops into place as soon as the rail ends meet, locking the platform to the wharf.

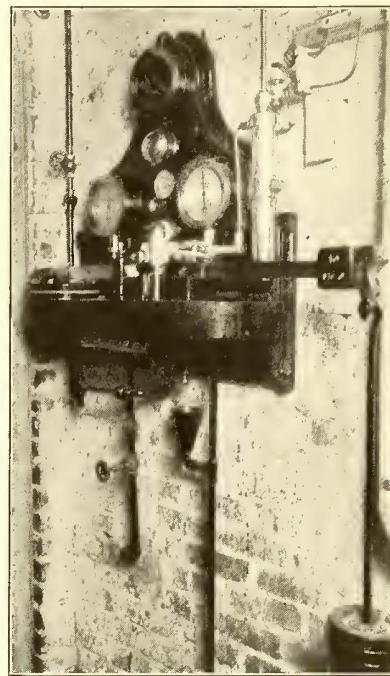
Damper Regulator Test

Automatic regulation of the damper and stoker feed in the steam generating plant of the Chicago, Lake Shore & South Bend Railway Company, Michigan City, Ind., has reduced the quantity of coal consumed between 8 and 10 per cent for the past three years. A McDonough automatic stoker and damper regulator performs this service, and, at the same time, makes it possible to maintain a more uniform steam pressure since it responds to sudden fluctuations in load more readily than has been found possible with hand regulation. The mechanical features of this regulator were described on page 791 of the ELECTRIC RAILWAY JOURNAL for April 22. On a basis of 8 per cent saving at this plant, where the coal consumption averages 150 tons

daily, and the average price of coal is \$1.70 per ton, the total annual saving is about \$7,500.

Recently one of these automatic damper regulators has been installed in the Hatfield generating station of the Evansville

Company, Evansville, Ind. The regulator installation in this plant is shown in one of the accompanying illustrations. To show graphically the effect of the regulator in and out of service in a small plant equipped with hand-fired boilers and natural draft, two charts are shown in the accompanying illustration. One of these is a twenty-four-hour record of steam pressure with the damper in service, and the other is a record for a similar period with the damper disconnected. While the contrast is marked, it is not unusually so, because the hand firing has been exceptionally well done. In this installation the damper regulator automatically controls the main damper and when pressure falls below a predetermined limit an alarm bell signals the fireman that his fires require attention.



REGULATOR IN POSITION

The Paducah (Ky.) Traction Company and the Paducah Light & Power Company have inaugurated a joint safety-first campaign, which will be in charge of four committees that have been selected from among the employees of the company.

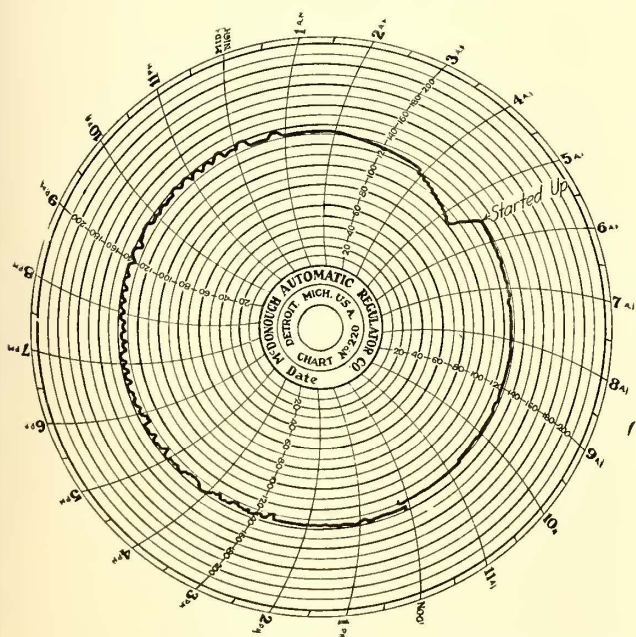


CHART OF STEAM PRESSURE WITH DAMPER REGULATOR IN SERVICE

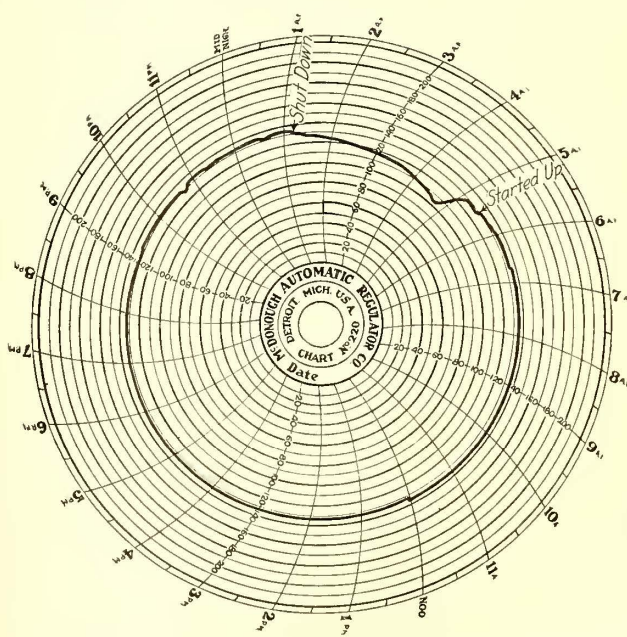


CHART OF STEAM PRESSURE WITH DAMPER REGULATOR OUT OF SERVICE

Electric Railway Legal Decisions

Charters, Ordinances, Franchises

INDIANA.—*Deed to Right-of-Way with Grantor's Covenant to Maintain Fence—Injury to Stock—Liability.*

The owner of land granted a right-of-way to defendant interurban company in 1901 with a covenant in the deed whereby the company was to fence the right-of-way and the grantor to maintain the fence. The grantor subsequently sold the land to plaintiff's lessor. The fence became out of repair, whereby plaintiff's cattle strayed on the track and were injured by a car. Held, that defendant was not liable for failure to maintain the fence, since there is no duty on interurban companies to maintain fences, except as imposed by Burns' Ann. St. 1914, Sec. 5707, which excepts existing contracts. (Union Traction Company of Indiana v. Thompson, 111 Northeastern Rep., 648.)

INDIANA.—*Passengers Who Lose Tickets Must Pay Fare.*

A rule of an interurban railroad company, that a ticket entitling a passenger to transportation shall be presented to the conductor on proper request, and if, through carelessness, inadvertence or casualty, the ticket has been lost, the legal fare may be exacted, is reasonable, and if the passenger does not produce and surrender a ticket or pay the fare, he may be ejected. (Union Traction Co. of Indiana v. Vestal, 110 Northeastern Rep., 211.)

IOWA.—*Definition of "Flooring" as Applied to Bridges.*

Under Code Supp, 1913, Sec. 1056A44, requiring that the owner of any street railway using any bridge within a city shall construct, reconstruct and repair the flooring of the bridge 3½ ft. each way from the center line of the space between the rails, a railway company was obligated, within the limits prescribed by the statute, to pay a special assessment levied against it by the city for the cost of reconstructing and repairing, not merely the planked surface on which its tracks were laid over a bridge, but also the stringers, joists and supporting timbers laid on a steel structure. The word "flooring" as used in the statute means more than "planked surface." (Cedar Rapids & Marion City Ry. v. City of Cedar Rapids, 155 Northwestern Rep., 842.)

LOUISIANA.—*Eminent Domain—Value of Property to Date from Filing of Expropriation Suit.*

Where a railway company has appropriated a tract of low vacant land and has improved it by filling and raising the level of the ground and by constructing valuable buildings upon it, and thereafter the railway company sues to expropriate the property, the value of the land is to be taken as of the date of filing the expropriation suit, without regard for the buildings constructed by the railway company. (New Orleans Railway & Light Co. v. Lavergne et al., 70 Southern Rep., 921.)

NEW JERSEY.—*Change in Location of Tracks by Freeholders.*

P. L. 1902, page 566, directing the boards of freeholders of two or more counties in which a plank road and bridge of a company whose charter had expired lay to acquire, maintain and operate such road and bridge at joint expense, does not authorize such boards to change, against the will of a street railroad operating over such a plank road, the location of its tracks. (Public Service Ry. et al. v. Board of Chosen Freeholders of Hudson and Essex counties, 96 Atlantic Rep., 98.)

PENNSYLVANIA.—*Payment for Partial Performance of Contract to Furnish Electric Power.*

A contract between an electric company and a traction company required the latter to pay a certain charge per year "based on ample power to operate not more than three double-truck cars at any one time," and it refused to pay, claiming that the power furnished was insufficient. The electric company then refused to furnish further power, until required to do so by injunction. The traction company then objected to being required to pay for the period while the power was not satisfactorily furnished, and the electric company claimed the full contract price. Held, that the court properly awarded defendant the contract price less an

amount necessarily expended by plaintiff in procuring extra power. (Irwin-Herminie Traction Co. v. West Penn Traction Co., 96 Atlantic Rep., 719.)

TENNESSEE.—*Operation of Jitneys Can Be Enjoined by Railway Company.*

Where, under an act of the Legislature, municipalities are authorized to regulate by ordinance, subject to the statute, the operation of jitney buses as common carriers, and the City Council fails to regulate, a street railway company can have the operation of jitneys enjoined.

Relief by an injunction against a nuisance by which the highway is obstructed need not be sought by an abutting owner, but may be had by any individual who can show special damage to himself. (Memphis Street Railway v. Rapid Transit Co. et al., 179 Southwestern Rep., 636.)

UTAH.—*Spur Track to Carhouse—Construction—Public Use.*

Carhouses of a railroad company necessary for the convenient and economical handling of its cars and electric locomotive and the care and repair thereof are a necessary part of the company's property as a common carrier, and a way to its carhouses is a necessity as a common carrier. (Whitmeyer v. Salt Lake & Ogden Railway, 151 Pacific Rep., 48.)

VIRGINIA.—*Reservation in Deed—Lapse of Interest.*

The owner of a large farm sold the property, reserving the family burying ground, occupying about one-fourth of an acre, with the right of free ingress and egress. Subsequently the only bodies buried were removed with the consent of the grantees. Held, that the burying ground did not belong absolutely to the grantor, but he was merely entitled to use it for the specified purpose, and, having abandoned, could not grant the land with the right of ingress and egress to third persons. (Bradley v. Virginia Railway & Power Co., 87 Southeastern Rep., 721.)

WASHINGTON.—*Rates for Surplus Power Sold by Traction Company—Not Subject to Regulation.*

Under the public service commission law (Sess. Laws 1911, page 543), providing that the commission shall ascertain the probable earning capacity of each public service company under the rates now charged, the commission cannot compel a traction company to disclose its private contracts for the sale of its surplus power to private enterprises, since "rate" means a charge to the public for a service open to all and upon the same terms, and not a consideration of a private contract in which the public has no interest. (State ex rel. Public Service Commission of Washington v. Spokane & Inland Empire Railroad, 154 Pacific Rep., 1110.)

Liability for Negligence

ALABAMA.—*Wagons Suddenly Crossing Track.*

The presence of a wagon being driven along a street beside a street railway is not an indication that it is apt to turn onto the track so as to require the motorman to slacken speed in anticipation of such a move. (Hilton v. Birmingham Railway, Light & Power Co., 68 Southern Rep., 343.)

CALIFORNIA.—*Company Liable for Injuries to Passenger Riding on Running Board.*

Where a passenger on the running board was injured in a collision between two cars in broad daylight, the railroad was guilty of negligence, since, if a passenger, on account of the crowded condition of a street car, takes up his position on a side step or platform, he voluntarily assumes the natural and obvious risks attending his position, but the company, in accepting his fare with knowledge of the increased danger of his position, is under greater obligation to use greater precautions in the operation of the car for his protection. (Kelly v. Santa Barbara Consolidated Ry., 153 Pacific Rep., 903.)

INDIANA.—*Master and Servant—Assumption of Risk.*

If a lineman is required by his contract to make an inspection of the poles, etc., he cannot recover for injuries resulting from his failure to inspect properly. (Walling v. Terre Haute, Indianapolis & Eastern Traction Co., 111 Northeastern Rep., 198.)

INDIANA.—*Failure to Protect Passenger from Assault and Robbery.*

Where a passenger was assaulted and robbed of his pocketbook, in the presence and view of the conductor, who failed to protect him when called upon, although young, athletic and capable of preventing the robbery, and who failed to call upon other passengers who would have helped if called upon, the company is liable. The contract of the carrier to transport a passenger includes the duty to transport a reasonable amount of personal effects and hand luggage, including a reasonable amount of money and such other articles of personal convenience, pleasure and comfort as are reasonably suited to his station in life and the journey he is taking. (Rep. v. Indianapolis, Columbus & Southern Traction Co., 111 Northeastern Rep., 614.)

INDIANA.—*Passengers Must Be Prevented from Leaving Car Prematurely.*

The stopping of a street car at or near a regular stopping place, after a signal to stop has been given by a passenger, is an invitation to such passenger to alight, and she has a right to alight the instant the car stops and to rely upon its not being started until a reasonable time for her to alight has been afforded. If, after a signal has been given, a stop near the regular stopping place is made for some other purpose than to allow the passenger to alight, the duty is then on the car crew to prevent passengers from then alighting. (Terre Haute, Indianapolis & Eastern Traction Co. v. York, 110 Northeastern Rep., 999.)

KANSAS.—*Injuries to Pedestrian Due to Change in Street Grade.*

Where a street railway company maintains its tracks in a city on the grade required by ordinance and is not required by ordinance to build crosswalks or keep them in repair and the city constructs a walk across the railway tracks and places the top of the walk 9 in. below the top of the rails, the company is not liable for injuries sustained by a pedestrian by being tripped by the rail while attempting to cross the railway track on the walk. (Nicholas v. Topeka Ry., 153 Pacific Rep., 506.)

KENTUCKY.—*Duty to Passenger a Continuing One Until He Reaches His Destination.*

Where a carrier sold a ticket to a city in which a street car strike was in progress, without warning that carriers would not be taken to the terminal station, and the passenger was put off at the outskirts of the city on a bad night, where there was no accommodation for her safety or comfort, and she had to make her way to the central part of the city, some 3 miles distant, she is not limited to a recovery for her loss of time and actual expense incurred in completing the journey to the terminal station and in returning to her home, but may also recover for any discomfort or sickness resulting directly from the failure of the company to transport her to the terminal station, though her action has its origin in contract, and it may not have been in the contemplation of either of the parties that what followed would happen. (Louisville & Northern Railway & Lighting Co. v. Comley, 183 Southwestern Rep., 207.)

MARYLAND.—*Operation of Cars at High Speed by Crossings Not Negligence.*

It is not negligence for a street railroad to operate its cars at crossings at a high speed, though there are passengers waiting to board the car, there being no rule of law requiring the company to stop its cars at all points on signal to take on passengers. (Westerman v. United Railways & Electric Co., 96 Atlantic Rep., 355.)

MASSACHUSETTS.—*Failure to Sound Gong or Operation at Too High Speed Does Not Excuse Contributory Negligence.*

Operation at too high a speed, or the fact that the gong of a street car was not sounded nor any signal given of its approach is immaterial as to the contributory negligence of one who knew that it was approaching within plain sight. (Welsh v. Concord, Maynard & Hudson Street Ry., 111 Northeastern Rep., 693.)

MASSACHUSETTS.—*Injury to Motorman Who Failed to Follow Rules.*

A motorman who was injured by his car running into one ahead, which had stopped on a down-grade, because his brake and the reverse refused to work, was guilty of con-

tributory negligence, as it was shown that he attempted the descent without first testing his brake and taking other precautions required by the rules, even though he knew it was doubtful whether the brake would work. (Cummings v. Boston Elevated Ry., 111 Northeastern Rep., 163.)

MASSACHUSETTS.—*Injury to Person on Track in Snowstorm.*

Where plaintiff's intestate in the daytime came from behind one car, holding an umbrella in front of her in the face of a snowstorm, and was struck by a slowly moving car on the other track, and in plain sight, she was, as a matter of law, guilty of contributory negligence. (Moran v. Boston Elevated Ry., 110 Northeastern Rep., 1037.)

MICHIGAN.—*Workmen's Compensation Act Must Be Legally Accepted by Employer.*

An employer can bring himself within the employers' liability and workmen's compensation act only by the means provided in the act, and the fact that the employee made statements or accepted compensation provided for will not bring the accident within the act. (Bernard v. Michigan United Traction Co., 154 Northwestern Rep., 565.)

MINNESOTA.—*Release, When Granted Under Mutual Mistake, May Be Set Aside.*

Plaintiff, while a passenger on one of defendant's cars, was injured in a collision. About nine days after the accident, plaintiff and defendant, believing the injuries to be slight, and relying on the statement of their physicians to that effect, settled the claim. Plaintiff received a cash payment from defendant and signed a release. About six months afterward plaintiff brought an action for damages for severe injuries received by her in the accident. Defendant set up the release, which plaintiff sought to avoid on the ground of mutual mistake of the parties and physicians in overlooking substantial injuries, of which the parties and the physicians had no knowledge at the time of the settlement. Held, that the law of the case as contained in the charge not having been challenged by the defendant by motion for a new trial, there is, under such charge, evidence sufficient to support the verdict for the plaintiff. (Smith v. Minneapolis Street Railway, 155 Northwestern Rep., 1046.)

MISSOURI.—*Liability for Injuries When Taking Up Passengers.*

Where a street car, before crossing an intersecting street to its regular stopping place on the far side of the crossing, had come to a very low speed, and the motorman saw persons attempting to board it, he was bound to see that they had an opportunity to do so in safety, as a person attempting to board the car was a potential passenger, and the relation of passenger and carrier was then created and existed between him and the company. (Gobel v. United Railways of St. Louis, 181 Southwestern Rep., 1051.)

NORTH CAROLINA.—*Piling Ties on Right-of-Way—Duties to Trespassers.*

It is not negligence for a corporation operating an electric railway to pile cross-ties 4 ft. high along its track in such a way that trespassers must walk dangerously near to the track, since the corporation has a right to pile cross-ties on its right-of-way. (Foard v. Tidewater Power Co., 86 Southeastern Rep., 804.)

TENNESSEE.—*Imputed Negligence—Automobile Accident—Husband and Wife.*

The negligence of the driver of an automobile, in consequence of which the machine ran into an obstruction negligently left at the roadside by defendant, was not imputable to his wife, who was riding with him, so as to bar her right to recover for her own injuries, where it did not appear that the danger was obvious or known to her, and that she did not rely on the assumption that her husband would exercise care and caution. (Knoxville Railway & Light Co. v. Vangilder et ux., 178 Southwestern Rep., 1117.)

VIRGINIA.—*Duty to Look and Listen a Continuing One.*

The duty to look and listen before crossing a railway track, which is imposed upon travelers upon a highway, continues as long as the occasion for the exercise of such duty continues, and if there is any point at which by looking and listening the person injured could have avoided the accident and he failed to do so, his contributory negligence defeats a recovery. (Springs v. Virginia Railway & Power Co., 86 Southeastern Rep., 65.)

NEWS OF ELECTRIC RAILWAYS

SHORT STRIKE IN PITTSBURGH

Pittsburgh Railways Agrees to Advance in Wages Conditioned Upon Prospect of Fare Readjustment to Secure More Income

The motormen and conductors in the employ of the Pittsburgh (Pa.) Railways went on strike at midnight on Sunday after breaking off negotiations with the company regarding wages and terms of service. The demand of the men as regards wages were for 30 cents an hour for the first year, working up to a maximum of 38 cents an hour for the third year and thereafter. The minimum had been 25 cents and the maximum of the four years 30 cents.

At a conference on April 29 the men consented to reduce their maximum demand of 38 cents an hour to 36 cents. The company said that the best it could do was to raise its maximum from 30 cents to 32 cents. This left an irreconcilable difference of 4 cents between the two parties to the negotiations. At the conclusion of the conference J. D. Callery, president of the company, issued a statement in which he said that the company had done everything in its power amicably to settle the differences. He made an offer of arbitration public to the newspapers.

The points of disagreement covered a number of subjects other than that of wages. Among them were the operation of interurban cars in the city, whether the trainmen should be permitted to enter saloons in uniform without punishment, the length of life of the agreement, whether passenger conductors should be placed on the interurban freight cars or the present freight messengers be continued on these cars and whether mail, freight and other miscellaneous cars should be subjected to frequent changes in men operating them, or whether men now running those cars should retain them as long as they desired.

The strike lasted less than thirty-nine hours. It was settled on May 1 at a midnight conference of railway officials and representatives of the men with members of the retail merchants' association and the newspaper publishers. The employees approved the decision by a vote of 1312 to 392 and the first cars were operated at 2 a. m. on May 2.

Under the settlement there will be separate scales of wages for the local lines and for the Beaver and Washington lines. On the local lines the pay per hour for the first six months will be 27 cents, an increase of 3½ cents; for the second six months, 29 cents, an increase of 4 cents; two years, 31 cents, an increase of 4½ cents, three years, 33 cents, an increase of 5 cents; four years, 34 cents, an increase of 5 cents; after four years, 35 cents, an increase of 5 cents. On the Beaver and Washington lines the pay per hour for the first six months will be 26 cents, an increase of 4 cents; second six months, 28 cents, an increase of 5½ cents; second year, 30 cents, an increase of 7 cents; third year, 32 cents, an increase of 6 cents; fourth year, 33 cents, an increase of 6 cents; after the fourth year, 34 cents, an increase of 6 cents. The agreement is to continue for two years from May 1.

The Pittsburgh Railways carried a full-page advertisement in the Pittsburgh papers of Wednesday morning, May 3, addressed to the people of Pittsburgh. It said that the settlement of the strike meant that the company would pay annually almost \$500,000 more in wages than it had paid before. This was more than the company could afford to pay from the present earnings. The men would not recede from their position, and inasmuch as the demands made imposed a burden greater than the company could afford to bear, the men were permitted to carry out their threat to strike. The company would have been happy to pay its men the increase in wages they asked if the business could have borne the increase. The company said that when it replied during the arbitration that the increase in the payroll was impossible it was suggested that the public would acquiesce in a readjustment of the fares in order to secure sufficient revenue to meet the added expense. It was upon the condition that the company would receive the co-operation of

the mediators in securing necessary additional revenue that it consented to pay an advance in wages greater than its present earnings would permit. The company said that the 5-cent fare was not sufficient for the complete ride on such long lines as those to Aspinwall, Sharpsburg, Aetna, Millvale and other similar outlying places, and that night cars were notoriously unprofitable. The fares for the night cars are 5 cents within the city limits. They should be 10 cents. In municipalities such as McKeesport, Wilkinsburg and Edgewood the fares in vogue would have to be increased to meet the new conditions. In conclusion, the company said: "The company desires it distinctly understood that if it is to pay the wages demanded it will be necessary to provide increased fares partially to cover the same and that action will be taken for such adjustments of the fare zone as are proper and reasonable."

CALIFORNIA ELECTRIC RAILWAY ASSOCIATION ORGANIZED

The California Electric Railway Association has been organized to facilitate concerted action on franchise and paving questions, to foster a better understanding between the public and the electric railways, to promote co-operation among the railways themselves, to collect and distribute data of value to the railways, and to secure proper regulation of auto competition. G. K. Weeks, president of the San Francisco-Oakland Terminal Railways, Oakland, is president of the association; William Clayton, vice-president and managing director of the San Diego Electric Railway, is vice-president; and W. V. Hill, tax and contract agent of the Pacific Electric Railway, Los Angeles, is manager, with offices in San Francisco. The directors of the association are Mr. Weeks, the president; Mr. Clayton, the vice-president; Paul Shoup, president of the Pacific Electric Railway; W. E. Dunn, vice-president of the Los Angeles Railway Corporation, and Jesse W. Lilienthal, president of the United Railroads, San Francisco. Mr. Hill will have a secretary to attend to office matters so his time can be given to paramount issues. Every electric railroad in California is represented, including the electrified steam lines.

FURTHER OPPOSITION TO REDUCTION OF MASSACHUSETTS COMMISSION

The ways and means committee of the Massachusetts Legislature held a final hearing on April 27 on the bill to reduce the membership of the Public Service Commission from five to three. Bentley W. Warren, for the Massachusetts Street Railway Association, opposed the provision in the bill assessing a portion of the cost of the commission's work upon the carriers. He urged that the financial condition of the street railways in the State would not allow of additional burdens being placed upon them, and said that it was not good public policy to transfer the cost of regulation from the taxpayer to the carrier.

Chairman McLeod of the commission stated that it was absolutely impossible for a commission of three men to conduct the public business efficiently and properly, in view of its volume and character. A body mainly executive could work with fewer men, but the speaker challenged any advocate of the bill to find any living ex-member of the board who would favor a commission of three instead of five at present. Mr. McLeod said that the commission and its predecessor had been at work in Massachusetts almost half a century and contended that it was a poor time in which to overthrow the established policy of a secure tenure of office which has placed the commission on a plane with the Supreme Judicial Court. The commission handled from 600 to 700 cases a year. The board courted the fullest investigation of its work. Mr. McLeod stated that the settlement of the Bay State fare case would probably be prolonged at least six months beyond Sept. 1 if a new commission of three men were substituted for the present tribunal.

CLEVELAND WAGES SETTLED

Unusual Conditions Attended Settlement in Which City Has Direct and Material Interest Under Tayler Franchise

At a conference of the representatives of the motormen and conductors and the officials of the Cleveland (Ohio) Railway, on April 27, John J. Stanley, president of the company, informed the men that the proposition of an increase of 1 cent an hour this year and the same next year, with a minimum day of five hours was the best he could make without increasing the rate of fare. This the company had no right to do. He said further that the establishment of schedules was in the hands of the city and that the company could not, under the Tayler franchise, submit them to arbitration. Mr. Stanley repeated that the proposition made to the men would mean additional operating expenses of \$400,000 for the two years, and that Fielder Sanders, street railway commissioner, agreed to recommend to Council that it allow this increase.

The men's representatives discussed the matter with the street railway committee of the City Council the following day. The committee agreed to recommend the proposition made to the men by the company, but it refused to go beyond this. The men insisted on a flat wage of 40 cents an hour and an eight-hour day for 90 per cent of the men.

Mr. Sanders said on April 29 that there were 2500 motormen and conductors in the employ of the company. Of this number about 1750 had regular runs. Their average monthly wage was \$90. Of the other 750 men 25 per cent received between \$70 and \$90 a month; 55 per cent, between \$60 and \$70 a month; 17 per cent receiver under \$50 a month, and 3 per cent, under \$40 a month. Mr. Stanley has said several times that he would be glad to do something for the extra men, but that it was almost impossible when the number of cars operated during the entire day bore such a small proportion to those used during the rush hours. He recommended an increase in the amount of service during the day, but the city has objected to this.

The demands of the men were considered at a conference on May 2, attended by Mayor Harry L. Davis, President J. J. Stanley, General Manager George L. Radcliffe and Engineer Joseph Alexander of the Cleveland Railway, Street Railway Commissioner Fielder Sanders and City Law Director W. S. Fitzgerald.

At the solicitation of the city officials Mr. Stanley late on the evening of May 3 agreed to make his proposition still more favorable to the men by advancing the wages 2 cents an hour for the present year, which would mean 31 cents for first-year men and 34 cents for all others, with wages for 1917 at 32 cents for first-year men and 35 cents for the others. He specified a five-hour minimum work-day for the two years. The men also modified their demands, asking for an increase of 3 cents an hour for the two years, with a minimum work day of five hours the first year and eight hours the second. They also asked for pay for twenty minutes in taking their cars out and returning them to the houses, and pay for time spent in going to and from relief runs. Mr. Stanley refused to consider these last demands. He announced that he had made his final offer. His offer will add \$532,000 to the payroll for the two years.

The offer of Mr. Stanley just mentioned was submitted to a vote of the men on the evening of May 3. The result of the balloting was announced on May 4. The vote was 1123 for and 496 against.

Engineer Joseph Alexander has made the following estimate of the increased expenses on the terms demanded by the men: wage increase, 1916, \$210,000; five-hour minimum day, \$91,000; extra twenty minutes' pay, \$76,092; pay for relief runs, \$16,193; wage increase, 1917, \$210,000; eight-hour minimum day, \$240,250; extra twenty minutes' pay, \$76,092; relief runs, \$16,193. Total \$935,820.

A peculiar feature of the controversy is the fact that the city's representatives say that the fixing of schedules is a matter for the street railway commissioner and the City Council, but that the amount of wages to be paid and the number of hours a day the men shall work are the company's affair. It is clear that the company's privilege in fixing a wage scale and the work-day is so limited by the Tayler franchise and by the city's assumed authority in the matter of schedules that it has little to say on anything.

ENGINEERS TO PARADE FOR PREPAREDNESS

A citizens' parade in favor of preparedness will be held in New York City on Saturday, May 13, and will be reviewed by Mayor Mitchell, Major-General Wood and Rear Admiral Usher. More than forty trades and professions have already signified their intention of taking part. The parade will be entirely non-partisan. It has been indorsed by the Mayor's committee on preparedness by the National Security League and other organizations in favor of national defense. The object is to demonstrate in a conclusive manner the overwhelming sentiment of the business and professional men of New York in favor of preparedness. The engineers' division of the parade will be made up of four general subdivisions, civil, mining, mechanical and electrical. These subdivisions are made for convenience in organization, and are not in any sense representative of any engineering society. Engineers are invited to parade as engineers, whether or not they are members of any organization. The committee which has had charge of the military lectures has undertaken the general organization of this division and for convenience has appointed the following sub-committees representing each general subdivision: civil engineers, Charles Warren Hunt, chairman; mining engineers, Bradley Stoughton, chairman; mechanical engineers, Calvin W. Rice, chairman; electrical engineers, F. L. Hutchinson, chairman.

ANOTHER DEADLOCK IN SAN FRANCISCO

Resort to Legal Action Necessary to Settle Dispute Over Connections With Two New Municipal Lines

The Church Street extension of the San Francisco Municipal Railway, which is being constructed to serve a district south of Market Street, will be completed on June 10 and negotiations have been under way for some time to provide connection between the Market Street terminus of this line and other parts of the municipal system. The United Railroads has tracks on Church Street for two blocks from Market Street, so that to connect the Church Street municipal extension with the nearest point on the municipal system now in operation it would be necessary to travel over, or parallel the United States Railroads' tracks for two blocks on Church Street and six blocks on Market Street from Church to Van Ness Avenue.

A number of conferences have been held between officers of the United Railroads and the public utility committee of the Board of Supervisors, with the result that the United Railroads offered to permit the transfer of passengers from Church Street to Market Street cars on a sixty-forty basis, favoring the United Railroads. The United Railroads also offered to permit the Church Street municipal cars to use United Railroads' tracks in return for the payment of a reasonable rental plus a proportion of the construction and maintenance costs plus an indemnity which it was estimated that the United Railroads would suffer as a result of business diverted to municipal lines. The city officials have not looked upon these propositions with favor.

The Twin Peaks tunnel is to be completed within a year and it is expected that municipal lines operating through this tunnel will bring to the outer end of Market Street a volume of business that will rapidly increase as the new residence district beyond the tunnel develops. It is in consideration of the provision that will be necessary for this traffic that the board of supervisors will plan the present Church Street connections, as it is manifest that the same problems of transfer, joint operation, or paralleling affecting the Church Street connection will also apply to the proposed municipal line through the Twin Peaks tunnel. City officials tendered the United Railroads a fifty-fifty transfer offer pending legal action over the respective rights on Church and Market streets. This proposition was refused.

On April 26 the public utilities committee passed a resolution instructing the board of works to proceed with the laying of tracks down Market Street to Van Ness Avenue, and also to pass an ordinance providing for the construction of municipal tracks down Market Street from the east portal of Twin Peaks tunnel to a connection with the Geary Street municipal line at Geary and Market streets. Such new construction would provide direct route from Twin Peaks tunnel and from Church Street and Van Ness Avenue exten-

sions direct to the ferries. These resolutions were to come before the board of works on May 1. The indications were that the resolutions would be promptly passed and the Mayor has already signified his intentions of signing the resolutions if passed. Jesse W. Lilienthal, president of the United Railroads, has announced that upon the passage of such resolutions by the board of public works he would feel called upon to secure an injunction preventing the construction of the proposed tracks paralleling the United Railroads' lines.

RECENT WAGE INCREASES

Outlines of Changes in the Wage Schedules of Nine Traction Companies

A. Benham, general manager of the Ohio Electric Railway, Springfield, Ohio, announced that beginning May 1 all trainmen of the road would receive an increase in wages amounting to about 10 per cent. The scale of increase will be based on the length of time in the company's service.

The East Liverpool Traction & Light Company, East Liverpool, Ohio, has announced an increase of 2 cents an hour in the wages of its motormen and conductors. The men formerly received 26, 28, 30 and 32 cents an hour for the first, second, third and fourth years, respectively, and thereafter.

The Columbus Railway, Power & Light Company, Columbus, Ohio, has advanced wages from one-half cent to 2 cents an hour, applicable to platform men. A new schedule is also being worked out for other employees. The minimum for the trainmen was increased from 20½ cents to 21 cents and the maximum from 27 cents to 29 cents an hour.

The York (Pa.) Railways has announced an increase in the wages of its trainmen. All men who have been with the company less than ten years will receive 1 cent additional over that now paid, while men who have been with the company more than ten years will receive an advance of 2 cents an hour. The sliding scale which has been in effect provides for a minimum of 19 cents an hour.

The Frankford, Tacony & Holmesburg Railway, Tacony, Pa., granted a wage increase to its employees on May 1. Motormen and conductors have been receiving 22½ cents an hour. Hereafter the wage will be 23 cents an hour after three years of service and 24 cents after four years. All the shopmen and other employees have also had their wages advanced about 10 per cent.

The officers of the Citizens' Traction Company, Oil City, Pa., and the employees have agreed to an increase in wages. The new scale dates back to April 15. It does not make any change in the wages that are paid first-year and second-year men, but increases the third, fourth and fifth-year men, and creates a new class, those men who have been employed for a period of at least five years. With the increase of the first of the year it will mean that the first-year men are getting 2 cents an hour more than last year, the second-year employees 1 cent more, the third, fourth and fifth-year men 2 cents more and the sixth-year men 3 cents more.

A new agreement covering wages was accepted on April 21 by all of the employees of the New York State Railways following the recent controversy on these lines. The terms, which apply to the Rochester, Syracuse, Utica and Oneida lines, specify a wage increase of 2 cents an hour for the first two years and a 1-cent increase the third year. The new contract went into effect on May 1. Under it employees will receive 26 cents an hour for the first six months, 28 cents after six months and 30 cents after the first year. Interurban men will receive 32 cents an hour with the exception of employees on the Oneida line, who will draw 35½ cents. The working day for all employees for the year will remain at nine hours as before. The matter of the working day, however, is to become an open question at the end of each year.

The Springfield & Xenia Railway, Springfield, Ohio, has announced an increase in wages from 25 to 29 cents an hour for its platform employees, effective on May 1. This is the second voluntary increase received by the trainmen in the last five years.

The Harrisburg (Pa.) Railways increased the wages of its trainmen 1 cent an hour on May 1.

TERMINAL OPENS AT NEWARK

Inspection of Building and Subway Follows Address by President of Public Service Railway

The Public Service Corporation of New Jersey formally opened its new terminal building in Newark on April 28. On the evening of that day the sections of the railway, gas and electric companies, with the Terminal Club, and invited guests, held a joint meeting which was addressed by Thomas N. McCarter, president of the corporation, who spoke on the subject "Transportation."

Mr. McCarter reviewed the history of the public utility companies in the Newark district and their successor, the Public Service Corporation. He referred to the opening of the terminal as the most auspicious occasion in the organic life of the company and as a fortuitous coincidence that it should come on the eve of the 250th anniversary celebration of the founding of Newark. In this sketch of the early history of the railway he paid tribute to the enterprise of some of the early builders of the properties, among them Bernard Shanley, E. F. C. Young, Leslie Ward and Garrett A. Hobart. He also traced the progress of the gas and electric utilities now operated by the Public Service Corporation and spoke of the contributions which residents of Newark or its environs had made to the act, citing particularly the names of Edward Weston and Thomas A. Edison.

He then gave a short résumé of the enormous task which was undertaken by the Public Service Corporation at the time of the consolidation of the railway, gas and electric companies in 1903 and showed what had been accomplished in the thirteen years of the corporation's existence. In speaking of the railway he said:

"The study of improving transportation facilities has developed a curious and troublesome fact; the more such facilities are improved, the more insistent the demand becomes for still greater improvement. The demand for better means of passage from place to place increases by efforts to comply with it, and no matter how successful these efforts may be, the demand for still better means becomes constantly louder."

The total business of the Public Service Corporation for the year 1915 amounted to approximately \$37,500,000, having more than doubled since the organization of the company, according to Mr. McCarter.

The meeting was closed by the singing of "America," accompanied by the Public Service Orchestra. The terminal was then thrown open and the company officials and guests inspected the building, subway and approaches.

Wage Demands in Massachusetts.—The members of the unions of employees on the lines of the New England Investment & Security Company in Worcester and Springfield, Mass., recently signified their intention of presenting to the company demands for changes in the terms of service under the working agreement which will expire on June 1.

Steam Road to Electrify.—The Salt Lake & Los Angeles Railway, Salt Lake City, Utah, has employed H. A. Strauss, consulting engineer of Chicago, to undertake the design of the complete electrification and extension of this 15-mile steam road between Salt Lake City and Salt Lake. Bonds to provide funds for this improvement are to be underwritten by the C. F. Childs Company, Chicago.

Arbitration Decided Upon in Akron.—The management of the Northern Ohio Traction & Light Company, Akron, Ohio, and the platform employees have reached an agreement to submit the wage dispute to arbitration. The company has selected John J. Stanley, president of the Cleveland Railway, as its member of the board of arbitration and the men will soon select their member. The union has conceded the open shop principle to the company.

Telephones in New York Subway Stations.—The Public Service Commission for the First District of New York has issued an order directing the New York Telephone Company to install slot telephones in subway stations. Soundproof booths are to be built of masonry. Where the quarterly gross receipts of a booth amount to \$25 or less, the city is to receive 15 per cent. On higher receipts the city is to get 20 per cent.

Evidence Completed in Holyoke Arbitration Case.—The presentation of evidence was concluded on April 21 before the wages arbitration board sitting in the Holyoke (Mass.) Street Railway investigation. Prof. Albert S. Richey of the Worcester Polytechnic Institute, was the last witness for the company. He criticised the time-table offered by the union representatives on the ground of its cost and impracticability in certain details and submitted testimony in rebuttal of the cost of living evidence presented by the union. Final arguments by counsel for each side will be heard in the near future. Printed briefs will be filed.

New Plans Suggested for Elevated in Philadelphia.—A system of elevated railways serving the centers of population contemplated under the proposed transit plans, which could be operated independently or in connection with the lines of the Philadelphia (Pa.) Rapid Transit Company and which it is said would be less costly in construction and less expensive in operating than the lines contemplated in plans presented previously is outlined in a survey of the municipal transit problem made by Charles G. Darrach, a consulting engineer, at the request of Wharton Barker. Mr. Darrach estimates the cost of the system as proposed by him at \$40,700,000.

Stockton Road Offered to the City.—F. W. Webster, general manager of the Stockton (Cal.) Electric Railroad, operating 16 miles of line in that city, suggested to the City Commissioners recently that they take over the company's holdings and operate the line as a municipal railroad. Mr. Webster said that the operating expenses and taxes were altogether disproportionate to the company's revenue. At present 5¼ per cent of the company's gross receipts went to the State, while about 12 per cent was consumed in the upkeep of the road exclusive of the rolling stock. The company also paid the city of Stockton a franchise tax on its gross revenue.

Five Million Dollar Fire at Augusta.—The fire at Augusta, Ga., on March 22, which razed thirty city blocks of office buildings, cotton warehouses and residences caused a loss of approximately \$31,000 to the Augusta-Aiken Railway & Electric Corporation. The loss consisted principally of poles, transformers, meters, wire and equipment. One car was destroyed. After the fire the wires were strung on dead trees and service was resumed shortly thereafter. Tentative reconstruction plans call for the removal of the tracks within the burned area from the center of the street to the sides, and the conversion of the space between the tracks into a park or central roadway.

Hearing on New York Bus Line Extensions.—The subject of motor buses was considered by the Board of Estimate of New York on April 28. Bids for additional motor-bus franchises for Manhattan Streets were received last June. The New York Motor Bus Company set forth that its bid had been made, its \$60,000 guarantee lost to it for ten months and the type of vehicle determined. The president of the Fifth Avenue Coach Company, which is at present operating in New York, wrote of the high standard and efficiency of his company, attained after years of costly experimentation, and called attention to the increased income the city would enjoy if the coach company's offer of extended service were accepted.

Chicago Home Rule Plan Opposed.—Opposition to utility home rule for Chicago has developed before the special legislative committee investigating the subject. At a hearing in Danville, Ill., it was brought out that the objection to home rule for Chicago was based on a fear that within a few years Cook County, in which Chicago is situated, would have a majority representation in the State Legislature. It was asserted that the down-state legislators would never consent to give Chicago home rule unless Cook County's representation was greatly reduced. Similar objection to Chicago home rule was brought out in the Peoria hearing, where Chairman Medill McCormick intimated that the opposition was fostered by the public utility corporations. The question before the legislative committee is whether it shall recommend that Chicago have a separate commission or the power to regulate Chicago utilities be conferred upon the City Council.

Extension of Seattle Municipal Line Contemplated.—The utilities and the franchise committees of the City Council

of Seattle, Wash., at a recent meeting, discussed the question of extending Division "A" of the municipal railway into Ballard. Councilman R. H. Thomson, former city engineer, has been delegated to obtain data relative to the proposed extension. He has also been asked to investigate and report on the question of the city charging a rental to the Puget Sound Traction, Light & Power Company for the use of canal bridges at Fifteenth Avenue N. W., Fremont Avenue and Tenth Avenue N. E. The city is laying track on the three bridges. A. L. Kempster, manager of the Puget Sound corporation, said his company was willing to pay a rental for the use of the bridges, if other common carriers in competition with the street railway were required to pay a proportionate tax. This was taken to refer to jitney bus competition.

Cincinnati Suburban Line Grant.—The West End Rapid Transit Company, Cincinnati, Ohio, was granted a perpetual franchise by the Cincinnati City Council on April 18 to construct and operate a rapid transit line between Anderson's Ferry and the west line of Race Street at the intersection of Third, in the heart of the business district. This line will give the Cincinnati, Lawrenceburg & Aurora Electric Street Railway an entrance to the city. Up to this time its terminus has been at Anderson's Ferry. The fare into the city will be 5 cents. Provision has been made for connection with the rapid transit belt line. After five years a division of the profits is to be made with the city. The city is to receive the first 1 per cent based on the capitalization, while the company is to have the next 7 per cent. All above 8 per cent is to be divided equally between the city and the company. Stanley Shaffer, secretary and attorney of the company, said that the road will cost about \$800,000. Construction work will begin in September. A goodly portion of the line will be on private right-of-way, and at two points in the city it will be elevated.

Seattle Valuation to Continue.—The Public Service Commission of the State of Washington will resume the valuation of the properties of the Puget Sound Traction, Light & Power Company where it left off last year, because of the statement of the City Council of Seattle that the city cannot properly undertake the work. The valuation will be carried on by the commission's engineering staff from the funds of the commission. The hearing on the application of the company for relief from franchise obligations in Seattle will await the termination of the valuation proceedings. According to Commissioner Spinning sufficient funds may not be on hand to complete the work of valuation, but as much work as possible will be done at this time. Hugh M. Caldwell, corporation counsel, has requested the commission not to hold the hearing until the commission has completed the valuation. The purpose of the valuation is to determine whether the company is earning a fair return on its investment. Chairman Reynolds of the commission states that the hearing on the franchise obligations undoubtedly will be postponed until the valuation by the commission is finished.

Thompson Committee Hearings Resumed.—The Thompson Committee, which suspended activities during the closing sessions of the New York Legislature, resumed its hearings on May 1, when the cave-in accidents of last September on the Broadway and Seventh Avenue sections of the new subway were investigated. Leonard M. Wallstein, commissioner of accounts, was the principal witness and told of the investigation he had made in conjunction with the Mayor's especially appointed committee of engineers. J. O. Hammitt of the Fire Department explained that he reported, after an investigation, that a seam in a rock had not been observed by the blasters. Richard P. Babbage, vice-president and general counsel of the U. S. Realty & Improvement Company, contractors for the sections on which the accidents occurred, testified that all but a few of the ninety-nine claims filed against his company had been settled. The sum disbursed amounted to approximately \$170,000. On May 2, Alfred Craven, chief engineer of the commission, was questioned regarding his knowledge of the conditions surrounding the cave-ins. On May 3 the committee inquired into the reasonableness of the subway construction bids. Henry B. Seaman, formerly chief engineer of the commission, testified that in his opinion the city could have saved considerably by reletting contracts on the Lexington Avenue line.

PROGRAMS OF ASSOCIATION MEETINGS

Central Electric Railway Accountants' Association

The Central Electric Railway Accountants' Association will meet at Toledo, Ohio, on June 6 and 7.

New York Electric Railway Association

The annual meeting of the New York Electric Railway Association will be held at the International Hotel, Niagara Falls, N. Y., on June 27 and 28.

General Conference on National Safety Code

A conference will be held at the La Salle Hotel, Chicago, on May 29 and 30, 1916, upon the National Electrical Safety Code which has been prepared by the Bureau of Standards. Sessions will begin on May 29 at 10 a. m.

The official representatives of the National Electric Light Association, the American Institute of Electrical Engineers, the American Electric Railway Association, the American Railway Association, the Association of Edison Illuminating Companies and of several other associations are being invited to this conference. The purpose of the meeting is to consider the code as it is now revised for publication, and this will be the last conference before publication. A large amount of work has been done upon the code since the New York meeting of last October, and many changes have been made in some parts, especially in the section upon overhead lines. These changes have been submitted for criticism and discussion at a considerable number of conferences, and it is believed by the bureau that they will receive the approval of the conference at Chicago. It is expected that the code will be adopted for a year's trial by commissions and municipal authorities after it has been published, with the recommendation that it be observed as far as possible during the first year, but that its complete observance will not in all cases be expected until after the experience of a year has shown what, if any, changes would be necessary.

A limited number of copies of the revised code have been prepared for the use of those who attend the Chicago conference, but no copies will be available for general distribution until after the Chicago conference, when the code will be published as soon as possible.

Pennsylvania Street Railway Association

The Spring meeting of the Pennsylvania Street Railway Association will be held at the Hotel Brunswick, Lancaster, on May 9 and 10. The meeting will be called at 1.30 p. m. on May 9. Thomas A. Wright, Wilkes-Barre, president of the association, will deliver his address, the treasurer will present his report and an address will be made by Charles L. Henry, president of the American Electric Railway Association. The following papers will then be read:

"Court Trials in Damage Suits," by D. I. McCahill of Pittsburgh.

"Current Street Railway Problems," by J. A. Keppelman, Reading.

"Physical Examination for Employees," by Francis D. Patterson, M.D., of the division of industrial hygiene and engineering in the Department of Labor and Industry.

At the session of the association on May 10 the following papers will be read:

"Legal Points in the Operation of Jitneys," by E. H. Davis of the Williamsport Passenger Railway.

"One-Man Car Operation," by W. E. Moore Pittsburgh, and L. H. Palmer of the Eastern Pennsylvania Railways, Pottsville.

"Street Railway Freight and Mail Service Rates," by J. E. Wayne of the York Railways.

"Manual of Standards," by F. R. Phillips of the Pittsburgh Railways.

"Rush-Hour Traffic," by P. T. Reilly of the Scranton Railways.

"Handling Accident Reserves," by F. J. Pryor, Jr., of the American Railways.

"Training of Platform Men," by W. A. Heindle of the Southern Pennsylvania Traction Company.

On the evening of May 9 at 7.30 o'clock there will be an informal dinner at the Hotel Brunswick.

Financial and Corporate

NEW BRITISH CAPITAL ISSUED

Most New Capital Being Turned to Government Use—
Utility Enterprises Are Showing Almost a Total
Suspension of New Financing

According to statistics reported by the London *Economist*, the new securities issued by Great Britain in the calendar year 1915 totaled £685,241,700 as compared to £512,522,600 in 1914. These figures, it may be said, are entirely for security issues newly created and do not include any figures covering refunding operations. The main point to be noted in connection with the new financing is the strict control that was exercised by the treasury department over the capital market. Exclusive of colonial government loans, the British government alone took £614,250,700 of the new securities in 1915 as compared to £332,500,000 in 1914, and in general the functions of London as a money lender were narrowed down almost entirely during the last calendar year to the raising of money for direct war purposes. This same tendency was exhibited in the case of the British railroads, which required £3,294,000 of new capital as compared to £2,161,500 in 1914, presumably on account of their further necessary development to serve as military aids to the government.

The extent to which the new capital available for use in Great Britain was turned almost entirely to government purposes naturally had a restrictive effect upon the financing of utility enterprises throughout the country. For example, tramway and omnibus financing fell off from £5,868,800 in 1914 to £432,500 in 1915, while electric light, power, telegraph, etc., companies; gas and water companies, and motor companies showed similar large decreases in new financing in the last year. The following comparative table gives the total financing for 1914 and 1915, but only such detailed figures thereunder as are deemed to be of interest to electric railway operators:

Group	1915	1914
Total new financing.....	£685,241,700	£512,522,600
New financing in selected groups:		
British government	614,250,700	332,500,000
Tramway and omnibus.....	432,500	5,868,800
Electric light, power, telegraph, etc.	546,900	6,746,400
Gas and water.....	20,000	699,400
Motor traction and manufacturing.	130,000	1,558,900
British railroads	3,294,000	2,161,500
Indian and colonial railroads.....	3,965,000	23,377,600
American railroads .....	.....	1,415,700
Foreign railroads	2,940,000	12,755,500

Since the beginning of 1916 the amount of new capital raised over and above that borrowed by the government has been insignificant. Out of a total of £145,724,690 for the first quarter £143,220,000 comes under the heading of British government loans. In the remaining £2,504,690 of new capital the British railways at £1,176,000 had the largest share, with docks, harbors and shipping running second at £800,000. Tramways and omnibuses and the electrical companies placed no new issues at all, and the gas and water companies only a small amount. Motor traction and manufacturing companies and foreign railways showed slight gains over 1915, but the totals were very small as compared to those in 1914. The great change that has taken place in British financing is shown by the following comparative table for the first quarter in 1914, 1915 and 1916:

Group	1916	1915	1914
Total new financing.....	£145,724,690	£46,313,500	£97,610,200
New financing in selected groups:			
British government.....	143,220,000	29,250,700	.....
Tramways and omnibus..	.....	.....	1,839,000
Electric light, power, telegraph, etc.	.....	356,200	4,336,900
Gas and water.....	16,440	.....	183,200
Motor traction and manufacturing	106,250	25,000	613,400
British railroads	1,176,000	65,500	120,000
Indian and colonial railroads .....	.....	.....	13,269,200
American railroads .....	.....	.....	354,100
Foreign railroads	384,000	.....	8,145,500

ANNUAL REPORTS

Illinois Traction System

The comparative statement of income, profit and loss of the Illinois Traction System, Peoria, Ill., for the calendar years 1914 and 1915, follows:

	1915	Per Cent	1914	Per Cent
Interurban lines	\$3,559,028	31.8	\$3,626,635	32.6
City lines	2,871,035	25.6	3,021,859	27.1
Gas	905,702	8.0	877,982	7.9
Electric	3,325,410	29.7	3,002,378	27.0
Heat	317,579	3.8	314,640	2.8
Water	14,215	0.1	14,385	0.1
Miscellaneous	195,022	1.7	254,972	2.2
Total gross earnings.....	\$11,187,994	100.0	\$11,112,854	100.0
Operating expenses and taxes	6,657,569	59.5	6,587,462	59.2
Gross income	\$4,530,425	40.4	\$4,525,391	40.7
Interest on bonds.....	3,268,607	29.2	3,290,786	29.6
Net income available for depreciation and dividends	\$1,261,818	11.2	\$1,234,605	11.1

The foregoing statement shows that the Illinois Traction System a little more than held its own during 1915 as compared to 1914. This showing, however, was brought about by the substantial increase in lighting receipts, particularly electric, inasmuch as both the interurban and the city railways showed decreases on account of jitney buses, automobile competition for business and pleasure purposes and unstable business conditions. The decrease in interurban earnings for the year was \$67,607 or 1.8 per cent and in city railway earnings \$150,824 or 4.9 per cent. The report of the company contains no data in regard to the detailed operating expenses, or even as to the division between operating expenses and taxes. The gross income showed a gain of \$5,034, which was increased to \$27,213 by lower interest charges on bonds.

In the early months of the year the jitney movement reached the cities served by the company's street railway lines, and during the height of the craze the railway receipts were reduced from 5 to 10 per cent. The city authorities in due course recognized the necessity for some regulation of this class of transportation service and in the latter months of the year the jitanes practically disappeared.

It is said that renewed efforts were applied in furtherance of interurban freight traffic development. Toward this end through rates were put into effect with two connecting steam railroads and a track connection established with the terminal railroad at Peoria which allows access to the principal industries of that city, as well as track connections with important steam lines not otherwise available. Additional grain elevators, brick factories and a large powder factory were constructed on the line and other new industrial tracks were installed. All of this, in conjunction with the increased earnings from the growth of coal traffic, will provide a substantial expansion in freight revenues.

Federal Light & Traction Company

The comparative consolidated statement of income, profit and loss of the Federal Light & Traction Company, New York, N. Y., and its subsidiary companies for the calendar years 1914 and 1915, follows:

	1915	Per Cent	1914	Per Cent
Gross earnings.....	\$2,352,015	100.0	\$2,416,960	100.0
Operating and administrative expenses and taxes...	1,545,716	65.7	1,528,307	63.2
Gross income	\$806,299	34.3	\$888,653	36.8
Interest charges	589,342	25.1	586,155	24.3
Central Arkansas Railway & Light Corporation dividend	84,000	3.5	84,000	3.5
Springfield Railway & Light Company dividend	23,890	1.0	.....	...
Federal Light & Traction Company dividend .....	.....	...	112,500	4.7
Balance	\$109,067	4.6	\$105,998	4.3

Owing to decreased earnings and increased expenses, as shown above, the operating ratio for this group of companies increased from 63.2 per cent in 1914 to 65.7 per cent in 1915. The gross earnings of the companies decreased \$64,945 or 2.7 per cent, as compared to 1914, while the operating expenses increased \$17,409 or 1.1 per cent, so that

the gross income decreased \$82,354 or 9.3 per cent. The balance, with no holding company dividend as in the previous year, showed an advance of \$3,069 after providing for a Springfield Railway & Light Company dividend not paid the year before.

The decrease in gross earnings was caused principally by a reduction in gas sales of \$21,196 and a drop in water sales of \$11,744 resulting in part from such failures in gas supply, and by a decrease in railway earnings of \$146,356 principally attributable to jitney competition. These reductions in gross earnings were partially offset by an increase in gross earnings of the electrical department of \$113,189 or 8.4 per cent, and an increase of \$1,481 or 15.6 per cent in the steam heating department. The decrease in total income was caused principally by a reduction in net earnings in the gas department of \$7,409, and also by a reduction in net earnings in the railway department of \$137,850. These were partially offset by an increase in net earnings in the electrical department of \$82,195 or 16.1 per cent, and by an increase in the water department of \$3,772 or 11.8 per cent.

In order to meet jitney competition and to conform to franchise requirements as to frequency of service, the regular railway schedules were maintained and, in fact, slightly increased at Springfield and at Tucson. Every other effort was made to reduce the railway operating expenses, but owing largely to floods at Trinidad, necessitating extraordinary expenditures for maintenance, the reduction in operating expenses in the railway department for the year amounted to but \$8,500.

The figures given above show that the principal decreases in earnings sustained during 1915 were in the railway department and that the present important problem is that of meeting and dealing with jitney competition.

Grays Harbor suffered severely from jitney competition and stagnation in the lumber business, the loss in railway gross earnings there aggregating more than \$50,000 or 42.6 per cent.

COMPREHENSIVE FINANCING BY NORTHERN STATES POWER COMPANY

The Northern States Power Company, a Bylesby corporation, has called for redemption interest bearing securities aggregating \$23,833,415, principal, interest and premiums. These securities represent all the divisional bonds and notes of the various units making up the Northern States Power Company's system, with the exception of the first mortgage bonds of the Minneapolis General Electric Company. They include bonds and notes of the Consumers' Power Company of Minnesota, notes of the Minneapolis General Electric Company, bonds of the Northern Mississippi River Power Company, and underlying bonds of operating companies at St. Paul, Fargo, Grand Forks, Minot, Sioux Falls, Mankato, Faribault, Stillwater and Galena.

When the present financing is completed the company's funded debt will consist of \$18,000,000 of twenty-five year 5 per cent first and refunding mortgage bonds, \$8,000,000 ten-year 6 per cent gold notes, and \$7,632,000 first mortgage 5 per cent bonds of the Minneapolis General Electric Company. Besides consolidating the heretofore existing funded debts the sale of the bonds will produce \$2,000,000 cash to be used for construction purposes during the remainder of the present year.

The present financing consists of three distinct phases, the first being an offering to investors of \$8,000,000 of ten-year 6 per cent notes on April 11, by a syndicate composed of the Guaranty Trust Company, New York; H. M. Bylesby & Company, William P. Bonbright & Company and Spencer Trask & Company.

The second phase was the offering on April 17 of \$2,000,000 of 7 per cent preferred stock at 97½ by a syndicate composed of William P. Bonbright & Company, H. M. Bylesby & Company and Spencer Trask & Company.

The third and final step was the public offering a few days since of \$18,000,000 of first and refunding 5 per cent bonds by a syndicate which has purchased the same, composed of Harris Trust & Savings Bank, Chicago; H. M. Bylesby & Company, Guaranty Trust Company, William P. Bonbright & Company and H. F. Bachman & Company.

In conformity with its policy of frankness toward the public served by operating units and to give its customers an opportunity to become owners of its securities, the Northern States Power Company will publish newspaper advertisements in all of the cities served, briefly describing the present financing, pointing out the benefits which will be derived by the communities concerned, and offering the securities to resident investors.

LOSS ON SEATTLE MUNICIPAL LINES

Official Report Shows True Loss of \$56,721 for 1915—
Councilman Moves for Searching Investigation
Into Future of Lines

According to official figures filed with Mayor H. C. Gill and City Comptroller H. W. Carroll by the State Bureau of Inspection and Supervision of Public Offices, the city of Seattle during 1915 lost \$56,721 in the operation of Division "A" and Division "C" of the Seattle Municipal Street Railway. The gross revenue of Division "A" amounted to \$16,395, which was \$1,324 less than the interest on its funded debt of \$425,000.

State Examiners W. W. Clark and Frank L. Mitten, who prepared the report, declare that the transfer of the Division "C" and Aloha Street substations from the public utility department to the lighting fund was contrary to law. The transfer of these substations was accomplished by the Council, notwithstanding the veto of the bill by Mayor Gill. The report states:

"The substations, which were constructed and equipped by the street railway out of the proceeds of the railway bond sale and loans at a cost of \$60,528, were transferred to the lighting department for a consideration of \$55,000. This amount was to be paid in power to be furnished the street railway for operating purposes. In other words, the \$60,528 part of the bond money voted by the people for construction purposes is being used for operation. This, we believe, is contrary to law. No part of the payroll of the public utility department, which has direct charge of the street railway and supervises and keeps all its accounts, is charged to operating expenses, but all such accounting and general expenses is paid out of the general fund. At a very conservative figure, \$1,200 per annum to cover accounting and general overhead supervision expenses should be borne by the street railway. The general fund has advanced to Division "A" \$19,000, and to Division "C" \$28,095 in the shape of loans, making a total of \$47,095, on which no interest is being charged. Inasmuch as the general fund is on a warrant basis and is paying 5 per cent interest on outstanding warrants the same rate of interest on this loan is properly chargeable to the street railway, making an annual interest charge of \$2,355. The general fund has also paid out on engineers' claim sheets \$5,241 on account of the construction of Division "A." This amount should be repaid at once, as there remains in the bond fund \$32,036, and the above amount was advanced for construction purposes."

The municipal lighting department is furnishing power for the operation of the street railway at \$0.0124 cents per kilowatt-hour, this being \$0.0123 cents less than production costs. In 1915, a total of 946,369 kw.-hr. was supplied, which means a lighting department loss of \$11,649. A true statement based on all losses is shown by the following for one year, 1915: Division "C," \$9,503; Division "A," \$32,169; accounting, etc., utility department, \$1,200; general fund, interest on loans, \$2,200, and lighting department loss on power, \$11,649—a total of \$56,721. There is also an undetermined loss to the city of Seattle for sundry legal experts.

Councilman R. H. Thomson, former city engineer, has introduced a resolution in Council, asking for information concerning the municipal lines, with an estimate of what losses have been sustained by the city, how long these losses are to continue and how many years will be required to repay them. The resolution was referred to the city utilities committee, of which Mr. Thomson is chairman. The resolution asks the department for its plans regarding extensions to increase revenues, as well as for information about the routes to be chosen for extensions, the number

of persons to be served and the net income to be derived. The resolution also calls for definite information regarding earnings, operating expenses, depreciation, taxes and interest on the investment. Finally, it is asked when the lines will become profitable at a 5-cent fare if they are not so now, and whether the service rendered by either of the present lines is such as would justify the city in charging a higher fare.

Division "A" and Division "C" have been operated approximately two and one-half years at a loss. For the last two years frequent announcements have been made of the intention of the Council to extend Division "A" into the Ballard section, and plans for the connection of Division "A" with the Lake Burien line have been proposed at various times.

Bay State Street Railway, Boston, Mass.—The Bay State Street Railway has invited proposals to sell to it \$35,000 par value of first mortgage 5 per cent bonds of the Lowell, Lawrence & Haverhill Street Railway, the date thereof being June 1, 1893.

Boston & Worcester Street Railway, Boston, Mass.—The Boston & Worcester Street Railway has made application to the Massachusetts Public Service Commission for authority to issue for \$105,600 at par additional shares of 6 per cent cumulative preferred stock of which there is at present authorized and outstanding \$397,000. The company also desires to issue \$60,000 of twenty-year 4½ per cent first mortgage gold bonds, making \$2,460,000 outstanding of an authorized issue of \$2,500,000. The proceeds from the sale of the new securities are to be expended for improvements.

Chicago & Milwaukee Electric Railroad, Highwood, Ill.—The Chicago & Milwaukee Electric Railroad was sold on May 1 under foreclosure to the reorganization committee for \$4,550,000, of which \$2,500,000 was for the Illinois division and \$2,050,000 for the Wisconsin division. The price now obtained for the property is \$1,300,000 larger than that in 1912 when the sale was set aside by the court. The committee will at once submit to the court plans for reorganization. The property has been in the hands of receivers since January, 1908. The reorganization committee that bought in the property and represents the bondholders is composed of George M. Reynolds, president of the Continental & Commercial National Bank, chairman; E. A. Hamill, president of the Corn Exchange National Bank; W. E. Stavert, former manager of the Bank of Montreal, Ont.; Miller Lash, Toronto, Ont.; Robert Cassels, Toronto, Ont.; R. Floyd Clinch of Crerar, Clinch & Company, Chicago; E. A. Shedd of E. A. Shedd & Company, Chicago; John R. Thompson, president of the John R. Thompson Company, and H. S. Osler, Toronto, Ont.

Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio.—The Cleveland, Painesville & Eastern Railroad has been authorized by the Ohio Public Utilities Commission to issue its forty-year 5 per cent refunding and extension mortgage gold bonds of the principal sum of \$28,000 for not less than 80 per cent of the par value. The proceeds are to be used to reimburse the company's treasury for \$28,553 expended from income during 1915 for the construction of additions and improvements to its facilities.

Columbus, Delaware & Marion Railway, Cincinnati, Ohio.—Eli M. West, receiver of the Columbus, Delaware & Marion Railway, has applied to the Ohio courts for permission to issue \$105,000 of receiver's certificates to pay the company's share for improvements, consisting of street paving in Columbus, Franklin County, Delaware and Marion, Ohio.

Fresno (Cal.) Interurban Railway.—The Fresno Interurban Railway has filed with the California Railroad Commission an application for authority to issue \$141,000 face value of its stock at \$80, and \$250,000 of its bonds at \$90, to net a total of \$337,400.

Kansas City Railway & Light Company, Kansas City, Mo.—The stockholders of Kansas City Railway & Light Company, at a meeting in Chicago on April 28, unanimously agreed to trustee the common and the preferred stocks with

two sets of trustees who will issue participation certificates against the trustee stock in the ratio of two-thirds for the street railway and one-third for the light and power participation. All the stock except 500 shares was represented and the committee was authorized to try to get in this remaining stock and also to ask Judge Hook to allow an extension of the time for the deposit of stock so that all may participate on an equal basis. Stockholders elected Robert J. Dunham and Charles W. Armour as street railway trustees and John H. Lucas and T. J. Connors for the light and power stock, each two trustees to select a third. The form of participation certificate was approved.

Lake Erie, Bowling Green & Napoleon Railway, Bowling Green, Ohio.—Clarence G. Taylor, receiver for the Lake Erie, Bowling Green & Napoleon Railway, has filed a petition in the Federal Court at Toledo for permission to sell the road, either as a going concern or as junk. Mr. Taylor has, however, asked permission to continue the operation of the electric light and power plant at Bowling Green, which shows a profit. He asserts the railroad has been operated at a loss since its construction in 1903.

Lake Shore Electric Railway, Cleveland, Ohio.—The Lake Shore Electric Railway has been authorized by the Ohio Public Service Commission to issue its general mortgage 5 per cent gold bonds to the sum of \$47,000 for not less than 85 per cent of the par value and pending the sale of the bonds may pledge them as security for a loan for not less than 60 per cent of the par value of the bonds. The money secured by the issue and disposition of the bonds is to be used to reimburse the applicant's treasury for 80 per cent of the money expended from income, within the period from Oct. 1, 1914, to Dec. 31, 1915, for the construction of additions and extensions to its facilities, of the total cost of \$58,398.

Los Angeles & San Diego Beach Railway, San Diego, Cal.—The California Railroad Commission has issued an order authorizing the Los Angeles & San Diego Beach Railway to issue promissory notes for not more than two years from April 30, 1916, in renewal of other notes amounting to \$53,500 at 7 per cent. These notes are to banks at San Diego and Los Angeles and range from \$2,500 to \$21,000 each, and if desired the maker is permitted to issue four notes of \$4,750 each to the Citizens National Bank, Los Angeles, in place of notes for \$19,000 authorized.

Monterey & Pacific Grove Railway, Monterey, Cal.—The California Railroad Commission recently issued an order finding the reproduction cost less depreciation of the property of the Monterey & Pacific Grove Railway, as of June 30, 1914, to be \$102,541. The company, which operates an electric railway in Monterey and Pacific Grove, is controlled by the Coast Valleys Gas & Electric Company, and is conducted as a subsidiary of that company. The valuation case was upon the commission's own initiative for the general purpose of ascertaining and reporting certain facts and estimates of cost which entered into the valuation of the property of various railroad corporations in California.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—Howard B. Smith, a stockholder of the Oakland, Antioch & Eastern Railway, has applied for a receiver for the company. He alleges that the company is being mismanaged. The petitioner asks that the \$5,000,000 of first mortgage 5 per cent sinking fund bonds, of which \$2,500,000 is outstanding, be foreclosed and the property sold at auction.

Public Service Corporation of New Jersey, Newark, N. J.—The Public Service Railway has filed with the Secretary of State of New Jersey a certificate certifying the issuance of \$100,000 of 5 per cent Weehawken extension bonds of the Hudson County Railway. There are three issues of North Hudson County Railway bonds, namely, \$3,000,000 of consolidated 5's, of which \$2,998,000 is outstanding; \$1,500,000 of improvement 5's, of which \$1,291,000 is outstanding, and \$100,000 of Weehawken extension bonds. The last-mentioned issue fell due on Feb. 1, 1915, and was extended for a period of thirty years. The certificate filed with the State covers that issue. Garret A. Hobart, Jr., has been elected a director of the Public Service Corporation of New Jersey and subsidiary companies. Mr. Hobart succeeds the late Thomas Dolan. He will serve until 1915. Other directors were re-elected.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—The San Francisco-Oakland Terminal Railways has deposited with the Mercantile National Bank funds for the payment of the Jan. 1 coupon on the East Shore & Suburban Railway first mortgage 5 per cent bonds. The company has also deposited with the First Federal Trust Company funds for the payment of the principal instalment of the Oakland Traction Company 6 per cent equipment notes, which matured on Jan. 1, 1916. This payment will reduce the amount of these notes outstanding from \$126,000 to \$95,000.

Southern Traction Company, Dallas, Tex.—The St. Louis Union Trust Company, syndicate manager, has issued a notice to the subscribers to the Southern Traction Company of an offer to purchase all the securities held by the syndicate. Practically all the stock and the bonds of the road are owned in St. Louis. The notice says that the offer, which has been accepted, is subject to examination of the property to be concluded on or before June 15, 1916. If this is satisfactory it is proposed that a definite contract be entered into under which it is expected that payment will be made for securities not later than Aug. 1, 1916. The outstanding securities of the company include \$5,000,000 of common and \$2,000,000 of preferred stock as well as \$6,000,000 of first mortgage 5 per cent gold bonds and \$500,000 of second mortgage 5 per cent gold bonds. The company operates an interurban service from Dallas to Waco, 96 miles, and from Dallas to Corsicana, 56 miles, and also local lines in Waco, Corsicana and Waxahachie. With sidings and turn-outs, and 6.5 miles in Dallas operated under trackage rights, the company has 184.5 miles of track. It began operations Jan. 1, 1914.

Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala.—J. S. Orlor & Company, Boston, Mass., are offering at 97½ and accrued interest the twenty-five year 6 per cent first mortgage bonds of the Tuscaloosa Railway & Utilities Company, dated July 1, 1915. Of an authorized issue of \$1,000,000 a total of \$800,000 has been issued. These bonds are available in denominations of \$1,000, \$500 and \$100, and they are subject to call at 102 and interest on and after July 1, 1918. The Tuscaloosa Railway & Utilities Company was created in October, 1915, by the consolidation of the Belt Steam Railway and the Tuscaloosa Ice & Light Company. The railway was operated as a steam line until 1914, at which time it was extended and electrified. It is strictly a belt and terminal railway, handling freight and passengers to and from all railway stations. It has interchange tracks with all steam railroads and spurs and sidings to local industrial houses. The company controls all of the local utilities with the exception of the municipally owned waterworks.

Worcester & Warren Street Railway, Brookfield, Mass.—The Massachusetts Public Service Commission has authorized the issue of 106 additional shares of stock of the Worcester & Warren Street Railway, and \$72,000 of twenty-year 5 per cent bonds of the company to be sold for not less than 90, to pay floating debt incurred in the purchase of the Warren, Brookfield & Spencer Street Railway and improvements on the property.

DIVIDENDS DECLARED

- American Railways, Philadelphia, Pa., quarterly, 1¾ per cent, preferred.
- Boston (Mass.) Elevated Railway, quarterly, one-half of 1 per cent.
- Bristol & Plainville Tramway, Bristol, Conn., 2 per cent.
- Cumberland County Power & Light Company, Portland, Me., quarterly, 1½ per cent, preferred.
- Detroit (Mich.) United Railway, quarterly, 1¾ per cent.
- Grand Rapids (Mich.) Railway, quarterly, 1¼ per cent, preferred.
- Lehigh Valley Transit Company, Allentown, Pa., quarterly, 1¼ per cent, preferred.
- Rio de Janeiro Tramway, Light & Power Company, Toronto, Ont., quarterly, 1¼ per cent.
- Sao Paulo Tramway, Light & Power Company, Toronto, Ont., 2½ per cent.
- Union Street Railway, New Bedford, Mass., quarterly, 2 per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '16	\$146,546	\$96,806	\$49,740	\$46,830	\$2,910
1 " " '15	139,636	94,395	45,241	44,664	577
9 " " '16	1,463,961	937,304	526,657	408,023	118,635
9 " " '15	1,511,809	964,526	547,283	390,643	156,640

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

1m., Mar., '16	\$63,794	*\$35,896	\$27,898	\$17,653	\$10,245
1 " " '15	63,222	*28,927	34,295	17,695	16,600
12 " " '16	792,384	*416,006	376,378	212,798	163,580
12 " " '15	783,153	*373,008	410,065	209,717	200,348

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

1m., Feb., '16	\$7,282	*\$7,721	†\$439	\$1,094	†\$1,533
1 " " '15	6,277	*7,216	†989	1,127	†2,116
12 " " '16	116,877	*97,005	19,872	13,420	6,452
12 " " '15	122,326	*102,007	20,319	13,282	7,037

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Mar., '16	\$100,095	*\$60,568	\$39,527	\$29,793	\$9,734
1 " " '15	83,439	*59,227	24,212	29,338	15,126
12 " " '16	1,142,425	*737,509	404,916	357,353	47,563
12 " " '15	1,052,266	*704,083	348,183	344,499	3,684

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., Mar., '16	\$639,780	\$19,079	\$620,701	\$44,716	\$575,985
1 " " '15	347,372	12,315	335,057	40,833	294,224
12 " " '16	5,295,093	190,217	5,104,876	499,368	4,605,508
12 " " '15	3,941,424	131,272	3,810,152	455,000	3,355,152

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO.

1m., Mar., '16	\$288,094	*\$169,962	\$118,132	\$44,375	\$73,757
1 " " '15	254,656	*150,327	104,329	39,225	65,104
12 " " '16	3,201,382	*1,891,333	1,310,049	499,482	820,567
12 " " '15	3,075,551	*1,869,999	1,211,552	475,816	735,736

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m., Mar., '16	\$1,353,713	*\$728,071	\$625,642	\$423,203	\$202,439
1 " " '15	1,138,211	*610,462	527,749	367,264	160,485
12 " " '16	15,192,163	*8,095,324	7,096,839	4,659,042	2,437,797
12 " " '15	14,031,558	*7,523,913	6,507,645	4,261,763	2,245,882

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m., Mar., '16	\$751,504	\$545,299	\$206,205	\$97,847	†\$130,775
1 " " '15	621,542	432,428	189,114	98,297	†12,268
9 " " '16	6,586,804	4,477,871	2,108,933	886,638	†1,429,356
9 " " '15	5,974,544	4,360,129	1,614,415	884,532	†924,545

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

1m., Mar., '16	\$209,374	*\$139,620	\$69,754	\$66,371	\$3,383
1 " " '15	188,728	*110,258	78,470	62,964	15,506
12 " " '16	2,692,080	*1,568,691	1,123,389	802,370	321,019
12 " " '15	2,543,661	*1,441,273	1,102,388	756,302	346,086

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., Mar., '16	\$231,887	*\$141,868	\$90,019	\$63,645	\$26,374
1 " " '15	198,612	*120,944	77,668	64,663	13,005
12 " " '16	2,563,131	*1,532,202	1,030,929	753,772	277,157
12 " " '15	2,552,109	*1,543,449	1,008,660	732,515	276,145

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

1m., Feb., '16	\$145,763	*\$99,442	\$46,321	\$36,617	\$9,704
1 " " '15	148,940	*694,347	54,593	36,208	18,385
12 " " '16	1,927,491	*1,215,644	711,847	434,099	277,748
12 " " '15	2,362,731	*1,280,569	1,082,162	438,096	644,066

GRAND RAPIDS (MICH.) RAILWAY

1m., Mar., '16	\$107,618	*\$67,418	\$40,200	\$14,086	\$26,114
1 " " '15	93,284	*69,168	24,116	13,706	10,410
12 " " '16	1,200,414	*829,505	370,909	167,168	203,741
12 " " '15	1,276,581	*835,091	441,490	161,998	279,492

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

1m., Feb., '16	\$24,165	*\$16,077	\$8,088	\$5,524	\$2,565
1 " " '15	18,765	*13,918	4,847	5,598	†751
12 " " '16	286,881	*160,712	126,169	66,358	59,811
12 " " '15	272,330	*178,326	94,004	67,063	26,941

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

1m., Mar., '16	\$3,405,051	\$1,309,213	\$2,095,838	\$1,105,187	†\$939,070
1 " " '15	3,055,708	1,143,052	1,912,656	1,111,794	†857,141
9 " " '16	26,458,814	10,395,029	16,063,785	10,182,821	†6,303,841
9 " " '15	24,912,836	9,690,490	15,222,346	9,781,320	†5,878,138

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

1m., Feb., '16	\$141,880	*\$88,509	\$53,371	\$28,725	\$24,646
1 " " '15	121,300	*75,277	46,023	27,204	18,819
12 " " '16	1,739,749	*1,070,285	669,464	334,159	335,305
12 " " '15	2,008,002	*1,112,669	895,333	322,405	572,928

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

1m., Feb., '16	\$597,214	*\$432,928	\$164,286	\$183,795	†\$19,509
1 " " '15	591,691	*385,442	206,249	181,472	24,778
12 " " '16	7,563,813	*4,811,870	2,751,943	2,186,819	565,125
12 " " '15	8,268,052	*4,973,698	3,294,354	2,129,059	1,165,295

Traffic and Transportation

ROCHESTER-LOCKPORT OPERATION APPROVED

Public Service Commission Accepts Findings of Its Expert With Respect to Buffalo, Lockport & Rochester Line

The Public Service Commission for the Second District of New York has received and adopted the report of Charles R. Barnes, electric railway inspector of the commission, upon an inquiry into the condition of the Buffalo, Lockport & Rochester Railroad with regard to safety of operation made when the district attorney of Monroe County, John F. Barrett, transmitted to the commission the recommendations of the Grand Jury which investigated the Elm Grove wreck in which one man was killed on the road last July. Mr. Barnes' findings are that the road is now operated "under modern and approved methods." Mr. Barnes says in his report:

"Notwithstanding that this road is not equipped with a block-signal system, it is operated under modern and approved methods; although with the possibility of man-failure always present, no absolute guarantee of safety in operation can ever be predicated. With the exceptions of the possible necessity for adoption by it of a higher standard of track maintenance, for additions to its snow-fighting equipment, illumination of crossing signs and necessary future replacements of trolley wire, no recommendations affecting the element of safety for immediate improvement in physical conditions, equipment, or methods of operation which could be made within reasonable financial limits, are at present deemed necessary by me."

Mr. Barnes divides his report into thirty-five conclusions with regard to the condition of the road. Many of these show that conditions have been materially improved since the fatal accident of last July, in which a passenger car collided with a work train which was standing on the main track. For instance, since then no work train has been permitted on the main track during the time when passenger cars are operated, except on urgent necessity, and then only with the permission of the general manager.

Reviewing the financial history of the road, Mr. Barnes has this to say of the adoption of a block-signal system, which he believes would go further than anything else toward establishing safety of operation:

"Several interurban railroads in this public service district similar in character to this one, are equipped with automatic track circuit control block signals. Supplementing methods employed on this road, such a system of signal equipment would be an added element of safety in the operation of it. The cost of such a system would exceed \$100,000, and its maintenance would materially increase operating expenses. In view of the present and apparently near future prospective earnings of the company, the time when it will be financially able to make such an expenditure and provide for necessary increased operating expenses is problematic. It should, however, be done as soon as financial conditions permit."

Mr. Barnes' report was made after a careful physical examination of the roadbed and equipment, frequent rides on the cars to observe the manner in which employees observed the rules, and a study of the rules, operating records and other reports of the company as to up-keep, etc. Mr. Barnes says that the telephone system for dispatching is properly installed and operated; that the rules in book and time-table are proper for safe operation; that the rate of speed required by time-table is not excessive nor such as to increase probability of accident; that limited trains are eliminated so that all trains meet on the same switches on each run; that when extra service is required it is furnished by two or three-car trains and not in separate trains with separate schedules; and that the safety of operation has been materially increased by new rules of last September with regard to freight trains, requiring them to clear passenger trains by five minutes, reporting to the dispatcher when clear.

*Includes taxes. †Deficit. ‡Includes non-operating income.

EAST CLEVELAND FARE INSUFFICIENT

The check of patrons of the Cleveland (Ohio) Railway living in East Cleveland made a few weeks ago on the order of Fielder Sanders, street railway commissioner, shows that the average length of the ride is 4.71 miles. A total of 10,468 people used the cars within twenty-four hours. A computation made by the company officials, it is claimed, would indicate that the rate of fare for East Cleveland residents would have to be increased from 3 cents to 7.3 cents before the company could afford to operate the lines, estimating that 30 per cent of the riders used transfers. The actual cost of service per passenger, according to the estimate, is 5.61 cents.

Mr. Sanders said he would ask for a meeting of East Cleveland officers to determine on a rate of fare that will relieve the city patrons from paying a portion of the expense for operating the cars for East Cleveland. The present franchise on Euclid Avenue does not expire until 1921. Under it East Cleveland has a contract with the company that the fare shall be the same as in the city.

BAY STATE FARE HEARINGS PROGRESSING

Cross-examination of R. M. Feustel, valuation expert of the Bay State Street Railway, continues to be the leading feature of the fare hearings before the Massachusetts Public Service Commission. At the session of April 26 details were given of the contract under which the engineering firm of Sloan, Huddle, Feustel & Freeman, Madison, Wis., agreed to make a study and survey of the Bay State company's property. The work included a complete field examination combined with a study of book records, and also included plans for an investigation of the rates charged by the different traction companies of the Middle West and Eastern States, for suburban and interurban service. The firm's terms for the above work were \$50 a day and expenses for the time of any of the principals, and \$20 a day and expenses for the time of the field engineer in charge, with 40 per cent on the pay-roll for the staff. The company also agreed to pay all traveling, general office and general field expenses for the staff. Subsequently the work was developed to cover the allocation of the investment and revenue requirements of ninety-six selected routes in Massachusetts.

Mr. Feustel stated that the probability of some diminution in traffic in case of increased fares was conceded in studying the revenue requirements. In general, a loss of 5 per cent was taken in the cities on the system, and on certain outside lines where a doubling of the fare is planned, due to adding a new fare zone, a 15 per cent maximum local traffic loss was estimated. Most of the additional revenue required is to come from the increase in the fare unit, only a small portion coming from zone changes. Only nineteen new zones are contemplated, and as far as possible these are added at so-called neutral points where the through traffic is relatively small. As far as possible the attempt has been made to eliminate discriminations in fares for particular lengths of haul. The short-haul passenger naturally will be the first to withhold patronage because of the fare increase. The witness said that whereas a fare increase would doubtless tend to stimulate jitney competition, there is no way in which the reception of an increase can be predicted for a given community. Mr. Feustel said that his firm was not employed by the company in the capacity of efficiency engineers charged to attempt a full solution of the company's problem of securing increased revenue.

In responding to inquiries the witness stated that an attempt had been made to design a zone system of fares for the Bay State company, but it was found impracticable from the actual physical collection standpoint through a greater part of the territory close around Boston, even out as far as Reading on the north and Brockton on the south. In regard to interurban lines in the Middle West, the witness stated that while most of these operate on a private right-of-way, the lines from Fort Wayne (Ind.) to Auburn and Springfield and from Lafayette to Soldiers' Home compare with the Bay State intercity lines in being located on highways. A passenger fare of 2 cents per mile is common, and the fares are arranged in 5-cent increments. Owing to zone changes in a few cases on the Bay State system the proposed new fare is 12 cents, as against 5 cents at

present. The witness said that there must be some portions of the Bay State system where the introduction of the one-man car would result in an increase in net revenue through the saving in expense secured, but he disclaimed any general advocacy of such units. At the close of the April 28 hearing it was agreed to hold only three sessions during the week ended May 6, and on alternate days.

REROUTEING AND CAR TYPES CONSIDERED AT TOLEDO

A meeting of the Council committee appointed to consider plans for rerouteing cars and improving the service of the Toledo Railways & Light Company was held on April 27. A number of Summit Street merchants protested against the proposed removal of two or three lines from that thoroughfare temporarily until additional cars can be secured. Councilmen replied that the merchants should think of the entire city instead of merely their own businesses and the street on which they are located.

The Toledo Times on April 24 suggested that before going too far with the rerouteing plan the wishes of the people be secured.

The company has been trying out different types of cars to ascertain which would be best fitted for relieving congestion and furnishing the proper service. A motor car of the front entrance, center exit type, was sent from Cleveland, and tested during the rush hours at the Willys-Overland plant. Peter Witt, Cleveland, presented a front entrance, center exit car of his own design. Dwight Dean, of the G. C. Kuhlman Car Company, and others, have also conferred with the company officials.

D. U. R. Baseball Calendar.—The Detroit (Mich.) United Railways has issued a calendar for the baseball season, which gives the schedule of the Detroit team. The "at home" dates are printed in red and the others in black. The months are prefixed by "Practice Safety First."

Disinfecting Little Rock Cars.—The Little Rock Railway & Electric Company, Little Rock, Ark., is installing in all of its cars on all lines the Sanzone system of deodorizing and disinfecting. This is said to be the only system which kills all germs and animal life with formaldehyde gas not necessarily by actual contact.

Daylight Saving Schedule Adopted.—The Winnipeg (Man.) Electric Railway has changed its schedule to conform with the "Daylight Saving" by-law recently passed by the City Council advancing the time at the City Hall one hour. A motion made in the City Council to increase the time for the sale of workmen's tickets one hour in the morning and evening was defeated.

Car-Capacity Ordinance Defeated.—An ordinance proposed to the General Council by the Allied Civic Clubs of Louisville, Ky., which sought to impose a fine whenever more than ten passengers had to stand in a car of the Louisville Railway, was voted down unanimously in the Council when the railroad committee returned the measure with an unfavorable report.

Hearing on McKinley Fares Concluded.—The hearing in the case before the Interstate Commerce Commission on the proposed increase in fare from 5 to 10 cents over the Illinois Traction System between St. Louis and Granite City was concluded in St. Louis on April 25. The testimony of both sides was largely a reiteration of that presented on the two previous days of the hearing as reported in the ELECTRIC RAILWAY JOURNAL of April 29, page 840.

Hit the Sunday Trail Over the Railway.—The Kansas City (Mo.) Railways is circulating widely, in Kansas City and on trains in surrounding towns, a folder advertising the meetings of "Billy" Sunday, scheduled to begin in that city on April 30. The folder bears a plan picture of the tabernacle, data on the building and its location, and directions for getting there by electric railway from various parts of the city. There is also a small map of the city showing the location of the tabernacle, and a list of other interesting places to visit. The 5-cent fare that prevails to all parts of the city is emphasized. The catch-line on the folder is "Hit the Steel Trail." The company will carry cards on the cars passing the tabernacle indicating that fact, and will advertise the meetings on all its cars.

Through Routes and Exchange of Transfers Ordered.—The Public Service Commission for the First District of New York has ordered the Third Avenue Railway, the Belt Line Railway Corporation and the Forty-second Street, Manhattanville & St. Nicholas Avenue Railway and the Second Avenue Railroad to establish through routes and exchange transfers so that passengers may ride over the Queensboro Bridge from any of these lines without the payment of an additional fare. The Belt Line, the Forty-second Street Company and the Third Avenue are ordered to construct such interchange or connecting tracks as may be necessary to permit of the operation of the routes required by the order of the commission.

Commission Holds Extension Unjustified.—In the case of the petition to the Railroad Commission of California to compel the Santa Barbara & Suburban Railway to construct an extension from its present terminus at Haley and Milpas Streets, in Santa Barbara, to the Santa Barbara Cemetery, the commission held that the estimated cost of the proposed extension would approximate \$78,552, with operating expenses and taxes \$19,054 per annum, while the estimated revenue would amount to only \$6,160, effecting an annual loss to the company of approximately \$12,894; that under such conditions the construction of this extension was not warranted, particularly in view of the fact that a local auto bus line proposed putting several buses in operation along the same route.

Certificates of Convenience and Necessity for Illinois Jitneys.—Jitney buses cannot operate in cities of Illinois along specified routes unless they have a certificate of convenience and necessity. This was announced in a decision handed down by the Illinois Public Utilities Commission on May 1. The decision was made in the case of the Tri-City Railway, Moline, and the Rock Island & Eastern Traction Company, Rock Island, against the Illinois Taxicab Company and others. The complaint against a number of defendants who were doing a cab service and not operating along certain routes was dismissed. The commission directed that all those who operate along given routes for hire must desist until they obtain a certificate of convenience and necessity. The case has been under consideration by the commission for some time.

Market Street Association Takes Action Against San Francisco Jitneys.—The Market Street Association of San Francisco, representing \$50,000,000 worth of property, claims that owing to the traffic congestion caused by jitney buses on Market Street property controlled by the association has depreciated 25 per cent in value. For this reason it will ask the Board of Supervisors to reduce the annual Market Street property assessments by about \$600,000. The association points out that there are eight lines of vehicles on Market Street and, rather than risk the danger of crossing, shoppers buy elsewhere, thereby injuring business. The association claims further that jitney drivers are constantly violating the law, due to an insufficient number of traffic policemen, and if the number of officers is increased it will mean an additional burden on the taxpayers, who will also be called upon to make up the reduction of \$600,000 for which the association asks.

Automobile Competition in Havana.—The Havana Electric Railway, Light & Power Company, Havana, Cuba, has to contend with about 1000 Fords that take people nearly everywhere charging 20 cents for one or more passengers. Many of these cars have been in service more than a year. The price of gasoline in Havana on April 26 was 40 cents to 41 cents. Many of the cars are owned by one individual, who rents them out at \$3 a day, the driver getting all over that amount. The cabs in the city are operated in much the same manner, but they charge only 10 cents. It is estimated that there are nearly as many cabs as Fords. The people in Havana ride more than do the people in the States; in fact, very few persons in Havana ever walk more than three blocks. Despite this competition the statistics of the railway department of the Havana Electric Railway, Light & Power Company for the year ended Dec. 31, 1915, show a decrease of only 2.84 per cent in passenger earnings. The operating expenses, however, were decreased by 8.11 per cent and net earnings from operation actually increased 6.72 per cent.

Personal Mention

Mr. Charles J. Murphy, Brookston, Ind., has tendered his resignation as a member of the Public Service Commission of Indiana to Gov. Samuel M. Ralston.

Mr. Anthony Deahl, an attorney of Goshen, Ind., has been appointed by Gov. Samuel M. Ralston to the Public Service Commission to succeed Mr. Charles J. Murphy, resigned.

Mr. J. W. Lee, Jr., publicity agent of the Pennsylvania Railroad, who resigned recently, will leave the company's service on May 15. He will be associated in business in New York with Mr. Ivy L. Lee.

Mr. Peter Witt, formerly street railway commissioner at Cleveland, Ohio, has been engaged by the Cincinnati (Ohio) Traction Company to study the transfer problem in connection with the pending revision of the terms of the franchise of that company.

Mr. Clifton A. Hoag has been appointed assistant treasurer of the United Traction Company, Albany, N. Y., to succeed Charles A. Relyea, who died recently. Mr. Hoag has been connected with the bureau of departmental accounts of the company.

Mr. J. J. Callahan has resigned as operating manager of the London & Port Stanley Railway, London, Ont. Before becoming connected with the London & Port Stanley Railway in August, 1915, Mr. Callahan was superintendent of transportation of the Montreal & Southern Counties Railway, Montreal, Que.

Mr. W. V. Hill, tax and contract agent for the Pacific Electric Railway, Los Angeles, Cal., has been appointed manager of the newly organized California Electric Railway Association and has established headquarters in San Francisco. As noted elsewhere in this issue the organization, under the direction of Mr. Hill, will undertake a statewide campaign of education designed to establish and maintain better understanding between the public and the electric railways.

Mr. Halford Erickson has resigned as chairman of the Railroad Commission of Wisconsin and will become associated with Mr. William Hagenah in making appraisals and other investigations of public utility properties. He will make his headquarters in the First National Bank Building, Chicago, Ill. Mr. Erickson had served on the Railroad Commission of Wisconsin since its creation in 1905, and the enviable reputation which this commission has gained is in a large measure due to Mr. Erickson's efforts and ability. He was born and educated in Sweden, and came to the United States in 1884. He continued his education in Minneapolis, Minn., and entered the service of the Chicago, St.



HALFORD ERICKSON

Paul, Minneapolis & Omaha Railroad in 1890. After serving in various capacities with that company he was appointed a labor commissioner of Wisconsin in 1896. Mr. Erickson continued in that office until 1905, when he was appointed a member of the original Railroad Commission of Wisconsin by Governor La Follette.

Mr. Frank N. Robinson has been appointed assistant secretary of the Public Service Commission of the First District of New York to succeed Mr. Matthew J. Harrington, resigned. Mr. Robinson has been the city hall and political reporter for the *Evening Mail* for several years, and for the last three years has been the Albany legislative correspondent for that paper. He began newspaper work in New York City in 1900 as a reporter for the Church News

Association, and later went to the New York City News Association. While with the latter association he was assigned to cover the Public Service Commission during the lengthy negotiations over the dual contracts, gaining wide information as to the activities of the commission.

Mr. Walton M. Wentz, formerly information clerk in the publicity department of the Pennsylvania Railroad, has been appointed assistant publicity agent of the company. Mr. Wentz has been with the Pennsylvania Railroad since December, 1902. He entered the service of the company as a clerk in the superintendent's office at Baltimore, and after six years in that department he was transferred to the office of the publicity agent in Philadelphia, where for the last two years he has been information clerk.

Mr. George B. Harley, formerly an assistant in the office of the Publicity agent of the Pennsylvania Railroad, has been appointed publicity agent. He will succeed Mr. J. W. Lee, Jr., whose resignation takes effect on May 15. Mr. Harley has been connected with the publicity department of the Pennsylvania Railroad since June, 1914. He entered the college department of the University of Pennsylvania in the class of 1901, and was transferred to the law school of the university, graduating with the class of 1902. He was on the reportorial staff of the Philadelphia *Press* from 1908 to 1910, the Philadelphia *News Bureau* from 1910 to 1914, and from February to June, 1914, he was on the staff of the Philadelphia *Public Ledger*.

OBITUARY

William Wallace, superintendent of the Eighth Street division of the Cincinnati (Ohio) Traction Company, died at Seton Hospital in Cincinnati on April 26 as a result of injuries sustained by being struck by an automobile some days previously. Mr. Wallace entered the service of the company as driver of a horse car.

Stephen Kendall Poole, secretary of Poole Brothers, Chicago, Ill., and the youngest son of George A. Poole, the founder of the company, is dead. Mr. Poole was born in Chicago on Aug. 2, 1883. He was educated in the Chicago public schools and was graduated from the Massachusetts Institute of Technology. He is survived by a widow and two children.

William H. Capel, secretary of the New England Westinghouse Company and the J. Stevens Arms & Tool Company, Springfield, Mass., died suddenly on April 23. Mr. Capel was born in New York City in 1867. In April, 1899, he entered the employ of the Westinghouse Electric & Manufacturing Company in New York. For several years past he had been closely associated with Mr. L. A. Osborne, vice-president. On June 2, 1915, he was elected secretary of the companies mentioned previously.

Julius E. Rugg, for fifty years actively employed in street railway service in Boston and vicinity, and for nine years superintendent of the transportation department of the Boston Elevated Railway, died at his home in Brookline on April 19. Mr. Rugg was born at Rindge, N. H., in 1838. He went to Boston in 1863 and entered the employ of the Lynn & Boston Street Railway as a conductor. When the Highland Street Railway was organized Mr. Rugg became its superintendent, and upon the consolidation of the road with the West End Street Railway he went to Minneapolis, serving there for a time as superintendent of the local street railway system. After a term as superintendent of the Citizens' Traction Company, Pittsburgh, Pa., Mr. Rugg returned to Boston in 1896 to become superintendent of the West End company. From 1898 to 1907 he was superintendent of transportation of the Boston Elevated Railway, and during the last years of his active railway life was head of the employment and discharge office. Among his inventions was a reversible car seat. Of distinguished personal appearance, Mr. Rugg was a gentleman of the old school, and his acquaintance with transportation men throughout the country was unusually extensive. He was twice married.

William B. Rockwell, manager of the Eastern Pennsylvania Railways and the Eastern Pennsylvania Light, Heat

& Power Company, Pottsville, Pa., died suddenly at the Polyclinic Hospital at Philadelphia on April 30 as a result of complication following an operation performed on April 27. Mr. Rockwell had been connected with the properties at Pottsville for six years. He was born in New York City, but was reared in Scranton, Pa., where his father was a coal operator. Mr. Rockwell entered business in Scranton, and lived in that city for more than thirty years. He was one of the pioneers of the electric railway field, having taken an active part in the construction of the Van Depoele road in Scranton in 1885. Later he assisted in building electric railways at Athens, Pa., and Middletown, N. Y. He also assisted in constructing the Staten Island Midland Electric Railway, and in 1895 planned and built Midland Beach, on the southern shore of Staten Island, now one of the most popular beach resorts around New York City. He left Staten Island to become manager of the Syracuse, Lake Shore & Baldwinsville Railway, and then of the Syracuse, Lake Shore & Northern Railway, but resigned the latter position to become general manager of the Syracuse & Suburban Railroad. It was from the Syracuse & Suburban Railroad that he resigned in June, 1910, to become connected with the properties in Pottsville. Mr. Rockwell is survived by his widow, two daughters and two sons, Mr. J. C. Rockwell, manager of the electrical department of the Manila Electric Railroad & Light Company, Manila, Philippine Islands, and Mr. R. W. Rockwell, Philadelphia. Mr. Rockwell was unusually successful in his relations with the public and with his men. Both the Pottsville *Evening Chronicle* and the Pottsville *Journal* of May 1 devoted their leading editorials to Mr. Rockwell and acknowledged his death as a great loss to the community. Mr. Rockwell's characteristics may, perhaps, be summed up best in the words of the *Journal*, which said that "he had the heart of a boy and the soul of a gentleman."

NORFOLK FRANCHISE REPORT BEFORE COUNCIL

The special joint committee of the Council of Norfolk, Va., which has been considering the matter of new franchises to be granted to the Virginia Railway & Power Company submitted its report to the Council on the evening of May 2. Consideration of the matter was postponed to a meeting of the Council as a committee of the whole to be held the latter part of the month. The committee says that in an effort to agree on a franchise that would eliminate all the differences which exist between the city and the company and to avoid the possibility of differences during the term of the proposed grant and at the same time reach a conclusion acceptable to both the city and the company, the committee went into the matter with the company, considering it from the standpoint of co-operation and mutual understanding.

It developed during the consideration of the matter that the various differences could be adjusted best by making new franchises and the surrender of the old ones, rather than by trying to amend the existing franchises. There are three operating subsidiaries, however, involving the interests of three separate sets of stock and bondholders, and in order to avoid any complications it was agreed to draw three separate grants similar in terms and conditions. The franchises now in force expire at different times and contain conditions at variance with each other. The committee gives at length its reasons for believing that the proposed ordinances are preferable to the several franchises now in existence.

A digest of the terms of the proposed franchises was published in the *ELECTRIC RAILWAY JOURNAL* of April 22, page 792. It was stated in that account that some of the lines in Norfolk were standard gage and some 5-ft. 2-in. gage and that the new grant prescribes that "all of the lines shall be standardized." This was, perhaps, somewhat misleading. The ordinance provides for the gage to be made uniform at 5 ft. 2 in. The fare on the old city division is at present 5 cents or six tickets for a quarter. The tickets are not sold on the cars, but at stations in different parts of the city. The other fare conditions as given previously in the *ELECTRIC RAILWAY JOURNAL* are correct.

Construction News

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

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

RECENT INCORPORATIONS

Tampa & Eastern Traction Company, Tampa, Fla.—Application has been made by this company for a charter to construct an electric line from Tampa to Lakeland via Plant City. Capital stock, \$750,000. Headquarters, Tampa. Officers: F. W. Cole, president; E. J. Binford, vice-president and general counsel; Frank L. Cooper, secretary, and F. M. Williams, treasurer. [April 15, '16.]

FRANCHISES

Miami, Fla.—The Miami Traction Company has received a franchise from the Council to construct a 1-mile extension on Biscayne Drive, Miami.

***Tallahassee, Fla.**—A. S. Metzner and associates have asked the Council for a franchise to construct a line on Depot, Gaines, Monroe and Copeland Streets and Park Avenue. Mrs. F. R. S. Phillips, secretary Tallahassee Boosters' Club, may give information.

Atlanta, Ga.—The Federal Construction Company has received a franchise from the Board of Aldermen of Atlanta to construct an electric railway from the city limits to Spring and Walton Streets. [Feb. 12, '16.]

Pocatello, Idaho.—The Pocatello Traction & Interurban Company has received a fifty-year franchise from the Council to construct and operate an electric line in Pocatello. [March 18, '16.]

Wichita, Kan.—The Arkansas Valley Interurban Railway has asked the Council for a franchise to construct a line over certain streets in Wichita. This is in connection with a proposed extension down the Arkansas River to Winfield and Arkansas City.

Newport, Ky.—The City Commissioners have granted the Cincinnati, Newport & Covington Street Railway a twenty-year franchise in Newport.

Newburgh, N. Y.—The Orange County Traction Company reports that it has received a thirty-year franchise from the Council to construct an extension on Lake Street from Broadway to the Newburgh Bleachery.

Cincinnati, Ohio.—The Cincinnati Traction Company has received a franchise from the Council to construct an extension of the Avondale line to Bond Hill.

TRACK AND ROADWAY

Calgary, Alta.—The Council of Calgary has adopted the recommendation of the city commissioners for the construction of a temporary street railway line to Sarcee military camp. The cost is estimated at \$6,000.

Visalia Electric Railroad, Exeter, Cal.—This company will construct an extension from a point a half mile below Terminus to Point of Rocks. The cost of the extension will be about \$5,000.

Marin County Electric Railway, Mill Valley, Cal.—This company's project to provide street car service in Mill Valley and the construction of a line from the Northwestern Pacific Railroad station in Mill Valley to the Cascades has been abandoned and the recently constructed mile of track is being torn up. The town trustees refused further extensions of time to the promoters within which the road should be constructed and ordered a \$3,000 bond forfeited. [Sept. 4, '15.]

Willimantic & Manchester Street Railway, Hartford, Conn.—This company has awarded a contract to the C. E. Coon Construction Company, Cleveland, Ohio, for the construction of a line from Manchester Green to Willimantic, about 20 miles. The contract, it is reported, will involve an expenditure of about \$1,000,000. John T. Henderson, Hartford, engineer. [May 22, '15.]

St. Petersburg & Gulf Railway, St. Petersburg, Fla.—This company proposes to extend its North Shore line to Southland Seminary. The construction will include a bridge over Coffee-Pot Bayou.

Alton & Jacksonville Railway, Alton, Ill.—It is reported that this company's line may be extended from Jerseyville to Jacksonville.

Chicago Heights (Ill.) Street Railway.—It is reported that this company will construct an extension this summer on Fourteenth Street and will later connect with Sixteenth Street by West Side loop.

Evansville (Ind.) Railway.—This company will extend its Michigan and Garvin Street line five blocks from the present terminal at Oregon Street to the plant of the Faultless Castor Company.

Newport & Alexandria Interurban Railroad, Newport, Ky.—Negotiations are under way between Gottlieb Hartweg, Col. Louis C. Wildrig, president of the Alexandria Turnpike Company, Newport, and others, for the purchase of a portion of the Alexandria turnpike as a right-of-way for this company's proposed line from Cincinnati to a point four miles beyond Fort Thomas. The company also intends to purchase a right-of-way over the Grand Avenue Turnpike Company's holdings from Newport to Fort Thomas. It is stated that the company plans to arrange a right-of-way over the tracks of the Cincinnati, Newport & Covington Railway from Cincinnati to the intersection of Tenth Street and Grand Avenue, Newport. The proposed route after reaching Grand Avenue is to continue to Fort Thomas Avenue, thence to the Alexandria turnpike. [March 18, '16.]

***Mandeville, La.**—It is reported that plans are being made to construct a line from Mandeville to Madisonville and Hammond, about 25 miles. The Town Council of Mandeville may be able to give further information.

Boston (Mass.) Elevated Railway.—Work has been begun by this company on the construction of an extension from the Sullivan Square terminal to the Boston & Maine station in Everett, about 1 mile.

Berkshire Street Railway, Pittsfield, Mass.—This company has purchased 5000 cedar ties which it proposes to use as an experiment. Chestnut ties are in general use, but it is believed that the cedar ties will last longer.

Detroit (Mich.) United Railway.—It is reported that the Detroit United Railway has agreed to accept the right-of-way and the franchises granted the Highland Park & Royal Oak Railroad, and will extend its tracks out Oakland Avenue, Highland Park, through Greenfield Township to Royal Oak, connecting with the Rochester interurban line. It is stated that the route has been donated to the Detroit United Railway by the Troyak Land Company, and the contract with the company stipulates that the road be built and cars placed in operation within two years.

St. Joseph, Mich.—In reply to an inquiry, M. W. Stock advises that he is not interested in the construction of an electric railway from St. Joseph to Michigan City, as reported in the *ELECTRIC RAILWAY JOURNAL* for April 22.

Kansas City (Mo.) Railways.—Work has been begun by this company on the reconstruction of its track on Eighteenth Street from Main Street to Woodland Avenue. The city widened Eighteenth Street 15 ft. and thus necessitated a removal of the street car tracks to the center of the thoroughfare. The tracks are being laid on new sawed-oak ties on a solid concrete base. It is estimated that the cost will be about \$75,000.

Great Falls (Mont.) Street Railway.—James R. Hobbins, superintendent of the Great Falls Street Railway, reports official authorization of extensions of the line on Sixth Avenue South to Sixteenth Street, thence Third Avenue North, thence to Fourth Street, making a complete loop for the South Side. An extension will also be built from the Eighth Avenue line at Fifteenth Street, where it will connect with the new Fourth Avenue line, extending east from Fifteenth Street to Thirty-sixth Street, or Boston Heights, where it will connect with the present trackage. It is expected that these extensions will be ready for use by Sept. 1. According to estimates, 6000 new ties will be required for the work and 422 tons of steel will be used for tracks. The electrical equipment has been ordered.

***New Egypt, N. J.**—The leading business men of New Egypt are making an effort to finance an electric railway from New Egypt to Bordentown, to connect with the lines of the Public Service Corporation. The length of the proposed line will be about 12 miles.

New York Municipal Railway, Brooklyn, N. Y.—Bids will be received by this company until May 16 for construction of tracks and installation of electrical equipment on its Jamaica line. For plans and further information apply to chief engineer, 85 Clinton Street.

Interborough Rapid Transit Company, New York, N. Y.—Bids will be received by the Interborough Rapid Transit Company until May 11 for the construction of Section No. 4-C of the Queensboro Bridge line, comprising a part of the Manhattan approach to the Queensboro Bridge, between Bent No. 1 near the east building line of Second Avenue and Bent No. 15 near the west building line of First Avenue and a part of the Queens approach from Bent No. 60 near the west building line of Van Alst Avenue to Bent No. 2-2, about 44 ft. east of the east building line of Ely Avenue.

Newbern-Ghent Street Railway, Newbern, N. C.—This company is contemplating the construction of an extension into Jones County.

Cleveland (Ohio) Railway.—The proposition for subway approaches to the new high-level bridge across the Cuyahoga River at Cleveland, Ohio, was approved by a vote of more than two to one at the election on April 25. This will enable the street cars to reach the bridge without danger of congestion and will insure continuous operation between the city proper and the West Side. The Cuyahoga County Commissioners will have charge of the construction of the subways and a bond issue of \$1,000,000 has already been authorized for that purpose.

Lancaster Traction & Power Company, Lancaster, Ohio.—A report from this company states that it expects to construct a 2-mile extension of its lines. All material for the construction has been purchased.

***Tulsa, Okla.**—Surveys have been made for the construction of an interurban railway from Tulsa to Coweta, 25 miles. H. D. Patee, Tulsa, is interested.

Johnstown-Somerset Traction Company, Johnstown, Pa.—This company has awarded a contract to the Phoenix Bridge Company of Phoenixville for the construction of a 650-ft. steel span bridge, to be erected on the outskirts of Boswell. It is stated that the cost of construction will be about \$50,000. The Cambria Steel Company has been awarded a contract to furnish 4000 tons of rails for extensions in Boswell. [March 25, '16.]

Lancaster & York Furnace Street Railway, Millersville, Pa.—At a recent meeting of the owners of the Lancaster & York Furnace Street Railway it was decided to repair and operate the line. Operation was suspended some months ago, as noted in the *ELECTRIC RAILWAY JOURNAL* of Jan. 22, page 187.

Eastern Pennsylvania Railways, Pottsville, Pa.—Operation has been begun on this company's extension from Pottsville to Frackville.

Providence & Danielson Railway, Providence, R. I.—Surveys have been begun by the engineers of the Water Supply Board on the new route of the Providence & Danielson Railway to be constructed by the city of Providence from North Scituate to Rockland to replace the present route, which must be abandoned because it passes through the area to be occupied by the Providence reservoir. The new line will be about 5 miles long and give a shorter route between North Scituate and Rockland than the existing one.

***Cross Anchor, S. C.**—Plans are being made to construct an electric railway from Spartanburg to Clinton via Walnut Grove, Hobbysville, Cross Anchor and Tylersville, about 35 miles. Among those interested are Dr. W. B. Patton, Cross Anchor; A. B. Calvert, Spartanburg, and T. B. Thackston, Walnut Grove.

Knoxville Railway & Light Company, Knoxville, Tenn.—The city of Knoxville has entered into a contract with the Knoxville Railway & Light Company for lighting the streets of the city for a period of ten years.

Dallas (Tex.) Consolidated Electric Street Railway.—This company has just completed the laying of 4255 ft. of double track on Commerce Street, using 103-lb. girder rail and International steel tie with 7-in. concrete paving base and bituminous concrete with wood block heading. The cost of this construction was \$78,000. The company proposes to reconstruct 2500 ft. of double track on Main Street, using similar construction and will spend \$3,000 for the installation of manganese crossings.

Ogden, Logan & Idaho Railway, Ogden, Utah.—This company has awarded a contract to the Utah Construction Company of Ogden for constructing grade for the Brigham-Hot Springs cut-off.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company, in a proposal to the City Council, offered to eliminate the right-angle turn in the street railway at Aloha Street and Taylor Avenue, providing the Council will give the company an extension of time to erect a steel or reinforced concrete viaduct along Taylor Avenue, between Republican and Mercer Streets. Superintendent A. L. Kempster states that his company is willing to pay a fair share of the condemnation of a new street to cross private property from the intersection of Fifth Avenue North and Aloha Street, to the intersection of Taylor Avenue and Prospect Street, which would eliminate the right-angle turn. In an agreement with the traction company four years ago, it was stipulated that not later than Oct. 14, 1916, the company should erect a viaduct to carry vehicular and foot traffic on Taylor Avenue between Republican and Mercer Streets.

SHOPS AND BUILDINGS

New York Municipal Railway, Brooklyn, N. Y.—Bids will be received by this company until May 16 for the construction of elevated stations on its Jamaica line. For plans and further information apply to chief engineer, 85 Clinton Street.

Interborough Rapid Transit Company, New York, N. Y.—Bids will be received by the Public Service Commission for the First District of New York until May 25 for the construction of station finish for seven stations on the Seventh Avenue-Lexington Avenue line.

Brantford & Hamilton Electric Railway, Hamilton, Ont.—A contract has been awarded to Schultz Brothers & Company, Ltd., for the construction of a brick station on Colborne Street, Brantford, to be used jointly by the Lake Erie & Northern Railway and the Brantford & Hamilton Electric Railway. The structure will be 36 ft. wide and 76 ft. long.

Rhode Island Company, Providence, R. I.—Arrangements have been completed by the Rhode Island Company for the construction of a new terminal on Eddy Street, between Richmond and Point Streets, Providence, as a receiving station for freight. It is expected that the structure and the rearranged tracks will be ready for business the latter part of July or early in August. The building will have an area about one-third greater than that of the present two freight houses combined. The cost is estimated at about \$75,000.

POWER HOUSES AND SUBSTATIONS

Connecticut Company, New Haven, Conn.—This company has ordered from the General Electric Company three 2000-kw. rotary converter equipments, including transformer and switchboard apparatus; one 200-kw. motor-driven exciter and one 200-kw. turbine-driven exciter.

Kentucky Traction & Terminal Company, Lexington, Ky.—This company will shortly add a new 500-hp. boiler to its power plant and make other improvements to the plant amounting to about \$40,000.

Columbus Railway, Power & Light Company, Columbus, Ohio.—Preparations are being made by the Columbus Railway, Power & Light Company for the erection of a new power plant on Kimball Street near Broad Street on the Scioto River, Columbus, at a cost of about \$375,000.

Milwaukee Light, Heat & Traction Company, Milwaukee, Wis.—Work has been begun by this company on the construction of a transmission line from Pewaukee to Merton and Lake Five.

Manufactures and Supplies

LUMBER PRICES REMAIN NORMAL

Reports from the National Lumber Manufacturers' Association headquarters, Chicago, Ill., show that while there have been marked increases in many other articles of manufacture, especially in the building line, the rise in the price of lumber has been but slight. The lumbermen have adhered to the policy of asking only a fair return on their production and have recognized the truth of the proverb that "it is not the runaway horse that does the work." Reports from all over the country indicate that prices are practically the same as they were in 1912, and this is particularly emphasized in the roofing material. Shortage of paper, rags and other such material used for patent roofing has greatly increased the price of this product, and therefore increased the demand for wooden shingles. In spite of this fact, however, the price of shingles has remained the same. During the past few weeks large contracts have been placed for timber, especially for car building and for railroad construction and repairs. Orders for carefully selected lumber running into many millions of feet have been placed within the past week or ten days by the steam railroads and the car manufacturers. To give further impetus to this situation the federal government has recently placed contracts for several million feet of bridge timber.

ROLLING STOCK

Rhode Island Company, Providence, R. I., has ordered two express car bodies from the Laconia Car Company.

Montgomery Light and Traction Company, Montgomery, Ala., has ordered six single-truck cars from the Southern Car Company.

Worcester Consolidated Street Railway, Worcester, Mass., has just placed in service a new prepayment car which was built by the Osgood-Bradley Car Company.

Boston (Mass.) Elevated Railway, reported in the *ELECTRIC RAILWAY JOURNAL* of April 22 as being in the market for fifty-two articulated center-section bodies, has ordered this equipment from the Laconia Car Company.

Reading Transit & Light Company, Reading, Pa., is reported to be in the market for ten double-truck cars, in addition to the order for fifteen cars recently placed with The J. G. Brill Company, as noted in the *ELECTRIC RAILWAY JOURNAL* for April 15.

Toronto (Ont.) Civic Railway, through Works Commissioner R. C. Harris, has recommended that the contract for the thirteen car bodies for the Bloor Street car line be awarded to the Preston Car & Coach Company at the price of \$4,907 per body. It is proposed that the thirteen cars will cost a total of \$112,000.

Bay State Street Railway, Boston, Mass., has ordered from the Wason Manufacturing Company seven steel under-frame express cars, 40 ft. over all, equipped with G.E.-201 motors, 75 hp., similar to those described and illustrated in *ELECTRIC RAILWAY JOURNAL* of Sept. 27, 1913; also five express box trailers of wooden construction and the same general dimensions.

Connecticut Company, New Haven, Conn., has ordered 100 additional cars. Thirty of these are to be exact duplicates of those recently built by the Wason Manufacturing Company described on another page of this issue and are to be built at the Wason plant. Sixty are to be built by the Osgood-Bradley Car Company, and will be practically the same, only longer. Ten interurban cars are also to be built by the Wason Manufacturing Company.

TRADE NOTES

Railway Storage Battery Car Company, New York, N. Y., is now located at 50 Broad Street, in rooms 1022 to 1026.

Hale & Kilburn Company, Philadelphia, Pa., has moved its New York offices from Suite 1433, 30 Church Street, to Suite 1412 in the same building.

Ohio Brass Company, Mansfield, Ohio, has received a large orders for strain insulators and trolley ears from the Shore Line Electric Railway.

American General Engineering Company and Imperial Rubber Company have moved from 253 Broadway to the Equitable Building, 120 Broadway, New York.

Holden & White, Chicago, Ill., have been appointed district representatives in the Atlantic Coast States from New England to Florida, for the U. S. Metal & Manufacturing Company.

Perry Ventilator Corporation, New Bedford, Mass., has received an order to equip with ventilators the twenty cars now being built by the Laconia Car Company for the Boston Elevated Railway.

Atlas Preservative Company of America, New York, N. Y., will move in the next few days to much larger quarters in the same building, 95 Liberty Street, to take care of its greatly increased business.

Western Electric Company, New York, N. Y., has appointed F. L. Gilman, formerly assistant general superintendent of the Hawthorne Works, as assistant chief engineer, with headquarters at New York.

Dielectric Manufacturing Company, St. Louis, Mo., has issued a booklet entitled "Data on Dependable Insulation" which contains information on the company's various insulating specialties. Prices of the material are also given.

F. Castiglioni, electrical engineer of the Railway Improvement Company, New York, N. Y., has been called to the colors by the Italian City Consulate in New York. He sailed on the Dante Alighieri on May 2.

A. L. Whipple has been appointed sales manager of the Railway Improvement Company. Mr. Whipple has long been a prominent factor in the supply business and was chairman of the entertainment committee at a number of steam and electric railway conventions.

Automatic Ventilator Company, New York, N. Y., has received orders to equip with ventilators the five cars now being built by the American Car Company for the Southwest Missouri Railroad, the fifty cars being built by the Laconia Car Company for the Rhode Island Company and the twelve semi-convertible cars being built by the same company for the Massachusetts Northeastern Railway.

G. S. Ackley, 50 Church Street, New York, N. Y., representing the Ackley Companies, is now carrying on a broader campaign throughout the world for the sale of Ackley no-staff and adjustable brakes, Tool Steel gears and pinions, Wasson air-retrieving trolley bases and other railway specialties for which these companies are sole export agents. These companies have agencies in all parts of the world, and their experience is available for the introduction and sale of additional American specialties.

Standard Underground Cable Company, Pittsburgh, Pa., announces the removal of its Chicago office from The Rookery to the Conway Building. The Detroit office has moved from the Free Press Building to the Whitney Building. A new office will shortly be opened in Minneapolis, Minn., in charge of W. J. Weld. The Portland (Ore.) office of the Pacific Coast department has been discontinued and a new office opened in the Newhouse Building, Salt Lake City, Utah, in charge of F. W. Wilson.

ADVERTISING LITERATURE

Stow Manufacturing Company, Binghamton, N. Y., has issued a booklet entitled "Portable Tools of Proven Value," which illustrates and gives details of portable electric tools, motor sets, combinations and flexible shafts of all sizes from $\frac{1}{4}$ in. up.

Searchlight Company, Chicago, Ill., has issued a circular dealing with the difference between dry acetylene and wet acetylene. The circular explains the effect which the presence of solvent acetylene has on the efficiency of the welding flame.

Chicago Pneumatic Tool Company, Chicago, Ill., has issued bulletin No. 34-Q, which shows a few applications of its "Giant" gas and fuel-oil engines and suggests how oil and gas as fuels may be used advantageously for operating generators, pumps, air compressors, etc., in direct-connected or belt-driven units.