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CONTENTS.

A British Convention.....	181
Test of a 5-Cent Coney Island Fare.....	181
Campaign Against Team Interference in Chicago.....	182
Problems in High-Tension Transmission.....	182
Co-operative Timber Treatment Plants.....	183
Accounting Methods of Illinois Traction System.....	184
Single-Phase Locomotive for the Loetschberg Line in Switzerland... 190	
Existing Fares of Wisconsin Road Upheld by Commission, After Val- uation	193
Hearing on Power Brakes and Height of Car Steps in New York... 196	
Changes in Cleveland Ordinance.....	197
A Hearing on Coney Island Fares.....	198
New Concrete Tie.....	198
Convention of the Tramways and Light Railways Association.....	199
Fast Trains in Indiana.....	200
Test of Couplers at Indianapolis.....	200
The Halsey Radial Truck.....	201
Report of Interstate Commerce Commission.....	202
News of Electric Railways.....	203
Financial and Corporate.....	205
Traffic and Transportation.....	207
Personal Mention.....	209
Construction News.....	210
Manufactures and Supplies.....	213

A British Convention

An abstract is published elsewhere in this issue of the papers read at the convention of the (British) Tramways & Light Railways Association at Edinburgh July 13-14. Probably the most striking feature of these papers to the American reader is the fact that our British cousins are wrestling with the two subjects which from an engineering and operating standpoint are perhaps most prominent in city transportation on this side of the Atlantic, namely, the reduction of the weight of cars and the transfer problem. The latter has never reached the importance abroad which it has in this country, because of the general adoption there of the zone system of fare collection. A transfer ticket on nearly all of the European lines does not entitle the holder as in America to a long ride on any car for no additional expenditure. Instead, the fares are based, as a rule, upon the distance traveled, irrespective of how many cars are used, and when free transfers are given they are entirely within a zone and entitle the holder to a very short ride only—perhaps a half mile or less. Hence, there is little temptation for anyone to use them fraudulently, and they are much simpler in design than those employed in this country. Nevertheless, there seem to be abuses which as yet it has been impossible entirely to correct. The problem of the lighter car in England centers largely about the double-deck car, which is almost exclusively a British institution. One of the convention papers, published elsewhere, indicates a sentiment in favor of the single-deck car, but a decided step in this direction is probably a long way off. But throughout Europe, as well as in America, there is a general desire to find the lightest car consistent with structural strength.

Test of a 5-Cent Coney Island Fare

In some respects the offer just made by the Brooklyn Rapid Transit Company to reduce the round-trip fare to Coney Island during certain hours of every day except Saturdays and Sundays is following a precedent because, on a number of railways, "workingmen's tickets," good only during certain hours of the day, are sold at lower than the ordinary rate. But in at least one respect the offer is probably of a unique character, because we do not now recall a fare reduction of this kind which is made for at least five days of the week during certain hours to a pleasure resort. President Williams takes pains to explain clearly that the arrangement is purely experimental, and that it will not be renewed next season if the company should encounter serious difficulties in its enforcement or, presumably, if the plan should involve considerable loss. At several hearings last year the expense of conducting Coney Island traffic by the Brooklyn lines was carefully considered and the average cost per passenger was shown to be

more than 5 cents. Hence the company can undertake this low-fare business only during those periods when the normal traffic to Coney Island is light, and if the concession is used as the basis for a demand by the public for a material extension of the low-fare hours the purpose of the whole plan will be defeated. This, in fact, is one serious objection to special rates of fare of all kinds. Many people in the community do not seem to be able to understand why reduced prices made at certain hours or to certain classes of people should not be extended to include all lines, at all times of the day and for other classes or for all classes of people. But there is no particular difficulty, from an operating standpoint, in enforcing hour-limits such as those proposed. They have been in use even on the elevated lines in New York, and since the Brooklyn company is willing to give the plan a trial we hope that it will prove successful.

Campaign Against Team Interference in Chicago

A strong effort is being made by the Chicago Railways Company to secure the co-operation of the owners of teams in reducing the number of car blockades. Although there is a penalty under the municipal code of that city which is enforceable against the drivers of wagons who refuse to get off the tracks promptly after they have been notified of the approach of a car, team interference constitutes a serious delay to surface railway transportation there, as it does in other cities. Ever since the days of Jehu, the drivers of teams have been noted for their disregard of the rights of other occupants of the highway, and the inability of a surface car to leave its tracks and reach its destination in some other way makes it particularly subject to annoyances of this kind. If the reform should have to come from the drivers themselves there would be little hope for improvement. Pleas for fair treatment or threats of the law would simply be incitement to further exhibitions of obstinacy and malice and to worse treatment, although possibly under such guise as to make prosecution difficult. But by addressing the owners of the teams directly the company is reaching people who have a sense of responsibility. It is satisfactory to learn that the results of this educational campaign so far have been good, and in this respect correspond to a similar action taken in Seattle, and described in these columns in our issue of June 17. The claim is sometimes made that the streets are public property and that the drivers of teams have as much right to use them as the railway company. This is true in only a very narrow sense. Certain vehicles now, such as mail wagons, ambulances and the equipment of the fire department, have rights superior to ordinary vehicles, and it is proper that they should because the interests of the people as a whole deserve consideration before those of individuals. There is equally no question as to the relative importance to the community, as regards time of transit, between a street car and the average load of freight in charge of a single driver. The car may be owned and operated by a private company, but its uses and purposes are of exactly as public a character as those of the mail wagon, ambulance or fire engine, and it should not be unduly hindered or obstructed in its use of the streets for the rapid transportation of passengers.

PROBLEMS IN HIGH-TENSION TRANSMISSION

The group of papers upon high-voltage power transmission read at the recent convention of the American Institute of Electrical Engineers not only were immensely instructive in themselves, but provoked a particularly valuable discussion. Aside from the reports on plants operated at extreme voltage, upon which we have already had occasion to comment, the most important topic from the standpoint of the engineer was the discussion of those extraordinary variations of potential due to electrical oscillations impressed upon the transmission system from one source or another. In the earlier days of power transmission these phenomena of temporary rise of voltage were commonly lumped together under the general title of "static." It has been long known, of course, that this is a misnomer, since the great mass of such phenomena are due strictly to electrodynamic conditions. That is to say, they are occasioned by oscillatory electric forces impressed upon the line by harmonics of a fundamental electromotive force or by surges induced in the system, or portions of it, by variations in the electrodynamic conditions, thus causing the storage and discharge of electromagnetic energy, or else they have their origin in disturbances caused in switching, or by short-circuits, or by rupture of the line. The two classes of phenomena, resonance and surging, are closely allied in their fundamental characteristics, although generally separated in cause.

During the discussion of the transmission papers one instance was cited of the actual observation of the seventeenth harmonic having a magnitude as great as 5 per cent of fundamental electromotive force. In the instance discussed no serious results followed, simply because the resulting frequency of 25 cycles per second did not happen to fall in with any portion of the system having the same natural period. It is perfectly possible, however, for such harmonics to fall into resonance and to produce somewhat startling results which would probably be attributed to everything and anything except the actual cause, unless the line were carefully investigated. It is not at all uncommon to find strong seventh and ninth harmonics of considerable magnitude, although the seventeenth and such higher harmonics are not commonly of amplitude enough to be conspicuous.

The fact is, however, that very many of the minor rises in voltage charged to "static" are really cases of minor resonance, resonance of fairly high harmonics with some portion of the connected system. Wherever there is an abrupt change in the constants of the system there is an opportunity for the occurrence of extraordinary voltage due primarily to resonance with harmonics, the fundamental frequency being generally so low compared with the period of any of the possible resonating points that it rarely appears, on lines of any length yet in use, to a degree which causes any material disturbance of operative condition. It is quite possible, however, for any of the harmonics to produce considerable trouble if by chance the periodicity happens to be just right. But such phenomena are not particularly likely to increase with an increase of the working voltage, and, in fact, in the case of high-voltage lines the factor of safety is usually high enough very readily to

take care of any resonance disturbance of the ordinary kind.

The question of surging is practically of much greater importance. There is constant opportunity for starting the surges when the main circuit is made or broken, or branch lines are switched on or off, or when even any violent change of load occurs which disturbs the normal electromagnetic characteristics of the system. The voltages due to surging are sometimes of most formidable character, and there have been repeated cases of breakdowns of lines and apparatus chargeable directly to the rise in voltage produced by heavy surge. The effect of surges is felt particularly at the apparatus where there is a violent change in the electromagnetic conditions, and time and again insulator bushings and transformers and protective apparatus in the stations have been attacked with disastrous results by the sudden development of a surge. The increasing use of oil switches, now become very general, tends to decrease the amount of trouble from surging, inasmuch as the character of the break is such as to diminish the danger of starting dangerous phenomena of this sort. Open air switches and apparatus in which air breaks occur are particularly likely to start surges, and the result is often shown in arcs of enormous extent compared to anything which could properly be due to the working voltage. Starting a long arc in one part of the system not infrequently produces surges which break through elsewhere, apparently without adequate reason and perhaps miles away from the disturbing source. Even circuits of relatively low voltage sometimes show terrific phenomena of this class, the magnitude of the effect varying with the magnitude of the current variation, whether this amounts to a complete make or break or merely to a very violent change in magnitude. In fact, some of the most formidable and disastrous surges recorded have been on circuits of only a few thousand volts, but carrying very large current. The comparatively small currents generally carried by lines at extreme voltage secure to them a certain degree of immunity, so that in a sense the long-distance and high-voltage systems are less liable to break down from this source than some of those at lower pressure. An extended system, however, gives an opportunity for more sources of surging than would be found in a smaller and simpler system, inasmuch as there are more switching points, more apparatus connected and many more opportunities for violent changes in inductance and capacity.

The moral of the whole discussion seems to be that some care should be exercised to select apparatus which is likely to put upon the system no harmonics of high degree and of considerable amplitude. Furthermore, the switching apparatus should preferably be comparatively simple and should be installed with the possibility of surges fully in mind. It is entirely practicable to operate a long system almost continuously and under load conditions that render violent changes infrequent. The steadier the load and the less the shocks administered by injudicious switching the less likelihood of troubles due to resonance. Fortunately, the long transmission lines which are increasing and common in railway practice can generally be operated with due regard to this danger, and with a large system having considerable resistance as well as capacity and inductance there is a certain softening effect which tends to decrease

the violence of the larger surges and confine danger to a comparatively limited region. The more extensive the system the less likelihood of widespread trouble from any of the sources here indicated.

CO-OPERATIVE TIMBER TREATMENT PLANTS

A feature of electric railway conventions during the past three or four years has been the presentation of papers upon timber preservation by representatives of the Forestry Division. These papers have not been solicited for their theoretical interest only, but because electric railway companies realize the rapidly increasing price of timber and the necessity of prolonging its life in those places where it is used in railway work. There are evidences that advantage has been taken in many directions of the lessons taught by these papers.

Partly as the result of one presented before the Central Electric Railway Association nearly four years ago the Indianapolis, Columbus & Southern Traction Company installed a pressure and vacuum treating plant at which it has treated all of its ties, poles, cross-arms and fence posts for the past three years. This plant has been in operation long enough to demonstrate its value to the railway company, and its successful operation has done much to promote the use of treated timber by other electric railways in the Central West. At the St. Joseph meeting of the Central Electric Railway Association another paper on wood preservation was read and was followed by an interesting discussion which brought out expressions of opinion from several members in favor of a co-operative treating plant. As the result of this discussion the executive committee was instructed to consider practical means for encouraging the use of treated timber by member companies and undoubtedly it will investigate the co-operative plan. Many of the steam railroads are operating their own treating plants, but their annual consumption of timber, of course, is on a much larger scale than that of the average electric railway. The problem is really the same as that presented in a manufacturing business. A plant of any size can be operated, but the greatest economy can be secured only if the output is large and continuous. There are perhaps few directions in which co-operation between electric railway companies would result in as high direct returns as in this way. Such a plan would not only reduce the cost for each participating company; it would encourage the general use of treated timber for a wide variety of purposes, many of which are not now usually considered in connection with timber preservation.

If the plan of the Central Electric Railway Association should be carried out, its progress will be watched with interest, because if it should prove successful, other plants would probably be started by other groups of companies which are close together geographically or which purchase their supplies of ties and timber from the same territory. The parties to such an undertaking need by no means be confined to electric railway companies, but might well include with mutual advantage other electrical interests such as electric lighting, telegraph and telephone companies.

Accounting Methods of Illinois Traction System

A Description of the Practices by Which the Departments of the General Auditor and the Auditors of Receipts and Disbursements Account for the Operations of the Company.

With the rapid increase in mileage of the Illinois Traction System there has been a corresponding development in the accounting department and in the methods employed therein until the practices and form of organization follow in many respects practically those which are standard on steam railroads. The accounting department is under the direct supervision of George M. Mattis, vice-president and treasurer, and B. E. Bramble, general auditor. George R. McComb is assistant auditor, J. D. Maynes auditor of receipts and L. Campbell auditor of disbursements.

The offices of the accounting department are at Champaign, where the construction accounts are handled under the direct supervision of the general auditor and the treasurer. At each city where local systems are controlled a local auditor is in charge, who reports for the operation of the city properties directly to the general auditor. In accordance with this system local auditors are located at Danville, Urbana, Champaign, Decatur, Bloomington, Peoria, Jacksonville, Edwardsville and Granite City, Ill. Two local auditors are located at Topeka, Kan., and one at Des Moines, Ia., in charge of the accounts of properties in those cities which are controlled by the McKinley interests. One auditor is located at each of three coal companies controlled by the Illinois Traction System—the Consumers' Coal Company, of Danville, the Kerens-Donnewald Coal Company and the Consumers' Coal Company, of St. Louis. One traveling auditor is engaged solely in the work of visiting the various city properties.

AUDITOR OF RECEIPTS

Mr. Maynes, the auditor of receipts, adopted in September, 1909, the system of monthly reports and settlement of accounts from agents, based on steam railroad practice. Since the adoption of this change there has never been any reason to regret it. Permanent station records in book form were furnished.

For the use of the freight agent three books are furnished, a cash book, a freight-received register and an "advances and prepaid on freight forwarded" register. At the head of the debit side of the cash book this notice is printed: "It is the duty of agents to collect and remit daily the revenues of the company. Agents will be held responsible for any loss by theft or otherwise resulting from their failure to remit promptly, or for losses occasioned by the violation of instructions." The headings of the columns on the debit side are as follows: Pro number, current month, previous month, prepaid forwarded collections, sleeper and local ticket sales, interline ticket sales, baggage revenues, switching revenues, extra revenue collections, auditor's special debits and total. On the credit side of the cash book the headings of the columns are: Account, date and number of way bill, number of pro, advance charges paid, prepaid beyond, auditor's special credits, remittances to bank or treasurer, relief claims remitted to auditor of receipts for credit, and total. By the adoption of the freight-received register it was made possible for agents to have a permanent detailed record of all received way bills, permitting them, after making their record, to forward the received way bills to the auditor of receipts to be audited and filed.

For the use of ticket agents there are three permanent book records, the cash book described, a daily record of ticket sales and a permanent record of ticket stock. The latter is used to show the tickets received from the traffic department and has columns in which the sales and cancellations and return of stock may be shown. Tickets reported sold are shown in black ink and tickets returned in

red ink. This book, the heading of which is indicated herewith, provides a record of value in connection with the audit of agents' accounts by traveling auditors, who are enabled to determine the exact condition of the ticket stock quickly, saving time in the inventory of tickets on hand required in support of their report.

The forms for abstracts of local freight-forwarded way bills and local freight-received way bills provide that only one station shall be reported on each blank. These reports must be forwarded to the auditor of receipts on the third day of each month and must include all way bills dated in the month for which the report is made. Separate columns are provided for report of the weight of carload and of less than carload tonnage. One column calls for the exact description of carload shipments. It has been found convenient and economical to divide the system into four accounting divisions in the audit of agents' freight abstracts. Agents are required to recapitulate each accounting division separately and to make a general summary covering the accounting division as a whole. This permits a clerk to verify, check and balance the forwarded and received abstracts of an accounting division without the necessity of referring to reports which are being handled by other clerks. Each accounting division is balanced first and then the general balance, by this method, is obtained without unnecessary labor or confusion.

INTERLINE FREIGHT ACCOUNTS

Interline freight accounts are handled in accordance with the rules of the Association of American Railway Account-

Form 357-209 BKS—(100 leaves)—10-12-10—35529*									
ILLINOIS TRACTION SYSTEM									
AGENT'S TICKET STOCK RECORD									
									Station
FORM NO.		DESTINATION.....			VIA, JCT.....				
TICKETS RECEIVED					TICKETS REPORTED (In Black)				
Enter in Invoice No. Order					RETURNED (In Red)				
DATE	Invoice No.	LOWEST NO.	HIGHEST NO.	No. of Tickets	DATE	OPENING	CLOSING	No. of Tickets	

Illinois Traction System—Heading of Agent's Ticket Stock Record

ing Officers, which represents the steam railroads of the country. Four forms are used to cover respectively the abstracts and the recapitulations of interline way bills received and forwarded. The forms are on different colors of paper. Separate sheets are used for the business of each road. The Illinois Traction System has through route and joint rate arrangements with several steam railroads. Four forms are used for reports of revenues on interline freight business to the accounting departments of the steam roads and the adjustment thereof. The headings of two of these forms are illustrated on page 185.

A form is used for advice to agents by the auditor of receipts of corrections and differences in their monthly freight reports. Agents are instructed on receipt of this notice to correct their records accordingly. The lines on the abstract correction sheet are numbered and if further correspondence between the agent and the auditor of receipts is necessary after the agent receives the advice of correction reference is made to the number. At the bottom space is provided for a recapitulation of the items as reported by the agent and as corrected by the auditor.

A monthly report of uncollected bills is made by agents in original and duplicate. The former is sent to the auditor of receipts, while the duplicate is retained in the file of the

agent. The report is designed to show a complete list of all uncollected bills and a list of unadjusted relief claims if any exist. Instructions to agents which accompany this form state that the report should be divided into eight sections with headings as follows: (1) Uncollected demurrage charges; (2) uncollected storage charges; (3) uncollected switching charges; (4) uncollected prepaid forwarded; (5) uncollected account, freight, short, damaged and refused; (6) unadjusted relief claims; (7) uncollected freight on hand more than thirty days; (8) uncollected freight received during month for which this report is made.

After the uncollected freight bills are listed in the order named a recapitulation is made showing the total uncollected freight bills on hand. Agents are also directed to state what efforts have been made to have the station record relieved of the uncollected charges. To avoid carrying charges for an unnecessary length of time for short, unclaimed, refused and damaged freight, company freight, etc., agents are directed to be particular to notify the proper officers each month of all such items and to follow the matter up energetically until the station is relieved of such charges. By means of this report the accounting department has a complete detailed statement of all outstanding items in the accounts of agents and is able to exercise careful scrutiny of the business each month so as to determine whether agents are giving credit to unauthorized shippers, are lax in the collection of charges or carry items that should properly be dropped from the account and for which the cash should be remitted.

A "monthly extra freight revenue report" is used by agents for report of freight items not reported otherwise. This report is to be forwarded not later than the fifth day of the succeeding month. If no revenue has been collected the agent must send in a blank report.

SWITCHING CHARGES

A separate report is used for advice of switching performed and charges collected at each station, and is for

for astray freight is also used. This has enabled the company to obtain revenues and better delivery of astray freight than was secured before the adoption of this form. Expense bills in two parts are used in connection with the delivery of freight and a special form is used for the collection of prepaid forwarded charges. After the agent's balance sheets have been checked and verified a debit and credit letter system is used for the adjustment of agents' accounts. The use of this system reduces relief claims of agents to a minimum, as it permits the accounting department to give agents, without undue delay, authority for credit or, when necessary, to charge agents. For debit and

New Form 206. 12-6-09. 1034. 13568.

ILLINOIS TRACTION COMPANY N^o 14002
SWITCHING TICKET

..... date 191

Car No. Switched from to

Initial
Contents
Weight Acot. of

Rate
Amount Moved by Switch Foreman date Time

NOTICE
Switch Foreman will positively refuse to move a loaded car in switch movement without this order and will mail this order to Auditor Receipts Champaign, Ill., when completed.
NOTE—Original to Switching Foreman; Duplicate to Auditor; Triplicate to be retained by Agent

Illinois Traction System—Switching Ticket

credit letters two forms are used, covering respectively passenger and freight entries.

In accordance with the policy of the company agents are authorized to file relief claims each month and to forward them with the monthly balance sheet. This permits the agents to take the accounts from their books without loss of time. If subsequent investigation by the accounting department shows that credit was claimed improperly the station is then charged the amount involved and advised by a debit letter. This practice concentrates all items of

ILLINOIS TRACTION COMPANY																						
ACCOUNTING DEPARTMENT										Champaign, Ill.												
CORRECTION ACCOUNT to be included in Settlement for Month of										190												
Received from										Via												
R. Co.										R. Co.												
No.										No.												
WAY-BILL		WEIGHT AND CHARGES AS SETTLED				PROPORTIONS AS SETTLED				WEIGHT AND CHARGES SHOULD BE				PROPORTIONS SHOULD BE								
DATE	PRICE AND NO.	FROM	TO	WEIGHT	FREIGHT	ADVANCES	PREPAID	Per Ct.	I. T. Co.	Per Ct.	Per Ct.	Per Ct.	WEIGHT	FREIGHT	ADVANCES	PREPAID	Per Ct.	I. T. Co.	Per Ct.	Per Ct.	Per Ct.	

Illinois Traction System—Heading of Correction Account for Interline Way Bills

FORM 205-6-18-09-231-13568

ILLINOIS TRACTION COMPANY													
Accounting Department										Champaign, Ill.			
DIVISION OF FREIGHT REVENUE on Interline Way-Bills from Stations on the										R. Co.			
Via										Via			
Month of										190			
FROM	TO	ROUTE	COMMODITY	WEIGHT	FREIGHT	ADVANCES	PREPAID	ARBITRARIES	PROPORTIONS				
								RATE	AMOUNT	%	I. T. CO.	%	%

Illinois Traction System—Heading of Statement for Division of Revenue on Interline Way Bills

warded to the auditor of receipts not later than the third day of the succeeding month. Revenue from switching service is an important item with this company, and it has been found that the use of this report and a switching ticket in accordance with this plan has increased the revenue of the company from this source. The switching ticket is in three parts, of which the original is sent to the switching foreman, the second copy to the auditor and the third is retained by the agent. The original is reproduced herewith.

The way bills are in regular steam railroad standard form, in quarter, half and full sheets. A form of way bill

this nature in the office of the auditor of receipts and keeps the agents' uncollected accounts free from uncollectible items. This plan has been found to afford excellent results in the accounts of agents and also advantageous because it enables the accounting department to keep a close watch upon such items as are usually the subject of relief claims.

Instructions to agents direct that the reason why relief claims are filed must be stated clearly in every instance and evidence submitted to show what efforts have been made to secure payment of the charges. The agent's monthly balance sheet is published on page 186.

PASSENGER ACCOUNTS

The passenger accounts are simple, and few complications are met. It has been found that simple blanks enable agents to make correct reports of ticket sales and other revenues in connection with passenger service. Separate forms are provided for monthly reports of ticket sales, baggage check sales, C.O.D. baggage received, C.O.D. baggage forwarded and government orders exchanged for revenue transportation. The latter blank has been found to be of great value. It provides for a complete identification of the order and the ticket issued in exchange and gives the accounting department a permanent record for reference in case any question arises as to an order or ticket. The form provides for the following data regarding the order: Form, number, date and place of issue. Concerning the ticket exchanged the agent is required to give the form, number, starting point of trip and destination and amount involved. This statement is made out in duplicate, and the original, together with all orders, is attached to the monthly balance

checks and drafts are listed singly. The agent is required to certify that the cash listed was counted by him in the presence of the traveling auditor, that the amount was correct and was the total due the companies which he represented. A number of other important details are covered in the report which includes the balance sheet, as, for instance, the names and occupations of all station employees, their rates of pay and the length of time they have been in the position occupied and in the service of the company. A special space is provided for notation of the name and occupation of all employees who handle funds of the company and are not bonded.

When a change of agents occurs the traveling auditor is required to state the following: Why the retiring agent left and where he went, the length of time of absence and whether any reason was known why pay should be withheld. The traveling auditor is asked to state where the incoming employee was last employed and in what capacity, and whether, in his opinion, the new man was competent

New Form 22-5-115M-3418

ILLINOIS TRACTION SYSTEM STATION AGENT'S MONTHLY BALANCE SHEET

(SEE INSTRUCTIONS ON BACK)

This Balance Sheet must be made in accordance with note 7, printed on back and forwarded to Auditor of Receipts with list of uncollected bills form 292 not later than the tenth of the month.

Balance Sheet from _____ Station, for the month of _____ 19__

Explaining in detail the various amounts to Debit and Credit of the Agent whose signature is attached hereto. I hereby certify this account to be correct.

AGENT
Personal Signature _____

Dr.	Cr.
1 To Balance due Company, as per last month's corrected duplicate balance sheet.	2 By Differences to my credit last month, as per corrected duplicate balance sheet
3 " Local charges on freight received, Form No. 104	4 " Remittances, to Treasurer, as per statement on back
5 " Advances on freight received, Local Form No. 104	6 " Advances on freight forwarded, Local Form No. 105
7 " Local Prepaid on freight forwarded, Form No. 105	8 " Local Prepaid on freight received, Form No. 104
9 " Freight charges on freight received interline, Form No. 284	10 " Advances on freight forwarded interline Form No. 282
11 " Advances on freight received interline, Form No. 284	12 " Prepaid on freight received interline Form No. 284
13 " Prepaid on freight forwarded interline, Form No. 282	14 " Special credits Auditor Receipts (freight) Form No. 294
15 " Special debits from Auditor Receipts (freight) Form No. 294	16 " Unadjusted Relief Claims for which credit is claimed, Form No. 262
17 " Switching charges, Form No. 297	18 " Special credits Auditor Receipts (passenger) Form No. 295
19 " Extra Freight Revenue, Form No. 314	20 " Orders for transportation remitted, Form No. 296
21 " Treasurer's Drafts as per statement on back	22 " Prepaid orders exchanged, Form No. P. D. 54
23 " Local Ticket Sales, Form No. 32	24 " †
25 " Sleeper and Parlor Car Ticket Sales, Form No. 383	26 " †
27 " Interline Ticket Sales, Form No.	" Balance to my debit carried to next month's account, made up as follows, viz:
29 " Baggage Check Sales, Form No. 237	28 " Uncollected bills for freight, Form No. 292
31 " C. O. D. Baggage Collections, Form No. 195	30 " Authorized working fund, See Note No. 3
33 " Special debits Auditor Receipts (passenger) Form No. 295	32 " Cash on hand. See Notes Nos. 4, 9 and 10
35 " Extra Passenger Revenue, Form No. 313	34 "
37 " Prepaid orders issued, Form No. P. D. 54	36 " +
39 " †	
41 " Advances forwarded, not paid out	
43 " Prepay due connecting line, not paid out	
45 " †	
Total	Total

BALANCE TO BE TAKEN UP BY AGENT NEXT MONTH

Item No. 1 - - \$ _____

Item No. 2 - - \$ _____

Auditor of Receipts

Illinois Traction System—Form of Station Agent's Monthly Balance Sheet

sheet, while the carbon copy is retained and placed in the files.

Monthly reports of extra passenger revenues are made. The form used for this purpose has the following headings: Newspaper revenue, destination, weight, rate, amount and shipper; automatic machine collection; accident insurance tickets; parcels receipts, open and closing numbers and amount; milk revenue, opening and closing numbers, starting point and destination, rate and amount; and other extra revenue. A special form is used for advices to agents of corrections, additions or errors in their monthly ticket, baggage or extra passenger revenue reports.

For the work of the traveling auditors a balance sheet and confidential report are used at each station. The balance may be taken in transferring, checking, opening or closing the accounts. In case of a change in agents both the retiring and the incoming employee certify to the correctness of the account drawn up by the traveling auditor. All cash on hand is counted and reported in detail as to the number of pieces, denomination and amount of paper currency, gold coin and other coin, respectively, while

to fill the position. The incoming agent signs this agreement, embodied in the balance sheet of the traveling auditor:

"The subscriber hereto agrees that he will make himself liable for all shortage of money collected at this station which may occur in excess of the bond of the cashier at this station, and in case he shall quit the service of the company, or be discharged therefrom, the company shall have the right to withhold any sum which may be due him until after the regular time for examination of his accounts as such employee has elapsed, and until the regular pay day of the company."

In addition to all that has been stated the balance sheet contains the following general questions for the traveling auditor to answer:

- "General condition of station and accounts.....
- "Did cash book show proper balance?.....
- "When did agent balance his cash last?.....
- "Cash over \$.....Cash short \$.....
- "Was shortage made good?.....If so, how.....
- "Does agent or do any of his employees drink?.....

"Does agent make a good personal appearance?.....
 "What explanation did agent give for cash being over or short?.....

CONFIDENTIAL REPORT OF TRAVELING AUDITORS

The confidential report of traveling auditors contains the following:

"This report is not only intended as a record of the examination or transfer, but it is also intended as a reminder to traveling auditors of the salient points to be investigated by them at each station.

"Traveling auditor is not required to answer questions marked X except in cases where he finds the agent delinquent. All other questions should be answered in every instance where a report is made.

"Where traveling auditor has not answered questions marked X it is understood that he has investigated and found the practice O. K.

"1. Are all station records kept in proper form?..... Are they written up daily?..... If not, give list of records improperly kept and not written up promptly, and explain errors in each.....

"2. Is cash book balanced daily?..... Did it show same balance as your report?.....

"3. Did you compare cash book with freight received book, corrected monthly balance sheets and other records?..... How far back did you go with this comparison?..... Any intentional errors or omissions in cash book?..... Does agent keep cash of this company separate from all other funds?.....

"Did you charge agent with all advertising and vending machine collections?.....

"4. Were any unauthorized credits claimed or proper charges suppressed?..... If so, list in detail.....

"Are proper precautions taken to prevent loss of money?.....

"x5. Did you instruct agent that overcollections must be reported at close of month and that refunds must not be made except upon presentation and indorsement of expense bills, and upon authority from auditor of receipts?.....

"x6. Does agent take receipts for advances to consignors and foreign prepaid charges paid out?.....

"x7. Does he take and file express company's receipt for all cash remitted?..... Do remittances on cash book agree with express receipts?..... Does agent close cash account and remit balance promptly at last of month?.....

"x8. Has agent a bank account for keeping company funds?..... If so, give name of bank and exact title under which account is kept.....

"9. Does agent collect and remit daily, including first of each month, while he is compiling his monthly reports?.....

"10. Are receipts of current month ever remitted to balance previous month's report?.....

"11. Were the uncollected charges on delivered freight collected while you were at the station?..... If not, did you obtain acknowledgment from consignees that amounts were due as claimed?.....

"x12. Does uncollected list contain charges for which relief should be asked?..... If so, did you have agent make out relief claims and send in while you were at station?.....

"13. Does agent take receipt for all freight delivered?..... Is receipt taken at time of delivery of freight?.....

"If not, when does agent take receipt?.....

"x14. Is station supplied with scales?..... If so, is all freight weighed?.....

"x15. Is there a drayman there?..... If so, does the agent hold proper orders from consignees to deliver their freight to drayman?.....

"Does drayman collect our charges from consignees?..... If so, does he settle with agent daily?.....

"16. Is freight received book-footed and does it agree with report to auditor of receipts and monthly balance sheet?.....

"17. Is this a competitive point?..... If so, what is the competition?.....

"18. Is the agent in the habit of giving credit for more than twenty-four hours?..... If so, to whom, and by whose order or authority? (Give name of official authorizing such credit, and date of each letter of authority).....

"19. If agent has no authority, does he acknowledge his responsibility in case he fails to make collection? (Agent will answer and sign.).....

"x20. Is agent vigilant and prompt in inquiring into and making returns of stolen, short, over, unclaimed and damaged property?.....

"x21. Did you investigate and see that all miscellaneous collections were properly charged in record for that purpose?.....

"x22. Did you carefully instruct agent how to make adjustment on his books each month, account of corrections, shown on duplicate balance sheet returned from auditor of receipts? (Agent will answer and sign).....

"23. Did you check all accounting department corrections back to date of last examination and see that agent had properly taken up in his accounts all debit and credit corrections?.....

"24. Did you check agent's car reports and the cars in the yard and compare with cash and pro books to see if all carloads received with charges had been properly accounted for and charged to station?.....

"25. Did you personally check freight house?..... Did you examine last uncollected report to see that all over and on hand freight was included?..... Give list of articles omitted..... Does agent carry any items unauthorized?.....

SUGGESTED CHANGES

"26. Can you suggest any changes in the organization of the station force or work that would effect a saving of labor?.....

"27. Does agent keep cash account and make up the balance sheet personally?..... If not, give name of cashier who does.....

"28. Did you locate and correct all errors and omissions from the time of last audited balance sheet and leave the records balanced?.....

"29. Did you count the tickets on hand and compare same with list of stock on hand, or prepare inventory of stock, and did you explain the necessary action to be taken in the event of tickets being lost or stolen?.....

"x30. Is agent keeping any unnecessary records or making any unnecessary reports?.....

"31. Is stationery kept reduced to a minimum?..... Is it clean and in order?.....

"x32. Did you send to stationer any supplies found in excess of amount needed?..... If so, attach list of same.....

"x33. Are old station records carefully preserved?..... Is rule relative to shipper's order bills of lading observed?.....

"34. Are there any unadjusted differences between the agent and accounting or any other department?..... If so, attach list of same.....

"x35. Are all special rates, circulars and letters filed where they can be easily referred to?.....

"x36. Is agent supplied with full sets of passenger and freight tariffs, and are they properly kept for ready reference?.....

"37. Are the office, passenger waiting rooms and freight warehouses kept clean and orderly?.....

"x38. Does agent invariably write his expense bills with ink or indelible pencil?.....

"x39. Are duplicate expense bill receipts filed carefully so they can be readily located?..... How far back did you check them?.....

"40. Date of last examination..... Condition of station then.....

"41. Time engaged checking and transferring railway accounts.....

"42. Time engaged checking and transferring express accounts.....

"43. Time engaged checking railway accounts.....

"44. Time engaged checking express accounts.....

"45. Arrived at this stationM.19.. Train No.....

"46. Left this station.....M.19.. Train No.....

"Important Note.—In those cases where, for any reason, answers in this report are unfavorable to the agent or employee, or to the practices indulged in at the station, the replies *must* be noted in *red ink or red or blue pencil*. This also to apply to all entries covering shortages or special debits and credits."

This enables the auditing department to know exactly the condition of affairs at a station, the ability of the agent to

forwarded to the banks on which the checks are drawn. Payrolls are drawn on five banks and the checks are printed on the same number of different colors of paper. The checks are payable in New York or Chicago exchange at par, and are drawn on banks located at the points nearest the places where the men work in order to avoid the possibility that the employees might have to pay exchange. On the face of the check is printed: "In full for wages to date"; on the reverse side of the check at the top the following is printed: "For all wages due me up to and including date on face of this check. Amount, \$..... Less deductions, \$..... Balance, \$..... Signed," Employees therefore are obliged to receipt in this manner when they indorse the check. The payroll sheets are numbered alphabetically with one letter for each sheet. After all the letters of the alphabet have been used once, double letters and then triple are used. Each check is lettered according to the sheet on which it is shown, and is numbered in accordance with the line on which it appears on the sheet. This system of numbering saves a great deal of time when the checks are sorted after they are returned from the banks.

For the purpose of meeting the amounts required for service vouchers a fund of \$900 is carried in the Millikin National Bank, Decatur, Ill. With the payment of every payroll this fund is reimbursed in the amount of the dis-

<p>Illinois Traction System</p> <p>REQUEST FOR SERVICE VOUCHER—STUB</p> <p>No. 9300</p> <p>Date 190...</p> <p>To</p> <p>Name</p> <p>Occupation</p> <p>Month</p> <p>Deduct For</p> <p>Board</p> <p>Balance due,</p> <p>FOREMAN</p>		<p>Illinois Traction System</p> <p>LETTER OF IDENTIFICATION</p> <p>No. 9300</p> <p>To</p> <p>Agent,</p> <p>Station</p> <p>The Bearer is entitled to amount shown on Service Voucher bearing above request number.</p> <p>FOREMAN</p> <p>(Signature of Party to be Identified)</p> <p>Foremen or timekeepers must see that this slip is signed in their presence by the man to be identified. If he cannot write his name, he must make his mark, and the foreman or timekeeper must sign as witness. No excuse will be taken for failure to comply with these instructions.</p>		<p>ILLINOIS TRACTION SYSTEM</p> <p>REQUEST FOR SERVICE VOUCHER</p> <p>No. 9300</p> <p>To</p> <p>Mr. (Working No.)</p> <p>has worked as on</p> <p>in month of 190</p> <p>Deduct For</p> <p>Balance due, for which Service Voucher should be issued,</p> <p>Payable at Station.</p> <p>THE REVIEW PRESS, DECATUR, ILL.</p>	
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Illinois Traction System—Request for Service Voucher

do his work and other general information of the character that should be in possession of the general officials. The two reports are numbered consecutively, indexed and filed for future reference. Frequently agents have made complaint that their accounts were not audited properly or that some fictitious credit which they claimed had not been allowed. The production of this record settles the dispute at once beyond all question.

FORMS USED BY THE AUDITOR OF DISBURSEMENTS

Some of the forms used in connection with the work of Mr. Campbell, the auditor of disbursements, are described and illustrated herewith.

The summaries of cash receipts are made out by the cashier for the treasurer. One is used for conductors' deposits and another for agents' deposits each day. Spaces are provided for the names of the persons who remitted the fund and for the amount. These statements are certified as correct by the cashier. They give the information from which the conductors' and agents' books are kept. The totals of the summary sheets are entered under conductors' account and agents' account on the daily cash report. Under these there is a column for a summary of accounts receivable. As the company sells power and has a number of outside interests, receipts from these sources are entered in this column. On the other side of the report fourteen banks are listed. They are the banks where conductors and agents deposit. The cash book is posted from this report.

Payroll checks are issued twice each month, when vouchers are drawn to cover the amount of the payrolls and are

charge checks issued for that payroll. A request for service voucher, which is illustrated herewith, is filled out and signed by the foreman in charge of the work. These requests are made out in three parts, one of which is retained as the stub in the book, while the second part is the letter of identification and the third is the request for issue of the voucher. The middle portion is given to the laborer to identify him as the proper one to receive the check. The request portion is given to the head of the department concerned, who makes out the discharge check. Only heads of departments have authority to sign these discharge checks, which are bound in book form, permitting a record on the stub of the details desired.

This check, when properly certified and approved, is negotiable and is authority for the bank to pay to the laborer the amount stipulated in New York or Chicago exchange at par. On the face of the check space is provided for notation of the character of the service rendered, the division and its location and the details of time when the work took place. Space is also provided for calculations of the number of hours and the rate per hour, less deductions, and the balance due. On the reverse side of the check the recipient is required to sign a receipt in full for personal services rendered to date. The service voucher stub provides places for the name, occupation, location, foreman or superintendent, etc.

After making out the discharge check the head of the department sends it to the agent closest to the place where the laborer works. The laborer surrenders his identifica-

tion card to the agent and receives his check. This card is then sent to the head of the department who signed the check and is filed according to number.

A fund of \$500 is carried in one bank with which petty cash checks are met. This fund is reimbursed at the end of each month. These checks are used for the payment of bills not larger than \$10. They are advantageous in that they save time and do not require for payment the signatures of heads of departments. These checks have printed on the faces in red ink "\$10 NOT OVER TEN DOLLARS \$10," and also "Petty Cash Account." They state on the face: "By the indorsement of this check the payee acknowledges full settlement for items described on the back hereof." On the back of the check space is provided on which the date, description and the amount are entered. There is also a line reading "In full settlement for the following items," while another line, "Make indorsement here," is followed by a space for indorsement.

PAYMENT OF FREIGHT CLAIMS

For the purpose of meeting checks and drafts issued on account of freight claims a fund of \$500 is kept in the bank. This fund is reimbursed at the end of each month in the amount of the checks drawn against it each month. Two forms are used in the payment of claims. A check is used in the payment of ordinary claims. This check is provided with a stub on which the name and address of the payee are entered, while there is provision also for checking the name of the subsidiary company which is liable. Space is also provided for the claimant's number, the traffic department's number and the auditor of receipts' number, together with a description of the claim. This check is stamped on its face, "Freight Claim Account," and reads, "By the indorsement of this check the claimant acknowledges payment in full settlement of all claims described on the back hereof." The back of the check contains spaces on which the claimant's number, traffic department number

"freight claim" checks. When checks are issued they are numbered according to the claims filed. If a claim was paid by check No. 3985 the files would show the same number for the claim.

Deposit slips used by conductors and agents are made out in four parts. This form is illustrated herewith. Part No. 1 is kept by the bank as its memorandum. The upper part and the blanks for enumeration of the character of the deposit are the same in all four parts, but the printing at the bottom differs. Part No. 2, which is forwarded by the bank to the treasurer at Champaign, Ill., provides for a stamped receipt by the bank below these words: "G. M. Mattis, treasurer,

ILLINOIS TRACTION CO.		No.
INTERURBAN LINES		
FREIGHT CLAIMS ONLY		
ON DEMAND	ILL.	101
PAY TO THE ORDER OF		\$
		DOLLARS
TO GEO. M. MATTIS, TREASURER		FREIGHT CLAIM ACCOUNT
CHAMPAIGN, ILLINOIS		

Illinois Traction System—Form of Draft Used to Pay Rush Freight Claims

Champaign, Ill. The above received and placed to the credit of your account." Part No. 3, which is held by the person making the deposit and which is called "employee's receipt," reads: "The above received subject to verification." The bank also stamps its receipt on this part. Part No. 4, which the bank also stamps received subject to verification, is sent to the auditor's office at Champaign, Ill., by the conductor or agent. By this method, in case part No. 2 or No. 4 is lost in the mails, the company receives advice of credit from the bank for the deposit. All four parts of the deposit slip are made out by the conductor or agent, who

gives the date covered by the collection and the division on which he works.

Journal entry vouchers, which are used by the auditor of disbursements in making journal entries on the books, are numbered in order and are filed with all information pertaining to the entry attached. As this information is attached in this way it is always possible to show the reasons why the entry was put through the books.

A cash voucher is used for the purpose of paying all bills in excess of \$10. Three signatures are required, those of the treasurer or general manager and the general auditor and auditor of disbursements. As receipted invoices are not required the

<p style="text-align: center;">1</p> <p style="text-align: center;">Illinois Traction Company</p> <p style="text-align: center;">Interurban Lines</p> <p style="text-align: center;">Deposit Slip of</p> <p style="text-align: center;">For Collections of</p> <p style="text-align: center;">On 19__</p> <p style="text-align: center;">Div.</p> <table border="1" style="width: 100%;"> <tr><td>Gold</td><td></td><td></td><td></td></tr> <tr><td>Currency</td><td></td><td></td><td></td></tr> <tr><td>Silver</td><td></td><td></td><td></td></tr> <tr><td>Total</td><td></td><td></td><td></td></tr> </table> <p style="text-align: center;">(Bank Memorandum)</p> <p><small>NOTE—The bank will please show date of deposit and forward Treasurer's stub at close of each day's business.</small></p>	Gold				Currency				Silver				Total				<p style="text-align: center;">2</p> <p style="text-align: center;">Illinois Traction Company</p> <p style="text-align: center;">Interurban Lines</p> <p style="text-align: center;">Deposit Slip of</p> <p style="text-align: center;">For Collections of</p> <p style="text-align: center;">On 19__</p> <p style="text-align: center;">Div.</p> <table border="1" style="width: 100%;"> <tr><td>Gold</td><td></td><td></td><td></td></tr> <tr><td>Currency</td><td></td><td></td><td></td></tr> <tr><td>Silver</td><td></td><td></td><td></td></tr> <tr><td>Total</td><td></td><td></td><td></td></tr> </table> <p style="text-align: center;">G. M. MATTIS, Treasurer, Champaign, Illinois; The above received and placed to the credit of your account. (Bank Stamp Receipt Here)</p>	Gold				Currency				Silver				Total				<p style="text-align: center;">3</p> <p style="text-align: center;">Illinois Traction Company</p> <p style="text-align: center;">Interurban Lines</p> <p style="text-align: center;">Deposit Slip of</p> <p style="text-align: center;">For Collections of</p> <p style="text-align: center;">On 19__</p> <p style="text-align: center;">Div.</p> <table border="1" style="width: 100%;"> <tr><td>Gold</td><td></td><td></td><td></td></tr> <tr><td>Currency</td><td></td><td></td><td></td></tr> <tr><td>Silver</td><td></td><td></td><td></td></tr> <tr><td>Total</td><td></td><td></td><td></td></tr> </table> <p style="text-align: center;">(Employee Receipt) The above received subject to verification. (Bank Stamp Receipt Here)</p>	Gold				Currency				Silver				Total				<p style="text-align: center;">4</p> <p style="text-align: center;">Illinois Traction Company</p> <p style="text-align: center;">Interurban Lines</p> <p style="text-align: center;">Deposit Slip of</p> <p style="text-align: center;">For Collections of</p> <p style="text-align: center;">On 19__</p> <p style="text-align: center;">Div.</p> <table border="1" style="width: 100%;"> <tr><td>Gold</td><td></td><td></td><td></td></tr> <tr><td>Currency</td><td></td><td></td><td></td></tr> <tr><td>Silver</td><td></td><td></td><td></td></tr> <tr><td>Total</td><td></td><td></td><td></td></tr> </table> <p style="text-align: center;">The above received subject to verification (Bank Stamp Receipt Here)</p> <p style="text-align: right;"><small>Form 77 2-10-10 50M-15437*</small></p>	Gold				Currency				Silver				Total			
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Illinois Traction System—Deposit Slip Used by Conductors and Agents

and auditor of receipts' number are entered, together with the date, amount, way-bill number and description. Following the description there is printed, "In full settlement for above described claims," and this is followed by a line, "Make indorsements here," with a line below for indorsement.

The form of draft which is used to pay rush claims is illustrated herewith. The reverse of this draft contains spaces for the same information as that which has been described in reference to the check. These drafts are issued to claimants by the freight claim department. They are presented for payment by the banks and are paid at the office of the company at Champaign, Ill., by the issue of

original invoices are attached to the stubs in each case and filed according to number. These vouchers are drawn on one of six banks and the name of the bank in each case is stamped on the face of the voucher. Provision is made on the voucher and on the stub for distribution of the invoice. The distribution is entered on the books from the stub.

The annual report of the Metropolitan Railway, Paris, France, for 1910, shows that the number of passengers carried was 251,701,253, as against 254,445,992 in 1909 and 229,700,519 in 1908, while the net receipts were \$2,132,668 last year, as compared with \$2,177,804 in 1909.

Single-Phase Locomotive for the Loetschberg Line in Switzerland

Full Particulars Are Given of a Side-Rod Locomotive of 2000 Hp. Recently Developed for Electric Trunk-Line Operation in Europe.

One of the most important through-line railways being constructed in Europe now is the Loetschberg railway, which is being built between Spiez and Brigue. At the latter place it will connect with the Simplon railway and in this way will furnish the shortest route between Milan and Berne.

Only a portion of the whole line, or that from Spiez to Frutigen, a distance of $8\frac{1}{2}$ miles, is at present opened to traffic; the remainder will follow in from one to two years' time after the completion of the Loetschberg tunnel. The section from Spiez to Frutigen, formerly operated by steam locomotives, has been electrified and serves for the present as an experimental line.

The maximum grade of this section is 1.5 per cent and the average grade is 1.117 per cent, while the continuation of the line will have a maximum grade of 2.7 per cent.

supplied by the Maschinenfabrik Oerlikon, and the framework and other non-electrical parts were supplied by the Swiss Locomotive Works, of Winterthur. The principal data of this locomotive follow:

<i>Mechanical data, in mm:</i>	
Gage (4 ft. 8.5 in.).....	1,435
Length over buffers.....	15,020
Width of cab.....	2,950
Height to top of cab.....	3,740
Height of cab floor above rail.....	1,500
Distance between centers of trucks.....	5,200
Total wheel base.....	10,700
Wheel base of each truck.....	4,050
Diameter of driving wheel.....	1,350
Width of rim of driving wheel.....	146
<i>Electrical data:</i>	
Line voltage.....	15,000
Number of motors.....	2
Frequency, cycles per second.....	15
Normal total rated hp.....	2,000
Normal speed, km per hour.....	42
Maximum speed, km per hour.....	70



Loetschberg Single-Phase Locomotive—Exterior View

About 40 per cent of the total length of the experimental line is in curves, of which the sharpest has a radius of 1000 ft. All of this track is now equipped with catenary overhead construction.

ELECTRIC LOCOMOTIVES

The electric rolling stock on this line consists of two single-phase locomotives and three motor cars. The latter and a 2000-hp locomotive were ordered from the "Elektrische Bahnen," Zurich (the joint office for electric traction on standard-gage lines in Switzerland of the Maschinenfabrik Oerlikon and the Siemens-Schuckert Works). The other locomotive, which is of 1600 hp, was supplied by the Allgemeine Elektrizitäts Gesellschaft, of Berlin. The Allgemeine locomotive is fitted with two Winter-Eichberg motors, each driving through connecting rods two axles, combined with one pony axle fitted to one bogie truck. The normal output developed by this locomotive enables it to haul a 250-ton train at a speed of 25 m.p.h. up grades of 2.7 per cent.

In the following is given a short description of the 2000-hp locomotive, which was placed on the line first. The electrical equipment of this unit was designed and

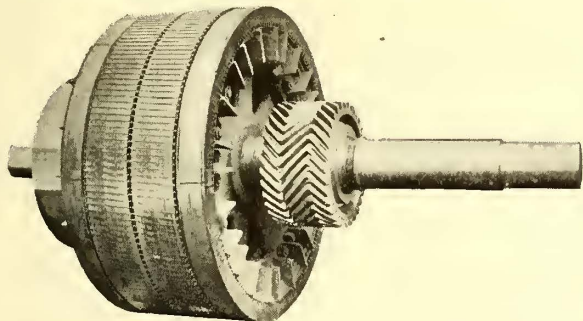
Normal drawbar pull, kg.....	10,000
Maximum drawbar pull, kg.....	13,000
Gear ratio.....	1:3.25
Coefficient of adhesion at normal drawbar pull.....	1:6.8
Coefficient of adhesion at maximum drawbar pull.....	1:5.3
<i>Weights in tons:</i>	
Mechanical equipment, including brakes.....	46
Electrical equipment.....	44
Total.....	90
Weight available for adhesion.....	90
Maximum weight per driving axle.....	15
Weight of one truck, without motor.....	18.5
Weight of one motor.....	9.8
Weight of one transformer.....	5.5

MECHANICAL EQUIPMENT

The locomotive is composed of two six-wheel trucks, and each truck is fitted with one motor. Each motor drives through a single reduction gear a countershaft, which, by means of a crank pin and connecting rod, operates the coupled driving wheels. The truck frame is supported on the axles by large elliptical springs. The motor is mounted rigidly on the truck frame.

The pinion is carried on the armature shaft between the core and the bearing on the pinion side. The gear teeth used are of the double herringbone pattern. The pinion and gear are 250 mm wide and have pitch circle diameters

of 447 mm and 1453 mm respectively, corresponding to a gear ratio of 1:3.25. The height of the motor shaft above the rail is 1.80 m. The countershaft carrying the gear is 265 mm above the driving axles and operates the three coupled axles by cranks and connecting rods 2.7 m in length. The crank pins on each side of each truck are placed 90 deg. apart. The transformers and other heavy auxiliary parts of the electrical equipment are carried on the trucks and not in the body of the locomotive, which is kept as light as possible.



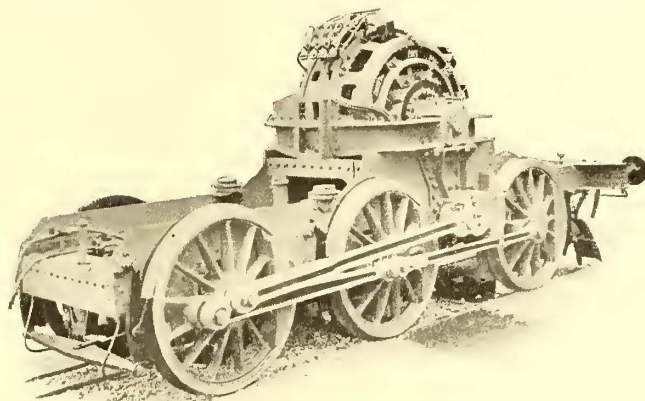
Loetschberg Single-Phase Locomotive—Armature and Pinion Mounted on Shaft

The locomotive body is divided into three compartments, one at each end for the motorman and a machine room in the middle. The equipment of each motorman's compartment is identical. Each is fitted with a benchboard comprising the controller, the switches for regulating the motor voltage and for operating the current collectors and the high-tension switches, the brake handles, the sanders

action by compressed-air cylinders. They have a range in height of 2550 mm.

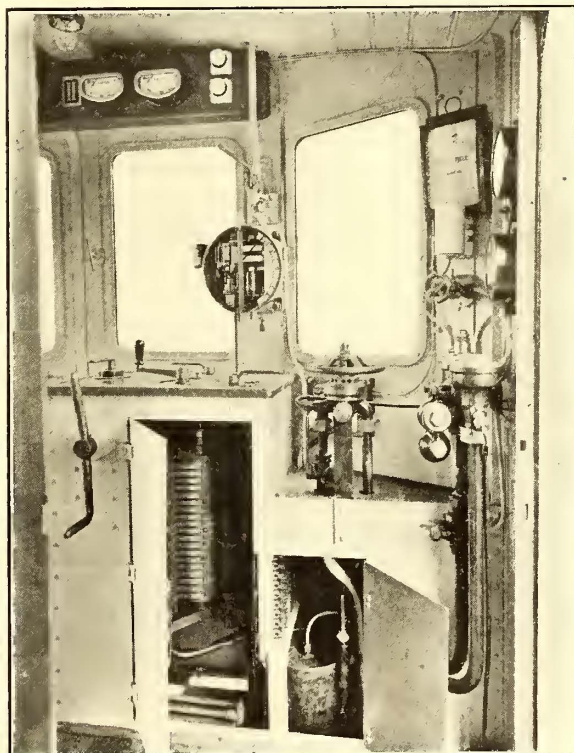
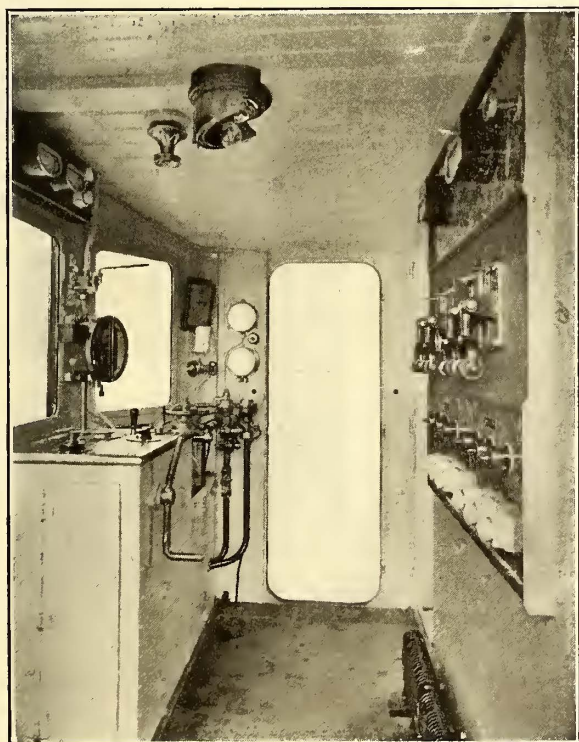
TRANSFORMERS

Each of the two transformers is designed for a continuous rated output of 1000 kva, when artificially air-cooled. They furnish the energy required for the motors,



Loetschberg Single-Phase Locomotive—Truck Equipped with Motor

the auxiliary machinery and the heating of the cars. They have been so liberally dimensioned that even should the artificial cooling be interrupted they still can be left under pressure and give their full output for a considerable length of time. The artificially air-cooled transformer has been preferred to the oil-cooled type owing chiefly to its lighter weight (5500 kg per transformer) and greater accessibil-



Loetschberg Single-Phase Locomotive—Side and End View of Motorman's Compartment

and the signal whistle. The measuring instruments, such as tachometer, voltmeter and ammeter, are fixed above in front of the benchboard. In the rear of each motorman's compartment is a switchboard with switches for the lighting and heating and the auxiliary machinery, and a number of measuring instruments.

The current collectors are of the pantograph type and have a total width of 1200 mm. They are kept up against the overhead line wire by means of springs, brought into

ity. The efficiency of the transformers, at all loads varying from 200 kva to 1300 kva, exceeds 95 per cent. The two iron cores of each transformer are placed horizontally side by side. The low-voltage winding on each core consists of one inner and one outer cylindrical winding, divided up in eight coils. Between the two low-voltage windings is placed the high-tension winding, which consists of two sections which may be connected in series or in parallel, so that, if necessary, the locomotive may also be run with a

line pressure of 7500 volts. On the top of each transformer are fixed eight "step switches" operated by direct-current remote control, which are connected with the low-voltage coils and which permit taking from the transformers sixteen different voltages, ranging from 0 volt to 420 volts. Normally the low-voltage transformer windings and the motors are connected in series through the above-mentioned step switches.

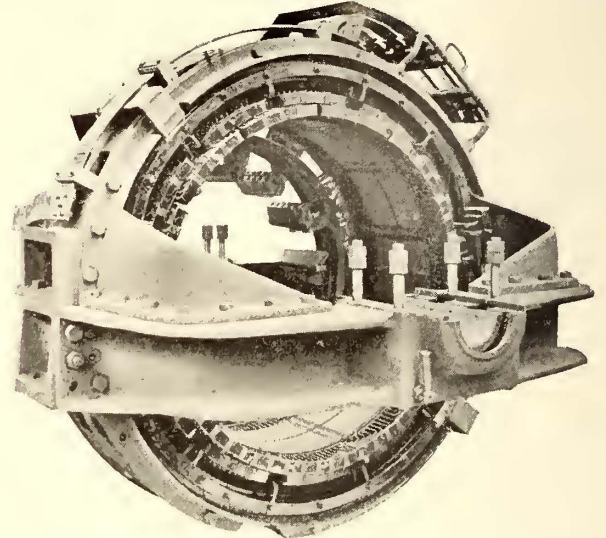
MOTORS

The motors are twelve-pole Oerlikon compensated series machines with out-of-phase commutating field.

The frame is of cast steel and made in two parts, so that the upper part of the rotor may be lifted. The design of the frame is such that cooling air from all sides finds easy access to iron, windings and to the commutator, so that effective ventilation is assured even without artificial cooling. The rise in temperature, ascertained by a full-load test run of one hour (420 volts, 2100 amp) and without artificial cooling, amounted to 62 deg. C. on the collector, 52 deg. C. on the iron, 60 deg. C. on the stator windings and 75 deg. C. on the rotor windings. With artificial cooling the motor can give the above output continuously.

The stator windings comprise the exciting winding, which produces the magnetic field and is connected in series with the rotor, and the compensating winding. Both windings consist of copper tape, insulated by mica and embedded in the uniformly distributed half-closed slots of

the stator. The exciting winding is a complete direct-current plant comprising a motor generator of 1.2 kw output and a storage battery of 2×18 cells, having a total rated output of 81 amp-hours. This plant supplies the direct-current energy required for operating the magnet coils of all the high-tension switches, and also for lighting the locomotive. The converter starts automatically and puts itself in parallel with the battery as soon as the locomotive is under pressure. The battery is also automatically charged. The employment of direct current for operating the magnetic coils of the switch gear



Loetschberg Single-Phase Locomotive—Motor with Armature Removed

greatly simplifies the regulating and the automatic switches.

The compressed air required for manipulating the current collectors, the Westinghouse brakes, the whistles and the sanders is furnished by a small air-compressor set driven through spur gearing by a 9-hp single-phase series motor. The cooling air required for the transformers and if necessary also for the motors is supplied by a low-pressure Sulzer fan, driven by a 10-hp single-phase motor.

The motors of the compressor set and of the low-pressure blower are supplied with energy at 150 volts, whereas the motor of the motor-generator obtains energy at 300 volts from the secondary windings of either transformer.

QUESTION BOX OF THE ENGINEERING ASSOCIATION

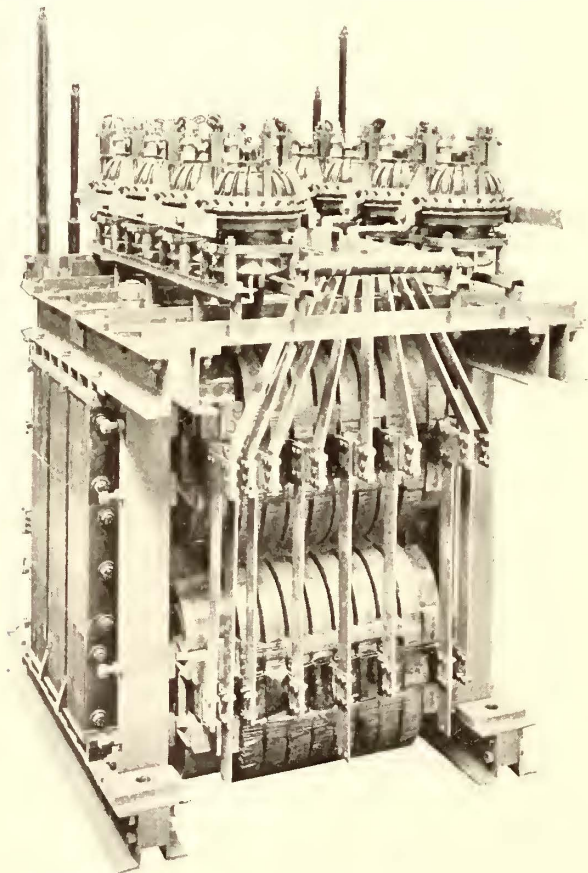
The question box of the Engineering Association was mailed to member companies July 20. It was compiled this year by a committee consisting of Norman Litchfield, Charles Rufus Harte and Rodney Hitt, and answers are requested by Aug. 15. The letter of transmissal says, in part:

"The number of questions put is unusually large, representing members from widely varying sections of the country, and indicates a very decided appreciation of the value of the Question Box. Your committee, therefore, earnestly hopes that the answers will be correspondingly complete and representative.

"It has been found that in some instances the blanks for questions did not reach the subordinate officials for whom they were intended, and executive officers are, therefore, particularly requested to forward these folders to their respective subordinates in order that they may be given opportunity to submit answers to the questions.

"In answering questions it is suggested that whenever possible the reasons leading up to the answer should be given, a mere affirmative or negative being of little of no value."

There are seventy-three questions under the heading of power distribution, eight under the heading of power generation, one under shops and forty-two under equipment.



Loetschberg Single-Phase Locomotive—Transformer and Step Switches

the stator. The exciting and the compensating windings overlap by half a pole distance. Inside the compensating winding and inclosing one tooth is arranged the commutating-field winding, the current of which is caused to be out of phase with the armature current by a non-inductive resistance connected in parallel. This resistance is fixed directly below the motor on the truck frame.

AUXILIARY ELECTRICAL EQUIPMENT

Among the auxiliary equipment carried by the locomotive

Existing Fares of Wisconsin Road Upheld by Commission After a Valuation

The Eastern Wisconsin Railway & Light Company's Increased Interurban Fares Are Approved After Complete Analysis of Costs—Relative Current Consumption of City and Interurban Cars.

In a fare case involving the Eastern Wisconsin Railway & Light Company, of Fond du Lac, Wis., the Railroad Commission of Wisconsin, after a valuation of the properties involved, upheld the existing rates on the interurban system and approved the zone system of fares as the only practicable one under the circumstances. The decision gives the results of tests to determine the relative current consumption of city and interurban cars made by O. M. Rau, superintendent of electric lighting Milwaukee Electric Railway & Light Company.

The original complaint to the commission in this case was made by a farmer who objected to a new schedule of rates which took effect on Jan. 15, 1910, on the line between Fond du Lac and Oshkosh. Others also complained about the change. At the hearing it was shown that the company had changed its fare systems twice, first increasing the number of zones from four to six and then, in 1910, from six to eight. Under the first plan the fare within each zone was 10 cents, but 5 cents additional was charged for each zone after the first. Under the later plans a fare of 5 cents was charged for each zone. The distances of the various zones under the last fare arrangement are respectively 3.2 miles, 2.1 miles, 2.1 miles, 2.1 miles, 2.0 miles, 2.1 miles, 2.7 miles and 3.7 miles, making the fares range, for trips covering an entire zone, from 1.35 cents to 2.5 cents per mile.

In brief, the testimony of the company tended to show that the six-zone system fell so far short of paying operating expenses and depreciation, to say nothing of interest on the investment, that an increase of rates by the shortening of zones was absolutely necessary; that the company had made no charge to depreciation; that the increases in expense of operation of late years are largely caused by higher cost of labor and materials and the doubling of taxes paid by the company and also by the fact that, as the property becomes older, its maintenance cost is greater.

Eliminating the gas plant of the company, the engineering staff of the commission valued the property, as shown in Table I, published herewith. The railway was divided further between the city and interurban systems, as shown in Table II. These valuations were not accepted by the company as correct. Undervaluation of a number of items was asserted and a going value was claimed. No testimony was presented on these points and no decision rendered, as the company believed that even under the valuation as determined the rate of return was so low as to make a reduction of fares unjustifiable.

INCOME ACCOUNT AS REVISED

The income account shows total gross earnings for the year ended June 30, 1910, of \$256,689, of which \$104,616 was received from the railway, \$84,110 from the electric department and \$67,963 from gas. Operating expenses were: Railway, \$61,830; electric, \$41,369; gas, \$55,815; total, \$159,014. Taxes aggregated \$10,584, divided as follows: Railway, \$6,202; electric, \$1,922; gas, \$2,460. There was also a franchise payment of \$1,000 on account of the railway. The net revenue from operation of \$86,091 was divided as follows: Railway, \$35,585; electric, \$40,818; gas, \$9,688. Against this balance there was charged for depreciation of the railway \$19,171. The opinion of the commission shows also income accounts for the years ended Dec. 31, 1909, and Dec. 31, 1908. Revisions of the income account by the commission consisted of changes in the method of apportionment between the departments and the

addition of a sum for depreciation. No change was made in the earnings as reported by the company. The changes in operating expenses are discussed by the commission in part as follows:

TABLE I.—VALUATION OF RAILWAY AND ELECTRIC PROPERTIES, JUNE 30, 1909.

Classification.	Railway		Lighting	
	New.	Existing.	New.	Existing.
1. Land	\$40,095	\$40,095	\$1,427	\$1,427
2. Track & track structures	205,583	167,914	.....	.....
3. Cars & car equipment..	82,510	57,644	.....	.....
4. Elec. dist. system.....	82,750	73,590	75,962	63,378
5. Power plant equipment..	50,977	38,664	63,319	44,614
6. Bldgs. & misc. structures	20,739	18,791	10,380	8,920
7. Office furn. & appliances.	646	549	808	687
8. Tools, impl. and machry.	4,619	2,602	292	160
9. Horses, wagons, misc....	211	180	.....	.....
Total, items 1-9....	\$488,130	\$400,059	\$152,218	\$119,186
10. Add 12 per cent*.....	58,576	48,007	18,266	14,302
Total, items 1-10..	\$546,706	\$448,066	\$170,484	\$133,488
11. Stores and supplies....	13,221	13,221	11,378	11,378
Total, items 1-11..	\$559,927	\$461,287	\$181,862	\$144,866
12. Paving	12,633	6,316	.....	.....
Total, items 1-12..	\$572,560	\$467,603	\$181,862	\$144,866

*Addition of 12 per cent to cover cost of engineering and supervision, interest during construction, contingencies, etc.

TABLE II.—DIVISION OF RAILWAY VALUATIONS BETWEEN CITY AND INTERURBAN SYSTEMS, JUNE 30, 1909.

Classification.	City		Interurban	
	New.	Existing.	New.	Existing.
1. Land	\$3,105	\$3,105	\$36,990	\$36,990
2. Track & track structures	57,690	49,278	147,893	118,666
3. Cars & car equipment..	53,732	35,653	28,778	21,991
4. Distribution system....	11,275	8,486	71,475	65,104
5. Power plant equipment..	36,194	27,451	14,783	11,213
6. Bldgs. & misc. structures.	11,452	10,411	9,287	8,380
7. Office furn. & appliances.	459	390	187	159
8. Tools, implements & machinery	3,279	1,847	1,340	755
9. Horses, wagons & misc.	211	180	.....	.....
Total, items 1-9....	\$177,397	\$136,801	\$310,733	\$263,258
10. Add 12 per cent*.....	21,288	16,416	37,288	31,591
Total, items 1-10..	\$198,685	\$153,217	\$348,021	\$294,849
11. Stores and supplies....	6,610	6,610	6,611	6,611
Total, items 1-11..	\$205,295	\$159,827	\$354,632	\$301,460
12. Paving	11,802	5,734	831	582
Total, items 1-12..	\$217,097	\$165,561	\$355,463	\$302,042

*Addition of 12 per cent to cover cost of engineering and supervision, interest during construction, contingencies, etc.

Power Expenses: The company's division of the power expenses, as between the electric lighting and railway departments, is made upon the basis of the kw-hours consumed by each department. This appears to be proper, but in the apportionment for 1908, as made by the company, the sum of the amounts apportioned to the two departments is greater by \$633 than the total power expense reported. The correction of this is the only change made in the power expenses.

General Expenses: In the company's reports the general expenses are in part charged directly to the three departments and in part to an apportionment account which is distributed on the basis of the gross operating earnings of each department. It appears that a more accurate method of distributing this apportionment account would be upon the basis of the overhead expenses, i. e., the total expenses, excluding general and undistributed expenses and taxes. This method has been used by the commission.

Undistributed Expenses: The undistributed expenses have been charged by the company in part to the different departments and in part to an apportionment account, which is distributed on the basis of gross earnings. These figures have been revised by making the basis of apportionment

the overhead expenses, the amounts directly charged to the three departments remaining unchanged.

Taxes: The company states the total taxes actually paid during 1907, 1908 and 1909, but, since the tax paid at the first of each year is the tax accruing during the preceding year, the amount reported as paid during 1909 has been applied to the year ending Dec. 31, 1908. For the year ending Dec. 31, 1909, since the amount actually paid in 1910 is not reported, the tax commission's figures for the railway and electric departments are applied as taxes actually applicable to the year 1909. For the year ending June 30, 1910, the company's estimates appear to be fair as compared with preceding years, and are therefore used. In apportioning taxes among the departments, the taxes upon the gas property require no arbitrary apportionment, as they are paid separately into the city treasury, while the larger part of the taxes upon the other properties is paid to the State as a whole. As between the railway and electric properties, some arbitrary basis of apportionment is necessary, and the basis used by the commission is the existing valuation of the properties upon the preceding June 30, as found by the engineers of the commission.

Depreciation: In addition to the operating expense accounts as reported by the company it is necessary to make a charge for depreciation. The engineering staff of the commission has worked out a series of depreciation percentages for railway and electric light and power properties, and these percentages have been applied. The rates of depreciation so used, on a straight line, 2 per cent sinking fund and 4 per cent sinking fund basis are shown in Table III.

TABLE III.—RATES OF DEPRECIATION.

	Railway.	Electric.
Straight line basis.....	5.55 per cent.	5.70 per cent.
2 per cent. sinking fund basis.....	4.67 per cent.	4.80 per cent.
4 per cent. sinking fund basis.....	3.90 per cent.	4.06 per cent.

"These percentages were applied to the valuation of June 30, 1909, for the depreciation for the years ending June 30, 1910, and Dec. 31, 1909, and to the valuation of June 30, 1908, for depreciation for the year ending Dec. 31, 1908. In arriving at the depreciable value for each year,

TABLE IV.—INCOME ACCOUNT—RAILWAY DEPARTMENT, YEAR ENDING JUNE 30, 1910.

Classification.	Total Railway.	City Line.	Interurban Line.
Earnings:			
Passenger	\$100,727.25	\$49,532.02	\$51,195.23
Mail, express, chartered cars....	2,668.94	88.80	2,580.14
Other than transportation.....	1,219.95	559.96	659.99
Total revenues.....	\$104,616.19	\$50,180.78	\$54,435.36
Operating Expenses:			
Way and structures.....	\$5,533.08	\$2,139.75	\$3,393.33
Equipment	5,839.80	2,493.33	3,346.47
Traffic	810.31	684.92	125.39
Power	21,343.70	9,924.57	11,419.13
Operation of cars.....	18,963.64	10,858.18	8,105.46
General	6,352.54	3,185.69	3,166.85
Undistributed	2,986.97	1,624.27	1,362.70
Total of above items.....	\$61,830.04	\$30,910.71	\$30,919.33
Taxes	6,201.58	2,195.98	4,005.60
Franchise payment	1,000.00	.....	1,000.00
Total operating expenses.....	\$69,031.62	\$33,106.69	\$35,924.93
Net revenue from operation.....	\$35,584.52	\$17,074.09	\$18,510.43
Depreciation	19,170.86	7,457.46	11,713.40
Balance for interest, etc.....	\$16,413.66	\$9,616.63	\$6,797.03
Or, upon valuation, Table II., per cent	2.87	4.43	1.91

land stores and supplies, paving and scrap value were omitted, and the 12 per cent addition for engineering, etc., is computed upon the remaining value. The figure obtained by the 2 per cent sinking fund method is the one adopted as a proper depreciation charge."

DIVISION OF INCOME BETWEEN CITY AND INTERURBAN SYSTEMS

In order to determine the part of the railway department's expenses properly chargeable to the interurban system, the railway expenses were separated between the city and the interurban system. The earnings and operating ex-

penses of the two systems had been kept separately by the company, and, except in cases where arbitrary apportionments were necessary, the company's charges to the city and interurban systems were accepted as correct. Besides the addition of depreciation, which was not included in the company's report, changes were made in the company's apportionment in the accounts of way and structures, power, general expense, undistributed expense and taxes. The division of earnings is shown in Table IV.

The accounts in which revision of the company's apportionments was made in making up the figures for Table IV are discussed by the commission in part as follows:

Way and Structures Expenses: It has been the practice of the company to charge \$450 per year to the interurban system and credit the same amount to the city system, on account of the use by the interurban system of the tracks of the city system within Fond du Lac. It would seem that, instead of this arbitrary charge, the interurban system's share of the way and structures expense should be based upon the amount of its car mileage within Fond du Lac. The engineering staff of the commission reports that 26 per cent of the total car mileage of the interurban system for the year ending June 30, 1910, was over the tracks of the city system. If 26 per cent of the interurban car mileage as reported for 1910 is added to the city car mileage as reported, the amount added will be 19.11 per cent of the total, and therefore 19.11 per cent of the total city system way and structures expense should be charged to the interurban system and credited to the city system. Using the same basis, 18.02 per cent of the city expense for 1909 and 15.24 per cent of that expense for 1908 is charged and credited in a similar manner. The resulting charge to the interurban system, instead of \$450 for each year, is \$320 for 1908, \$555 for 1909, and \$505 for 1910.

Power Expenses: Most of the power is generated by the company, but a small part, used exclusively for the interurban line, is purchased. The company in its report apportionments that part of the power which it generates, as between the city and interurban systems, on the basis of the current consumed by each system. This basis seems to be correct, but the method by which the company arrives at the consumption of each system cannot be accepted. As to the power purchased, the only data at hand are the records of a meter from March 1 to Aug. 15, 1909, as follows: Total, 5½ months, 124,394 kw-hours. Since there appears to be no other basis for estimating the amount of current purchased except to apply the above records for the years previous, the annual total is estimated at 275,000 kw-hours, a slight extra allowance being made for winter months.

CURRENT CONSUMPTION OF CITY AND INTERURBAN CARS

"With reference to power generated, the company reports that it has two meters in use, one of which records only interurban power generation, while the other records that of the city system, which is used by both city and interurban cars, and also that of a small part of the interurban system. The company assumed that its small city cars consume 1 kw-hour and its large city cars 2 kw-hours per car mile. After deducting the estimated city consumption thus obtained from the total wattage recorded by the second meter, the remaining wattage, plus that shown by the meter recording only interurban consumption, was taken by the company to be the total current generated for the interurban system. This added to the current purchased gave the total interurban consumption. Under this method the total consumption of the interurban system in 1909, for example, was estimated at 1,073,787 kw-hours, or 4.75 kw-hours per car mile. This figure per car mile is more than double that used for the large city cars.

"It seems, however, that there is no such difference in consumption between city and interurban cars as the company's estimates indicate. Tests of the company's cars, made by O. M. Rau, superintendent of electric lighting for the Milwaukee Electric Railway & Light Company, indi-

cate the relative consumption of city and interurban cars as summarized in Table V.

TABLE V.—POWER CONSUMPTION PER CAR MILE AND CAR HOUR, 50 HP, 4-MOTOR CARS, 29 AND 28 TONS, RESPECTIVELY.

City Running					Interurban Running					Per cent. city to int. kw-hours per car mile.
Time, min.	Miles run	Total kw-hrs.	Kw-hours per car hour.	Kw-hrs. per car mile.	Time, min.	Miles run.	Total kw-hrs.	Kw-hours per car hour.	Kw-hours per car mile.	
19	3.97	10.30	32.53	2.59	30	14.20	26.78	53.56	1.89	137.0
17	3.97	10.30	36.35	2.59	34	14.20	31.40	55.38	2.21	117.2
24	3.97	12.36	30.90	3.11	37	14.20	35.02	58.78	2.46	126.4
20	3.97	10.30	30.90	2.59	35	14.20	32.44	55.62	2.28	113.6
80	15.88	43.26	32.44	2.72	137	56.80	125.64	55.03	2.21	123.1
17	3.97	10.40	36.72	2.62	28	12.37	24.42	52.28	1.97	133.0
19	3.97	9.45	29.84	2.39	29	12.37	30.16	62.40	2.44	97.9
18	3.97	12.48	41.60	3.14	29	12.37	26.00	53.79	2.10	149.5
19	3.97	8.94	28.23	2.25	28	12.37	31.72	67.80	2.56	87.9
73	15.88	41.27	33.92	2.60	114	49.48	112.30	59.13	2.27	113.5
153	31.76	84.53	33.12	2.66	251	106.28	237.94	56.87	2.23	117.2

“Similar tests for the smaller cars used in the city exclusively show an average consumption of 2.30 kw-hours per car mile. The figures indicate that the consumption of the interurban cars is actually less than that of the same cars when used in the city. These figures, however, make no allowance for line losses, which are greater in the country than in the city. Mr. Rau states these losses to be about 7.5 per cent in the city and about 23 per cent in the country, and upon this basis the power consumption of the respondent’s cars per mile would be about 2.90 kw-hours on the interurban system and 2.88 kw-hours on the city system.

“A compilation of the power output per car mile on a number of interurban railroads in the State shows that the output per car mile ranged from 1.91 kw-hours to 2.19 kw-hours in 1909, and from 2.43 kw-hours to 3.36 kw-hours in 1910.

“We are of the opinion that 3 kw-hours per car mile will more than cover the actual consumption of energy per mile in both city and country running by the interurban cars, but, allowing something extra to be sure of covering line loss, we have placed the average at 3.25 kw-hours per interurban car mile. The total amount of current applied to the interurban system is thus arrived at approximately by multiplying the car mileage of that system by 3.25, and the remaining current is assigned to the city system. Deducting from the total current used by the interurban system the amount purchased, we have the total amount generated by the respondent company for the interurban line. The detailed figures for these operations are shown in Table VI.

TABLE VI.—DIVISION OF OUTPUT BETWEEN INTERURBAN AND CITY LINES.

Year ending	Total Railway Power				Car Mileage			
	Generated.	Purchased.	Total.		Total.	Interurban.	City.	
June 30, 1910.	1,176,822	275,000	1,451,822		482,133	229,503	252,630	
	Division of Total Power.				Division of Power Generated.			
	Interurban		City		Interurban		City	
Year ending.	Total kw-hrs.	Per car mi.	Total kw-hrs.	Per car mi.	Total kw-hrs.	Per cent.	Total kw-hrs.	Per cent.
June 30, 1910	745,885	3.25	705,937	2.79	470,885	40.01	705,937	59.99

“General Expenses: The general expenses of the railway system have for the most part been charged to a clearing account, which the company apportions between the city and interurban systems on the basis of gross earnings. It seems that a more accurate basis of separation would be the overhead expenses of the two systems, consisting of all operating expenses except general and undistributed expenses and taxes. Such amounts as were directly charged by the company to the interurban and city systems have been considered correct.

“Undistributed Expenses: The same change is made in

the apportionment of the undistributed expenses between the city and interurban systems as in the case of general expenses. The company’s division of its apportionment account is made on the basis of gross earnings.

“Taxes: The total taxes chargeable to the railway department have been apportioned between the city and interurban systems upon the basis of the valuation.

“Depreciation: The apportionment of depreciation between the city and interurban systems for the years ending June 30, 1910, and Dec. 31, 1909, has been made upon the basis of the valuation of the property of each system as of June 30, 1909, the apportionment of which is shown in Table II. Only items 2 to 9, inclusive, of the valuation are included in arriving at the separation. For the year ending Dec. 31, 1908, since no separation of the railway valuation of June 30, 1908, into city and interurban portions has been made by the engineers, the same percentages are used as those upon which the 1909 and 1910 apportionments are based.”

CONCLUSIONS OF THE COMMISSION

In its conclusions the commission says:

“The result of the figures shown in Table IV is to indicate that the interurban system of the respondent company has at no time during the past three years earned as much as 2 per cent upon the physical valuation of that system as made by the engineers of the commission. The year ending June 30, 1910, during which the net earnings were 1.91 per cent upon the investment, includes five and a half months during which the new rates were in effect; while the preceding year, under the former rates, shows a net return of 1.09 per cent. It is apparent, therefore, that no order can be made which would reduce the earnings of the company below their present figure.

“The complaint as to the location of the zone limits is the principal objection of the petitioner. The zone system results in hardships upon certain patrons of the road, especially when a shifting of the zone points takes place. The zone system seems, however, to be the only practicable system of interurban rates upon the line operated by the respondent company. The petitioner suggested that a straight rate of 2 cents per mile, such as that charged by steam railroads, would be satisfactory and fair to everyone. The respondent company does not come within the provisions of the 2-cent fare law of this State so as to make a rate of more than 2 cents per mile unlawful. Moreover, an interurban line differs greatly from a steam railroad line in the frequency of its stops. A system of rates under which the fare would be 2 cents per mile between any two points at which the respondent’s interurban cars might stop would be exceedingly difficult to administer. Instead of collecting a uniform fare throughout the car as each zone point is passed, the conductor would have to keep track of each passenger’s trip, in addition to the burden of remembering a large number of distances and fares. The duties of a conductor upon an interurban car are so numerous that any system of fares which would add to them so materially as the 2-cent-a-mile system might seriously overburden him and interfere with the safety and regularity of operation. Then, again, with the present fare in most of the zones averaging something over 2 cents a mile, the respondent company seems unable to earn a fair rate of return, so that a change to the 2-cent-a-mile system would be a reduction in rates, which is entirely unwarranted at this time.

“With the exception of the zones located within the cities of Oshkosh and Fond du Lac, there is a marked uniformity in the length of zones. Such uniformity tends to reduce the inequalities of the zone system to a minimum, if it is not obtained by making patrons at the most important points pay an increased rate by reason of residing a short distance beyond a zone boundary. That is, the placing of a zone limit only a short distance from an important point, so that patrons going to and from that point

must pay an extra fare for the short ride to the zone point, might not be justifiable merely for the sake of uniformity of zone lengths. But in the present case it seems that the only point of importance which is subjected to an increased rate by the change in the zone limits is that at which the petitioner resides. If the petitioner's station were only a short distance from the zone point next south, it might be practicable to establish overlapping zones, as is the case farther north, and permit the traveler to go to the zone point which would give him the longer ride; but in the case of a station half way between two zones it is difficult to find any way by which the intermediate point can be given the same benefit as a point half a zone removed from it without doing injustice to patrons on other parts of the line.

"It would seem, therefore, that not only are the respondent company's revenues too low to warrant any reduction in rates, but the zone system, as at present in effect on the respondent's line, is so arranged as to satisfy reasonably well the requirements of the general public.

"In view of these facts the proceedings are, therefore, for the present, dismissed."

HEARINGS ON POWER BRAKES AND HEIGHT OF CAR STEPS IN NEW YORK

A hearing was held before Commissioner John E. Eustis, of the Public Service Commission of the First District of New York, on July 20, 1911, on the subject of power brakes for use on surface cars operated within the jurisdiction of the commission. Mr. Eustis asked if any of the companies desired to make a statement.

Arthur S. Masten, for the receivers of the Metropolitan Street Railway, said:

"We shall be very glad to submit to the commission such facts and figures as we have been able to obtain so as to be of assistance in coming to a conclusion. Ever since the receivers were appointed the company has been making careful observations in regard to brakes. We have tabulated our statistics as to the various kinds of accidents which occur in which the question of brakes is a factor, and we have also compared the cost of the two kinds of brakes. We have concluded that the way we have our brakes installed now is on the whole about as near right as is possible. It seems to us that after the cars get to a certain weight the air brake is preferable to the hand brake, but in the lighter type of cars the percentage of accidents is such that it is a real economy to continue with the hand brake. In other words, there is a line behind which the air brake is not economical, and a line behind which it is foolish to use the hand brake. It was not our intention to make any immediate change as regards our lighter cars. We are using the air brake on our heavy cars and whenever we re-equip a car and bring its weight beyond the limit which we consider advantageous we install the air brake."

George D. Yeomans, of the Brooklyn Rapid Transit Company, said that the company proposed to have statistics tabulated to show the effectiveness of the brakes installed on its cars.

A. G. Peacock said that all of the closed cars of the New York & Queens County Railway weighing 13,000 lb. were equipped with air and hand brakes.

Adrian H. Larkin said that the Richmond Light & Railroad Company had only a few double-truck cars. All its cars were equipped with hand brakes.

Edward A. Maher said that the Third Avenue Railroad had 551 cars, of which 406 were equipped with air brakes. The Union Railway had 473 cars, 206 of which were open cars, of which 181 were double truck and 25 single truck. Of the entire 473 cars, about 350 were equipped with air brakes. It was proposed to equip the remaining cars with

air brakes. The Yonkers Railroad had 133 cars, all equipped with air brakes.

E. G. Connette, transportation engineer of the commission, gave the figures from the census report in regard to the number of power brakes in use in the United States. Mr. Connette said:

"From the study of the records it appears evident to me that considerable reduction in accidents would result if all cars weighing more than 25,000 lb. were equipped with power brakes; in fact, I believe that the equipment of double-truck cars even of lesser weights with power brakes would improve the conditions so far as accidents are concerned. I am very strongly of the opinion that all double-truck cars ought to be equipped with power brakes. The possible load of the car must be taken into consideration as well as the weight of the car itself in considering the subject of brakes."

James L. Quackenbush, for the Metropolitan Street Railway, said that despite the instruction given to motormen on the subject of accidents the personal equation on the front end of the car was such that the man operating a car which was equipped with a power brake took chances that the man operating a car equipped with a hand brake would not take.

Mr. Connette said that returns which showed the results which Mr. Quackenbush claimed for the Metropolitan Street Railway would seem to reflect on the inspectors and other road officers of the company who permitted misuse of the air brakes.

L. H. Palmer, superintendent of transportation of the company, said that the company found that motormen operated cars more safely with the hand brake than with the air brake, and that teamsters and drivers of vehicles took more chances with cars equipped with air brakes than they did with cars equipped with hand brakes. Mr. Palmer explained the training of motormen. The division general foremen disciplined men who have had accidents. Continued carelessness resulted in discharge. A new man always had more accidents than an old man, and it was impracticable to discharge a man for his first accident. Very often a slight accident had the result of increasing the efficiency of a man.

Mr. Quackenbush said that Mr. Palmer had been called because he did not want to have it appear on the record that the company had more failures on its part than it ought to have.

The hearing was adjourned until Aug. 14, 1911, at 10:30 a. m.

HEIGHT OF CAR STEPS

On the same day a hearing was held before Commissioner Eustis on the question of the height of car steps. Mr. Connette said that many complaints had been received about the steps and that the height of the first step of cars in operation in New York from the ground up varied with different types of cars from 12 in. to nearly 20 in. He had brought the matter to the attention of the commission so as to adopt if possible a uniform or standard height for car steps or at least to fix a maximum height. He suggested as maximum heights the following: From rail to step approximately 15 in. or 15¼ in.; from first step to platform, 13 in. or 13¼ in.; from platform of car to floor of car body, 11 in. or 11½ in. He then quoted from the report of Ford, Bacon & Davis on the Philadelphia Rapid Transit Company to show that the alighting and boarding accidents in Philadelphia had been decreased by the installation of the folding steps. The question of folding steps involved the reconstruction of platforms, and, in the discretion of the commission, the steps might be applied only to new equipment or where cars were rebuilt. To cut into the platform so as to make two steps would interfere with the safety devices which were installed under the car.

This hearing was also adjourned until Aug. 14, 1911.

CHANGES IN CLEVELAND ORDINANCE

The principal changes contained in the amendments to the original Cleveland Railway ordinance, adopted recently by the Cleveland City Council, relate to the purchase of the property by the city, the amortization or possible discount on bonds, and provisions that, it is believed, will maintain the value of the stock at par, as was intended by Judge R. W. Tayler when he wrote the grant.

Section 16, which defines the capital value, was amended so as to provide that, upon the refunding of bonded debt, there shall be paid out of the interest fund that rate per cent upon such refunded bonded debt which the refunding bonds may bear and such rate as may be necessary to amortize the discount, if any; the total, however, of interest and amortization provision not to be in excess of 6 per cent per annum on par. Another amendment of this section, relating to the provision that the company may sell its stock at not less than par and its bonds on a basis which will not be in excess of 6 per cent on par, stipulates that the company shall include in such rate provision for amortization of the discount, if any. It is further provided that if the bonds are sold at a premium the premium shall be used for extensions, betterments or permanent improvements or for payment of any existing indebtedness.

Section 19 was amended so as to allow the surplus remaining from operation each month to be deposited in the interest fund and to allow the investment of this fund in such securities as may be found desirable. Under Section 21 as amended the surplus remaining from the car-mile allowances, if any, shall be deposited in the interest fund at the end of each year, instead of at the end of each six-month period, as in the original franchise. This section also provides for the increase or decrease of car-mile allowances for all purposes by agreement between the city and the company, the matter to be submitted to arbitration in case of disagreement.

BETTERMENTS AND EXTENSIONS

In Section 28, as amended, provision is made for either the city or the company to propose betterments, extensions and permanent improvements, but the right of the city in this respect shall cease whenever the unexpired term of the present franchise or any renewal thereof is less than fifteen years. In case of proposals by the city the company is under obligations to make extensions, improvements or betterments, if by acting in good faith and employing the usual means it can secure the necessary funds by the sale of stock or bonds or by increasing the floating debt, unless the company should claim that by complying with the city's demands its ability to earn a sufficient amount to pay interest and dividends would be impaired, or that it is unable to finance the proposed betterments or improvements. In that case the question may be submitted to arbitration, provided, however, that the company shall at once expend \$2,500,000 for such purposes and this shall not be a subject of arbitration. This money may be secured by the sale of stock or bonds, as may seem best, and provision for the interest or dividends shall be made as in the case of present investments. The street railway commissioner is authorized to employ such assistance as is needed in making plans for the improvements or checking up those made by the company, provided the expense does not exceed 1 per cent of the cost. This to be paid by the company.

Nothing shall be added to the capital value without the consent of the city under the provisions of Section 29 as amended.

Section 30 provides that the consent of the city must be secured before extensions, betterments or permanent improvements can be made on the suburban lines, and the cost added to the capital value. The city cannot increase the service above or reduce the fare below the requirements of existing contracts between the company and municipali-

ties or county commissioners. Any dispute may be submitted to arbitration. No provision is made for fare in the suburbs as they may be admitted, but a portion of that part of the city which was formerly known as Collinwood may be given the low fare.

Policemen and firemen in uniform are to be carried free of charge under Section 31, and provision is also made whereby the street railway commissioner may have supervision over the platform crews to the extent of insisting that any laxity in the collection of fares must be corrected by the company upon notification.

Section 32, as amended, contains a provision giving the city the right to purchase the company's property at any time within the life of the grant on giving six months' notice of its intention. The terms fixed by the amendment change the original plan, in that it must pay the company the capital value, as fixed in Section 16, plus 10 per cent. This section defines just what deductions must be made under possible conditions that may exist at the time the property is taken over, as well as any additions that may have been made in the same way. Under Section 35, as amended, it is provided that if the city should have failed to exercise this right at the end of this grant or any renewal thereof, it may purchase the property on the same terms, but without the addition of the 10 per cent mentioned in Section 32, or it may purchase the portions of the system lying within the city on these terms, the outlying portions to be subject to agreement in regard to price. All this is contingent upon the city having legal right to purchase and operate a railroad system, and the last condition is made on the theory that any law enacted on this subject might forbid the city the right to own railroad properties outside its limits.

Section 37 provides that the city may name a purchaser for the property, in case the franchise or renewal is not renewed on the terms named in Section 35.

RIGHTS OF COMPANY UNDER REDUCED FRANCHISE TERM

As amended, Section 40 provides that in the event of the unexpired term of the franchise becoming less than fifteen years the rate of fare may be advanced to the maximum figure and the company shall have full charge of the schedules, without intervention from the city. The company shall continue to receive the sums provided in Section 16 from the interest fund, and when that fund contains \$200,000 in excess of the required \$500,000 the excess shall be used to reduce the capital value, by payments as follows:

1. Payment of any outstanding floating indebtedness.
2. Payment of any outstanding bonds which can under their terms be paid.
3. Creation of sinking fund to assist in securing a reduction of the capital value.

In case the city should renew the ordinance within the last period of fifteen years, allowances in the capital value must be made for the sinking fund accumulated or such payments as have been made.

Section 44 gives the city the right, if it has not exercised its prerogative to purchase the entire property before the expiration of the grant or renewal, either to purchase or to nominate an individual or company to purchase the line on St. Clair Avenue, with all its appurtenances, at a price to be agreed upon between the city and the company. In case of disagreement resort is to be had to arbitration.

It is reported that the city of Sumas, Wash., has made a ten-year contract with the British Columbia Electric Railway for furnishing power to Sumas, in which city the lighting question is in the hands of a civic body appointed for the purpose. This incident is of interest as it is stated to be the first time that the British Columbia Electric Railway has supplied power without the borders of the Dominion and in view of the international agreement regarding transmission of power across the border.

HEARING ON CONEY ISLAND FARES

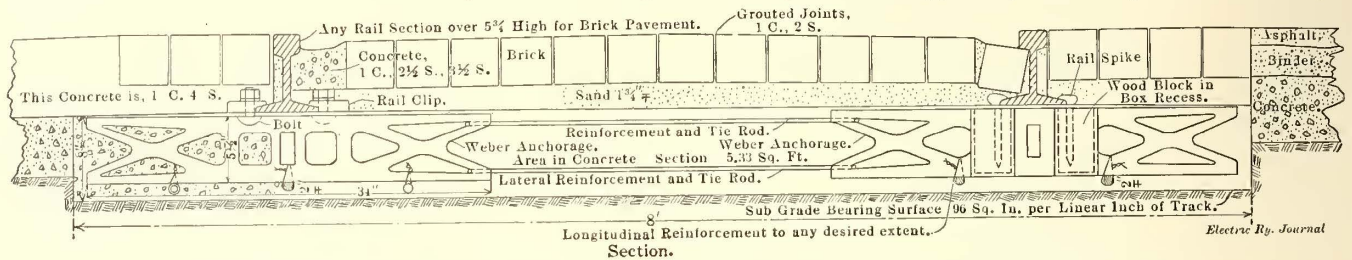
NEW CONCRETE TIE

A hearing was held before the Public Service Commission of the First District of New York on July 24 in regard to the question of fares to Coney Island.

After the order of the commission had been read G. D. Yeomans, counsel for the Brooklyn Rapid Transit Company, said that as the order read he understood that it meant a reopening of the whole question as to whether or not the fare to Coney Island should be 5 cents or 10 cents. Commissioner Willcox said that at the previous hearings

H. L. Weber, formerly chief engineer of the Columbus, Marion & Bucyrus Railroad and now chief engineer of the Utah & Grand Canyon Railroad, has invented the new type of reinforced concrete tie shown in the accompanying engraving. The design permits the use of a rail with any width of base from 3 in. to 7 in.

As shown, the rail is attached to an anchorage, which may be of forged steel, cast steel or malleable iron, and is in two parts with oppositely extending arms. The depth



Section Showing Preferred Form of Construction in Paved Streets with Weber Anchorage

in regard to the fare to Coney Island the commission had announced that the question might be opened again.

Mr. Yeomans said that the previous study of the question had extended over many months and that it would not be fair to the Brooklyn Rapid Transit Company to reopen the case at this time.

Mr. Yeomans was asked whether or not the Brooklyn Rapid Transit Company would be willing to establish a service at a 5-cent fare east-bound to Coney Island between 6 a. m. and 9 a. m. and a service west-bound from Coney Island at a 5-cent fare between 4 p. m. and 7 p. m. He replied that, while he was an officer of the company, he was not one of its executives and could not say what the management might be willing to do in this regard. He promised, however, to bring the question of reducing the fare during the hours mentioned to the attention of the management, and to report to the commission at a hearing to be held on July 27. The representative of the Coney Island & Brooklyn Railroad also agreed to report to the commission at the same time.

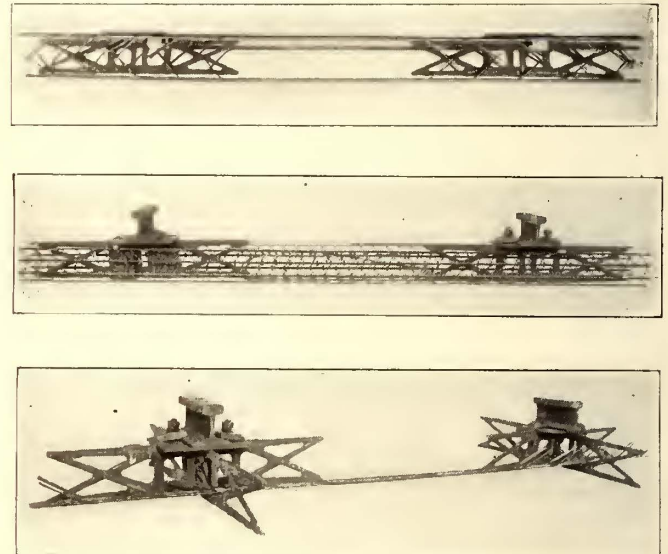
On July 26, 1911, T. S. Williams, president of the Brooklyn Rapid Transit Company, sent a letter to the commission in which he said that the company would be willing to place on sale as an experiment special round-trip tickets at 10 cents, good for a ride on its elevated lines to Coney Island between 6 a. m. and 9 a. m. east bound, and between 2 p. m. and 4:30 p. m. westbound. In his letter Colonel Williams said in part:

“Our proposal is that with the exception of Saturdays and Sundays (and legal holidays) we will sell at the stations of our elevated lines between the hours of 6 a. m. and 9 a. m. a special ticket for 10 cents, which will enable persons between such hours to go to Coney Island, such tickets being good for return trip from Coney Island between the hours of 2 p. m. and 4:30 p. m., this privilege to begin as soon as tickets therefor can be prepared (probably, about Aug. 1) and to continue until Oct. 1, with no commitment on the part of the company to a continuance of the arrangement after this season, although we frankly say that if the experiment should not be too costly our disposition would be to make the same arrangement in succeeding seasons. We propose the limitation of the service to the elevated lines because these lines furnish the safest, most frequent and rapid service to the island. In adopting voluntarily your suggestions we wish to have it distinctly understood that in our opinion the lower rate during the hours mentioned is less than a reasonable one, and is accepted as an experiment.”

The Public Service Commission has adjourned to Oct. 1, 1911, the hearing on the 5-cent fare set for Aug. 27, 1911.

of the arms approximates that of the concrete base or finished concrete tie. In one form of anchorage Mr. Weber provides keyhole-shaped openings, into which fit the bolts which fasten the rail to the tie. Where the ordinary railroad spike or screw spike is to be used the anchorage is provided with a boxed recess which holds a wooden block with corrugated edges. The top of the anchorage has a rail plate or tie plate on which the rail rests.

This anchorage is adaptable to various forms of reinforced concrete ties, as shown in the accompanying illus-



Different Forms of Weber Tie

trations. It can also be used in the sheet or platform type of subconstruction for paved streets, as shown in the line engraving. Mr. Weber is a strong advocate of this type of construction, in which the track and pavement foundation are treated as a unit, rather than the beam construction, in which the rails are mounted on steel ties embedded in concrete, and a reinforced concrete beam, say 6 in. or 8 in. in depth and 20 in. in width, is carried under each rail. He believes that after a depth of 5 3/4 in. to 6 in. is attained in the rail of the A. S. C. E. section it possesses all of the structural strength necessary for electric railway operation, and is also deep enough to permit the use of practically any type of paving. The only further requirement is a good bearing service for the rail, and this is provided far better by the platform type of construction than in the beam construction.

CONVENTION OF THE TRAMWAYS & LIGHT RAILWAYS ASSOCIATION

The annual convention of the Tramways & Light Railways' Association in Great Britain was held in Edinburgh July 13-14. Four papers were presented. One related to "Tramways and Light Railways Legislation of the Future," by Alderman William Ivey, who recommended modifications in the existing laws. Digests of the other three papers follow:

TRANSFERS

This subject was treated by C. W. Shepherd, J. P., general manager Edinburgh & District Tramways Company. The speaker said that he was in favor of transfers when issued on penny fares, but not in favor of transfers when issued for half-penny fares. He considered the form of ticket used by his company desirable. The conductor on the second car should not collect transfer tickets, as that immediately gave the ticket a value, but should deface it by tearing a piece out, opposite the destination punch hole. The use of transfer tickets was fortunately not as great in Great Britain as in America, because of the longer ride possible in America on a transfer ticket. In Edinburgh the distance covered by a transfer ticket does not as a rule exceed a half mile by each car. The Edinburgh company has discontinued the practice of indicating any time limit on the ticket, but the latter states that it is good only for a continuous journey on the day of issue.

ELECTRIC TRACTION IN ENGLAND

G. H. J. Hoogwinkel read a paper entitled "A Few Reasons Why Electric Traction in England Remains Stationary." It was largely an argument in favor of single-deck cars, flexible track construction and the bow trolley. The principal arguments in favor of the double-deck car, as given by him, were that they take less room on the streets than a larger number of short cars or long single-deck cars, and a smaller number of employees is required than for single-deck cars of the same length. He believed, however, that if passengers were allowed to ride on the platforms the difference in length of car between single-deck and double-deck, carrying the same number of passengers, would not be great. It was difficult now, he said, to accommodate passengers on the platforms of double-deck cars because of the obstruction caused by the reversed staircases. Double-deck cars were also severe on the track. The accompanying table was presented, showing statistics

The writer also believed that the use of the bow system would reduce the trolley wire maintenance and produce a much lighter overhead construction. Besides this, he recommended the use of radial trucks, pay-as-you-enter cars and trailers. He thought that the uniform fare used in the United States made the adoption of the pay-as-you-enter car more easy than when a graded fare was used, but believed that there was also a field for the pay-as-you-enter car with a graded fare. He recommended a penny minimum fare, to be obtained only by the use of strip tickets in advance, and with a universal two-penny fare for any distance under 5 miles, with right of transfer.

NOTES ON TRAMWAY PROBLEMS

This topic was treated in a paper by C. W. Mallins, general manager Liverpool Corporation Tramways. The writer claimed that the single-truck car was the most economical for British conditions, (1) because it would hold 70 passengers, which was about as many as one conductor could reasonably attend to, and (2) because it consumed less power than double-truck cars. He recommended a wheelbase of 7 ft. 6 in. or 8 ft. He regretted the continuous demands for preferential treatment in the way of fares by the working classes during certain hours of the day. Concessions granted to laborers and artisans were followed by requests for similar treatment to shop assistants, clerks and others, with the result that about 60 per cent of the public were now pleading for preferential treatment or free transportation. There were also demands for half-penny fares, transfers and extension of zones. The usual third-class steam railroad passenger rates in the United Kingdom were one penny per mile, and the writer believed that street railway undertakings should fix upon some general basis for charging for transportation, though this need not necessarily be one penny per mile.

DATA FROM VARIOUS GROUPS OF BRITISH ELECTRIC RAILWAY UNDERTAKINGS.

	Highest.	Lowest.	Average
Cost of track construction per mile of single track, in £.....	9877	3255	6719
Cost of overhead construction per mile of single track, in £.....	2788	640	1790
Annual maintenance of track per mile of single track, in £.....	300	21	99
Cost of hired power per kw-hour, in pence.....	2.149	1.3	1.651
Cost of generated power per kw-hour, in pence..	.96	.405	.684
Average ride furnished for a penny fare, mile..	2.75	1.63	2.04

He presented statistics, printed herewith in the form of a table, showing financial and other data of different tramway enterprises. The first five items were based upon figures obtained in each case from twelve different companies and the last item from sixteen different companies. He also believed that a business could be secured for transportation of freight within the city.

SINGLE-DECK CARS (CONTINENTAL).

	Population in thousands.	Passengers carried in thousands.	Car miles per An. in thousands.	Power cost in cents per motor car mile.	Receipts in cents per car mile.	No. of passengers per car mile.
Vienna	2,023	259,000	47,496	2.198	15.62	5.47
Amsterdam .	523	70,789	8,370	1.542	13.44	7.04
The Hague.	206	36,000	4,989	1.846	14.34	6.05
Dresden	516	.....	18,437	1.344	.....	.....
Leipzig	537	67,000	18,437	1.702	12.8	5.50

DOUBLE-DECK CARS (UNITED KINGDOM).

Liverpool ..	760	121,920	12,187	3.776	2.24	10.
Brighton ..	130	10,160	1,112	3.392	20.64	9.64
Dublin	390	52,661	7,750	2.896	18.05	6.8

from the various Continental cities where single-deck cars are used and from cities in the United Kingdom where double-deck cars are employed. The lower figures of power given for cars on the Continent are not due entirely to lighter cars, but also to the wider rail groove. He said that Munich recently removed its concrete track and was now laying its rail on wooden ties laid in gravel. A single-deck car 29 ft. over all, with a capacity for twenty sitting and twenty standing passengers, and weighing without load 7 tons, is used. Vienna has recently put in service a car measuring 27 ft. over all, with a seating capacity for twenty-two passengers, and weighing without load 5 tons. The frame is of steel with aluminum side panels.

APPOINTMENT OF CHICAGO SUBWAY BOARD

Mayor Harrison has appointed John Ericson, city engineer; E. C. Shankland, designing engineer, and James J. Reynolds, an operating engineer, to constitute an advisory board of engineers to recommend a plan for a passenger subway in Chicago as soon as practicable. Bion J. Arnold was chief subway engineer for Chicago during the preceding administration and prepared an elaborate report which will be considered by the new commission among other plans suggested. The members of the board will be paid at the rate of \$12,000 a year.

Mr. Ericson has already made a subway report and is regarded as an authority on underground building foundations and subsoil conditions, and Mr. Reynolds is particularly familiar with transportation problems. The Mayor is reported to be in favor of a subway in the loop district only and says that important questions to be considered are whether it shall be a single-deck or double-deck system and whether it shall be constructed from building line to building line or from curb line to curb line.

FAST TRAINS IN INDIANA

The accompanying illustrations show one exterior and two interior views of the "Muncie Meteor," one of the comfortable high-speed trains which the Indiana Union Traction Company is operating for the convenience of its



The Muncie Meteor

interurban patrons. This train makes two trips each way a day between Indianapolis and Muncie. It is similar to the "Marion Flyer," which is operated between Indianapolis



Interior of Motor Car

and Marion for the same number of daily round trips. One of the departures in the make-up of these trains as instituted by H. A. Nicholl, general manager, is the use of



Interior of Trailer Parlor Car

a luxuriously furnished parlor trail car. This service is proving popular, especially as no extra charge is made for it.

COMMUNICATION

TEST OF COUPLERS AT INDIANAPOLIS

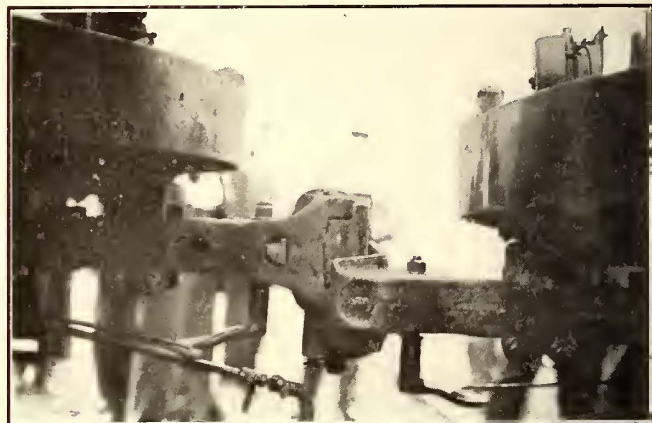
THE MCCONWAY & TORLEY COMPANY,
PITTSBURGH, PA., July 25, 1911.

To the Editors:

We inclose herewith a photograph taken of our Janney radial couplers in a test made at Indianapolis before the equipment committee of the American Electric Railway Engineering Association.

The report appearing in your paper last week about this meeting referred to the test, but did not give specific information in regard thereto, and in view of the fact that another picture was shown of two M. C. B. couplers in connection with that article, which did not refer to any test that was made so far as we are aware, we are afraid as the matter stands there is likely to be a misunderstanding on the part of your readers as to the picture believed to show the test of our couplers.

The accompanying photograph was taken at a point where the Terre Haute, Indianapolis & Eastern Railway crosses the Belt Line with a grade of about 3 per cent at either approach and a hump in the crossing due to the fact that one of the steam switch tracks is about 2 ft. lower than the main line tracks. These cause a severe



View Showing Couplers in Engagement on Severe Break in Grade

condition, and the interurban company has experienced trouble from trains coming uncoupled at this point. The coupler illustrated had an 11-in. face and at the time when the photograph was made it was found that one of the couplers had slipped vertically out of the other $4\frac{1}{2}$ in., leaving the couplers still in engagement to the extent of $6\frac{1}{2}$ in. This, we believe, is sufficient for all practical purposes, with a good margin of safety against possible uncoupling, and to demonstrate that it is unnecessary to provide special appliances with the M. C. B. type of coupler to take care of reasonable breaks in grade. When conditions are so severe that M. C. B. couplers having 11-in. knuckles will not operate satisfactorily and with safety, it would appear that the track at those points should receive the attention of the track department, and it should not be put up to the mechanical department to provide and take care of mechanism upon cars to obviate occasional abnormal track conditions which should be obviated otherwise.

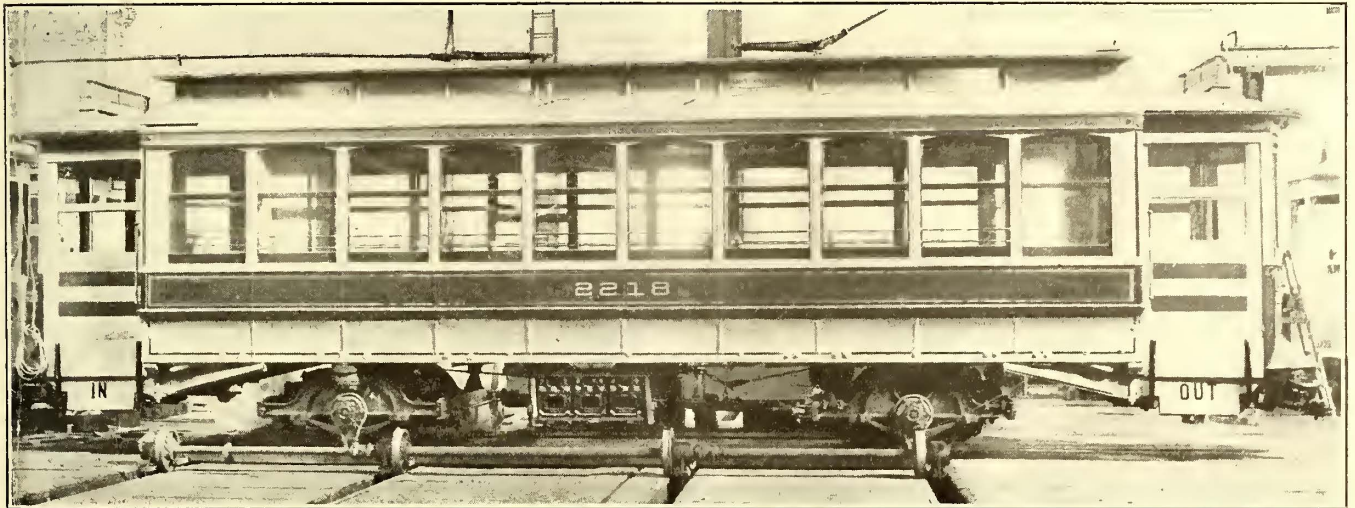
THE MCCONWAY & TORLEY COMPANY,
STEPHEN C. MASON, Secretary.

Col. D. C. Collier, director-general of the Panama-California Exposition to be held at San Francisco in 1915, and John C. Olmsted, landscape gardener, conferred at Brookline, Mass., recently in regard to plans for the architectural features of the exposition, which will possibly include an electric railway park.

THE HALSEY RADIAL TRUCK

Those who have been following the development of the radial or non-parallel axle truck abroad and its applications in this country will be interested to learn some particulars of a radial truck which has been designed especially to meet American electric railway conditions, even to the use of such standard parts as have been adopted by the American Electric Railway Association. This truck is the invention of James T. Halsey, Philadelphia,

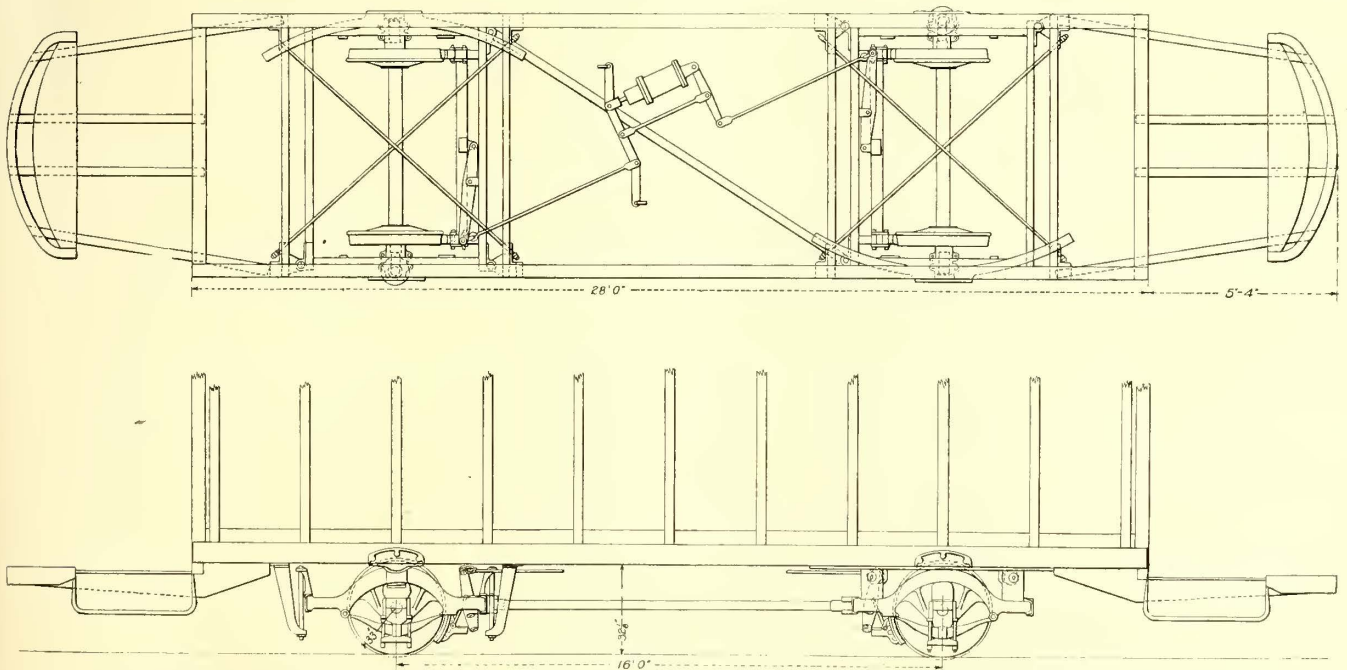
wheels, \$80, and two axles, \$40, a total of \$1,020. The halving of the motor and truck equipment would also tend to reduce the maintenance of motors, bearings, journals, brakeshoes, etc., by approximately 50 per cent. As regards weight, it is asserted that, exclusive of wheels and axles, the truck is much lighter than any other of corresponding center-pin capacity. For the same center-pin load the radial truck, exclusive of wheels and axles, weighs less than one-half as much as a pair of maximum traction trucks and, furthermore, it requires no idler



New Radial Truck—Former Double-Truck Car Now Equipped with One Four-Wheel Radial Truck

who began his experiments nearly three years ago. On Feb. 4, 1911, a sample four-wheel truck was placed in regular service on a certain city railway under a prepayment car with 28-ft. car body, which had been equipped originally with two parallel-axle four-wheel trucks and

wheels and idler axles. One hundred per cent of the weight of the car body and load is made available for traction compared with 60 per cent for the maximum traction truck and 50 per cent for an eight-wheel equipment made up of one motor and one trailer truck.

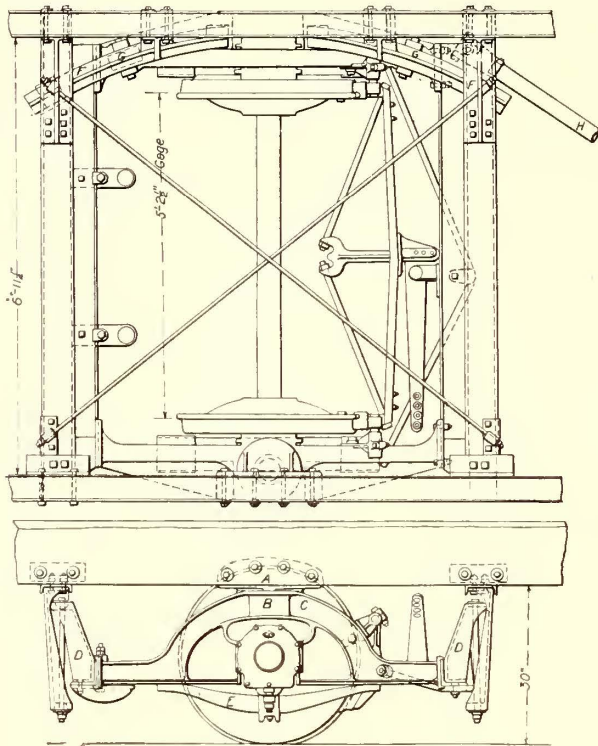


New Radial Truck—Plan and Side Elevation, Showing the Application of a 28-ft. Car Body to One Truck.

four GE-80 motors. As the result of this change it was found possible to maintain the usual schedule with but two of the original motors. The elimination of two motors and one truck reduced the total weight of the car from 45,000 lb. to 32,050 lb., a saving of 12,950 lb. It is estimated that, based on the cost of the original car equipment, the following amounts would have been saved by using this radial truck: Two motors, \$900; four 33-in. rolled forged

One of the greatest operating economies sought from a radial truck is, of course, the reduction of wheel wear, owing to the radial feature of the truck. In the case of the experimental car under consideration, the manufacturers state that it shows absolutely no wheel flange wear after six months' regular service over 33-ft. curves, and even after runs over a 25-ft. curve. They estimate that each of the eight wheels required for a four-motor equipment of

the type which was displaced would lose $\frac{3}{4}$ in. more of tread metal in renewing flanges than would each of the four wheels in the radial truck. This total saving of 6 in. in tread metal would be equivalent to the cost of three new wheels, or \$60. The combination of less dead weight and reduced friction would also, of course, produce substantial economies in current consumption. In this case



New Radial Truck—Construction Details

the energy expense based on a reduction of 6 tons in weight for a car running 100 miles a day for 300 days in the year is estimated as \$1,080 a year less, assuming an energy cost of 6 mills per ton mile.

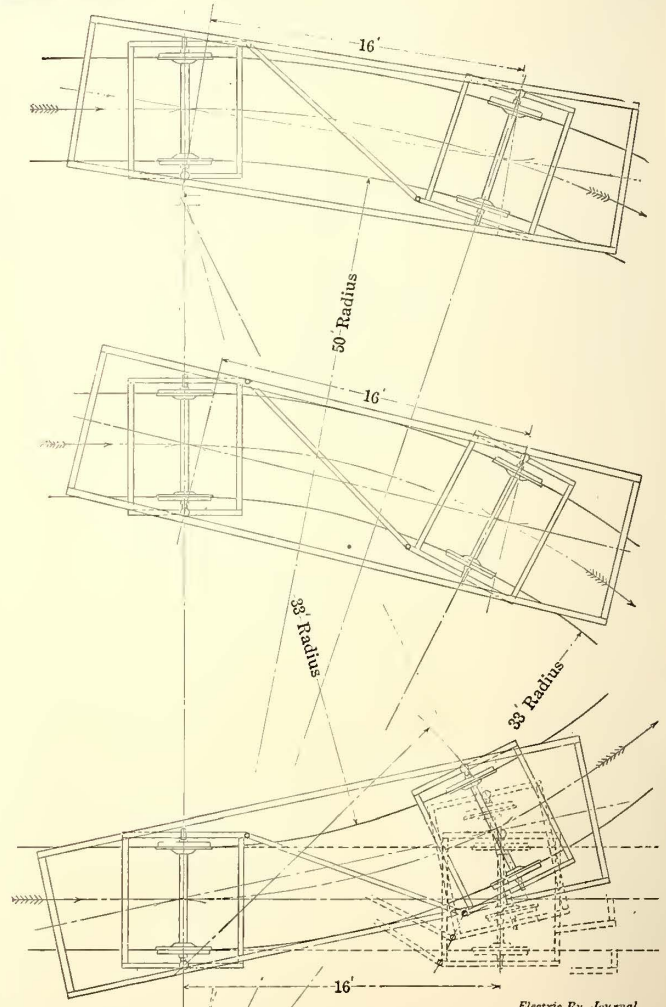
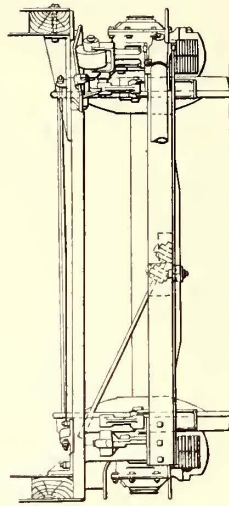
An important feature of the Halsey radial truck is that the wheelbase may be increased to any length desired so as to mount the car properly with the approved and practicable length of overhang at each end. The wheelbase need not be limited by the radius of the curve.

The simple construction of this truck will be noted from the accompanying working drawing. The part marked *A* is the top bearing, which is bolted to the side sill of the car. *B* is the bottom bearing, which is cast solid with the side frame *C*, and *DD* are the depending hangers which are located on the pivot side of each half truck and which constitute a four-point suspension in connection with the rollers *GG* on the free side. *E* is the longitudinal half-elliptic spring. *F* is the radial side bearing upon which the rollers travel. This side bearing is slightly inclined from the center in both directions toward the ends and when the car is on a tangent the rollers ride in a slight groove in the side bearing. The rollers are of cast iron, 6 in. in diameter and 4-in. face.

At the July meeting of the executive committee of the National Electric Light Association communications relative to the two frequencies now employed in the transmission of energy for railway service were read from B. F. Wood, of the Pennsylvania Railroad, and Henry L. Doherty, of New York. Mr. Doherty stated that the association should endeavor to establish the electrification of main lines of railroads in directions that would be of value to the central stations of the country. He expressed the opinion that it would be best and preferable to use 60-cycle current for railway work. The matter was referred to the committee on apparatus.

REPORT OF INTERSTATE COMMERCE COMMISSION

The report of the Interstate Commerce Commission giving the statistics of the railways of the United States for the year ended June 30, 1910, shows the following totals: Miles of single track, 1910, 240,439. Increase over 1909, 3605 miles. Locomotives in service, 1910, 58,947. Increase over 1909, 1735. Total number of cars, all classes, 1910, 2,290,331. Increase over 1909, 72,051. Total number of employees, 1910, 1,699,420. Increase over 1909, 196,597. Par value of capital outstanding, 1910, \$18,417,132,238. Of the capital outstanding \$6,710,168,538 was common stock, \$1,403,488,842 was preferred stock, and the remainder, \$10,303,474,858, represented funded debt. The number of passengers carried, 1910, was 971,683,199. Increase over 1909, 80,210,774. The number of tons of freight carried, 1910, was 1,849,900,101. Increase over 1909, 293,340,360 tons. The total operating revenues, 1910, were \$2,750,667,435. The total operating expenses, 1910,



New Radial Truck—Positions of Truck When Entering and Passing Through a 33-Ft. Radius Curve

were \$1,822,630,433. The total number of railway employees (omitting 95,328 not distributed) was apportioned among the six general divisions of employment as follows: To maintenance of way and structures, 504,979; to maintenance of equipment, 329,373; to traffic expenses, 21,652; to transportation expenses, 661,355; to general expenses, 53,385; and to outside operations, 33,348.

News of Electric Railways

Mayor Whitlock Reviews Franchise Negotiations in Toledo

In a long statement, issued on July 18, 1911, Mayor Brand Whitlock, of Toledo, Ohio, discusses the present condition of the negotiations between the company and the city.

Mr. Whitlock says he believes that the transportation problem will not be solved finally until the railways pass to the ownership of the various municipalities. He said that cities are powerless to fix rates of fare or rentals, or to order tracks removed where franchises have expired. The Mayor said in part: "In the first place, the city has no legal power over the company except that which is included in the ordinary police power. This power, however, does not extend to such subjects as regulation of the service and fixing of the rate of fare. The only potent right the city has is to contract with the company, and as it takes two to make a bargain, the city cannot compel the company to do what it does not wish to do. There is no legal power in the city, no law by which arbitrarily it can compel the company to grant desirable things. If there were the city would have compelled the company to 'give' 3-cent fares long ago. There is no law by which the city can compel the company to pay rental for streets on which its franchises have expired; no law, even, by which the city could legally accept rental, and if there were, that would not be the correct solution of the problem.

"I do not now propose my way of settling the question by having the lines owned by the city, because the law would not permit it. The truth is that the public utility companies are stronger than the city. Only last winter a bill indorsed by the Council was presented in the Legislature giving the cities the power to own and operate their own street railway systems, but this bill was defeated for the simple reason that the private privileged interest is more influential with the Legislature generally than is the public interest.

"The source of power in the city is not in the city officials, nor even in the people of the city, but in the Legislature of the State. The city cannot own and operate a street car system because the State Legislature will not let it; it cannot demand and collect a rental from the company because the State will not let it; it cannot give a franchise to another company because the company under the State laws has rights in those portions of the city streets where it still holds franchises that are superior to the city's rights.

"In the negotiations that have been going on between the company and the city we have come to the crucial point, namely, the fixing of the fare, and as this depends upon the cost of service, and as this cost of service includes a reasonable return to the company on its actual investment, it is necessary to ascertain the value of the investment before the rate of fare can be fixed. In these evaluations millions and millions of dollars are involved and questions involving millions of dollars are not settled easily or speedily.

"The plan of negotiations agreed upon between the city and the company was that an ordinance be drawn, taking the memoranda prepared by Mr. Schreiber as a basis, leaving to the last the fixing of valuations and the rate of fare, the company's proposal of a board of three experts having been declined by the city. In the negotiations thus begun a contract was drawn section by section; in that contract, which necessarily took the form of an ordinance, the city retained power that few American cities to-day exercise over the operation of street car companies. It was provided, for instance, among other things, that the city was to dictate and control absolutely the service, including the character, operation and routing of the cars, etc., and, of vaster importance, the right to take over the system, when authorized by the State Legislature to own and operate public utilities, was explicitly retained and assured.

"Then the subject of the rate of fare was reached, and as the cost of service was to be the basis of the rate, it became imperative to find out what reasonable return was to be allowed the company on its investment. Thereupon the company renewed its original proposal to have the

valuations fixed by a board of three experts. This the city again rejected and proposed that the value be ascertained by competent men, one representing the company and one representing the city. The company then refused to proceed further unless a third man were selected to umpire or arbitrate the difference between those two representatives. Then the city suggested as arbiter Judge John M. Killits. The company insisted that the arbiter be what is called an 'expert.' The city, of course, couldn't accept this proposal, and in committee of the whole Council said so, but reasserted its willingness to leave the arbitration to Judge Killits.

"In the meanwhile, however, Mr. Schreiber, the city solicitor, was to examine the law to ascertain whether or not the company's remaining franchises could be forfeited, because, if they can be, the city would be in position to invite proposals for an entire and unified street railway system. The city now awaits the company's definitive acceptance or rejection of Judge Killits as arbiter, and in the event of rejection, Mr. Schreiber's report on the law. It is evident that the practical street railway men in the country are or hope to be in the private employ of street railways and that their views of the respective rights of public and private properties are wholly prejudicial to the public interest.

"The differences in the valuation would arise when it was attempted to fix the so-called 'intangible values.' It was my hope when I had the honor to suggest Judge Killits' name that he would be found acceptable to the company, and that he would be permitted to work out some plan of settlement here as the late Judge Tayler worked out a plan of settlement under similar conditions in Cleveland. If the judge of the United States Court was qualified to act as arbiter in Cleveland, the judge of the United States Court in Toledo should be satisfactory. His selection would have settled the traction question in three months. The responsibility for delay must rest with the company.

"The public convenience is paramount to every other interest. Transportation is a necessity, and it cannot be interrupted. This fact is exactly what makes the franchise so valuable. For us to stop the cars would not settle the traction question.

"I have done the best I could. Everything I have done I have done in the hope of getting a 3-cent fare eventually. Everything I have forborne to do I have forborne in the same hope. I am anxious to have this question settled promptly, but for the sake of settling it promptly I do not propose to surrender the people's rights. The city is at a disadvantage, but the people, after all, have this immense advantage, namely, that every hour the company delays it is swept that much nearer to the abyss, for its remaining franchises will ere long expire, and then it will have no vestige of right left, in the city's streets.

"It will not require so long a time to settle the question in Toledo as it did in other cities because we have the experience of those other cities to guide us. They have 3-cent fares in Cleveland to-day, and we will have them in Toledo if we can be firm long enough, but we will not have them if we yield weakly to those who want peace at any price, or to those who are ready for any settlement so long as it is made immediately, or what is worse, if we listen to those who by pretending to speak in the people's interest hope to secure a satisfactory settlement in the interest of privilege."

Transit Affairs in New York

The rapid transit situation in New York has been complicated to such an extent by the various proposals and counter proposals of the companies that it has been suggested that the commission issue a bulletin of information, authoritatively summing up, in a form as brief as is compatible with clearness, the main facts of the negotiations that have been carried on.

The Public Service Commission on July 27, 1911, awarded the contract for the construction of another section of the

Lexington Avenue subway, that between Fourteenth Street and Twenty-third Street.

President Mitchel, of the Board of Aldermen, before sailing for Europe on July 27, 1911, said that the Public Service Commission would proceed with the contracts on new routes with a view to closing negotiations with the Brooklyn Rapid Transit Company as approved by the Board of Estimate on July 21. Mr. Mitchell is reported to have said:

"The Brooklyn Rapid Transit Company will undoubtedly be the successful bidder, as the contracts will call for the kind of operation that can be supplied only by the Brooklyn Rapid Transit Company. If the Interborough Rapid Transit Company had made terms with the city the contracts would have been so drawn as to fit the peculiar physical conditions of that company's lines.

"Even if we never have an operating contract with either of the companies with which we were in negotiation, if the Public Service Commission goes ahead we are assured of a complete subway system under construction in the next few months. The system will be practically the triborough, with the very important addition of the Broadway loop. Many statements have been made to the effect that the matter is still unsettled, while in point of fact it has been settled as to construction and operation, and the best evidence of that settlement is the letting of contracts for construction.

"There will be three or four separate but independent contracts. The contracts will be so drawn that no one of them will be awarded without the others. The Lexington Avenue route, for instance, will not be let to the Brooklyn Rapid Transit Company unless it takes the two other routes, nor the Broadway line unless it accepts the Lexington Avenue line. Neither will the Queens routes be let to the Brooklyn Rapid Transit unless it takes the two other routes, nor the other routes unless it takes the Queens routes."

On July 27 the Board of Estimate considered the tunnel from the Battery to Brooklyn, the recommendation of the commission for a new route through Fifty-ninth Street and the contract for the section of the Lexington Avenue subway in New York between Twenty-sixth Street and Fourteenth Street.

Progress of New York, Westchester & Boston Railway

The Public Service Commission, at its meeting on July 12, 1911, acted favorably upon the application of the New York, Westchester & Boston Railway for permission to use the tracks of the Harlem River & Port Chester Railroad from One Hundred and Seventy-fourth Street to the Harlem River. The Board of Estimate and Apportionment has granted the company certain changes in its franchise. The action of these two boards will now permit the company to commence the construction of its transfer station and enable it to make at an early date connection with the Second and Third Avenue elevated lines of the Interborough Rapid Transit Company at the Harlem River. The transfer station will be 550 ft. in length and 250 ft. in depth, and contain five platforms, from which nine tracks may be reached. The entrances and exits will be on the street level, and the platforms may be reached either by direct staircases or by more easy ascent by means of ramps and short flights of stairs. In speaking of the plans of his company regarding the transfer station, L. S. Miller, president of the company, said:

"This station is a necessity, and will be an important part of Greater New York's rapid transit system, no matter who builds the projected subways or elevated lines, and if the construction of those lines in the Bronx keeps pace with the work that we are doing the congestion of New York city can be relieved to a large extent sooner than in any other way—say in two years and a half, as all of the work to be done consists of elevated structures. Our reason for establishing this extensive transfer station at One Hundred and Eightieth Street, instead of transferring our passengers at Willis Avenue or by a shuttle train to the subway at One Hundred and Seventy-seventh Street, is to effect those transfers before we get into a district that is already rapidly filling up. Moreover, it divides the traffic further away from its greatest density, enables the companies handling the traffic to do so to better advantage and extends the zone of a single 5-cent fare."

Pittsburgh Council Passes Conference Resolution

As a result of the message sent to the City Council of Pittsburgh on June 27, 1911, by Mayor Magee, in which he suggested that the officers of the Pittsburgh Railways should be invited to confer with the city officials in regard to transit matters, the Council of that city has passed the following resolution:

"Resolved, by the city of Pittsburgh in council assembled, and it is hereby resolved by the authority of the same, that the president of this Council notify the president of the Pittsburgh Railways Company that this Council desires to meet the executive officers or board of directors of the Pittsburgh Railways Company at an early date for the purpose of discussing the said questions in dispute and attempting to arrive at an amicable settlement of the same."

The ordinance in regard to the use of power brakes on street cars in Pittsburgh, which was referred to in the *ELECTRIC RAILWAY JOURNAL* of July 22, 1911, came before the Council for consideration on July 18, 1911, and was returned to the committee on public service and surveys of that body. As previously stated in the *ELECTRIC RAILWAY JOURNAL*, the committee recommended to the Council that the company be required to equip all motor cars with power brakes by Jan. 1, 1912, and to equip all new double-truck trailers with power brakes. The company was, however, to be permitted to continue to use hand brakes on its single-truck trail cars. It is said that when the ordinance comes before the Council again a vigorous effort will be made to have stricken from the measure the clauses which exempt the trail cars from the provisions of the measure.

The question of subways for Pittsburgh came before the City Council on July 20, 1911. Opinion of the members of the Council was divided as to the authority of the city to act as sponsor for any bonds that might be issued to provide rapid transit in the city. A. E. Anderson favored a city-built system. He expressed the opinion that means could be devised to overcome the present debt limit requirement. While he did not say so, it is understood that he would have any bonds issued for subway construction exempted from the debt limit provision by changing the law so as not to bring within its scope bonds for self-sustaining improvements. Others expressed the opinion that the city should lay out a comprehensive system and then advertise the lines for construction and operation, or else negotiate with the present companies which have applied for rights, on the basis of the city sharing in the profits of the lines with supervision over their operation.

Municipal Ownership Measure in Detroit

The measure passed by the Legislature of Michigan to make possible municipal ownership of street railway lines in Detroit goes into effect on Aug. 1, 1911. In anticipation, Alderman Glinnan, of Detroit, has prepared an ordinance to secure municipal ownership in Detroit, and has introduced the measure in the Council. The plan is to have the committee report the bill out soon after Aug. 1, 1911, and then call an election, giving the voters about sixty days in which to discuss the measure. The principal features of the bill follow: Five street railway commissioners are to have charge of the city street railway system. Two methods of selecting them are provided; one election on a non-partisan ticket, the other appointment by the Mayor, the Council to decide which method shall be submitted to the people. The commission to acquire street railway system exclusively for the city, build extensions, etc. Shall adopt civil service rules, based on merit. May purchase the existing lines or acquire them under condemnation proceedings. If no purchase or condemnation is accomplished in six months, may build on other streets, as directed by the Council. Contract to purchase or condemn must have approval of 60 per cent of the voters. Council to issue bonds to 1 per cent of assessed value of city, money to be used to bring about purchase. Council to issue additional street railway bonds secured by street railway property, including franchise, for not more than twenty years, proceeds to be used in completing payment of purchase price or condemnation award. Franchise and bonds must be approved by 60 per cent of voters. The rate of fare shall be sufficient to cover operat-

ing expenses, paving and watering between tracks, fixed charges and to pay bonds at maturity. The commission may sell surplus power.

Committee to Consider Public Utility Commission for Illinois.—A committee consisting of five State Senators and five State Representatives has been appointed by the Illinois Legislature to investigate the general subject of public service commissions, with a view to forming a public service commission in Illinois. Senator John Dailey, Peoria, has been appointed as chairman of the committee, and Representative William P. Holaday, Georgetown, as secretary.

Municipal Ownership in Winnipeg.—The Mayor of Winnipeg, Man., has announced that the city has decided to accept the offer of Sir William MacKenzie, president of the Winnipeg Electric Railway, and purchase the property of the company for \$15,000,000. The acquirement will consist of an electric railway with fourteen years of the franchise yet to run, a power plant sixty miles east of the city, and a gas and electric light works. The city has a new municipal power plant under construction.

Electric Drive for San Francisco Cable Lines.—The United Railroads of San Francisco has converted its Mason and Washington power station from steam to electric drive, so that all their cable lines are now motor driven. The Castro and Pacific Avenue stations are operated with direct-current motors, while at Mason and Washington station the new installation is all alternating-current apparatus. The speed of all cables has been increased about 3 per cent, and owing to the practically constant speed of the motor the cables travel at a much more uniform speed now than with the old equipment, it having been found impossible to control the steam engines within less than 5 per cent.

Convention of Colorado Electric Light, Power & Railway Association.—The next meeting of the Colorado Electric Light, Power & Railway Association will be held at the Hotel Colorado, Glenwood Springs, Col., Sept. 13 to 15 inclusive. The program includes the following papers: "Lamp Efficiency," by S. E. Doane, Cleveland, Ohio; "Welding by the Oxycetylene Process," by K. L. Brackett, Denver, Col.; "Electricity for Advertising Purposes," by G. E. Williams, Denver, Col., and "The Sale of Electric Power for Mining Purposes," by Franklin P. Wood, Cripple Creek, Col. F. D. Morris, Colorado Springs, Light, Heat & Power Company, Colorado Springs, is the secretary.

Funds for Philadelphia Terminal Improvements.—The Connecting Railway, Philadelphia, Pa., has made a mortgage to the Girard Trust Company, Philadelphia, Pa., as trustee to secure an issue of \$15,000,000 of bonds to provide funds to carry out the plans of the Pennsylvania Railroad to electrify its terminal lines in Philadelphia. The Connecting Railway owns 36 miles of road in and about Philadelphia. The \$3,613,650 of stock of the company is owned by the Pennsylvania Railroad, which operates the road under lease. There are now outstanding \$2,059,000 of refunding mortgage, 3½ per cent, thirty-year guaranteed gold bonds of the Connecting Railway due on March 15, 1932, and \$1,000,000 of first-mortgage, thirty-year guaranteed first-mortgage 4½ per cent bonds of the Philadelphia, Germantown & Chestnut Hill Railway, which will become due May 1, 1913.

Outing of New York Railway Men and Supply Men.—About seventy New York railway men and supply men enjoyed an outing at College Point, L. I., on Friday, July 14, 1911. The afternoon's sport began at 3 o'clock with a baseball game between the "Run Ins." or railway men, and the "Pull Ins," or supply men. The players for the "Run Ins" were Messrs. Clark, Banghart, Shaughnessy, Mullaney, McWhirter, Wood, Adams, Killeen and Lingerman. The "Pull Ins" lined up as follows: Messrs. Keys, Mason, Coonan, Ellicott, Ransom, Strickland, Van Anden, Boyer, Denton. The game was called by Mr. Kirschner, the umpire, after the seventh inning on account of rain. The score was 5 to 4 in favor of the "Run Ins." At 6:30 a shore dinner was served, W. W. Wood acting as toastmaster. The return trip to New York was made by steamer, arriving at 10 p. m.

Financial and Corporate

New York Stock and Money Markets

July 26, 1911.

The New York market to-day declined up to noon and recovered at the close. While the trading was largely professional, the market was influenced by the serious aspect of the Moroccan situation and by selling of stocks here for London account. Crop conditions are now regarded as favorable. The rates for money to-day were: Call, 2@2½ per cent; ninety days, 2¾@3 per cent.

Other Markets

Very little of interest has taken place in the Philadelphia market during the week as regards traction shares. Rapid Transit was sold in large quantities on Monday at 22½, and Union Traction on Wednesday dropped to 52.

Chicago trading has been active, but there have been but few important price changes. Slight concessions were made in Chicago Railways certificates, Series 2 and 4, and in the common issue of the Chicago Elevated Railways.

In Boston interest has been chiefly in copper shares. The market in general has been rather dull and sales have been of small volume. Boston Elevated sold at 130 on Wednesday, a new level for the year.

Augusta-Aiken Railway & Electric preferred gained a point to-day on the Baltimore Exchange. Other changes were few and trading was light.

Quotations of traction and manufacturing securities as compared with last week follow:

	July 19.	July 26.
American Light & Traction Company (common).....	a305	a305
American Light & Traction Company (preferred).....	a108	a107
American Railways Company.....	a44	a44¾
Aurora, Elgin & Chicago Railroad (common).....	a44¾	a44½
Aurora, Elgin & Chicago Railroad (preferred).....	a87	a87
Boston Elevated Railway.....	a129	a129½
Boston Suburban Electric Companies (common).....	a15	a15
Boston Suburban Electric Companies (preferred).....	75	75
Boston & Worcester Electric Companies (common).....	a12½	*12½
Boston & Worcester Electric Companies (preferred).....	a58	a56
Brooklyn Rapid Transit Company.....	83¼	82¾
Brooklyn Rapid Transit Company, 1st ref. conv. 4s.....	87¾	86¾
Capital Traction Company, Washington.....	a130	a132
Chicago City Railway.....	a190	a190
Chicago & Oak Park Elevated Railroad (common).....	3	3
Chicago & Oak Park Elevated Railroad (preferred).....	5	5
Chicago Railways, ptcptg., ctf. 1.....	a90	a95
Chicago Railways, ptcptg., ctf. 2.....	a28	a28¾
Chicago Railways, ptcptg., ctf. 3.....	a9½	a9¾
Chicago Railways, ptcptg., ctf. 4.....	5½	a6
Cincinnati Street Railway.....	*130½	a130¾
Cleveland Railway.....	a99½	99½
Columbus Railway (common).....	*81½	81½
Columbus Railway (preferred).....	*92	a100
Consolidated Traction of New Jersey.....	a75½	a76
Consolidated Traction of N. J., 5 per cent bonds.....	a105	a105
Dayton Street Railway (common).....	a25	a25
Dayton Street Railway (preferred).....	a100	a100
Detroit United Railway.....	74	a76
General Electric Company.....	162	163½
Georgia Railway & Electric Company (common).....	a155	a156
Georgia Railway & Electric Company (preferred).....	93	a95
Interborough Metropolitan Company (common).....	19¾	18
Interborough Metropolitan Company (preferred).....	55¾	51¾
Interborough Metropolitan Company (4½s).....	81¾	79¾
Kansas City Railway & Light Company (common).....	a19	a19
Kansas City Railway & Light Company (preferred).....	a41	a44
Manhattan Railway.....	141½	a143
Massachusetts Electric Companies (common).....	a23¾	a23¾
Massachusetts Electric Companies (preferred).....	94½	a93½
Metropolitan West Side, Chicago (common).....	a27½	*27½
Metropolitan West Side, Chicago (preferred).....	15	*75
Metropolitan Street Railway, New York.....	15	15
Milwaukee Electric Railway & Light (preferred).....	*110	*110
North American Company.....	a73½	a74¾
Northern Ohio Light & Traction Company.....	*49¾	a51
Northwestern Elevated Railroad (common).....	a30	*30
Northwestern Elevated Railroad (preferred).....	a70	*70
Philadelphia Company, Pittsburgh (common).....	a55½	a54¾
Philadelphia Company, Pittsburgh (preferred).....	a44	a44¾
Philadelphia Rapid Transit Company.....	a22¾	a22¾
Philadelphia Traction Company.....	a86½	a86½
Public Service Corporation, 5% col. notes (1913).....	*101	*101
Public Service Corporation, cfs.....	a107	a107
Seattle Electric Company (common).....	a110½	a110¾
Seattle Electric Company (preferred).....	102¾	103
South Side Elevated Railroad (Chicago).....	a76	*76¾
Third Avenue Railroad, New York.....	11¼	a11
Toledo Railways & Light Company.....	a7½	*7½
Twin City Rapid Transit, Minneapolis (common).....	a110¾	109
Union Traction Company, Philadelphia.....	a52¾	a52½
United Rys. & Electric Company, Baltimore.....	*19½	a19¾
United Rys. Inv. Co. (common).....	a37½	a38½
United Rys. Inv. Co. (preferred).....	a70	69
Washington Ry. & Electric Company (common).....	a42¾	*42¾
Washington Ry. & Electric Company (preferred).....	a89½	*89½
West End Street Railway, Boston (common).....	a88½	88½
West End Street Railway, Boston (preferred).....	a102½	a103
Westinghouse Elec. & Mfg. Co.....	75¾	75
Westinghouse Elec. & Mfg. Co. (1st pref.).....	a120	a120

a Asked. *Last sale.

ANNUAL REPORT

Halifax (N. S.) Electric Tramway Company, Ltd.

The following statement compares the operations for three years:

	1910	1909	1908
Railway earnings	\$214,184	\$198,423	\$184,927
Electric light and power and sundry earnings	203,855	191,323	182,437
Gas and products earnings.....	59,070	57,834	57,254
Total earnings	477,109	447,580	424,618
Operating expenses	246,634	239,606	234,713
Bond interest	30,000	30,000	30,000
Net earnings	200,475	177,974	159,905
Dividends paid and interest.....	98,000	85,130	87,058
Surplus	102,475	92,844	72,847

Against the net earnings of \$200,474, there were charged \$8,000 for dividends, \$21,125 for renewals and betterments and \$1,103 for accounts written off. The final surplus as of Dec. 31, 1910, was \$518,048.

D. MacKeen, the president, in discussing the operations of the year, says:

"As will be observed from a perusal of these statements, an encouraging increase in the volume of business has marked the operations of the year.

"In view of the general condition of the company, the directors decided during the year to make a substantial reduction in the rates for electric light—the general consumers being allowed a further discount of 10 per cent from Oct. 1. This additional concession to consumers is equivalent to something over 1 per cent on the capital stock of the company. The directors trust that their action will meet with the approval of the shareholders.

"The proportion of operating expenses to income was reduced to 51.94 per cent.

"In addition to other improvements during the year, the sprinkler system, referred to in last year's report, was installed, thus reducing the risk of loss by fire and enabling the company to obtain insurance at greatly reduced rates.

"The property has been well maintained during the year."

Traffic statistics compare as follows:

	1910	1909	1908
Per cent operating expenses to income..	51.94	53.54	55.29
Passengers carried	4,848,767	4,465,308	4,162,986
Car mileage	907,498	888,024	814,375

Bay State Street Railway, Boston, Mass.—Formal consolidation of the Boston & Northern Street Railway and the Old Colony Street Railway was completed July 21, 1911, at a special meeting of the stockholders of the companies. The name The Bay State Street Railway was adopted as the new designation of the combined roads. To make the formal change of name the approval of the Railroad Commissioners and the Commissioner of Corporations will be required. The officers of the new company will be the same as the officers of the old companies, the two consolidating companies having had identical officers. The new company will have fourteen directors, the two companies each having had seven. The directors follow: Gordon Abbott, C. F. Adams, second, J. S. Bartlett, C. E. Cotting, J. H. Cunningham, D. B. Darroll, Philip Dexter, R. S. Goff, F. S. Hall, John P. Morse, J. A. Parker, Percy Parker, G. L. Stone and P. F. Sullivan.

Boston (Mass.) Elevated Railway.—Governor Foss, on July 21, 1911, approved the legislative act authorizing the consolidation of the West End Street Railway and the Boston Elevated Railway. The stockholders of both companies will meet on Sept. 12, 1911, to authorize the consolidation.

Chicago (Ill.) Elevated Railways.—Henry A. Blair has announced the completion of the merger of the elevated railways of Chicago in all its details. The organization committee, consisting of Henry A. Blair, Frank A. Vanderlip and Samuel McRoberts, has been named as the trustee of the Chicago Elevated Railways. This committee will have all powers, voting all of the stock, etc., and will be in full control. The governing committee follows: Henry A. Blair, Samuel Insull, Ira M. Cobe, F. A. Delano, Chicago; Frank A. Vanderlip, Samuel McRoberts and Edward W. Harden, New York. Mr. Blair probably will be made chairman. The executive committee comprises: Samuel Insull, chairman; Henry A. Blair and Ira M. Cobe. The

separate organizations of the four companies comprising the merger, the Metropolitan West Side Elevated Railway, the South Side Elevated Railroad, the Northwestern Elevated Railroad and the Chicago & Oak Park Elevated Railroad, will be maintained for some time. It is stated that the organization agreement provides that the dividends on the \$16,000,000 of 6 per cent cumulative preferred stock of the Chicago Elevated Railways shall begin on Sept. 1, 1911, and that the first quarterly payment will be made on Dec. 1, 1911.

Columbus, Delaware & Marion Railway, Columbus, Ohio.—Eli M. West, appointed receiver of the Columbus, Delaware & Marion Railway in 1909 by the Franklin County courts, has filed charges of contempt of court with Judge E. B. Kinkead, Columbus, against C. C. Williams, former Common Pleas judge of Franklin County; John G. Webb, president of the Columbus, Delaware & Marion Railway; George Whysall, former co-receiver of the road, and Guy M. Walker, New York. This step grew out of the appointment of George Whysall as receiver of the property by Judge Daniel Babst in the Marion County courts recently. The claim is made that a court order, issued in 1909, has been violated in an effort to take the matter to the Marion County Court. Eli M. West, receiver of the company, has deposited \$23,600 with the Mercantile Trust Company, New York, to pay the interest on \$920,000 bonds of the company, due on Feb. 1, 1911.

Illinois Valley Gas & Electric Company, Streator, Ill.—Under date of July 19, 1911, a circular letter and a copy of the deposit agreement were sent to the shareholders of the North Shore Electric Company, Economy Light & Power Company and the Illinois Valley Gas & Electric Company, calling for the deposit of stock with the committee, consisting of Samuel Insull, Henry A. Blair, Frank G. Logan, Charles H. Randle and H. M. Byllesby, looking toward the merger of the three companies. The agreement between the stockholders, the committee just mentioned and the Illinois Trust & Savings Bank, as depository, gives the committee power to work out the merger as it deems best. The interests which are promoting the merger have given themselves a year to work out the details of the new corporations, and if the stock of the new company is not delivered to the depository before July 1, 1912, the purpose of the agreement just sent out to the stockholders of the three companies is to be deemed abandoned without further action.

Louisville & Interurban Railroad, Louisville, Ky.—The Louisville & Interurban Railroad has filed amended articles of incorporation at Louisville, Ky., increasing its capital stock from \$1,500,000 to \$3,750,000 to discharge the indebtedness of the company to the Louisville Railway.

Metropolitan Street Railway, New York, N. Y.—The brief of the Guaranty Trust Company of New York in the so-called "termination of release" proceeding in the suit brought by the Pennsylvania Steel Company and the Degnon Contracting Company against the New York City Railway and the Metropolitan Street Railway has been filed in the United States Circuit Court. This proceeding is under an order of the court to determine as to the time the release executed Feb. 14, 1902, by the Metropolitan Street Railway to the Interurban Street Railway, now the New York City Railway, terminates; whether expenditures made and obligations incurred by Receivers Joline and Robinson between Sept. 24, 1907, and Aug. 1, 1908, are chargeable against the New York City Railway and whether receipts of these receivers during this period are to be credited to the New York City Railway. The company asks in the brief that the court order that the receiver of the New York City Railway be charged with all expenses and liabilities actually paid and incurred by him and that he is entitled to all revenue collected from the mortgaged property.

Sherbrooke Railway & Power Company, Sherbrooke, Que.—The stockholders of the Sherbrooke Railway & Power Company have ratified the purchase of the assets of the Hanstead Electric Company and the Eastern Townships Electric Company.

Upper Hudson Electric & Railroad Company, Catskill, N. Y.—The Public Service Commission of the Second District of New York has received an application for approval of consolidation, under the name of Upper Hudson Electric

& Railroad Company, of the Schoharie Light & Power Company, the Catskill Illuminating & Power Company and the Upper Hudson Electric & Railroad Company, the consolidated company to have an authorized capital stock of \$500,000 and to execute a mortgage securing the issue of bonds in the amount of \$1,000,000

Washington, Baltimore & Annapolis Electric Railway, Washington, D. C.—The reorganization committee of the Washington, Baltimore & Annapolis Electric Railway and the Baltimore Terminal Company gave notice to holders of certificates of deposit and subscription allotment warrants that the new bonds would be ready for delivery after July 24, 1911. It was proposed to deliver stock deposit receipts representing the common stock instead of actual certificates of common stock to such underwriters as had agreed or desired to become parties to the stock deposit agreement. The managing committee representing the holders of the common stock is composed of George T. Bishop, George R. Sheldon and Frank H. Ginn.

Dividends Declared

- Fairmont & Clarksburg Traction Company, Fairmont, W. Va., 2½ per cent, preferred.
- Harrisburg (Pa.) Traction Company, 3 per cent.
- Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., quarterly, 1½ per cent, preferred.
- Lincoln (Neb.) Traction Company, quarterly, 1½ per cent, preferred.
- Manchester Traction, Light & Power Company, Manchester, N. H., quarterly, 2 per cent.
- Mexican (Mex.) Tramways, quarterly, 1¾ per cent.
- Union Street Railway, New Bedford, Mass., quarterly, 2 per cent.
- West Penn Railways, Pittsburgh, Pa., quarterly, 1¼ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

AMERICAN RAILWAYS.						
Period.		Gross Revenue.	Operating Expenses.	Net Revenue.	Fixed Charges.	Net Income.
1m.,	June, '11	\$359,547	.....	.....	.....	.....
1 "	" '10	337,404	.....	.....	.....	.....
12 "	" '11	4,029,464	.....	.....	.....	.....
12 "	" '10	3,780,338	.....	.....	.....	.....
AURORA, ELGIN & CHICAGO RAILROAD.						
1m.,	June, '11	\$161,382	\$83,833	\$77,549	\$36,536	\$41,013
1 "	" '10	151,851	76,794	75,057	34,467	40,590
12 "	" '11	1,735,675	995,955	739,720	416,643	323,077
12 "	" '10	1,596,777	885,892	710,886	375,395	335,491
GALVESTON-HOUSTON ELECTRIC COMPANY.						
1m.,	May, '11	\$128,831	\$75,724	\$53,107	\$24,668	\$28,439
1 "	" '10	103,823	66,317	37,505	23,548	13,959
12 "	" '11	1,390,298	817,282	573,016	297,257	275,760
12 "	" '10	1,239,668	753,235	486,433	272,535	213,898
HOUGHTON COUNTY TRACTION COMPANY.						
1m.,	May, '11	\$24,108	\$11,836	\$12,271	\$6,498	\$5,774
1 "	" '10	25,472	15,100	10,373	6,317	4,056
12 "	" '11	304,758	162,863	141,896	78,552	63,343
12 "	" '10	321,633	168,764	152,869	76,083	76,786
HUDSON & MANHATTAN RAILROAD.						
1m.,	June, '11	\$375,871	\$162,502	\$213,369	\$212,293	\$1,076
JACKSONVILLE TRACTION COMPANY.						
1m.,	May, '11	\$47,625	\$25,698	\$21,927	\$10,053	\$11,875
1 "	" '10	46,721	25,530	21,191	9,307	11,884
12 "	" '11	584,448	322,045	262,404	117,656	144,748
12 "	" '10	528,100	277,921	250,179	113,321	137,858
NORTHERN TEXAS ELECTRIC COMPANY.						
1m.,	May, '11	\$136,227	\$70,689	\$65,539	\$25,032	\$40,507
1 "	" '10	117,766	64,484	53,282	19,722	33,560
12 "	" '11	1,525,094	801,653	723,441	266,503	456,938
12 "	" '10	1,332,859	721,490	611,369	212,244	399,125
PADUCAH TRACTION & LIGHT COMPANY						
1m.,	May, '11	\$21,350	\$12,079	\$9,271	\$89,847	\$1,616
1 "	" '10	19,330	11,748	7,582	6,987	595
12 "	" '11	255,952	140,336	115,616	89,947	25,668
12 "	" '10	236,428	142,229	94,199	81,654	12,544
PENSACOLA ELECTRIC COMPANY.						
1m.,	May, '11	\$23,844	\$13,388	\$10,455	\$5,850	\$4,605
1 "	" '10	21,806	13,632	8,174	4,998	3,176
12 "	" '11	281,186	163,925	117,262	65,839	51,423
12 "	" '10	256,079	148,622	107,456	55,313	52,143
PUGET SOUND ELECTRIC RAILWAY.						
1m.,	May, '11	\$148,828	\$101,743	\$47,085	\$48,206	\$1,121
1 "	" '10	169,190	105,837	63,354	50,680	12,674
12 "	" '11	1,865,301	1,246,422	618,879	605,818	13,061
12 "	" '10	1,940,613	1,289,495	651,118	594,227	56,891
SAVANNAH ELECTRIC COMPANY.						
1m.,	May, '11	\$56,777	\$38,231	\$18,547	\$217,934	\$124
1 "	" '10	55,379	34,307	18,072	18,020	52
12 "	" '11	655,729	436,615	219,115	217,934	1,180
12 "	" '10	610,360	396,749	213,611	211,779	1,832

Traffic and Transportation

Campaign Against Team Interference in Chicago

The Chicago (Ill.) Railways Company has begun a crusade in the interest of improved schedules by appealing to team owners to keep their teams off the street-car tracks as much as possible. Agents of the railway company ride on the street cars and take the numbers of wagons that do not turn out promptly upon the ringing of the gong. The next day the company sends a courteous letter to the owner of the wagon, calling attention to the penalty imposed by the city code for such an offense, appealing to the public spirit of the team owners, and calling attention to the fact that the city receives 55 per cent of the net receipts of the company. The body of this letter follows:

"This company desires in a friendly way to call your attention to the action of the driver of your wagon number who delayed our car on Street, between and on at about by refusing to get off car tracks promptly after having been notified repeatedly by the ringing of the gong on the car.

"For your information, would say that, under Section 1953 of Municipal Code of Chicago, there is a penalty enforceable of \$5 and costs for every such established offense.

"We also beg to say that under our present ordinance the city receives 55 per cent of the street railway net receipts, and that, therefore, as a matter of self-interest, all citizens should co-operate to the end that good street-car service may obtain and the city of Chicago's proportion of such revenue be not impaired.

"We take the liberty of asking you, as a matter of civic pride, if you will kindly instruct your drivers of vehicles to refrain from delaying or interfering with the operation of our street cars."

The blanks filled out by the company agents show the car line, direction, car number, street location, time, name of team owner and number of wagon. A column has been left for remarks. Under the heading of "Remarks" appear entries such as follow: "Held for over 200 ft."; "Held for one-half block"; "Pulled in ahead of car and made car come to a full stop before turning out"; "Remained on track for two blocks and paid no attention to gong. Ample room to turn out." Judging from the reports, coal wagons and brewery wagons delay the cars more than any other types of vehicle. Express wagons are also frequently mentioned in the reports.

R. G. Hutchins, vice-president, who is signing the letters sent out by the company, has received hundreds of responses from team owners, indicating that they desire to co-operate with the company in reducing the causes of delay. Some of these letters have commented upon the increasing diplomacy of motormen in dealing with the drivers. The Chicago Railways Company operates about 2000 cars over 450 miles of track, and carries a daily average of 1,500,000 passengers over 63 distinct lines.

Position of New Jersey Commission with Regard to Commutation Rates to New York

In connection with its refusal to act upon the complaint of the New Jersey State Commuters' Association relative to the rates between points in New Jersey and New York City, the Board of Public Utility Commissioners has issued a memorandum asserting that it will not attempt to assume power it does not possess. The association suggested that the board should take as a basis the old rates from each suburban town to New York and deduct therefrom the amount of money which the railroads pay for transit through the subway or by way of the ferry. The remainder, it was asserted, would be the rate which the commission should order to be charged from such suburban towns to Hoboken or Jersey City. The board gave the following reasons for not adopting the suggestions of the association:

"1. Because a similar procedure might be taken as regards every passenger and freight rate in the United States. To suppose that the United States government

through its courts would even sanction this piecemeal disintegration of all rates into intrastate rates and thus acquiesce in the nullification of federal power over interstate commerce is a sheer absurdity.

"2. Because for this board to attempt such a course would subject it rightly to the suspicion that it is willing by devious indirection to grasp at powers beyond its jurisdiction. Such a course might be pursued by an unscrupulous attorney, motivated by no other purpose than to win or try to win at all hazards, but it is below the level of fair procedure in a body which must command so far as it rightly can the confidence even of public utility corporations.

"3. The plan proposed is quite unnecessary, inasmuch as the very points on which it hinges were in the case of Shephard against Northern Pacific Railway Company et al. decided adversely by the Circuit Court for the District of Minnesota on April 8, 1911, by Judge Sanborn, and the final decision upon appeal must eventually come from the Supreme Court of the United States."

In conclusion the board said:

"This board will not attempt to assume powers it does not believe itself to have, and it will not be coerced into any course or policy which it considers contravenes the supreme law of the land. It therefore urges that those who are aggrieved by the advance in commutation rates to New York await with what patience they can command the final and legitimate disposition of the case. To attempt a premature and ill-considered adjustment can only delay the final and rightful determination of the whole matter."

Fare Decision in Washington.—The Supreme Court of the State of Washington has affirmed the opinion of the trial court that the Seattle, Renton & Southern Railway must not charge a fare of more than five cents within the city limits of Seattle as now fixed.

Meeting of Central Electric Traffic Association.—The Central Electric Traffic Association met in the office of the chairman at Indianapolis on July 18, 1911, and discussed routine matters relative to the welfare of the association. The next meeting will be held Sept. 25, 26 and 27, 1911.

Accident in New Jersey.—Three men were killed and more than a dozen passengers were seriously injured in a head-on collision on the afternoon of July 21, 1911, between two cars of the North Jersey Rapid Transit Company near Ridgewood, N. J. One of the persons killed was F. J. Pelgrim, superintendent of the company.

Side Doors for All Subway Cars.—The Public Service Commission of the First District of New York has adopted an order for a hearing on a proposed order to compel the Interborough Rapid Transit Company to equip all subway cars used in the local as well as in express service with side doors at the center. The hearing has been set for Aug. 16, 1911, before Commissioner Eustis.

Automobile for Inspection Work.—W. G. Irwin, president of the Indianapolis, Columbus & Southern Traction Company, Columbus, Ind., has had an automobile equipped for use as his private car in making inspection trips over the company's lines. On the wheels of the automobile, from which the tires have been taken, wooden rims have been placed, protected with steel rims equipped with flanges.

Advertising Lake Shore Electric Railway Service.—The Lake Shore Electric Railway, Cleveland, Ohio, has recently issued a number of notices calling attention to its regular and special service for large excursions and encampments at the resorts which it serves. A vest-pocket folder of eighteen pages, which gives reasons why one should travel on the Lake Shore system, has been prepared by J. F. Starkey, general passenger agent.

Transfer Petition Refused in Massachusetts.—On July 13, 1911, the Massachusetts Railroad Commission dismissed a petition of the Mayor of Brockton which asked for additional transfer privileges in that city. The case has come before the board several times before, and on Sept. 15, 1910, a similar application was dismissed. The board states that "nothing now appears to show a different situation from that then before the board, and we must adhere to our former rulings."

Reduction in Fare Between Weymouth and Braintree.—A reduction in fare for workmen, between Rockland

and Weymouth, Mass., has been granted by the Old Colony Street Railway at the instance of the Weymouth & Braintree Improvement Association. The company will issue a book good for certain hours of the day which will give the class of passengers mentioned a 7-cent rate in place of the 10-cent rate between Rockland and Weymouth. The company will also give transfers to Rockland on rainy days.

Hearing in Regard to Transfers in Brooklyn.—The Public Service Commission of the First District of New York has ordered a public hearing to establish the necessity for issuing an order to require the surface lines of the Brooklyn Rapid Transit Company and its Fifth Avenue elevated division to exchange transfers at certain points in South Brooklyn, and also to determine whether the company should be required to transfer passengers where its elevated lines cross at Fulton Street and Flatbush Avenue. The structures are at different levels at this intersection.

Arbitrators Chosen in Trenton.—In accordance with the understanding between the New Jersey & Pennsylvania Traction Company, Trenton, N. J., and its employees, by which the men who went on strike recently returned to work, the company has named as its representatives to arbitrate the question of wages J. A. Campbell, president of the Trenton Potteries Company, and Gardner Cain, a real estate operator of Trenton. The men have named Frank Hutchins, one of the candidates for city commissioner of Trenton, and Luke Travers, a labor representative.

Car Capacity Ordinance Vetoed in Seattle.—Mayor George W. Dilling has vetoed the bill passed by Council to regulate street car traffic by limiting the number of persons to be carried on street cars used in Seattle. The Mayor's general reason for disapproving the bill was that the proposed ordinance would not remedy existing conditions, while it would impose fixed rules difficult to meet and which would prove annoying to the traveling public. The bill limits the capacity of each car with cross seats to 50 per cent more than the seating capacity, with an allowance of 60 per cent on all cars which are fitted with longitudinal seats.

Employees of Cincinnati Traction Company on Vacation Trip.—Twenty-six employees of the Cincinnati (Ohio) Traction Company, winners of the popularity contest at the recent outing of the Street Railway Employees' Mutual Protective Association, left Cincinnati recently in a special Pullman over the Big Four Railroad to enjoy the vacation trip awarded them. The party went direct to Boston and then by steamer to New York. After two days spent here, they went to Atlantic City for nine days. They will return by way of the Pennsylvania lines, arriving in Cincinnati on Aug. 1. The men were given \$25 in gold for pin money. All expenses of the trip will be borne by the association.

Advertising Campaign of Louisville & Northern Railway & Lighting Company.—The advertising campaign of the Louisville & Northern Railway & Lighting Company, New Albany, Ind., is attracting attention, especially in connection with the reduction of accidents. Space is used in the Sunday newspapers circulating in the territory served by the company, and a series of educational advertisements is being run, explaining some of the dangers resulting from carelessness, and suggesting methods of preventing accidents. The records of the company show that during the past three years, partly as the result of the advertising which the company has done, accidents have been reduced 60 per cent. Just now the company is co-operating with the proprietors of Glenwood Park, near New Albany, who are conducting a summer Chautauqua, in advertising the attractions to Louisville people, with the result that the attendance at the Chautauqua has been much larger than ever before.

Car Capacity Ordinance in St. Paul.—When the ordinance introduced in the Assembly of St. Paul, Minn., to limit the carrying capacity of cars in that city came before the committee on streets of the Assembly recently W. J. Hield, general manager of the Twin City Rapid Transit Company, which operates in St. Paul and Minneapolis, explained that the ordinance in effect in Minneapolis limiting the capacity of cars had proved very unsatisfactory. Employers of labor in Minneapolis were decidedly opposed

to the measure, as it increased the number of employees who were late and afforded the employees an excuse which was reasonable. Assemblyman Handy agreed with Mr. Hield that the ordinance would work to the detriment of both the employer and the employec, and at his request the measure was put over for thirty days. The measure introduced in St. Paul differs from the ordinance in force in Minneapolis in that it would make it a misdemeanor to keep persons waiting more than ten minutes for a car not filled to the capacity fixed in the ordinance.

Another Ruling on Reduced Fares by New Jersey Commission.—William H. Bannard, postmaster at Asbury Park, N. J., advised the Board of Public Utility Commissioners of New Jersey, recently, that the Atlantic Coast Electric Railway, which has been selling tickets at a reduced rate to the government for the transportation of letter carriers and special delivery messengers, had ceased to do this, claiming that the practice was made unlawful by the Public Utility Act. The board advised Mr. Bannard of its ruling to the effect that free transportation, without discrimination on behalf of a municipality, of policemen, firemen and inspectors of boards of health, in the performance of their public duty, is not regarded as a violation of the law, and expressed the opinion that the principle upon which this ruling is based would also apply to the transportation of letter carriers and special delivery messengers on behalf of the United States government at reduced rates, and that the practice of issuing tickets and free transportation to such carriers and messengers would not be considered a violation of the law.

The Question of Fare to Ensley.—The following statement was issued following a recent conference of the City Commissioners of Birmingham, Ala., and officials of the Birmingham Railway, Light & Power Company at which the subject of the company extending the 5-cent fare to Ensley was considered: "In an informal discussion of the Ensley 5-cent fare question between Commissioners Lane and Weatherly (Mr. Exum being absent) and A. H. Ford and Lee Bradley, for the Birmingham Railway, Light & Power Company, it was represented to the commissioners that the new management of the street railway had not assumed active administration, but would probably do so in a few days. It was further represented that the management of the new company had not given consideration to the Ensley 5-cent fare proposition. At the request of the commissioners Mr. Ford and Mr. Bradley agreed to submit the request of the Board of Commissioners, heretofore made on the old management of the company, to the new management, and to obtain at an early date the response of the latter to the commissioners' report."

Michigan United Railway's Summer Folder.—The Michigan United Railways, Jackson, Mich., of which A. W. McLimont is general manager, and F. W. Brown general express and passenger agent, has issued an attractive summer folder and timetable of 12 pages, each 8 in. x 9 in. in size, prepared by Eugene E. Soules, publicity agent. The folder is printed in three colors and plentifully illustrated. The first page presents a map of the southern part of Michigan, showing the 300 miles of route over which the cars of the company operate in giving its service across the State from Detroit, through Jackson, Battle Creek and Kalamazoo to South Haven, also showing its north and south lines from Jackson to Lansing, and thence either to St. Johns or Owosso. The map page is followed by several pages describing and illustrating garden spots and recreation resorts in Southern Michigan reached by the Michigan United Railways. Two pages are devoted to timetables, another page to the express and freight service of the road, another to points of interest, rates of fare, hotels and railroad and steamship connections. Considerable space is given to the description of the territory served by the Kalamazoo, Lake Shore & Chicago Railway, recently leased by the Michigan United Railways. The Kalamazoo, Lake Shore & Chicago Railway passes through the famous Michigan fruit belt, and its trains make connections at South Haven with steamers operating to and from Chicago. Thus the Michigan United Railways gives service from points on its interurban system to Chicago. The folder concludes with the usual notes to patrons and a description of its chartered-car service.

Personal Mention

Mr. J. B. Sucese has resigned as general superintendent of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., and the position has been abolished.

Mr. W. H. Murphy, who has been superintendent of the Trenton, Bristol & Philadelphia Street Railway, Bristol, Pa., has been appointed superintendent of transportation of the company.

Mr. L. H. Mounthey has resigned as superintendent of the Carbon Transit Company, Mauch Chunk, Pa., to become general manager of the State Belt Electric Street Railway, Pen Argyl, Pa.

Mr. Edward Riedel has resigned as general manager of the Walnut Ridge & Hoxie Light, Power & Transit Company, Walnut Ridge, Ark., to become electrical engineer and master mechanic of the Doe Run Lead Company, Rivermines, Mo.

Mr. H. S. Dickey, who has been traffic manager of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., has been appointed general passenger and freight agent of the company, and the office of traffic manager has been abolished.

Mr. C. H. Dallow has been appointed purchasing agent of the Louisville & Northern Railway & Lighting Company, New Albany, Ind., effective Aug. 1, 1911, to succeed Mr. W. H. Newhouse, resigned. Mr. Dallow has been connected with the executive offices of the company for several years.

Mr. J. M. Burns, who has been assistant superintendent of the Morris County Traction Company, Morristown, N. J., has been appointed superintendent of the electrical and mechanical departments of the company. Mr. Burns was graduated from Cornell University in June, 1910, with a degree of electrical engineer. He entered the service of the Morris County Traction Company immediately after graduation, and previous to his appointment as assistant superintendent of the company, in the fall of 1910, he served as electrician and draftsman and had charge of all the track bonding and testing.

Mr. F. I. Hardy has been appointed superintendent of transportation of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind. Mr. Hardy has been engaged in railway work fourteen years, during which time he has served the Southern Pacific Company, the New York Central & Hudson River Railroad, the Indiana Union Traction Company and the Ft. Wayne & Northern Indiana Traction Company in various capacities. The office of general superintendent of the Chicago, South Bend & Northern Indiana Railway has been abolished, and the general passenger and freight agent, chief dispatcher and all local superintendents report to and receive instructions from the superintendent of transportation.

Mr. John B. Austin, who has been engineer of maintenance of way of the Long Island Railroad, New York, N. Y., since 1904, has been appointed superintendent of the company in charge of operation, to succeed Mr. Frederick Hartenstein, resigned. Mr. Austin was born in Philadelphia on Oct. 31, 1873. He was graduated from the University of Pennsylvania in 1894, as a civil engineer. In 1895 he was appointed construction engineer of the Scranton & Pittston Traction Company. From 1896 to 1899 he was assistant engineer of the bureau of surveys at Philadelphia, on the Reading subway. From 1899 to 1902 he was roadmaster of the Great Northern Railway and chief clerk to the assistant general superintendent and chief clerk to the general superintendent. From 1902 to 1904 Mr. Austin was superintendent of the yard department of the Lackawanna Steel Company, at Buffalo, N. Y.

Mr. H. H. Archer has resigned as general manager of the Morris County Traction Company, Morristown, N. J., to become general manager of the Parkersburg, Marietta & Interurban Railway, Parkersburg, W. Va. Mr. Archer began his railway career with the Pennsylvania Railroad in 1874, and continued with the company until 1881, serving as section laborer, telegraph operator and locomotive fireman. From 1881 to 1884 he was with the Wilmington & Northern Railroad as station agent and train dispatcher, and from

1884 to 1888 he served the Philadelphia division of the Baltimore & Ohio Railroad as train dispatcher and yard master. Mr. Archer next entered the employ of the Wilmington (Del.) City Railway and remained with the company from 1888 to 1892, serving one year as superintendent, one year as general manager and two years as general manager, secretary and treasurer of the company. From 1892 to 1897 Mr. Archer was in business in Scranton, Pa. Later he went to Trinidad, British West Indies, as manager of the Belmont Tramway Company, and subsequently became connected with the National Asphalt Company as resident engineer in Venezuela. In 1903 and 1904 Mr. Archer was connected with a Canadian syndicate which was engaged in consolidating the tramway and electric interests at Trinidad. In 1904 he returned to the United States to take charge of the Woodside-Schamberg interests in West Chester, Pa., as general manager. From 1906 to 1908 he specialized in power-plant economics. Mr. Archer was appointed engineer of construction of the Morris County Traction Company in 1909, and was subsequently made general manager of the company. The Morris County Traction Company operates 45 miles of line in New Jersey and has 16 miles of line under construction.

OBITUARY

Frederick L. Threedy, former general manager of the North Chicago Street Railway, Chicago, Ill., is dead.

F. J. Pelgrim, superintendent of the North Jersey Rapid Transit Company, Paterson, N. J., died on July 21, 1911, as a result of injuries which he received in a collision between cars of the company near Ridgewood, N. J.

Leander F. Taylor, superintendent of the Augusta division of the Lewiston, Augusta & Waterville Railway, died on July 4, 1911, at his home in Augusta, Maine, aged fifty years. Mr. Taylor entered electric railway work in 1891 as a conductor with the Augusta, Hallowell & Gardiner Street Railway and in 1897 was made superintendent of the company. In 1907 the Augusta, Winthrop & Gardiner Railway, which succeeded the Augusta, Hallowell & Gardiner Street Railway, was absorbed by the Lewiston, Augusta & Waterville Railway and Mr. Taylor was made a division superintendent. The lines from Augusta to Waterville and from Gardiner to Lewiston were built and added to Mr. Taylor's division, placing under his supervision more than 60 miles of electric railway.

The United Railways & Electric Company of Baltimore is now operating its cars by power from the Pennsylvania Water & Power Company, which is brought from McCall's Ferry. Under the contract between the United Railways & Electric Company and the Pennsylvania Water & Power Company, which was entered into last February, both corporations have since been engaged in installing necessary cables, switching apparatus and other electric devices. According to W. A. House, president of the United Railways & Electric Company, this work was not expected to be completed until next September. It is not proposed to discontinue entirely operations at the Pratt Street power station, but to utilize the river power in conjunction with that generated at Pratt Street. The power is transmitted from the Orangeville substation to the Pratt Street power station, where it is distributed to the substations of the United Railways. At these stations it is stepped down from 13,000 volts and transformed into direct current.

Among the matters which have been referred to the public policy committee of the National Electric Light Association is a suggestion that action be taken to induce the United States to prohibit the importation of electrical energy from Windsor, Ont., to Detroit, Mich. The Ontario Hydroelectric Commission is reported to be unwilling to build a transmission line to Windsor unless permitted to supply energy also to Detroit. The project is meeting with opposition from certain local central-station companies in Canada, which would be involved in financial and political difficulties if the line were constructed through their territory.

Construction News

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

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

RECENT INCORPORATIONS

***Sacramento & Woodland Railway, Sacramento, Cal.**—Application for a charter has been made in California by this company, which is a subsidiary company of the Vallejo & Northern Railway, to build an electric railway between Sacramento and Woodland, connecting at Woodland with the Vallejo and Northern Railway. Capital stock, \$1,000,000. T. T. C. Gregory, president. [E. R. J., July 8, '11.]

***Millen & Newington Railroad, Millen, Ga.**—Application for a charter has been made in Georgia by this company to build a 25-mile electric railway between Millen, Newington and some point on the Brinson Railway in Screven County. Capital stock, \$75,000. Incorporators: E. S. Lane, H. S. McCall, W. H. Marsh, W. M. Parker, D. H. Blackburn, J. T. Walker, J. H. Evans, Jr., W. R. Turner, R. G. Daniels, and A. S. Anderson.

***Springfield Northwestern Interurban Railroad, Springfield, Ill.**—Incorporated in Illinois to build an electric railway from Springfield, via Greenview and Athens to Petersburg and Mason City, the line to branch off at Athens west to Petersburg and north to Mason City. About 60 per cent of the right-of-way has been secured. The main office will be at Springfield. Capital stock, \$15,000. Incorporators: Homer J. Tice, Greenview; Richard Y. Kincaid, Athens, and Samuel E. Prather, George L. Harnsberger and W. Frank Workman, all of Springfield.

***Leavenworth & Excelsior Springs Railway & Power Company, Leavenworth, Kan.**—Application for a charter will be made soon by this company to build a 40-mile electric railway between Leavenworth and Excelsior Springs. D. A. McKibben and W. B. Walker are the promoters.

***Cleveland & Youngstown Railroad, Columbus, Ohio.**—Incorporated in Ohio to build an electric railway between Cleveland and Youngstown via Cuyahoga, Portage, Trumbull and Mahoning Counties. It is expected to extend it eventually to Leavittsburg. The construction of a 12-mile line between Garrettsville and Leavittsburg would make a through line between Cleveland and Youngstown. Capital stock, \$10,000. Incorporators: James P. Wilson, Fred J. Heim, Theodore A. Johnson, John T. Harrington and Thomas A. Jacobs.

***Hood River Terminal Company, Salem, Ore.**—Application for a charter has been made in Oregon by this company to build an electric, gasoline or steam railway from a point on the Oregon-Washington Railroad in Hood River to the steamboat landing, ½ mile east of Salem. The company also desires to construct a line from the north end of First Street in Hood River northerly to a point where the east line of the Coe Donation land claim, if extended northerly, would intersect the line of extreme low water in the Columbia River. The company is capitalized at \$5,000. Incorporators: W. A. Delashmatt, A. B. Irelan and W. S. Chapman.

***Ellwood City & Koppel Electric Railway, Ellwood City, Pa.**—Application for a charter has been made in Pennsylvania by this company to build an electric railway from Ellwood City to Koppel. Most of the right-of-way has been secured and surveys will soon be begun. Incorporators: T. A. Wilson, R. A. Todd, Fred C. Johnson, H. K. Gregory and W. J. Coursin, all of Beaver Falls.

FRANCHISES

Redwood, Cal.—The Peninsular Railway, San José, has received a franchise from the Board of Trustees for a 6-mile electric railway from Redwood City to Woodside.

Turlock, Cal.—The Tidewater & Southern Railway has received a franchise from the Board of Trustees to build an electric railway between Stockton and Turlock.

***Jackson, Ga.**—W. F. Smith has received a franchise from the Council to build an electric railway in Jackson. The line is to extend to Indian Springs, with a branch to Griffin.

East St. Louis, Ill.—The Southern Traction Company has asked the Council for a franchise to extend its tracks on Market Avenue.

East St. Louis, Ill.—The East St. Louis & Suburban Railway has asked the Council for a franchise to build an electric railway from Relay Depot to the east end of the Illinois approach of the St. Louis bridge.

Loogootee, Ind.—The Vincennes, Washington & Eastern Traction Company, Vincennes, Ind., has asked the Common Council for a franchise to extend its tracks over Main Street from where the line enters Loogootee to the eastern part of the city.

Perry, Ia.—B. C. Dilenbeck, Perry, has received at a special election a fifty-year franchise to build an electric railway in Perry. [E. R. J., May 27, '11.]

Louisville, Ky.—The Louisville Railway has asked the City Council for a franchise to extend its Seventh Street line one mile to the plant of the B. F. Avery & Sons Company.

New Orleans, La.—Leigh Carroll, representing the Algiers Railway & Light Company, has received a franchise from the Council to extend its tracks over certain avenues in New Orleans.

Montague, Mass.—The Connecticut Valley Street Railway has been granted a franchise by the Board of Aldermen to use T-rails on its extensions of the Barncoat Street, Pleasant Street and Granite Street lines, providing that the T-rails be replaced by girder rails at the end of fifteen years.

Worcester, Mass.—The Worcester Consolidated Street Railway has been granted a franchise by the Board of Aldermen to use T-rails on its extensions of the Barncoat Street, Pleasant Street and Granite Street lines, providing that the T-rails be replaced by girder rails at the end of fifteen years.

***Duluth, Minn.**—N. J. Upham, representing the Suburban Traction Company, has a twenty-five-year franchise from the City Council to build a 7-mile electric railway in Duluth and extending into the country tributary to Duluth. The franchise states that the company must have that part of the line from the Maple Grove Road to Highland Street completed and in operation by July, 1912.

Jersey City, N. J.—The Public Service Railway has asked the Street and Water Board for a twenty-year franchise to make certain extensions and improvements in Jersey City.

Little Falls, N. Y.—The Little Falls & Johnstown Electric Railroad has been offered a ninety-nine-year franchise by the franchise committee to build its electric railway over certain streets in Little Falls, if it will build an extension to Moreland Park within ten years.

Rome, N. Y.—The Utica & Mohawk Valley Railway has received a franchise from the Common Council to extend its track on East Dominick Street and West Dominick Street, and for its suburban railway to enter Rome by way of Mill Street and Dominick Street.

Schenectady, N. Y.—The Schenectady Railway has received several franchises from the Board of Aldermen to extend its lines in Schenectady.

Watertown, N. Y.—The Black River Traction Company will ask the Common Council for permission to double-track its Court Street line in Watertown.

Durham, N. C.—The Durham Traction Company has asked the County Commissioners for a franchise for an extension to Watts Hospital.

Raleigh, N. C.—The Carolina Light & Power Company has received a franchise from the Board of County Commissioners to build a 5-mile extension from Glenwood out the Fairview Road to Lassiter's Mill.

Middletown, Ohio.—The Ohio Electric Railway has asked the City Council for a franchise to build its tracks in Middletown.

Olympia, Wash.—P. H. Carlyon has received a franchise by the City Council for the construction of a belt line railway around the Carlyon fill on the waterfront in Olympia. [E. R. J., April 15, '11.]

Milwaukee, Wis.—The Milwaukee Electric Railway & Light Company has received a franchise from the Council to extend its Twenty-seventh Street line north of North Avenue to the city limits of Milwaukee.

TRACK AND ROADWAY

Oakland, Antioch & Eastern Railway, Oakland, Cal.—Through a \$2,000,000 bond deal closed in New York by this company the extension of the road into Oakland and Stockton is now assured. The new road has a traffic agreement with the Key Route which will permit cars to reach the pier of that system and to run to the center of Oakland. The new company also holds a franchise along Shafter Avenue in Oakland in the name of the Oakland & Bay Shore Railroad. The Anglo-California Trust Company will act as trustee in the bond deal.

***Tulare County Power Company, Porterville, Cal.**—This company plans to build and is securing right of way for an electric railway to connect Porterville and Lindsay on the north and Tulare on the west. This is a coöperative company financed by power users and ranchers in Tulare County.

***Van Nuys, Cal.**—The Los Angeles Suburban Homes Company, Los Angeles, is building an electric railway through Cahuenga Pass, from Hollywood to Van Nuys. This company is also building a 10-mile electric railway to connect Van Nuys and Owensmouth.

West Peak Railroad, Meriden, Conn.—This company advises that it will begin work on the construction of its 1200-ft. incline railroad to the summit of West Peak about Aug. 15. The company's power station will be located at Meriden. It will furnish power for lighting purposes and operate two cars. Capital stock authorized, \$100,000; bonds authorized, \$50,000. C. J. Danaher, Meriden, is interested. [E. R. J., July 8, '11.]

***Galesburg, Ill.**—James C. Long, Monmouth, it is reported, plans to build an electric railway from Galesburg to Alexis. Surveying has been begun.

***Chicago, Marseilles & Peoria Railway, Peoria, Ill.**—This company has been organized to build an electric railway to connect Chicago, Streator, Peoria and Marseilles. Capital stock, \$5,000,000. Charles M. Nichols, New York, promoter.

Sioux City (Ia.) Service Company.—This company plans to build an extension of its line to Crystal Lake.

Boston & Eastern Railway, Boston, Mass.—This company has filed with the City Clerk of Salem plans showing the route of its proposed line between Boston and Beverly.

Battle Creek, Coldwater & Southern Railway, Battle Creek, Mich.—The J. T. Adams Construction Company, Columbus, Ohio, has been awarded the contract by this company for the construction of its 28-mile electric railway to connect Battle Creek and Coldwater. [E. R. J., June 3, '11.]

***Suburban Traction Company, Duluth, Minn.**—This company will award a contract at once to build a 7-mile electric railway over various streets in Duluth and extending into the country tributary to Duluth. About 5 miles of track will be built this year. N. J. Upham, Duluth, is interested.

Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo.—Cameron, McManus & Joyce, Keokuk, Ia., have been awarded the contract by this company for grading 5 miles of the route on the Clay County side of the Missouri River. George S. Beardsley, Kansas City, is interested. [E. R. J., Apr. 1, '11.]

***Bretton Woods, N. H.**—It is reported that plans are being considered for an electric railway between the principal resorts in the White Mountains. Bretton Woods would be the center, and from here one line would go around the Presidential Range, taking in Jefferson, Gorham, Jackson, North Conway, Intervale and Crawford Notch, while another line would go to Maplewood, Bethlehem and Profile.

Trenton (N. J.) Street Railway.—Plans are being made by this company to extend its line in Chambersburg from Stanton Street to Emery Avenue, Franklin Street and Cedar Lane.

Corning, Keuka Lake & Ontario Railway, Corning, N. Y.—This company has applied to the Public Service Commission, Second District, for permission to build a railroad from Corning to Sodus Bay, on Lake Ontario, a distance of 90 miles.

Waterville, N. Y.—D. C. Hadcock, Oneida, and associates will soon organize a company to build a 24-mile electric railway to connect Oriskany Falls, Augusta Center, Knoxboro, Vernon Center and Bronson's Crossing, on the West Shore Railroad, then to Lowell and Rome. [E. R. J., June 24, '11.]

North Carolina Public Service Company, Greensboro, N. C.—The Robertson Construction Company, Charlotte, N. C., is grading about 1½ miles of extension from Lindley Park to Terra Cotta for this company.

Portland Railway, Light & Power Company, Portland, Ore.—Work has been begun by this company on a 1-mile extension on Bybee Avenue from the Sellwood line on Milwaukee Street through Westmoreland and Eastmoreland.

***Tarentum, Brackenridge & Butler Railway, Butler, Pa.**—Samuel Gamble, Carnegie, has been awarded the contract by this company to build its 3½-mile electric line from Birdville to Butler. J. M. Griffith and H. M. Brackenridge will report on the advisability of using Edison storage battery cars.

Ephrata & Lebanon Street Railway, Lebanon, Pa.—A contract has been awarded by this company for 6000 tons of rails for its line between Lebanon and Ephrata.

Lebanon & Campbelltown Street Railway, Lebanon, Pa.—Sealed proposals will be received at the office of the engineer of this company at the Hershey Trust Company Building, Hershey, Pa., up to Aug. 17, for the roadbed and track construction to Twelfth Street, Lebanon. All materials except masonry to be furnished by the company. H. N. Herr, engineer. [E. R. J., July 15, '11.]

Phoenixville, Valley Forge & Stratford Street Railway Phoenixville, Pa.—This company placed in operation on July 15 its railway between Phoenixville and Williams Corner. This is part of its proposed line to connect Phoenixville and Valley Forge.

Piedmont & Northern Railway, Greenville, S. C.—Work has been begun by this company on its line from Gastonia to Lowell.

Amarillo (Tex.) Traction Company.—This company advises that it has been operating its line with gasoline motor cars for over a year, but is now changing to electricity. The line is 2 miles long and connects West Amarillo and San Jacinto Heights. The company will operate two cars and will rent power from the Amarillo Water, Light & Power Company, Amarillo. Its repair shops are located at Tenth Street and Virginia Avenue, San Jacinto Heights. N. A. Brown is interested. [E. R. J., July 8, '11.]

Southern Traction Company, Dallas, Tex.—The complete route of this line, as now selected by this company, extends 100 miles from Dallas to Waco, via Hutchins, Wilmer, Ferris, Waxahachie, Forreton, Italy, Milford, Hillsboro, West and Days Lake, with a 35-mile branch from Ferris via Ennis to Corsicana. J. F. Strickland, president. [E. R. J., April 22, '11.]

Nashville-Gallatin Interurban Railway, Gallatin, Tenn.—The Fidelity Securities Corporation, Nashville, which is building this line, is in the market for 70-lb. rails with plates, etc., for 24 miles of track. Delivery is to be made within the next five months. H. H. Mayberry, 431 Stahlman Building, Nashville, Tenn., president.

Belton & Temple Traction Company, Temple, Tex.—Within the next three months work will be begun by this company on a 2-mile extension of its line to the Tal-Coe addition on the south side of Temple. Other improvements will also be made.

Utah & Salt Lake Electric Railway, Salt Lake City, Utah.—Surveys have been completed on the proposed electric railway between Salt Lake City and Payson. The route is over a private right-of-way the greater part of the distance. Simon Bamberger, president of the Salt Lake & Ogden Electric Railway, is said to be interested. [E. R. J., Mar. 8, '11.]

Southern Wisconsin Railway, Madison, Wis.—The Columbia Construction Company, Milwaukee, has been awarded the contract by this company to build 4,500 ft. of single track and some double track in the city of Madison, Wis.

Milwaukee Western Electric Railway, Milwaukee, Wis.—Arrangements have been made by this company for an extension of its line from North Lake to Hartford. About 60 per cent of the right-of-way has been secured. The proposed extension from Sussex to Waukesha has been decided upon and contracts are now being secured for the right-of-way.

Mercer Electric Railway, Athens, W. Va.—This company advises that work has been begun on its 7-mile electric railway between Princeton and Athens. Capital stock authorized, \$100,000; capital stock issued, \$32,000. Officers: R. G. Meador, president; T. B. Cook, vice-president; J. F. Halroyd, secretary; R. G. Meador, general manager, all of Athens. [E. R. J., July 15, '11.]

Grafton (W. Va.) Traction Company—The Farris Bridge Company, Pittsburgh, has been awarded the contract by this company to build a single-track 754-ft. bridge across the Tygart Valley River. Boyer, Patterson & Morris, Philadelphia, have been awarded the contract by the Farris Bridge Company to build three concrete piers and two concrete abutments for this bridge.

Union Utilities Company, Morgantown, W. Va.—During the next 90 days this company will award contracts to build about 2½ miles of new track to Dellslow and two small concrete bridges.

Morgantown (W. Va.) Interurban Railway.—Surveying has been begun by this company on its electric railway from Morgantown to Point Marian, Pa. J. H. McDermott, president. [E. R. J., July 15, '11.]

SHOPS AND BUILDINGS

Wilmington, New Castle & Southern Railway, New Castle, Del.—An option has been taken by this company on a building at Front Street and Market Street, in Wilmington, to be used as a station for its new line.

Rockford & Interurban Railway, Rockford, Ill.—Work has been begun by this company on its new carhouse on Kishwaukee Street in Rockford.

Ft. Wayne & Northern Indiana Traction Company, Ft. Wayne, Ind.—A new terminal station will be built by this company on the block bounded by Main, Webster, Pearl and Ewing Streets, in Ft. Wayne. The structure will be 150 ft. x 300 ft.

Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.—This company has leased the first floor of a three-story brick building, now almost completed, to be occupied as a passenger station at Lebanon. The station is to be equipped with all modern conveniences.

New York, Westchester & Boston Railway, New York, N. Y.—This company will build a transfer station at 180th Street in New York. The building will be 550 ft. x 250 ft. and contain five platforms, from which nine tracks may be reached. The entrances will be on the street level and the tracks may be reached by direct stairways.

Northern Ohio Traction & Light Company, Akron, Ohio.—The village council of Kenmore has vacated Lakeside Avenue south of the Boulevard and granted this company a twenty-five-year franchise to handle cars on part of the Boulevard. This opens the way for construction of the company's carhouses, repair shops and machine shops, which will cost about \$500,000. The company has purchased sixteen acres of land there and a contract will be awarded within sixty days for the construction of the buildings.

Toledo, Fostoria & Findlay Railway, Fostoria, Ohio.—It is reported that this company will enlarge and remodel its union interurban station in Fostoria.

Mt. Hood Railway & Power Company, Portland, Ore.—This company has completed plans for a new terminal station between Vancouver Avenue and Williams Avenue, in Portland. The structure will be 60 x 70 ft., and entirely of steel and reinforced concrete. The cost is estimated to be about \$45,000.

Galveston-Houston Electric Railway, Galveston, Tex.—This company will build a carhouse and offices on the block bounded by Texas Avenue, Capital Avenue, Smith Street and Brazos Street. The carhouse will be a one-story 160 ft. x 100 ft. brick building. The offices will front on Texas Avenue.

Milwaukee Western Electric Railway, Milwaukee, Wis.—This company has obtained title to the Alton lots in Pewaukee, upon which it expects to build a new passenger station.

POWER HOUSES AND SUBSTATIONS

Birmingham Railway, Light & Power Company, Birmingham, Ala.—This company will soon build a cooling tower. The cost is estimated to be about \$25,000.

Pacific Railway Company, Los Angeles, Cal.—The General Electric Company has been awarded a contract by this company for four 1000-kw motor generator sets, three 600-kw motor generator sets and eighteen 450-kw transformers.

San Diego, (Cal.) Electric Railway.—This company has placed in operation its new power station in San Diego.

Pueblo & Suburban Traction & Lighting Company, Pueblo, Col.—This company has ordered, through H. M. Byllesby & Company, Chicago, three 500-kva oil-insulated, water-cooled, 44,000-volt transformers, from the Westinghouse Electric & Manufacturing Company.

Gainesville Railway & Power Company, Gainesville, Ga.—This company has awarded the contract to the Westinghouse Electric & Manufacturing Company for two 135-kva oil-insulated, self-cooling, 11,000-volt transformers, one switchboard and two regulators, constituting a complete substation equipment.

Dixon, Rock Falls & Southwestern Electric Railway, Tampico, Ill.—A site has been selected by this company about 2 miles south of Tampico on which to build a new power house.

Des Moines (Ia.) City Railway.—This company has purchased from the General Electric Company one 500-kw rotary and one 2000-kw low-pressure turbine, and from the Westinghouse company one 300-kw rotary converter.

Louisville & Interurban Railway, Louisville, Ky.—The power house on the Louisville & Eastern division of this company at Marcia, Ky., has been converted into a substation, power being transmitted to Marcia from the central stations of the Louisville Railway, which controls the Louisville & Interurban Railway. The installation of the substation equipment at Marcia has been completed and the steam plant there is no longer in operation. The equipment at Marcia was installed by the Westinghouse Electric & Manufacturing Company.

Valparaiso & Northern Railway, Valparaiso, Ind.—This company's power station in Valparaiso was destroyed by fire on July 16.

Bangor Railway & Electric Company, Bangor, Maine.—This company has purchased a hydraulic plant of the Bodwell Water Power Company, costing nearly \$1,000,000.

Portland Railway, Light & Power Company, Portland, Me.—This company has placed an order with the General Electric Company for one 500-kw and one 300-kw motor generator set and a switchboard. These generators will be installed in new substations and will be supplied with power purchased from the lighting company.

Boston (Mass.) Elevated Railway.—This company is building a new transformer station on Kendall Square, in Cambridge. The building is 50 ft. x 80 ft. and 50 ft. high, and of brick and stone construction.

Ohio Valley Electric Railway, Cincinnati, Ohio.—Plans are being considered by this company for the construction of a new substation in Huntington.

Philadelphia (Pa.) Rapid Transit Company.—This company has awarded the contract to the Westinghouse Electric & Manufacturing Company for two 3000-kva, one 2000-kva and two 1500-kva self-starting rotary converters. These are all of the six-phase, 25-eye type, and they will deliver direct current at 600 volts. The transformers for supplying current to these rotaries were also ordered from the Westinghouse Electric & Manufacturing Company, and will include six 1100-kva, three 750-kva and six 375-kva air-blast transformers, 25 cycles, for 13,200 volts on the high-tension side.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—This company has placed an order with the General Electric Company for one 1000-kw motor generator set, four 1500-kw transformers and a switchboard.

Manufactures & Supplies

ROLLING STOCK

Memphis (Tenn.) Street Railway is said to be considering the purchase of twenty cars.

Baltimore & Ohio Railroad, Baltimore, Md., it is reported, will order two electric locomotives.

Peninsular Railway, San José, Cal., has ordered one 36-ft. car from the W. L. Holman Company.

Trenton, Bristol & Philadelphia Street Railway, Bristol, Pa., is in the market for two double-truck cars.

Pensacola (Fla.) Electric Company has ordered four 21-ft. closed cars from the St. Louis Car Company.

Dallas (Tex.) Electric Corporation has ordered ten 26-ft. double-truck city cars from the Cincinnati Car Company.

Northern Texas Traction Company, Ft. Worth, Tex., has ordered ten 26-ft. double-truck city cars from the Cincinnati Car Company.

Grand Forks (N. D.) Street Railway has ordered one 28-ft. semi-convertible car body, mounted on Brill 21-E trucks, from the American Car Company.

Boston (Mass.) Elevated Railway has purchased one Brill-27 MCB motor truck without wheels and axles, and five Brill-27 MCB-2 trailer trucks without wheels and axles, from The J. G. Brill Company.

Connecticut Valley Street Railway, Greenfield, Mass., has ordered two 30-ft. closed car bodies with cross seats and three 30-ft. closed car bodies with longitudinal seats from the Wason Manufacturing Company.

Capital Traction Company, Washington, D. C., has ordered twenty double equipments of No. 306 interpole railway motors, with type K-2 control, from the Westinghouse Electric & Manufacturing Company.

Columbia Railway, Gas & Electric Company, Columbia, N. C., has ordered six double equipments of No. 306 interpole railway motors and type K-36 control from the Westinghouse Electric & Manufacturing Company.

Chicago (Ill.) Railways has ordered three hundred four-motor car equipments from the General Electric Company. This order calls for twelve hundred 35-hp, type GE-226 motors and six hundred K-35 controllers with auxiliary equipment for three hundred cars.

Southwestern Traction & Power Company, New Orleans, La., which is building a 65-mile line to connect Lafayette, New Iberia and Morgan City, La., is said to be in the market for three interurban passenger and baggage cars and one electric locomotive. Headquarters, Hennen Building Annex, New Orleans.

Philadelphia (Pa.) Rapid Transit Company has included the following details in the specifications for the thirty closed-steel motor cars being built by The J. G. Brill Company, for use on the Market Street elevated line:

Length over vestibule,	Curtain fixtures.....Forsyth
49 ft. 7¼ in.	Curtain material...Pantasote
Width over posts at belt,	Gears and pinions,
8 ft. 7 in.	Ry. Co.'s Std.
Height from top of rail to sills	Journal boxes.....Symington
4 ft. 1 in.	Motors
Body	G.E. 66
metal	Motors.....inside-hung
Interior trim	Paint
mahogany	S.-W.
Underframe	Roofs
metal	Roofs
Air brakes....Ry. Co.'s Std.	Sash fixtures....double sash
Axles,	Seats
6 in. dia. at motor bearings	long.
Bolsters	Seating material.....rattan
composite	Side bearings
Bolsters, truck....cast steel	Stueki
Brakeshoes ..Ry. Co's Std.	Springs
Car trimmings	Brill
bronze	Trucks.....Brill,-27-MCB-3
Center bearings..Symington	Varnish
Control system.....G.E.	Murphy
Couplers	Ventilators
Van Dorn	Automatic
	Wheels,
	34-in. Midvale rolled steel

International Railway, Buffalo, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of July 15, 1911, as having ordered sixty semi-convertible near-side cars from The J. G. Brill Company, has specified the following details for these cars: Seating capacity

53	Fenders
	non-protruding
Weight (ear body) ..	17,000 lb.
	Gongs
	Dedenda

Bolster centers, length. 21 ft.	Hand brakes Peacock
Length of body. 34 ft. 7 $\frac{3}{8}$ in.	Heaters,
Over vestibule. 45 ft. 2 $\frac{1}{2}$ in.	truss plank and panel type
Width over all. 8 ft. 6 in.	Headlights Crouse-Hinds
Sill to trolley base. 12 ft.	Journal boxes Brill Std.
Body wood	Motors G.E. 210
Interior trim cherry	Motors outside-hung
Headlining maple veneer	Push button signal. Cons.
Roof. Brill plain arch	Sash fixtures double
Underframe metal	Seats. Brill stationary back
Air brakes. Ry. Co.'s Std.	Seating material rattan
Axles Brill Std.	Springs Brill
Bumpers Brill angle iron	Step treads Mason
Car trimmings bronze	Trolley retrievers Earll
Control G.E.	Trucks Brill 39-E.
Curtain fixtures. Forsyth	Ventilators. spec'l mushroom
Curtain material. Pantastote	Wheels. 34-in. and 22-in.
Destination signs. Hunter	

TRADE NOTES

Seattle Car Manufacturing Company, Seattle, Wash., has completed plans for a new forge and machine shop to be erected at Renton, Wash.

Manning, Maxwell & Moore, Inc., New York, N. Y., have elected J. H. Evans secretary, treasurer and director of the company, to succeed Colby M. Chester, Jr., resigned.

Cleveland Trolley Wheel Company, Cleveland, Ohio, has been incorporated with a capital stock of \$50,000 by C. E. Beam, L. L. McAdams, C. W. Hartley, William H. Thompson and Charles Ammerman.

H. W. Johns-Manville Company, New York, N. Y., is erecting a twelve-story office building at Forty-first Street and Madison Avenue, New York. It will be of fireproof steel construction throughout, fronting 48 ft. on Madison Avenue and 68 ft. on West Forty-first Street, and will be ready for occupancy May 1, 1912.

The J. G. Brill Company, Philadelphia, Pa., has received the following orders for export: Byington & Company, three 24-ft. gondola motor bodies mounted on Brill-21-E trucks; Buenos Aires Pacific Railway, Buenos Aires, Argentina, four Brill-27-E-3 trucks without wheels and axles; United Electric Car Company, for Pretoria Tramways, South Africa, four Brill-27-GE-1 trucks without wheels and axles; E. G. Long & Company, five Brill-21-E trucks.

Baldwin Locomotive Works, Philadelphia, Pa., has called a meeting of its stockholders, to be held on Sept. 21, 1911, for the purpose of approving a reduction in the capital stock from \$20,000,000 to \$1,000. This corporation was the one originally formed in 1909 to take over the interests of the old partners in Burnham, Williams & Company. Baldwin Locomotive Works has now been superseded by The Baldwin Locomotive Works as the operating corporation.

Pawling & Harnischfeger Company, Milwaukee, Wis., announces that Alonzo Pawling, president and treasurer, has disposed of his interests in the company and retired from business life. The Pawling & Harnischfeger Company was founded by Mr. Pawling and Henry Harnischfeger in December, 1884. Henry Harnischfeger becomes president and treasurer of the company; W. H. Hassenplug, vice-president; F. P. Breck, second vice-president, and S. H. Squier, secretary.

Terry Steam Turbine Company, Hartford, Conn., has appointed Ashley P. Peck district sales manager for the Middle West, with offices at 814 People's Gas Building, Chicago, Ill. Mr. Peck was actively connected with the machinery sales field of Chicago prior to 1902 and since that date for three years was manager of the Milwaukee district sales office of the National Electric Company. Since 1905 he has been connected as sales engineer with the New York office of the Allis-Chalmers Company.

W. N. Matthews & Brother, St. Louis, Mo., announces the appointment of John L. Fay as sales engineer throughout the entire United States, effective Aug. 1, 1911. Mr. Fay was formerly superintendent of construction of overhead system for the Union Electric Light & Power Company, St. Louis, and has been connected with various electric construction and lighting companies for more than twenty-five years. Mr. Fay is the inventor of the Fay insulator, which eliminates the use of tie wire and the Matthews fuse switch.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has appointed W. W. Briggs assistant sales manager with headquarters at San Francisco, Cal., and jurisdiction over the Pacific Coast. Mr. Briggs has been connected with the sales department of the company since 1899 and in May, 1905, he was made district manager. The Westinghouse Electric & Manufacturing Company reports the receipt of the following orders: City of Barnesville, Ga., for one substation equipment consisting of three 150-kva, oil-insulated, self-cooling, 6600-volt transformers and one two-panel switchboard; Cataract Power & Conduit Company, Buffalo, N. Y., three 300-kva, oil-insulated, water-cooled, 22,000-volt transformers; Demarara Electric Company, British Guiana, S. A., for No. 12-A railway motors and type R control; City & County Contract Company for one 80-ton switching locomotive with quadruple equipment of No. 410 single-phase, alternating-current motors and unit switch control for the New York & Westchester Railroad. The frame and running gear will be built by the Baldwin Locomotive Works.

ADVERTISING LITERATURE

General Railway Signal Company, Rochester, N. Y., has issued Bulletin No. 114-A, which describes and illustrates its selective signaling system, model 3, form B.

Indianapolis Brass Company, Indianapolis, Ind., has appointed the Midland Company, Inc., Richmond, Va., to act as its representatives in Virginia and North Carolina.

Power Specialty Company, New York, N. Y., has issued Bulletin No. 201, which describes and illustrates the Power water cooler which the company is introducing into this country.

D & W Fuse Company, Providence, R. I., has issued Catalog No. 15, in which is listed and illustrated a complete line of cartridge fuses and cut-outs which the company manufactures. The catalog also contains a brief description of the more important methods of construction of the inclosed fuse. It is divided into five sections and contains 112 pages.

International Oxygen Company, New York, N. Y., has issued a 16-page booklet, in which are presented the principles of construction and operation of the I. O. C. system for producing pure oxygen and hydrogen; also a brief survey of the industries where these gases are utilized, together with a comparison of the relative merits of oxygen combined with hydrogen and that of oxygen combined with acetylene for auto-welding and oxy-cutting.

Ohio Brass Company, Mansfield, Ohio, has printed supplement No. 2, in which are listed several new devices of special interest to the electric railway trade. Among these is a line of overhead construction devices with renewable flexible bronze tips, including splicing ears, malleable iron frogs, insulated cross-overs and section insulators. The Tomlinson MCB coupler is listed for the first time, as is also the O-B thermo-bonding process. The supplement also includes a new line of trolley harps, wheels, bushings, etc.

The J. G. Brill Company, Philadelphia, Pa., in *Brill Magazine* for July, 1911, presents an illustrated biography of John Blair MacAfee, who is identified with several large electric railway properties in the country. Among the feature articles are the following: "Conditions Which Govern the Type of Car for City Service, Liverpool, England," "Closed Trail Cars for the Emigration Cañon Railway, Utah," "Interurban Cars for the Norfolk & Southern Railroad," "Pay-Within Cars for Beaumont, Tex.," "Large Open Cars for Asbury Park, N. J."

Curtain Supply Company, Chicago, Ill., has issued a very complete illustrated catalog of 46 pages of its curtain fixtures, roller diaphragms and curtain materials. The closed car curtains and the open car curtains are described separately, and as an introduction to each of these subjects there are valuable suggestions in regard to rollers, mounting and handling curtains, adjusting fixtures, etc. An index at the front of the publication arranged alphabetically contains upward of sixty subjects receiving attention. In a foreword the company says that it can undertake at all times the manufacture of articles which require the same general factory equipment as does its regular output.