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Of this issue of the ELECTRIC RAILWAY JOURNAL 9000 copies are printed.

Prospect of Electrification of Illinois Central Railroad

It has just been announced that the Illinois Central Railroad Company is seriously considering the electrification of its terminal and suburban lines at Chicago. For some years the company has been besieged with protests on the part of the municipal and civic bodies in Chicago against the use of smoke-producing locomotives, but it has claimed that electrification of the railroad terminal would not

be feasible from a financial standpoint, and that it would not be wise to undertake so large a project until the results of electrification on the part of the New York Central and the New York, New Haven & Hartford railroads in New York could be available for use in choosing the most acceptable types of apparatus. The terminal property of the Illinois Central Railroad comprises eight tracks paralleling the lake front, extending from the business district of the city to southern suburban districts. It will be necessary in electrifying these tracks to provide for the handling of not only through passenger and freight trains, but both local and express suburban trains; these four classes of traffic occupy the eight through tracks. This complication of traffic is made much more difficult to handle electrically because the Illinois Central tracks accommodate the passenger traffic of four other trunk lines. With combined steam and electric operation in many places, this condition presents no serious obstacle, if partial steam service is to be retained, but from the number of complaints on the part of the railroad company's neighbors in Chicago nothing less than complete transformation may prove satisfactory. A committee of railroad officials has been appointed to consider the subject.

Accounting for Operations in Chicago

The feature of the system of accounts of the Chicago Railways Company, which is described in another part of this issue, is its simplicity. The Chicago Railways Company operates the properties of the old Chicago Union Traction Company, comprising the surface lines on the North and West Sides of the city. The gross earnings of the company will amount during the present year to about \$11,000,000. The classification of operating expenses adopted by the company differs only in slight degree from that recommended by the American Street & Interurban Railway Accountants' Association. The number of the primary accounts is 53. The detailed statement of operating expenses shows a subdivision of the charges to the reserve funds on account of injuries and damages, but the totals of these charges are comprised in two primary operating expense accounts. It will be observed that the number of primary operating expense accounts compares with 38 accounts in the last standard classification adopted by the association. Of the increased number of accounts shown by the Chicago Railways Company, nine constitute the arbitrary renewals accounts. In the association classification the renewals charges are comprised in the maintenance accounts, but the Chicago classification had to follow somewhat different lines on account of the requirements of the ordinance. The number of accounts adopted by the company with the approval of the board of supervising engineers is much smaller than the number tentatively suggested by the Inter-

state Commerce Commission and the Public Service Commissions of New York State for companies with operations of as large magnitude as the Chicago property. With the exception, perhaps, of a reference to the adjustment on the 70 per cent basis, the accounts will be clear to accounting officers. The ordinance accepted by the company provides that it is to be allowed 70 per cent of the gross revenue for operating expenses and taxes during the three-year period of rehabilitation. If the expenses are greater than that percentage, the excess amount is to be capitalized; if they are less the balance is to be deducted from the capital allowance. As the city is to receive 55 per cent of 30 per cent of the gross revenue, it was thought advisable to show the accumulated amount due the city on this basis. This made the adjustment accounts necessary.

Changes in Car Design

During the past 30 years inventive genius has laid dormant so far as successful improvements in car body design are concerned, with the exception of a few notable inventions which could practically be counted on the fingers of one hand. Platform accidents, lost fares and car ventilation have constituted a trio of difficulties which street railway managers have despaired of solving. Conditions have now changed, and no subject is being given greater attention at present than rolling stock design. The credit for this must undoubtedly be given to Messrs. Ross and McDonald, of Montreal, through whose courage and clear insight into the conditions of street railway operation the pay-as-you-enter car was developed in Montreal and introduced in this country. The recent spread of the pay-as-you-enter car idea is one of the most remarkable movements in street railway history, and has undoubtedly given an impetus to other inventions designed to facilitate access to the car and prevent accidents, such as the folding step, either by itself or combined with the platform door. The latter had been used to a considerable extent in elevated work and in a limited way in surface cars, but interest in both step and door has been stimulated by the readiness with which other radical changes in car design have been accepted by the public. It seems as if the railway companies for a long time had not dared to make any important alteration in that portion of the equipment in which the passengers are carried, except to increase the length of the cars. But the public has shown that it is willing to aid in a work in which ultimately it will be benefited to quite as great an extent as the company. The latest development in the direction of a car in which the fares are collected on entering will be placed in service this week by the Philadelphia Rapid Transit Company, and is fully described in this issue. It not only possesses the prepayment feature, but through its employment of side doors instead of bulkhead doors, and of movable sash, is claimed to meet the problem of ventilating a box car in summer and of heating it in winter. Perhaps the most striking point about the new design is that these changes have been introduced without involving great alterations in the car structure. The trial in Philadelphia will be conducted on a sufficiently large scale to determine the practical value of the improvements proposed, at least for the conditions in that city, and will attract wide attention.

An Express Company for Express Service

The newly incorporated Interurban Electric Express Company, of Syracuse, has been denied by the New York Public Service Commission, Second District, the privilege of exercising rights as an express company. The opinion of the commission on the application of this company states, in brief, that a railway should not be permitted to divest itself in favor of another corporation of the obligation to perform any of the public services for which it is incorporated, unless it can show clearly that public necessity so demands or public convenience can be better served thereby.

This express company, which was formed with \$5,000 capital stock, was designed to carry on an express business in connection particularly with the Auburn & Syracuse Electric Railroad; the Rochester, Syracuse & Eastern Electric Railroad; the Syracuse & South Bay Electric Railroad; the Syracuse, Lake Shore & Northern Electric Railroad; the Auburn & Northern Electric Railroad; the Skaneateles Lake Transportation Company, and the Newark & Marion Railway. It is necessary to specify the railways on which the express company proposed to do business, only to show that they were lines with physical connection, and thereby able to furnish continuity of service.

The opinion of the commission does not rest arbitrarily on the fact that a new express company was to be set up to perform a public service; it appears rather to be based on the belief that a new company of this character must demonstrate that public necessity or convenience could be met more readily by the formation of a new corporation than if the duties of express carrier were to be fulfilled directly by the railways. The commission does not indicate definitely what its decision would have been if the company had been organized to transact express business only instead of to engage in both express and freight service, but states that if the application was for authority to engage in the express business alone, there would still remain the question whether public needs would justify the formation of an independent corporation for the purpose. The value of the service rendered by the express companies which operate principally on steam railways does not seem to be open to argument, and we believe that similar companies, operating on electric carriers, can supplement the service of the railways with advantage to the public. An independent express company, for instance, might add materially to the facilities afforded the public if it furnished wagon service. An electric railway company might not think it advisable to provide wagon service, even though there should be a public demand for this facility.

The discussion of the commission regarding the expediency of creating a new company to transact both freight and express service suggests an undoubted point of weakness in the electric railway situation. Express service is of more value to the public than freight service and costs more to furnish, and managers should analyze their revenues and expenses with great care in order to make sure that the traffic yields a profit on the investment commensurate with the risk assumed. Many companies make a small profit on their express and freight business, and others conduct this service at an actual loss. Where the profit is slight, or no serious loss occurs, the service is continued by some companies in the expectation that it will increase in

the future. Development can be hastened where interchange of business can be effected with connecting lines, and such interchange is facilitated in some instances by the existence of a company formed for the especial purpose of transacting express business. The mileage of electric railway companies is relatively small, and if traffic contracts can be made by an express company that will assure better service than the railways could provide by themselves, it would appear to be in the interest of the public for an independent company to contract to furnish such service if it could do so, perhaps in conjunction with other business, without loss.

The opinion of the commission is not calculated to cause development of the express business on electric railways unless the position assumed is subject to modification under other circumstances. The opinion points out other features of the case which were probably of leading importance in the formation of the conclusion in this instance. These features relate to the duplication of companies and the possibility of an additional tax on the public for the service rendered. These features could not enter into the argument if an express company should be controlled wholly in the interest of the railways over which it was designed to perform a public service.

New York Fender and Wheel-Guard Tests

The fender and wheel-guard tests of the Public Service Commission, First District, of New York, have been in progress at Schenectady for a little over a week, but already give promise of good results. They constitute the most important study yet made by either public or private interests of an important part of the equipment of electric cars for city service. The commission is to be commended upon the care and completeness with which the programs have been arranged.

Of course all will admit that in tests of this kind no system of scoring is able to tell the whole story. There are some very radical differences between the action of a fender on a dummy and on the unfortunate pedestrian, differences for which it is very difficult to make experimental allowance. The most conspicuous variation lies in the fact that the victim of a street car accident is usually in motion, while the dummy, standing or prone, is at rest when struck. Perhaps the commonest source of accidents is the carelessness of a person in walking or running from behind a vehicle right in front of a moving car. In such case the person is rarely moving in any sense toward the approaching car, but across its path, and commonly diagonally away from it. Consequently when struck by the fender or any part of the car, the body is likely to be thrown forward rather than toward the fender, which, unless very close to the track, is likely to ride over the victim instead of picking him up. If the person in danger had presence of mind enough to drop toward the fender, the chance of dangerous injury would be decreased.

The fundamental practical requirement would therefore seem to be the successful picking up of a dummy just in the act of falling across the track or away from the car. Of course, unless the fender is practically on the track at the moment of impact under such circumstances, the tendency to ride up over the body is very considerable and

has been the cause of many fatal accidents. The most important single requirement for a fender in fact is that it shall practically scrape the track when thrown into action. We should be disposed to regard a test in which any part of the dummy remained under the fender or wheel guard as virtually a complete failure. Of course a good fender should pick up a dummy from the prone positions as well as when falling, and a poor fender is likely to fail in both requirements.

Another very important matter is that the fender itself should not be so constructed as to be likely to cause serious injury by its impact. Here is a particular in which there is likely to be trouble with models otherwise successful. There is such a thing as too solid construction of fenders, and a form which will show minimum depreciation is quite likely to be too heavy and rigid to make a safe pick-up. A fender is an emergency device at best, and its office is strictly to save life, not to demonstrate low repairs. If it picks up one person in safety, its further history is comparatively unimportant, for it has done its work. A fender able to do this is probably strong enough to do it again, but the number of times a fender can pick up a person is of less importance than that it should do so without becoming smashed the very first time it needs to be used. Proper inspection and upkeep will maintain it in a condition of efficiency. Another consideration is what happens to the person who is successfully removed from the track after he lands on the fender. If the car is moving rapidly and his skull is fractured or his spine injured by collision with dashboard or coupling head, the net result from his point of view is failure. Here again it is possible to go too far with solidity of construction, but the general remedy is obvious and easily applied. A dummy hard hit and battered, even when removed cleanly from the track, should not be counted as an unqualified success.

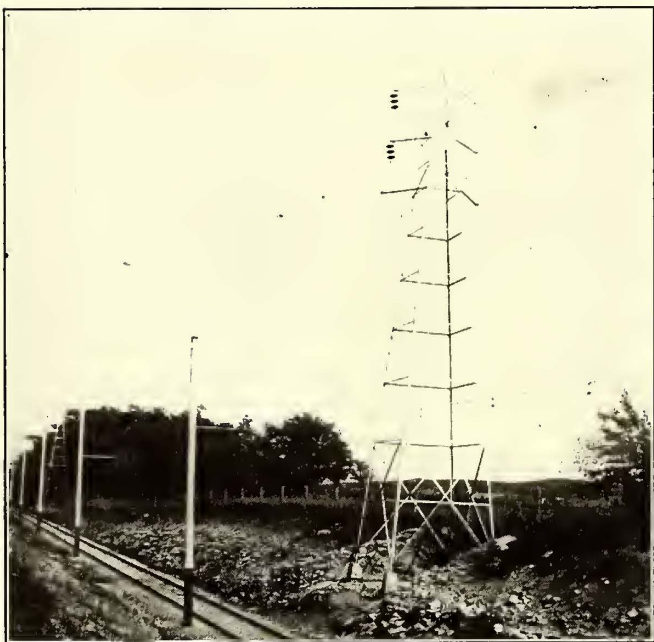
The fender problem is one that is capable of solution, even if none of the forms recently tried is wholly satisfactory, but no fender should be expected to do the impossible or effect a radical alteration in the habits of the public. An electric car when running at good speed cannot be stopped quickly enough to avoid running down a person who suddenly dodges out from behind a vehicle. Speed low enough to enable a car to be fully under control for such a case would be so slow as to be impracticable. The next best thing is an efficient fender to minimize the results of such a casualty. The real cause of most accidents as stated is the reckless way in which pedestrians cross the street. Nothing is commoner than to see people get off a car and pass immediately around its rear upon the other track, conversing industriously with each other, or looking backward instead of having an eye open for danger. Children playing in the streets often, without looking, run squarely in front of an approaching car, and the wonder is that accidents are not more numerous than they are. A fender is to a large extent to protect people from the results of their own carelessness, but nevertheless it is necessary to do this, and the more thoroughly it is done the better. We do not think it will tend to increase carelessness, first, because that would be difficult, and, second, because, being slammed into the lap of a fender will never become a pleasant amusement.

STEEL TOWER TRANSMISSION LINE OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

The Milwaukee Electric Railway & Light Company is building a steel tower transmission line which includes in its design features of interest. It will serve as a main artery of power distribution for the Milwaukee company's chain of interurban and lighting properties extending westward from the city of Milwaukee. A considerable increase in the load in this territory is anticipated and the new line

standard wooden-pole transmission lines carrying current at 33,000 volts. From Waukesha west the line of steel towers will closely parallel the interurban track 53 miles to Watertown. Detours are made around some of the towns so that the line may be clear from obstructions.

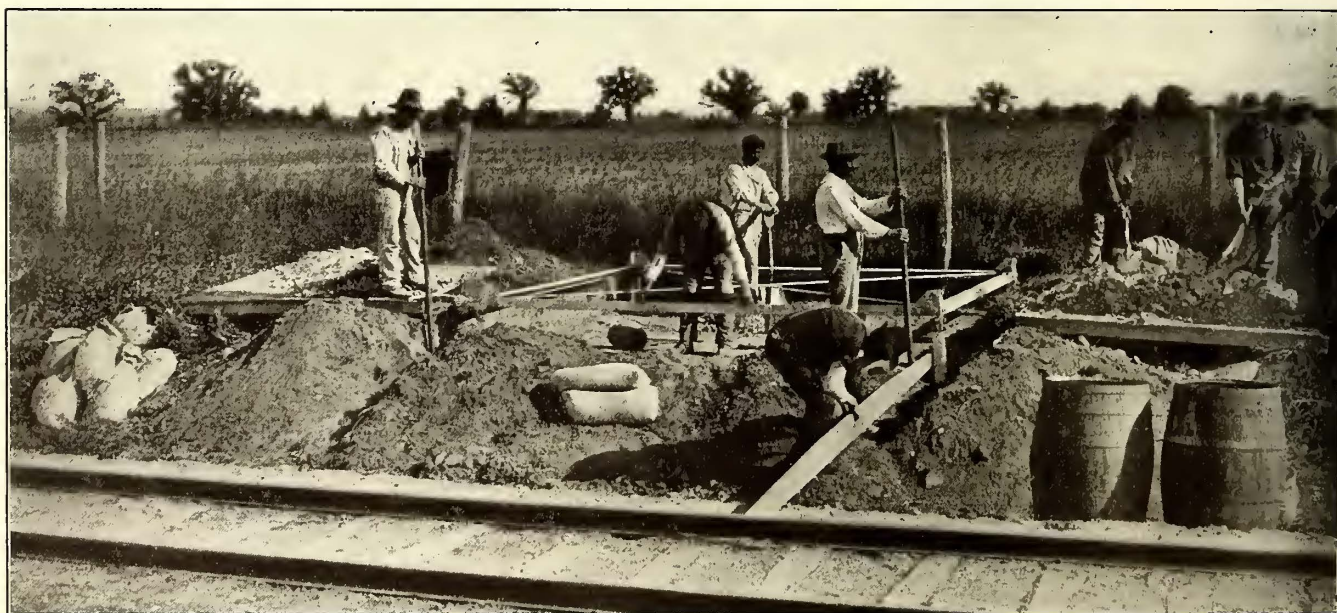
O. M. Rau, electrical engineer of the Milwaukee Electric Railway & Light Company, and D. R. Scholes, chief engineer of the Aermotor Company, Chicago, which built the



Milwaukee Transmission Line—Roadway and Tower



Milwaukee Transmission Line—Electric Work Car Raising Tower



Milwaukee Transmission Line—Tympan for Holding Anchors in Place While Building Concrete Footings

is being built with a view to permanency and with ample capacity for future development. The route in general follows the Watertown extension of the Milwaukee Electric Railway & Light Company's interurban system. The eastern terminus of the steel tower transmission line is at a switching station at Waukesha Beach, into which current is fed from the Milwaukee power plants over duplicate transmission lines made up of underground cables, and

towers, executed the design of this transmission line and planned the novel erection methods employed. Before deciding upon the use of steel towers a careful comparison was made between them and a wooden pole line, and the steel towers were found preferable. Special care was used in the design of the towers so that all unnecessary expense was eliminated. The resulting transmission line cost but little more, and had far greater permanency than could

have been obtained by the use of wooden poles. The accompanying illustrations show the general appearance of the line and the method of assembling and erecting the towers.

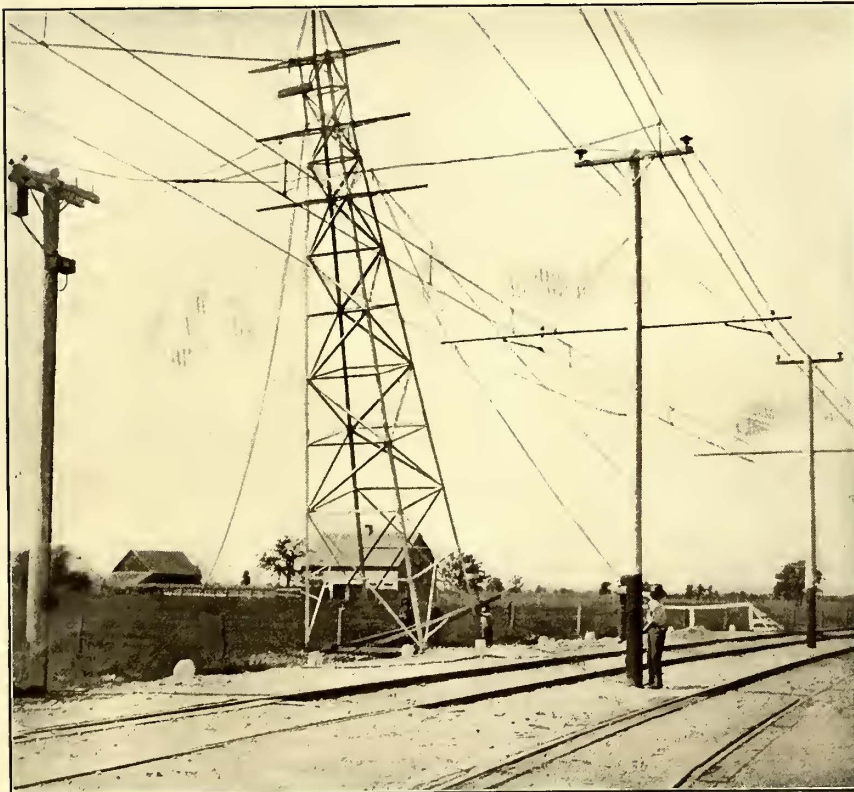
The standard towers are of such a height that the lowest conductor is 40 ft. above the ground at the tower when this conductor is supported by the suspended type of insulator. Two three-phase lines eventually will be carried on this line of towers. A few special towers carrying the lowest wire 50 and 60 ft. high were furnished for locations where it was desirable to perfect the grade of the line. The base dimensions of each tower are 12 ft. x 12 ft. at the ground line. The towers are designed to withstand actual test loads of 1500 lb. applied to any insulator support and 8000 lb. applied to a tower structure near the top in a horizontal direction, either at right angles to the line or parallel therewith. The anchorage consists of an angle bar 5 ft. long provided with footplates at its lower end embedded in concrete. The towers are made of steel throughout, carefully galvanized by the hot process after all shop work, such as punching, shearing, machining, etc., had been completed. They were shipped completely knocked down

extra length, so that the distance between conductors would not be decreased at the corners.

Where the transmission line follows the railway tracks the average length of span is 550 ft., the spans ranging from 400 to 600 ft. in length. The concrete anchorages for the four legs of the towers vary between 2 and 3 ft. on a side, according to the necessity of the locations. Reference



Milwaukee Transmission Line—Assembling Tower



Milwaukee Transmission Line—Raising Tower

and were assembled in the field by means of bolts. Extra heavy towers were furnished for corners in the line and these towers were subjected to test loads of 3000 lb. applied to any insulator support, and 20,000 lb. was applied to the tower structure near the top in a horizontal direction, either parallel to the line or at right angles therewith. The towers withstood these tests without permanent distortion of any part. The corner towers are provided with crossarms of

wires being carried by Thomas suspended-type insulators, each made up of three 20,000-volt sections. The aluminum cables are supported from the insulators in clips of the saddle type. These clips are fitted with arcing rods so that if an arc occurs near a tower the discharge will take place between the 4-in. iron arcing rod and the tower, thus protecting the aluminum conductor. On an average span of 550 ft. the conductor cables were strung with a sag of 18

to the illustrations, will show that the transmission wires for each 3-phase circuit are carried one above the other in a vertical plane. No attention was paid to arranging them at the corners of a triangle and there will be no transposition in the circuits.

Particular attention was paid to obtaining an extremely high insulation for the lines, as Mr. Rau believed that this was an important factor in providing against troubles from lightning. At the top of each tower provision is made for carrying a ground cable. This cable, however, will not be installed until experience has shown its necessity. Electrolytic arresters will be connected with the line at the stations and the operating forces will make it a special point to watch the disturbances occasioned by lightning. Whether or not additional protection will be supplied will depend upon the results of these observations.

The conductors of the 3-phase circuits comprise aluminum cable equivalent in conductivity to No. 0 copper. The sections of this cable are connected by McIntire splices. The lines will be operated at 40,000 volts pressure, the

ft. at +80 deg. F. Under the extreme conditions (a temperature of -30 deg. F. with wind at 50 m.p.h.) the factor of safety of the transmission line is 5.5.

As already stated, the towers were assembled on the



Milwaukee Transmission Line—Special Footings with Anchors

ground and erected as a unit. With the concrete anchors in place and a tower assembled, two legs of the towers were connected to the angle-iron anchorages by means of special erecting hinges shown in one of the illustrations.



Milwaukee Transmission Line—Tower-Raising Hinge

These hinges were temporarily fastened with bolts and after erection were removed and the legs of the tower bolted in place. When a tower was ready for raising, the tackle was so arranged that the pulling rope could be fast-



Milwaukee Transmission Line—Road Gardening

ened to the coupler of the electric car. Thus as the car moved along the track the tower was quickly raised into a vertical position. It is stated that after the preparations were complete a tower could be raised in three minutes.

A SIMPLE SYSTEM FOR NUMBERING FEEDER CABLES

The Twin City Rapid Transit Company has two water power and one steam generating stations feeding 11 substations. A simple yet ingenious method for numbering the underground feeder cables connecting these various stations has been devised. Each power station is given a number from 1 to 10 inclusive. The distributing station, that is, those points from which main circuits from the power-house terminate or branch, or at which the construction of the circuits changes, are given numbers from 11 to 1,000. The independent numbers of the various lines are then made up as follows:

Line numbers:—

3-phase alternating-current lines—numbers consist of three parts:

- 1.—The number of the station from which the line goes.
 - 2.—A letter distinguishing lines between the same stations.
 - 3.—The numbers of the station to which the line goes.
- Examples: Lines between Power Station No. 1 and Distributing Station No. 11 are as follows: 1A11, 1B11, 1C11, etc.

600-volt positive feeders—Numbers consist of two parts:

- 1.—The number of station from which feeder goes.
- 2.—The relative number, 1 to 99 inclusive, of the feeder.

Example: Positive feeders from Station No. 11 are as follows: 11-1, 11-2, 11-3, etc.

Negative feeders.—Numbers consist of two parts:

- 1.—The number of the station from which the feeder goes.
- 2.—The relative number, 101 to 199 inclusive, of the feeder.

Example: Negative feeders from Station No. 11 are as follows: 11-101, 11-102, 11-103, etc.

Miscellaneous lines—that is, arc circuits, lighting circuits, etc., not covered by the above—numbers consist of two parts:

- 1.—The number of the station from which the line goes.
- 2.—The relative number, 201 to 299 inclusive, of the line.

Example: Miscellaneous lines from Station No. 27 are as follows: 27-201, 27-202, 27-203, etc.

With this system of station and line numbering it is possible for a line foreman to identify any cable by its number without the use of an elaborate set of charts or a book of distribution maps. Whenever cables or circuits are built the terminals at all switches and junction points are neatly lettered according to this system.

THE AUTO 'BUS ABROAD

A comprehensive paper on the operation of auto 'buses was presented at the convention of the International Street & Interurban Railway Association at Munich, Sept. 7 to 10, by M. Maclère, general manager of the General Omnibus Company of Paris. The author states that in London, in the spring of 1908, there were 13 companies owning 1017 auto 'buses, of which 972 were gasoline, 34 steam and 11 electric. In June, 1908, there were in Paris 103 auto 'buses. The Tramways Company of Berlin owned 60, of which 13 were in regular city service and 47 were engaged in miscellaneous traffic. No other cities in Europe had more than six. The expense of operation was high and the cost of tires on the Continental lines in the statistics given averaged nearly \$400, with a usual guarantee of 8000 miles.

In his conclusions Mr. Maclère states the auto 'buses have a field in city service provided the traffic will stand a much higher fare than charged on tramways for the same distance.

NEW ACCOUNTING SYSTEM OF THE CHICAGO RAILWAYS COMPANY

The Chicago Railways Company has adopted a new system of accounts, designed to facilitate the accounting for the operations of the road under the new ordinance accepted last year. Details of the system have been received from F. E. Smith, comptroller of the company.

The new system is, of course, based somewhat on the scheme of accounts followed by the Chicago Union Traction Company and by the receivers of that property prior to its acquisition by the new Chicago Railways Company. Some of the features of the system have been adopted from the last standard system recommended by the American Street & Interurban Railway Accountants' Association, but various changes have been necessitated by the relations with the city and the new board of supervising engineers,

accompanying illustration. The partnership accounts comprise 12 monthly report forms. Form A is a comparative income statement; it shows, as indicated in an accompanying illustration, that revenues from rent of land and building, and equipment and tracks, and interest on deposits are considered as items of earnings on which the percentage of operating expenses is to be based. As revenues of this character are treated as earnings from operation, the percentage of the City of Chicago is, of course, larger than if some of these items were handled through the non-partnership income account, but this treatment is provided for by the ordinance.

The classification of operating expenses comprises a larger number of accounts than the last standard classification approved by the American Street & Interurban Railway Accountants' Association, although it is based primarily on that classification. The Chicago Railways classi-

MONTHLY REPORT FORM A			
CHICAGO RAILWAYS COMPANY			
PARTNERSHIP ACCOUNT			
COMPARATIVE INCOME STATEMENT			
MONTH OF _____ 190__			
ITEMS	THIS YEAR	LAST YEAR	INCREASE OR DECREASE
INCOME			
PASSENGERS			
CHARTERED CARS			
MAIL			
ADVERTISING			
RENT OF LAND AND BUILDINGS			
RENT OF EQUIPMENT			
RENT OF TRACKS			
SALE OF POWER			
INTEREST ON DEPOSITS			
MISCELLANEOUS INCOME			
GROSS			
EXPENSE			
MAINTENANCE WAY AND STRUCTURES			
MAINTENANCE EQUIPMENT			
RENEWALS			
OPERATION POWER PLANTS			
OPERATION CARS			
GENERAL EXPENSES			
EXPENSE ACCT INVESTMENT REAL ESTATE			
TAXES (ESTIMATED)			
TOTAL			
BALANCE ACTUAL			
BALANCE (BASED ON 70% FOR OPERATION)			
DEDUCT INTEREST @ 5% ON VALUATION			
NET INCOME			
DIVISION OF NET INCOME			
CITY OF CHICAGO, 55%			
CHICAGO RAILWAYS CO., 45%			
CORRECT			
CONTROLLER			
CHICAGO, ILLS.			

Chicago Railways Accounts—Statement of Partnership Income Account

Chicago Traction, for which provision was made in the ordinance.

As the accounting for operations of the company must follow certain lines prescribed by the ordinance and the board of supervising engineers, provision is made both for partnership and non-partnership accounts, as the City of Chicago is to receive 55 per cent of the net income from the operation of all the property, including investment real estate. The non-partnership accounts are two in number, comprising a statement of the income account for the month and the cumulative income account for the current fiscal year, and a comparative general balance sheet showing the increase or decrease in assets or liabilities as compared with the previous month. The form used for the statement of the income account is presented herewith.

The comparative general balance sheet is shown in an

CHICAGO RAILWAYS COMPANY			
NON-PARTNERSHIP ACCOUNT			
INCOME ACCOUNT, MONTH OF _____ 190__			
AND CUMULATIVE INCOME ACCOUNT FOR CURRENT FISCAL YEAR			
ITEMS OF INCOME	FOR CURRENT MONTH	FROM FEB 15 TO CLOSE OF PREVIOUS MONTH	TOTAL TO DATE
AS PERCENT OF NET INCOME FROM OPERATION			
ADD ADJUSTMENT (70 PER CENT BASIS)			
TOTAL INCOME FROM OPERATION			
DEDUCT ADJUSTMENT (70 PER CENT BASIS)			
NET INCOME FROM OPERATION			
INTEREST ALLOWANCE ON VALUATION			
INTEREST ON BANK BALANCES			
INTEREST ON TREASURY SECURITIES			
INTEREST ON BONDS NOT ISSUED			
MISCELLANEOUS INCOME			
GROSS INCOME			
DEDUCTIONS			
FIRST MORTGAGE BONDS 5%			
CONSOL. MORTGAGE BONDS 4%			
COLLATERAL NOTES 5%			
COLLATERAL AND FUNDING NOTES 5%			
UNDERLYING SECURITIES			
CURRENT LIABILITIES			
SINKING FUND RESERVE ACCRUED			
CORPORATE EXPENSES			
MISCELLANEOUS			
TOTAL DEDUCTIONS			
NET INCOME			
CORRECT			
CONTROLLER			
CHICAGO, ILLS.			

Chicago Railways Accounts—Statement of Non-Partnership Income Account

fication agrees closely with that of the association except in three particulars: The use of the separate renewals accounts; the hired equipment account, which is a sub-account in the association classification; and the addition of the expenses included in accounts Nos. 33 and 34 in the association classification to the total of the other operating expense items.

The association classification provides but three primary accounts under maintenance of way and structures; the Chicago Railways classification provides for eight maintenance of way and structures accounts, including in addition to those listed in the association classification the following: Paving. Bridges and viaducts. Tunnels. Track tools and lights. Total track and roadway.

It is also to be noted that the Chicago Railways classification provides for a distinct separation of charges to

operating expense for maintenance on the one hand and for renewals on the other. The renewals accounts provided in the Chicago Railways classification are as follows: Track and roadway. Paving. Bridges and viaducts. Electric light. Buildings and fixtures. Steam plant. Electric plant. Cars. Electric equipment of cars. These nine accounts are the titles of five of the maintenance of way and structures accounts and four of the maintenance of equipment accounts.

The titles of the operation of power plant accounts are more abbreviated than those given in the association classification, but provide for the same expenses.

Accounts Nos. 33, 34 and 35 in the association classification are designed to cover damages, legal expense in connection with damages and other legal expenses. Under the heading "general expenses," the Chicago Railways classification does not include these accounts, but has one

serve fund to cover the damages only are divided as follows: Adjusters' salaries and expenses. Doctors' salaries, fees and expenses. Injuries to persons. Injuries to horses and vehicles. Injuries to property. Other expenses account injuries.

The charges against the reserve fund for legal expenses are divided between the following: Attorneys' salaries, fees and expenses. Court costs and expenses. Law books and printing.

Four forms are provided for operating statistics. The number of one-way trips, of car-miles and of car-hours are shown for passenger cars, mail cars and total cars. The numbers of revenue, free, transfer and total passengers are shown, with the percentage of each class of passengers (revenue, free and transfer) of the total. The percentage of revenue and free passengers using transfers is also shown. Other statistics are: Average passengers each

MONTHLY REPORT FORM I

CHICAGO RAILWAYS COMPANY
PARTNERSHIP ACCOUNT

STATEMENT OF CHANGES IN RESERVE FUND
DURING MONTH OF _____ 190__

	FOR CURRENT YEAR	FOR PRIOR YEARS	TOTAL
RESERVE FOR DAMAGES			
AMOUNT AT FIRST OF MONTH			
ADDED DURING MONTH			
TOTAL			
CHARGES AGAINST RESERVE DURING MONTH			
SALARIES AND EXPENSES OF ADJUSTERS, ETC.			
SALARIES, FEES AND EXPENSES OF DOCTORS, ETC.			
CLAIMS FOR INJURIES TO PERSONS			
CLAIMS FOR HORSES AND VEHICLES			
CLAIMS FOR OTHER PROPERTY			
OTHER EXPENSES			
TOTAL CHARGES			
BALANCE AT CLOSE OF MONTH			
RESERVE FOR LEGAL EXPENSES ACCT DAMAGES			
AMOUNT AT FIRST OF MONTH			
ADDED DURING MONTH			
TOTAL			
CHARGES AGAINST RESERVE DURING MONTH			
SALARIES, FEES AND EXPENSES OF ATTORNEYS			
COURT COSTS AND EXPENSES			
LAW BOOKS AND PRINTING (TRAIL DEPARTMENT)			
TOTAL CHARGES			
BALANCE AT CLOSE OF MONTH			

Chicago Railways Accounts—Statement of Changes in Reserve Funds

account, "miscellaneous legal expenses." After showing the general expenses in substantially the same manner as that indicated by the titles of accounts in the association classification, the Chicago Railways classification takes up in separate accounts the question of damages and legal expenses incident thereto. The ordinance under which the company operates provides that the company may set aside as a separate fund such percentage of the gross receipts as the board of supervising engineers shall deem to be sufficient to protect the company against all claims for injuries and damages. In accordance with this permission a charge is shown for a reserve account for damages and a reserve account for legal expenses on account of damages. The monthly report form of the comparative detailed statement of operating expenses shows the details of the charges against the reserve funds on account of damages and legal expenses resulting therefrom. The charges against the re-

CHICAGO RAILWAYS COMPANY
NON-PARTNERSHIP ACCOUNT

COMPARATIVE GENERAL BALANCE SHEET
AS OF _____ 190__

SHOWING INCREASE OR DECREASE IN ASSETS AND LIABILITIES AS COMPARED WITH PREVIOUS MONTH

ASSETS	AT CLOSE OF CURRENT MONTH	AT CLOSE OF PREVIOUS MONTH	INCREASE OR DECREASE
ROAD, EQUIPMENT AND FRANCHISES			
TREASURY STOCKS AND BONDS			
COLLATERAL BONDS			
CASH AND CASH ITEMS			
ACCOUNTS RECEIVABLE			
ADVANCED RENTS AND INSURANCE PREMIUMS			
INCOME FROM TREASURY SECURITIES ACCRUED			
TOTAL			
LIABILITIES			
CAPITAL STOCK			
FIRST MORTGAGE BONDS			
CONSOLIDATED MORTGAGE BONDS			
COLLATERAL AND FUNDING NOTES			
MORTGAGE AND EQUIPMENT NOTES			
CURRENT LIABILITIES			
INTEREST, TAXES AND SINKING FUND ACCRUED			
RESERVE FOR DAMAGES			
PROFIT AND LOSS			
TOTAL			

CORRECT

CHICAGO, ILLS _____ 190__

Chicago Railways Accounts—Comparative General Balance Sheet

one-way trip. Average miles each one-way trip. Average number of cars in use per day of 18 hours. Average miles per car per day of 18 hours. Average speed per car-hour. Another form is provided for the car-mile, car-hour and per revenue passenger and per total passenger figures of the following: Passenger earnings. Gross earnings from operation. Operating expenses. Net earnings from operation. Miscellaneous income. Gross income less expenses. Taxes accrued. Interest on plant value accrued. Total deductions. Net income. Similar statistics are given per mile of single track operated. In addition to provision for the usual statement of the percentage of gross earnings required for operating expenses, the percentage of the following is also to be worked out in accordance with one of the forms for statistical purposes: Renewals to gross earnings. Renewals to operating expenses. Taxes to gross income. Interest on

plant to gross income. Net income to gross income. Reserve for damages to gross income.

The following power statistics are to be given for the month of the current year with a comparison showing the increase or decrease from the corresponding month of the previous year: Kilowatt output in hours (all plants). Total rated kilowatt capacity (all plants). Load factor, 24 hours (all plants). Cost per kilowatt (all plants). Average kilowatt-hours per car per day (18 hours). Energy consumed per car per mile.

The numbers of men in the different departments and their wages in the month of the current year as compared with the same month of the previous year are to be shown.

The complete figures of the pay-roll expenses, except the general offices, the proportion charged to the capital and the balance included in expense are also shown. The percentage of the total operating expense required for the different class of employees, trainmen, car house, power house, maintenance of way, maintenance of equipment and miscellaneous are also illustrated. The statement of the changes in the reserve fund is shown in an accompanying illustration.

A form is also shown for a detailed statement of changes in the road and equipment accounts. This statement follows with slight changes the classification of construction expenditures approved by the association, but several additional accounts are provided. Account No. 4 of the association classification is entitled "track and roadway construction," but the corresponding charges in the Chicago Railways classification are to be divided into two accounts, D-1 track and D-2 paving. Account No. F in the Chicago Railways classification is entitled "real estate (land only)" and account K is "cars (revenue cars only)." In addition to the accounts recommended by the association, provision is made by the Chicago Railways Company for the following in the statement: Franchises. Tunnels. Bridges. Floating tools and supplies. Horses. Material in storerooms. Work in progress.

Another form provides for a detailed statement of charges for renewals included in the operating expenses during the month. Descriptions of the work on road and equipment are to be given together with the work order number, the charges in the current month and in prior months and the total charges.

The comparative general balance sheet under the partnership account shows the total of road and equipment in accordance with the city valuation, the changes, the cash and cash items (net) and the special deposits. These constitute the assets. The liabilities are the total of capital, comprising the prices at which the city may purchase the property under the ordinance of Feb. 11, 1907, the amounts of reserves for damages, etc., and any balance due the City of Chicago.

PROPOSED ELECTRIFICATION AT MELBOURNE

Charles H. Merz, consulting engineer of London, who is retained by the Victorian government to report on the proposed substitution of electric for steam traction on the suburban lines around Melbourne, as stated in the *STREET RAILWAY JOURNAL* for Dec. 7, 1907, has rendered his report to Thomas Tait, chairman of the Victorian Government Railways. The report states that electrification is desirable both for financial reasons and for public convenience. The equipment should be carried out in three sections, of which the first comprises 29 miles, the second 65 miles, and the third 124 miles of track. The entire cost would be £2,227,050. The expenses per train mile with electric traction are

estimated by Mr. Merz as 11*d.*, as against 18*d.* with steam. The total annual expenditure, including 4 per cent on the capital investment, would be more with electricity than with steam, but it is proposed with electricity to give an improved service, which should bring additional revenue.

Mr. Merz recommends the adoption of the multiple unit system, with an increase of 71 per cent in the train-mileage, but of only 21 per cent in the ton-mileage and an increase in speed which would reduce the number of cars required. He recommends the employment of 800 volts d.c., with a protected third rail and three-phase power distribution.

COMMUNICATION

VENTILATION PARTITIONS IN THE SUBWAY

NEW YORK, Sept. 18, 1908.

To the Editors:

In reference to the suggestion of a correspondent in your issue of Sept. 12 that steel shutters could be used instead of terra cotta for the proposed partition walls in the Interborough subway in New York, I beg to state that I recommended terra cotta for this purpose because it was cheap and could be installed quickly, owing to the construction of the columns now in place.

A great deal of drilling and fitting between columns would be necessitated in case a steel partition were used, and at best the partition could not be made as nearly airtight as a terra cotta or concrete partition. I have, however, no objection to any kind of partition, other than the one which I have recommended, being constructed, if it can be made practically tight and installed cheaper than the one which I have recommended. In this connection various kinds of composite materials suggest themselves, such as asbestos board, etc., any of which would be preferable to steel plate, for the reason that if used the noise would probably be less than if steel plate were adopted.

BION J. ARNOLD.

TRADE MARK OF CLEVELAND, PAINESVILLE & EASTERN

The Cleveland, Painesville & Eastern Railroad, of Willoughby, Ohio, has adopted a trade mark after receiving 186 competitive designs. The officials of the company



offered a prize of \$25 some time ago for an accepted design for a trade mark. Responses were received from the different towns on the line of the road and from many other places, including Boston, Hartford, New York City, Philadelphia, Pittsburg, Cincinnati, St. Louis, Chicago, St. Paul and Madison, Wis. From the various designs submitted the judges, who were editors of various papers in places reached by the railroad, selected three. When they had gone this far the judges asked four officials of the company to assist in the final decision. The judges and these four officials then decided to cast a ballot to see how near their opinions agreed regarding the most desirable one of the three drawings. Each of the seven voted for the design which is illustrated herewith, and this was accepted by the judges. This design was made by Dr. Frank A. Green, of Geneva, Ohio. The advertisement offering the prize said that either the full name of the company or the initials could be used as the basis for a design, but most of the contestants used only the initials, C., P. and E. The foregoing information has been received from E. L. Schmock, assistant secretary of the company.

PHILADELPHIA'S PAY-WITHIN CAR

On Sunday, Sept. 27, the Philadelphia Rapid Transit Company will place in service on its Twelfth and Sixteenth Street lines 50 single-end cars, which had been remodeled for fare prepayment operation, partly in the shops of the railway and partly in those of the J. G. Brill Company. The design of these cars has been worked out by the

the company to introduce radical improvements in ventilation and heating the car body.

FARE COLLECTION

Fig. 1 is a view of one of the first "pay-within" cars built, and shows how passengers enter at the rear and leave at the front end of the car. The passenger may leave at the rear also, but is not allowed to board the car by way of the motorman's platform. From Fig. 2, illustrating the rear

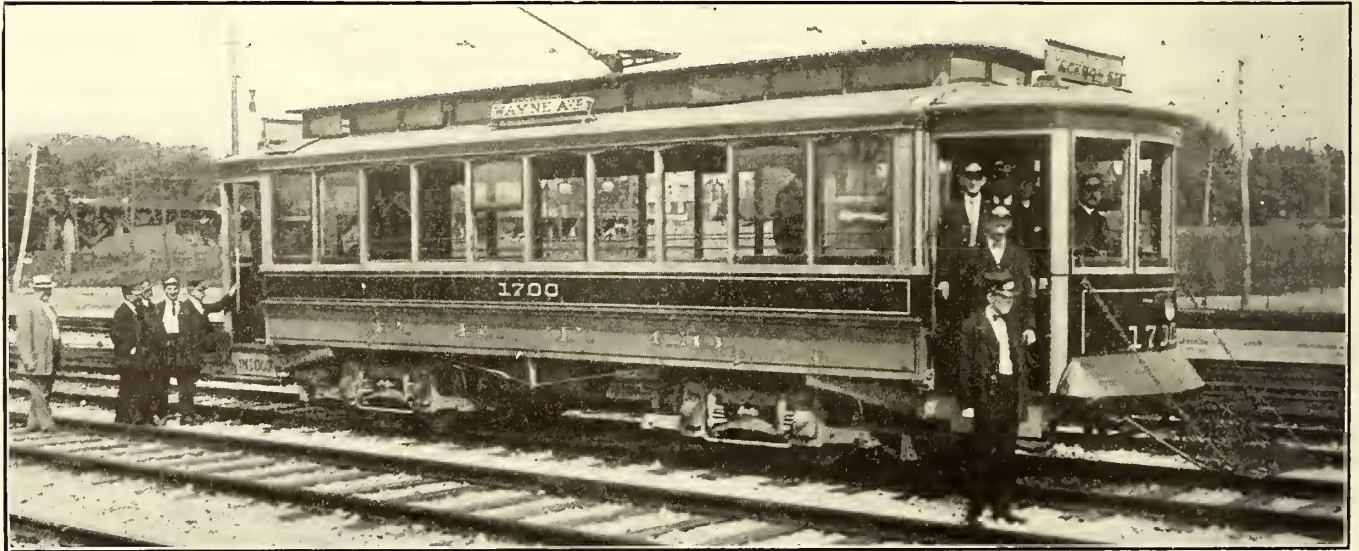


Fig. 1—Philadelphia's Pay-Within Car, Illustrating Passenger Movement in Entering the Car at the Rear Platform and Departing from the Front Platform

management of the Philadelphia company, which has given this type the name of the "pay-within" car, because the conductor stands inside to collect the fare as the passenger enters the car body, instead of taking the money on the

platform, it will be noted that on boarding a car the passenger is faced by the conductor, who stands 10 in. above the platform level, directly behind the short platform railing,

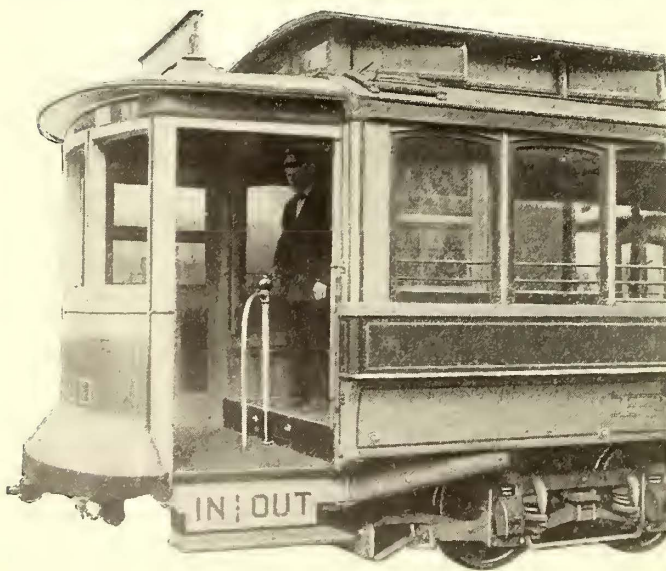


Fig. 2—Philadelphia's Pay-Within Car—Conductor Standing Inside of the Car Behind the Dividing Rail

platform. The variations from the standard pay-as-you-enter car consist principally in a different door arrangement, which has enabled the company to change over existing cars without lengthening or otherwise materially altering the platforms, and the addition of a pneumatically-operated platform gate or door, which completely prevents passengers from boarding the car when the door is closed. The form of car design adopted has also permitted

platform, it will be noted that on boarding a car the passenger is faced by the conductor, who stands 10 in. above the platform level, directly behind the short platform railing,



Fig. 3—Philadelphia's Pay-Within Car. Front Platform with Door Opened by Motorman for Alighting Passengers

movement of passengers. It also shows the normal position of the conductor.

When the passenger reaches the conductor, he pays his fare in the usual hand-to-hand manner and enters the car proper. The conductor immediately registers the fare on the register over his head, and which is operated by a short hand strap. The signal cords are also within the convenient reach of the conductor.

which, with the words "in" and "out" on the step, serves as a guide for the movement of incoming and outgoing passengers. Passengers are not allowed to stand on the rear platform, except during times of very heavy business. This avoids the necessity of a long railing. Fig. 2 also shows that the door and bulkheads at the rear of the car body are removed and the longitudinal seating at the entrance has been tapered to insure the freedom of

SLIDING DOOR AND FOLDING STEP

A very important feature of the car from the standpoint of reduction of accidents is the pneumatic mechanism for closing the side door and at the same time folding the step. This mechanism is operated by the conductor from a small handle at the top of the dividing rail. As the door closes the step rises, and finally assumes a vertical position, completely filling the space between the bottom of the door and

represents the car running with both doors closed, while Fig. 3 illustrates the motorman's platform when the door is opened for exit.

VENTILATION AND HEATING

The removal of the door in the front end of the car has permitted the installation in the front bulkheads of drop sash, and since the sash in both vestibules can also be lowered, as well as the lower half of the side windows, the



Fig. 5—Philadelphia's Pay-Within Car. Appearance of the Car When Running, Showing Both Doors Closed and the Steps Raised

the platform. As there are no outside grab handles, it is practically impossible for anybody to board a moving car. The mechanism is arranged so that it will not close if a person is standing on the step. The final movement of the door is slow, so that the arm or foot of a passenger will not

maximum summer comfort possible in a closed car is attained. In spite of the fact that the car is thus open from front vestibule to rear vestibule, it is thought that the cars will be easier to heat in winter than the old type, because they are completely closed while running. Moreover, the

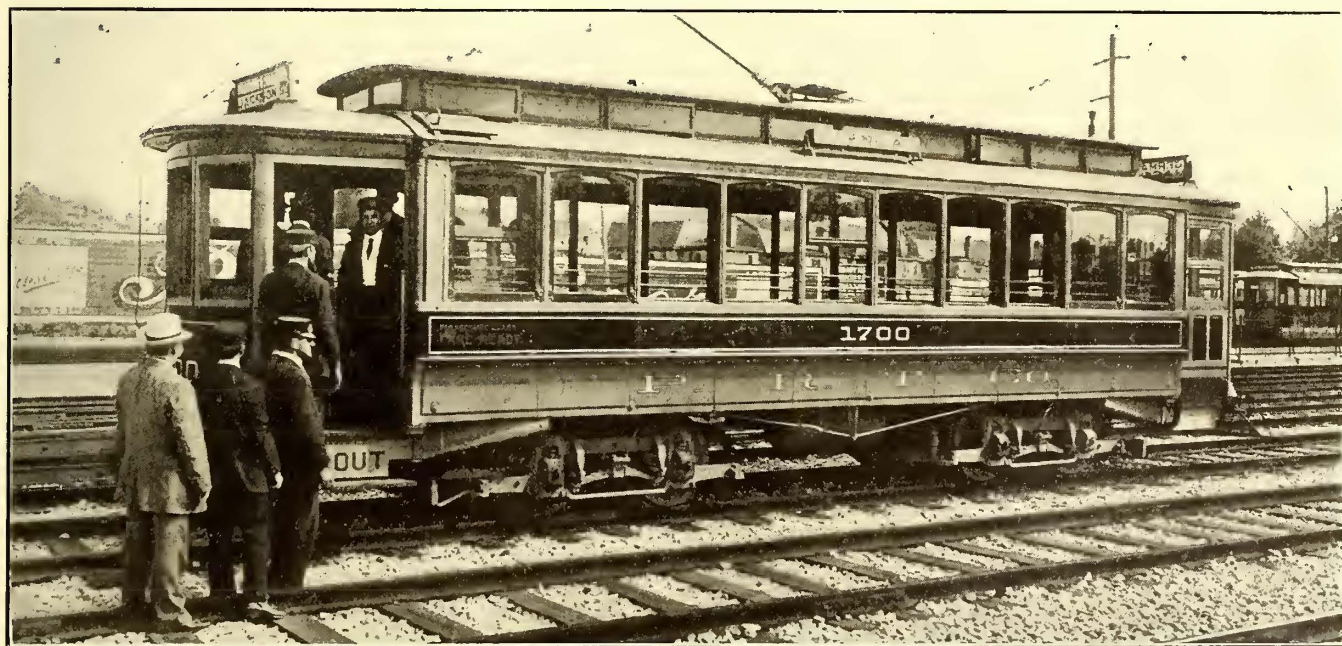


Fig. 4—Philadelphia's Pay-Within Car, Illustrating In and Out Passenger Movement on the Rear Platform, While the Front Platform Remains Closed and the Step Up

be crushed against the jamb of the vestibule if in the way of the closing door. When the car stops, a movement of the handle in the opposite direction serves to open the door and lower the step. The door of the front platform is operated in a similar manner by the motorman. Fig. 4 illustrates how the conductor controls the movement of passengers entering and leaving the car at the rear platform, while the door on the front platform is closed. Fig. 5

door movement is under complete control of the trainmen, while in the ordinary car the doors are often open longer than necessary because of the passenger's neglect to close them. The conductor and motorman are also benefited by the elimination of cold, open vestibules, and they are at all times subjected to less annoyance from crowding passengers.

As will be seen from the accompanying plan, Fig. 6, the

over-all width of the conductor's platform is 7 ft. 1½ in., and the length at the step 3 ft. 3½ in. As the short railing can hardly be considered a barrier, both incoming and outgoing passengers have a clearance of 3 ft. 6¾ in. at the end of the car and of 1 ft. 7¾ in. at the step. The platform is practically unobstructed, as there is no fare box,

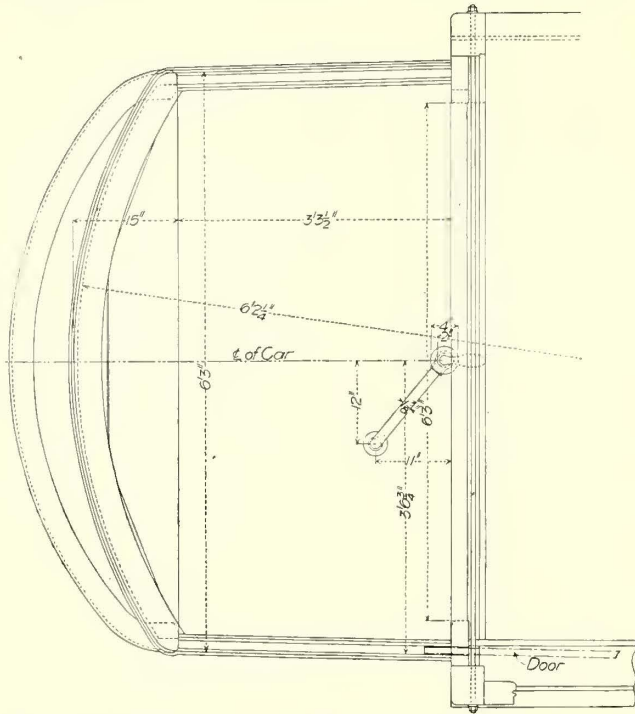


Fig. 6—Philadelphia's Pay-Within Car—Dimensional Plan of Conductor's Platform

and the door and step-operating lever is small enough to be covered by a man's hand.

The engineers of the Philadelphia Rapid Transit Company lay great stress on the feature that the changes described have been made in existing cars without increasing their weight or length, or changing the length of the platform. The details of conversion must depend, of course, on the design of the original cars, but the ultimate result is a car of the same outside dimensions and platform dimensions as before, but with sliding platform doors instead of inside bulkhead doors. If desired, the bulkheads at the front end of the car could also be removed, and a platform railing provided to keep passengers from interfering with the motorman. This would be the plan followed on a double-ended car.

As the first cars changed over in Philadelphia are of the single-end type, blind doors have been installed in the vestibule on the opposite side from the entrance. During the

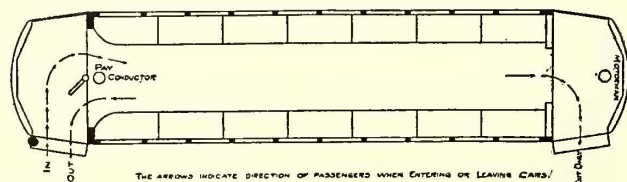


Fig. 7—Philadelphia's Pay-Within Car—General Plan, Showing Seating and Passenger Movement

summer these doors will carry brass screens in place of stationary sash, the change from one to the other being the only work necessary to make this an all-year car.

The mechanism installed for the simultaneous operation of the doors and steps was especially designed for these cars by the Burdett-Rowntree Manufacturing Company, of

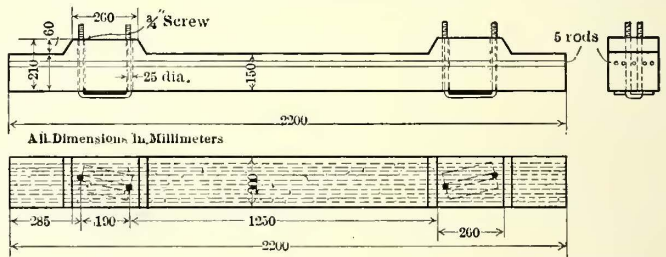
Chicago. It requires about ⅓ cu. ft. of free air for every complete operation, and receives its power through a tap from the air-brake compressor.

OPERATION OF THE "PAY-WITHIN" CAR

Before placing the "pay-within" cars in service the Philadelphia management issued a 16-page (3½ in. x 6 in.) illustrated booklet, covering special instructions to trainmen. The views in this publication are similar to those accompanying this article. The text concerns itself with the methods of operation. Particular attention is given to the accident and schedule question, the rules pointing out how much easier it will be for the trainmen to prevent injury to passengers, reduce overcrowding and cut down the running time through the use of the sliding door and folding step. The public has been informed about these cars through the medium of the daily press and an illustrated pamphlet distributed on the lines affected. Further instruction is provided by the words "Please have exact fare ready," which are painted on the end panels of the car, and by a large sign across the middle of the car to "Leave by the front door."

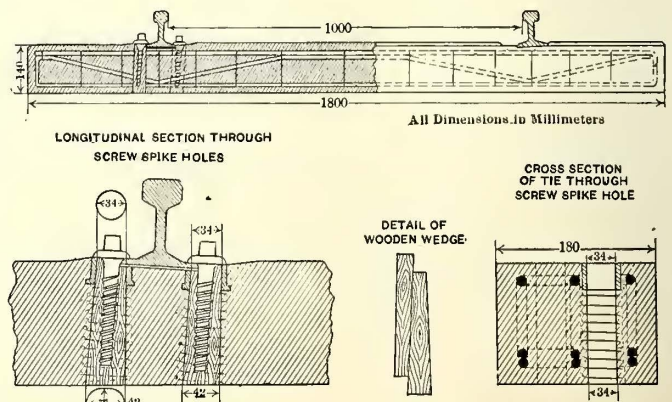
CONCRETE TIES FOR ELECTRIC RAILWAYS IN EUROPE

C. de Burlet, general manager of the Société Nationale des Chemins de fer vicinaux, of Belgium, presented a paper at the Munich convention of the International Street & Interurban Railway Association, Sept. 7-10, in which he discussed track construction and described the experiments



Reinforced Concrete Tie Used by the Hamburg Tramway Company

now being conducted abroad with concrete ties for electric railway tracks. Two companies have adopted his form of tie, the Strasseneisenbahngesellschaft, of Hamburg, the principal street railway in that city, and the Voiron & St.



Reinforced Concrete Tie Used by the Voiron & St. Beron Railway

Béron Railway. Diagrams of both of these ties are presented herewith.

The Hamburg tie, which is laid in a track with standard gage, weighs about 140 kg (308 lb.), and costs 7.50 fr., or \$1.50. It is one-third cement and two-thirds sand. The ties have been in use since 1906 and are considered superior to

either wood or steel ties. Their weight gives a substantial foundation to the track. The attachments have proved durable and the life of the ties is estimated as longer than that of wooden ties. The reinforcements consist of five iron rods, 16 mm (5/8 in.) in diameter, laid in a horizontal plane in the upper part of the tie. The surface of the tie is elevated at the places where the rail rests to facilitate paving, and the rail is held to the tie by a U-shaped bolt, 25 mm (1 in.) in diameter.

The tie of the Voiron & St. Béron Railway is of the Gilland type, and 400 have been used since 1903. Their composition is as follows: 40 liters (2400 cu. in.) of sand, 33 kg (72.6 lb.) of cement, 8.4 kg (18.5 lb.) of iron and 12 liters (12.7 qt.) of water. The weight of the tie is about 105 kg (231 lb.), and the tie costs 5 fr., or \$1. The company reports that the ties seem to be giving good satisfaction and have every indication of a long life. As shown in the drawing, the reinforcement is more complete than with the Hamburg tie and consists of three iron rods, which are carried through the upper and lower part of the tie and are then bent back and forth to act as braces. The attachment of the rail is secured by screw spikes, which are set into wooden plugs, which fit in conical holes in the tie. The screw hole is reinforced by a spirally wound wire and the top of the hole is protected by a metal socket. The rail rests on the tie plate.

In discussing the subject of ties, Mr. de Burlet states that most of the European steam and electric interurban railways are using wooden ties, generally pine or oak. With few exceptions the ties are impregnated, especially the pine. The life of the ties is increased thereby at least 100 per cent for pine and 50 per cent for oak, at relatively small expense. The impregnating material generally used is either mineral oil or chloride of zinc. A few companies are using metal ties and report satisfaction, but the life of metal ties is yet indeterminate and they are probably more expensive than wooden ties, except under special conditions. The two trials of concrete ties mentioned above are interesting, but have not been conducted long enough yet to warrant any definite conclusions.

DECISION ON TWO-CENT RATE LAW IN PENNSYLVANIA

A note referring to the decision of Judge Fuller, of the Court of Common Pleas of Luzerne County, Pennsylvania, sitting in equity, restraining the County of Luzerne from enforcing the 2-cent rate law in the case of the Wilkes-Barre & Hazelton Railway Company, was published in the ELECTRIC RAILWAY JOURNAL of Sept. 12. The text of the decision is now obtainable and is given in abstract herewith.

The Wilkes-Barre & Hazelton Railway Company was organized under the general railroad law of Pennsylvania and is a third-rail line, 30 miles in length. During 1907 the company's earnings were as follows:

Passenger income	\$130,876
Freight, express, baggage and mail.....	8,721
Sale of power generated at power house.....	42,016
Rent arising from corporate property.....	592
<hr/>	
Total	\$182,206
Operating expenses	86,051
<hr/>	
Gross income, less operating expenses.....	\$96,155
Interest on funded and unfunded debt.....	75,296
<hr/>	
Net profit for the year.....	\$20,858

Up to about Oct. 1 the cars entered Wilkes-Barre over

the lines of the Wilkes-Barre & Wyoming Valley Traction Company. Since that time the company has had its own terminal in the business center of Wilkes-Barre. Beginning also with Oct. 1, the company has complied with the 2-cent fare law of the State. The fares previously charged were at the rate of 3 cents per mile for single tickets, 2½ cents per mile for excursion tickets and 1000 mileage books were sold at the rate of 2 cents per mile. At least 90 per cent of the passenger receipts were in excess of 2 cents per mile.

Judge Fuller, in his opinion, stated that it was conceded that all of the capital stock of \$1,500,000 was not fully paid in cash, but that the actual cost to the corporators over the funded debt of \$762,521. He continued:

It does not appear what portion of this sum could be distinctively accredited to the investment in the passenger business, but a fair approximate apportionment would be determined by the passenger percentage of gross receipts, or 71 per cent.

If the old rate had been maintained throughout the gross receipts from the same kind and volume of passenger business during that year would have been \$138,273, upon which the net profit to the stockholders, after deduction of interest on bonds, would have been about 2.96 per cent on the investment of \$762,512 and about 4.18 per cent on the apportioned investment of \$540,000.

If the new rate had been maintained throughout the gross receipts from the same kind and volume of passenger business during that year would have been \$110,841, upon which no profit whatever would have accrued and perhaps even a deficit would have resulted. From these figures the conclusion seems natural that the plaintiff's passenger income is injuriously diminished by the reduction in fare; but inasmuch as this conclusion is really predicated upon assumption without positive proof that the kind and volume of passenger business were not affected by the change, we should consider the assumption further in light of other testimony.

During January, February, March, May and June of 1908, the gross passenger receipts increased \$3,385.92 over the gross passenger receipts in corresponding months of 1907, and the defendant attributes this increase to the reduction in fare, while the plaintiff attributes it to terminal improvements and other causes. No doubt the inducement of lower fare would tempt travel to some extent and increase somewhat the number of passengers, but it is impossible to believe that so small a reduction on so small a road could have caused in that respect any substantial increase. It is more natural to attribute the increase chiefly to other causes.

The controlling question of fact is, whether taking the plaintiff's property as it stands to-day, with a completed road and a terminal depot, and under all the present conditions, a maximum rate of 2 cents per mile materially diminishes the passenger income below the amount which would be derived on rates charged prior to the reduction.

From the figures in the case, as well as from inherent probability, we feel bound to answer this question in the affirmative, and to say that the enforcement of the act directly tends to diminish and does, in fact, diminish a substantial amount the income derived to the corporators from the passenger business, which with rates prevailing before the act took effect was less than 6 per cent on the investment.

It follows as a necessary conclusion of law that the enforcement of this act against the plaintiff at the present time would be injurious to the corporators and should be enjoined.

Judge Fuller also draws a distinction between unconstitutionality and unenforceability. He says that, while the 2-cent fare act "should not be declared unconstitutional and void, the plaintiff has established its right on constitutional grounds to be absolved from observance at the present time."

As a result of this decision, the county has decided not to appeal the case, and the company on Sept. 21 re-established the rates in vogue prior to Oct. 1, 1907.

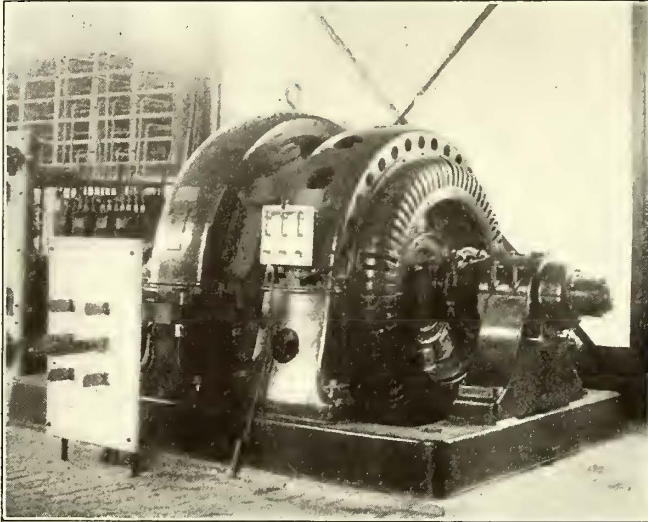
THE SAN ANSELMO SUBSTATION OF THE NORTHWESTERN PACIFIC RAILROAD COMPANY

The Northwestern Pacific Railroad Company contemplates the extension, a distance of 20 miles, of the third-rail system of the North Shore Railway Company, which now forms a part of the Northwestern Pacific Railroad Company and is operated in connection with the latter com-

pany's steam lines. The increased needs of the service covered by this extension required an extension of the San Anselmo substation.

The present electric traction system of the Northwestern direct current at 500-600 volts, but the Point Reyes extension will be a 1200-volt system, and provision has been made so that by proper combination of motor units trains may be run on either the 600 or 1200-volt service.

The new substation installation consists of two 500-kw revolving field, synchronous motor-generator sets, excited by a 30-kw induction motor-generator set, switchboard equipment for these machines, and three 500-kw 54,000-



San Anselmo Substation—500 kw Synchronous Motor-Generator Set

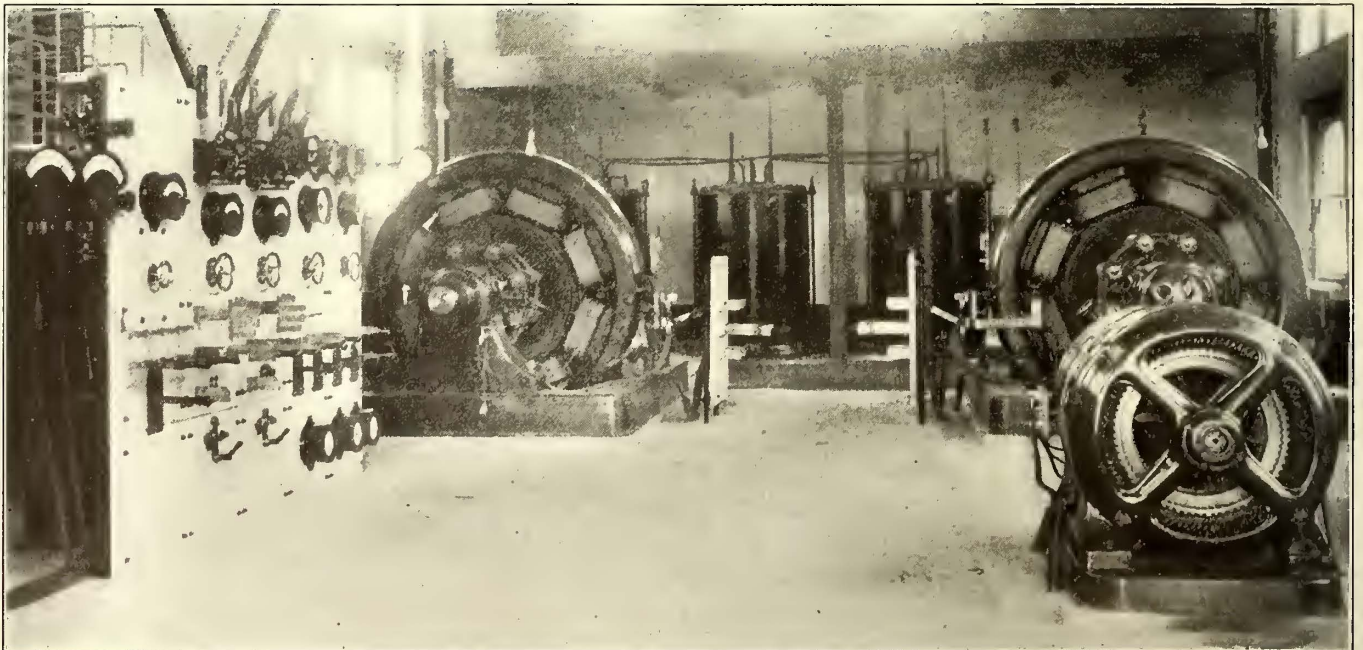
500-kw revolving field, synchronous motor-generator sets, excited by a 30-kw induction motor-generator set, switchboard equipment for these machines, and three 500-kw 54,000-



San Anselmo Substation—Oil-Cooled, Shell Type Transformers

volt oil insulated water-cooled lowering transformers.

An interesting departure from ordinary practice is the method of excitation adopted. The exciter set generates at 600 volts and the synchronous motor fields are likewise



San Anselmo Substation—Switchboard, Motor-Generators, Exciters and Transformers

Pacific Railroad Company starts at Sausalito, on San Francisco Bay, with termini at Mill Valley, Fairfax and San Rafael, the longest single run being 13 miles. Current is supplied from the company's own power house at Alto or taken from the long-distance transmission circuits of the California Gas & Electric Corporation, operating at a potential of 54,000 volts, 3 phase, 60 cycles. The present equipment of the road is operated on power converted to

wound for the same potential, so that exciting current may be taken in emergency cases from the "third rail."

The motor-generator exciter is of the two-bearing type, the induction motor operating at 850 r.p.m. at 2200 volts and being started in the usual manner. This single exciter supplies field current for both the motor generator sets.

It will be noted that while the combined normal capacity of the motor-generator sets is 1000 kw, 1500 kw capacity

has been supplied in lowering transformers. This is to provide for two additional motor-generator sets when the Point Reyes extension is built. These later sets will have the same characteristics as the present 500-kw sets and will operate two in series, thus delivering to that portion of the system intended 1200 volts. The switching equipment is such that any two machines may be operated in series, and with this end in view special insulation in the windings has been provided.

The motor-generator sets consist of a 500-kw direct-current generator with synchronous motor, having common base, shaft and two bearings, making a compact unit occupying a minimum floor space. The synchronous speed of the unit is 600 r.p.m., and it is started from the direct-current end in the usual manner by graduated insertion of armature resistance, the starting current being taken through the third rail from the Alto plant.

The synchronous motor is wound for 2200 volts, 3 phase, 60 cycles, and is of sufficient capacity to drive its generator at 50 per cent overload for at least two hours, with a rise in temperature of the windings of not exceeding 55 deg. C. above the temperature of the surrounding atmosphere referred to 25 deg. C. The pole pieces are easily removable, allowing convenient access to the stator windings. The generators are of the eight-pole class, wound for 600 volts at full load and compounded for 550 volts at no load.

The 500-kva transformers are wound for 54,000 volts, with taps for 36,000 and 45,000 volts. They are operated star connected with the neutral grounded. The secondary potential is 2200 volts, delta connected. They are of the shell type construction, with coils mounted in vertical position, insuring good circulation of oil through liberal ducts between coils. The windings are in thin coils, one turn per layer, giving a maximum surface exposed to the cooling effect of the circulating oil and effecting a minimum voltage between layers. The cases are cylindrically constructed of boiler iron, riveted and caulked. The insulation test was rigorous, consisting of applying 110,000 volts between high voltage and low voltage coils and case, and operating the transformers at twice normal voltage, or 108,000 volts, for 20 minutes.

All of the apparatus was manufactured by Allis-Chalmers Company and is of its latest design.

TORQUE WITH MOTORS IN MULTIPLE AND IN SERIES

BY C. GEORGE

In clearing up a wreck or pulling a derailed car back on the track, it often happens that the line drop is so great that, even when the motors of the car doing the pulling are in series, with all the resistance cut out, they do not exert sufficient torque either to move the car or to spin the wheels. The natural conclusion then is that a greater pull will be obtained by throwing the motors in multiple. When this is done the voltage drops, as may be observed by the dimming of the lamps, and the inference is that an increased torque has been obtained. A close observer, however, will often notice that the truck springs ease up as though the pull of the motors had been decreased. This is especially the case on those portions of the system farthest from the power house. The reason becomes apparent by a consideration of the resistances of the line and of the motors.

For a concrete example: Assume a two-motor equipment at some point on the line where the total resistance of track return and trolley and feeder system is 2 ohms. The

voltage at the generating station may be taken as 550 volts. If the motors are of 30 hp to 40 hp their resistance may be assumed as 1 ohm each. When in the series position, the total resistance of the complete circuit is 4 ohms and a maximum current of 137 amp will be obtained. When the motors are thrown in full multiple, the resistance of the circuit is that of the trolley and ground return plus one-half that of one of the motors, or it is 2½ ohms. The total current obtained then is 175 amp, one-half of this or 87½ amp passing through each motor. In the series position each motor received the total current, 137 amp. By throwing the motors in multiple, the torque is then reduced in the proportion of 137 to 87½. The rather anomalous statement that, although more current is flowing in the line, less power is exerted by the motors, is explained by the fact that the line losses are greater in the latter case.

Near the power house, however, it would usually be advantageous to throw to the multiple position. If the same reasoning be followed with an assumed line resistance of ½ ohm, the results are very different. In such a case, with motor resistances as in the previous example, the current through the line, when the motors are in series, is 220 amp, and when in multiple 550 amp, or more than twice as much, so that the torque is increased.

From the two examples given, it is seen that the resistance of the line is the factor deciding whether or not it is advantageous to throw the motors to the multiple position to obtain the greatest torque. For a two-motor equipment it may be shown mathematically that when the line resistance is greater than that of one of the motors the torque is decreased in the multiple position, and when less the torque is increased.

Let X equal line resistance and Y that of a motor. Remembering Ohm's law that $\text{Current} = \frac{\text{Voltage}}{\text{Resistance}}$ we have

for the series position $\text{Series Current} = \frac{\text{Voltage}}{X + 2Y}$. In

multiple, $\text{Multiple Current} = \frac{\text{Voltage}}{X + \frac{1}{2}Y}$

To have equal pulling effect, multiple current must be twice that of series, or $2 \frac{\text{Voltage}}{X + 2Y} = \frac{\text{Voltage}}{X + \frac{1}{2}Y}$.

The term "voltage" cancels showing that the effect is independent of this. The equation is easily reduced to $X = Y$, which shows that for the condition given, the line resistance must equal that of a motor. In a four-motor equipment two motors in parallel replace each of the motors of a two-motor equipment. The resistance of this parallel unit must then be greater than that of the line in order that more torque be obtained with the motors in multiple. In other words, the resistance of each motor must be greater than twice that of the line.

At first thought it might appear that the operation of other cars between the power house and the car under consideration might influence the results. This, however, is not true, as the voltage drop in the line produced by the current to each individual car is independent of any other current consumption. Other cars on the line lower the voltage, it is true, but this in effect is the same as lowering the switchboard voltage. It has been previously shown, however, that the station potential has no effect on the results.

The Spokane & Inland Empire Railroad, of Spokane, Wash., has opened its extension to Moscow. The entire line is 15 miles in length.

THE BENEFITS OF THE INDEX BUREAU*

BY ELLIS C. CARPENTER, CLAIM ADJUSTER, INDIANA UNION TRACTION COMPANY

For many years electric lines, steam roads, casualty companies and various other corporations have been victimized by unscrupulous persons who, in one way or another, would make claims for injuries alleged to have been received under circumstances that would seem to make it desirable to secure an adjustment. At times just enough information would reach the company to lend color to the claimant's statements; at other times the claim would be based upon a fabrication, the claimant taking chances of forcing some settlement by a bluff. The fact that no report of the case was on file and the inability of securing information regarding the claim with which to defend it successfully, made an adjustment seem advisable, the result being that many cases were adjusted when settlement could be made by the payment of a sum that would be partially commensurate with the claimant's alleged injuries.

If the first effort failed and the cash was not forthcoming, some claimants would go further and join interests with some equally disreputable attorney, who would put the allegations of the claimant in such form of legal complaint as to state a cause of action which, under the law, would make the defendant liable in damages. Should the defendant still contest the case, it then became necessary for the claimant to be reinforced by some evidence sustaining his position. This involved bringing in at least two classes of witnesses: First, those who would corroborate the claimant's story as to how the injury was received, and, second, medical testimony as to the nature and severity of the injuries. Herein the old saying, "Birds of a feather flock together," is well illustrated, for the claimant's attorney usually had a list of persons upon whom he could depend, including some alleged doctors, who for a part of the "plunder" would testify to a condition that would be bad enough in the eyes of the jury, where possibly there had been impaneled 10 honest men and one or two rogues. The latter, being in league with the claimant's attorney, would see that the verdict provided for sufficient damages to compensate fully the claimant, his attorney, doctor and others in interest. It is difficult for honest men to believe that such conditions prevail, but when they have been shown to exist not only in one, but in many, cases, it behooves all of us to be watchful.

The larger cities and more densely populated communities are more likely to produce this class of claimants, as the chances of detection are greatly reduced. It is a fact that not many years ago a man, formerly an acrobat, who could readily dislocate his shoulder, was struck one day by a street car and when picked up was found to have a dislocated shoulder. A claim adjuster soon had the matter settled for a few dollars, but the acrobat was not long in separating himself from his cash; he managed to get hit by another car, with the same result—a dislocation of the shoulder followed by a claim adjuster and cash. This being so easy, he formed a combination with some friends. He was to be hit by a car and insist upon being taken to his room; there a physician would reduce the dislocated shoulder. After the doctor left a confederate would take the place in bed and await the adjuster. This form of accident occurred so frequently that suspicions were aroused, and observations taken, with the result that at one time six persons, all confederates of the acrobat, were found in bed with the same complaint. It was not long until they had ample time to meditate over the matter in the penitentiary.

The ingenuity of the fakir is at times remarkable. Here in Indianapolis in one case two men were on a car; after alighting as the car started, one was found to have a dislocated ankle. Proper attention was rendered, the physician reduced the dislocation and it was not long before the two men appeared at the adjuster's office for a settlement. The adjuster's suspicions were aroused and the men were requested to call the next day. They did so, and one man walked with crutches, apparently suffering greatly. The adjuster was too busy to see the men at that time and they were asked to call the following day; out they went,

hobbling along for a few blocks until they reached a convenient alley, where the crutches were discarded and both walked off as well as any one. A policeman placed both men under arrest and they were soon serving time in Michigan City. These, however, are the exceptional cases.

The persons that cause the most trouble are those who are more than willing to exaggerate their sufferings and injuries and, if not abetted by the attending physician, may mislead him, even though he may want to treat the patient honestly. It is seldom that you can get a doctor to state positively that a condition exists that is in conflict with the patient's statement.

Nearly every community has members of the legal profession who seem to believe in the theory that all corporations are legitimate prey and must contribute accordingly. Such attorneys have been classed as professional damage lawyers, ambulance chasers and the like. Some lawyers have attained so high a standing in their profession that it would seem to be improper for them to go about personally and solicit business, yet their names are to be found upon many damage complaints as attorneys for the plaintiffs, their partners usually being the understudies who go out and solicit the business, while the respectable attorneys do the heavy work by preparing the papers, indicating the lines of evidence and trying the cases. Many thousands of dollars have been filched from the treasuries of corporations in this way. Only recently an adjuster told me that his company had purchased two farms for one damage lawyer, and if the lawyer lived many years longer it might have to purchase another.

The condition, as you can see, is bad enough. Can we improve it?

With the idea of bettering conditions a plan has been devised for keeping a record of claimants and carried out by some companies in a very systematic way. The benefits of this plan became apparent and a private bureau was organized which sought to cover nearly all classes and kinds of claims. It has done much good. It was believed, however, that a better exchange of information could be made under a somewhat different plan and an Index Bureau was organized so as to put its members in close touch with specific information regarding claimants. After some study of the plan it seemed to fit conditions present in the territory covered by the Central Electric Railway Association and the plan was acted upon favorably at a previous meeting.

I am pleased to know that our secretary, within a few days, will provide the member companies with the proper blanks so that our records can be started; once started, the success of the bureau will depend upon the action of each company in making full reports of all claimants, according to request. How are we to be benefited by this plan?

Suppose the bureau to have been in existence a year or more. The circumstances regarding a claim presented to my company are not very clear, or for some reason my suspicions have been aroused. I fill out a little card and for 2 cents I get whatever information the secretary can furnish me, which means that if all the companies have sent in reports the secretary, as soon as a reply can be returned by mail, will inform me of all the companies with which my claimant has had dealings. I can then get detailed information as to the nature of the claim, injuries, amount paid, etc., directly from the companies.

The probabilities are that the claimant, upon first inquiry, will deny ever having made a previous claim against any company and will make affidavit to it. When he learns later that full information is in my hands his case may be disposed of easily. If he is stubborn and presses the matter in court he can be confronted with the facts, should he have had claims against others for the same or similar injuries; the names of his attorneys and physicians can be used with good effect.

We must not expect to get information about every one regarding whom we make inquiry and we may report hundreds of cases for a time where we will get information regarding one claimant. All claimants are not fakes or dishonest. Who knows just where or when to pick out the fakir? In order to catch the few we must report the many. Then, again, we must remember that each case we report does not cost us over 3 cents and that we can report 500 cases for \$15. If we get information of value about one claimant for each 500 reported, the probability is that the

*Abstract of paper read before the Central Electric Railway Association, Indianapolis, Ind., on Sept. 24, 1908.

information we receive about the one case will save us several hundred or even thousands of dollars.

Most of us have escaped thus far the fake claimant remarkably well, but we may as well prepare for the inevitable; he will turn up sooner or later, for he is the "bad penny." The fact that the territory of the Central Electric Railway Association is thoroughly organized will have a tendency to deter such claimants from operating here.

Who is there among us that can say that we have escaped the class that wilfully exaggerate conditions of injury and who is there who has not paid tribute to the unscrupulous attorney and doctor? If, by keeping an accurate record of claimants, attorneys and doctors, we can accumulate information that may be utilized in the adjustment and litigation of claims, we will have performed a valuable service for the members of this association.

RECENT DEVELOPMENTS OF LIGHTNING ARRESTERS*

BY D. B. RUSHMORE, GENERAL ELECTRIC COMPANY

Ordinarily a lightning discharge, which is an equalization of potential between the earth and either clouds or saturated atmosphere above the earth, will take place through the path of least resistance, but, as pointed out by Rowland, there is a certain factor somewhat resembling inertia which causes the lightning, once started, to follow sometimes an irregular path, similarly, for instance, as when a piece of paper is suddenly torn. Transmission lines and buildings of ordinary height surrounded by trees are not peculiarly subject to damage from lightning, because they cover a comparatively small portion of the earth and are surrounded by objects of greater height, which offer a better path for the lightning discharge to the earth. They do, however, receive some discharge, and the damage which might be done can be very great. It is, therefore, necessary to provide ample protection.

Generally speaking, the severe manifestations of lightning are confined to a relatively small area, which rarely exceeds in extent an area of about one square mile. It may be concluded from this that protective apparatus situated at certain points along the line will afford no protection to remote points.

Generally speaking, the broad requirements for lightning protection consist in supplying paths to ground for any charge which might accumulate on lines or machinery from any cause whatever. The ideal arrester will cause excessive potential differences to be relieved instantaneously and stop the flow of current, as soon as the potential has fallen to safe limits for the line. No one type of lightning arrester fulfills all requirements, and accordingly it is found expedient to use different types and combinations in different situations and under differing conditions.

For the protection of electric circuits, grounded guard wires are best, and when the cost over the whole system would prove prohibitive, they should be confined to such localities as are peculiarly liable to suffer destructive discharges. Three ground wires are required for the best practicable protection. One of these should be placed on top and in the middle of the line, and should be a heavy galvanized steel cable, and the other two, which should be heavy telegraph wires, are placed outside and above the top side conductors. The ground wires should be earthed at every pole for the first 10 or 12 poles from the building, and at every second pole on the rest of the line. Graded resistance or aluminum type lightning arresters should be installed on every feeder issuing from the station, and on primary and secondary of every transformer, and a surge protector in the station, but choke coils having a large number of turns should not be used in the station as they represent a possible source of danger.

Lightning may consist of a single discharge of great violence and very small duration, or it may consist of a great number of distinct discharges following each other rapidly and each lasting only a very short time. Thus the same path may serve for a great number of short discharges closely following each other. The total time of passage and

number of discharges have been determined by Alex. Larsen from photographic records made with a revolving camera. In an extreme case, 48 flashes were recorded in a total interval of .624 second.¹ This establishes the unsuitability of arresters depending upon moving parts for their operation. Such arresters might possibly leave the line unprotected during a minute interval of time, which might be of momentous magnitude in comparison with the very brief period of duration of a single lightning flash.

Where from internal causes, e. g., flashing over a bushing or insulator, the arcing ground sends a series of oscillations through the circuit, it is necessary to provide an arrester which will continue to discharge the abnormal voltage for a sufficient period to permit the operator to locate and isolate the trouble. Half an hour is generally found to suffice for the period of an arrester, as this will give time to discover the point of trouble, where this is remote from the station.

Horn arresters placed along the line at various places will do much to protect insulators from puncturing or arcing across. These horn arresters should be adjusted to arc at something below the wet arc-over voltage of the insulators, and should be connected to earth direct. Only one phase per pole should be protected by a horn arrester, so that in the event of two horns arcing simultaneously, the earth resistance can be utilized to limit the discharge. Ground wires should not be grounded at poles carrying horn arresters. Lightning rods above wooden poles are advantageous. Graded resistance multigap or aluminum arresters should be used on outgoing and incoming lines. Choke coils should be in the circuit just back of arresters, which, in turn, are placed quite near the passages and are provided with disconnecting switches.

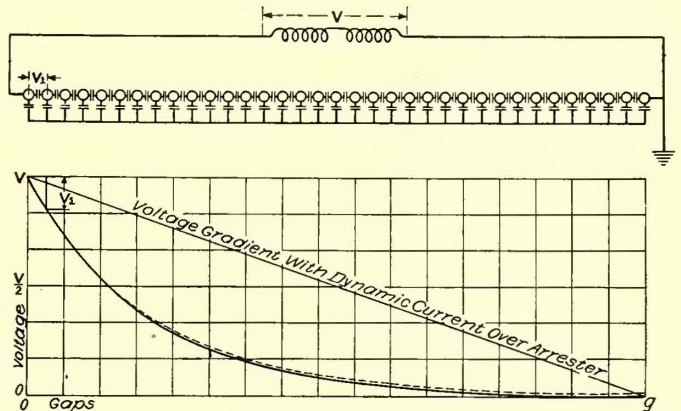


Fig. 1—Theoretical Voltage Gradient

Single-phase locomotives have a specially designed graded resistance multigap type of arrester, which meets the requirements of space limitation.

For voltages exceeding 60,000, the aluminum or electrolytic type of arrester should be recommended exclusively, and even for moderate and low voltages they are so far superior to other types that their ultimate selection reverts to a question only of initial cost. Aluminum cell arresters are designed especially to take care of recurrent or continuous discharges, which are, as a rule, of comparatively low frequency, and therefore travel over the entire system, so that even if the system is supplied with multigap arresters, it is advisable to install one or more aluminum cell arresters having low adjustment. This arrangement will prevent the other types of arresters from discharging continuously until they are injured.

The general theory of the multigap arrester² is as follows: When voltage is applied across a series of multigap cylinders, the voltage distribution is not uniform. The voltage distributes according to the capacity of the cylinders, both between themselves and also to ground, and the capacity of the cylinders to ground results in the concentration of voltage across the gaps nearest the line. Fig. 1 shows the theoretical voltage gradient along an arrester

¹Mr. E. E. F. Creighton has recently conducted a series of experiments in Colorado, in which he has determined the frequency and duration of the flashes in a large number of lightning discharges. *Proceedings A. I. E. E. Convention, 1908.*

²See also STREET RAILWAY JOURNAL for May 9, 1908.

*Abstract of paper presented at meeting of Central Electric Railway Association, Indianapolis, Sept. 24, 1908.

for a certain given case. When the voltage across the end gaps reaches a certain value, they arc across, passing the strain back to the other gaps, which in turn arc over until the spark has passed entirely across. The arrester in this manner arcs over at a voltage much lower than would be required if the voltage distributed evenly. When the arrester has arced over and current is flowing, the voltage then does distribute evenly between the gaps, and is for this reason too low to maintain an alternating-current arc. The arc, therefore, lasts only to the end of the half-cycle, and then goes out. The maximum voltage per gap at which the arc will extinguish at the end of the half-cycle depends to a great extent upon the metal of the cylinders. Thus some metals are more efficient than others in extinguishing the arc. When the voltage of an alternating-current arc passes through zero, of course no current flows. Before the current flows in the reverse direction the voltage must again break through the dielectric; the voltage required to do this depends upon how much the dielectric has been weakened by the passage of the arc. The cooler the arc, the less is the dielectric weakened and the higher will be the voltage required to reverse the arc. As the temperature of the arc depends upon the boiling point of the cathode metal, in very much the same way as the temperature of steam depends upon the boiling point of the water, metals with low boiling point are used for the lightning-arrester cylinders in order to keep down the arc temperature.

The use of resistance in a lightning arrester needs very careful consideration. Lightning does not readily pass through resistance, especially when in series with multigaps, and, therefore, series resistance should not be used. At the same time it is very desirable in some way to limit the line current. This problem has at last been solved by use of low shunt resistance, shunting a part of the gaps, and so proportioned as to divert the arc from the gaps after the discharge has crossed the ground. Shunt resistance has been used before, but never for this purpose, and was never made low enough to divert the arc in this way.

It is obvious, of course, that a discharge taking place through a high resistance will not relieve the line except in the case of the static. What happens, however, is something like this: When a surge of dangerous voltage rises, and before it reaches a danger point, the series gaps arc over. The series gaps then being practically short-circuited by the arc, the voltage concentrates across the

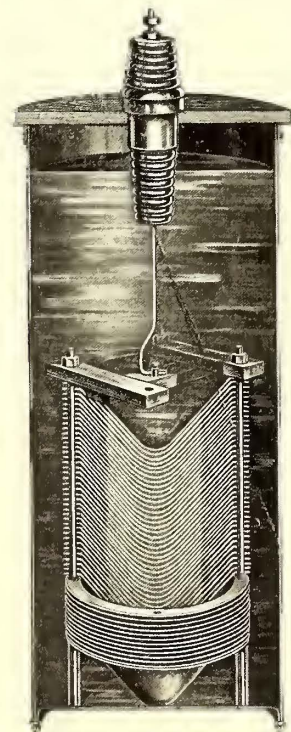


Fig. 2.—Multi-Gap Arrester

lowest division of the shunted gaps, and these at once also break down. The current is then limited by the medium resistance, and the voltage is concentrated across the second division of the arrester. If these gaps break down, the discharge is limited only by the low resistance, which should take care of most cases. If necessary, however, the voltage can "break back" in this way and cut out all resistance. The number of gaps to rectify depends largely upon the current that can flow. In this arrester the number of gaps discharging increases as the limiting resistance decreases. The arrester will, therefore, operate and extinguish the arc at the end of a half-cycle, no matter which path the current takes. A sectional view of the aluminum cell lightning arrester is shown in Fig. 2.

The annual report of the Belfast (Ireland) City Tramways for the year ended March 31, 1908, shows total receipts of \$943,191; operating expenses, \$583,119; gross profits, \$361,142. The total deductions from income were \$340,188, giving a net surplus of \$20,954. There was no deduction in 1908 for depreciation.

SUBURBAN ELECTRIC RAILWAY RETURN CIRCUITS*

BY E. G. HINDERT, FORMERLY CHIEF ENGINEER OF POWER, CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY COMPANY

This subject is of vital importance to every electric railroad. We seldom realize how large the losses on our return circuits are and therefore postpone vigorous action until a more convenient time because the repairs mean the expenditure of money and the manager naturally wishes to have a favorable balance sheet. If these losses attracted attention noisily like the escaping steam from a boiler blow-off or leaky steam joints, or occurred spasmodically like burned-out armatures, we should feel justified in spending an unlimited sum to repair or to remove the cause of the defects, yet the combined losses of those mentioned may not equal the losses in the track.

In the early days of electric railroading the return circuits were considered to be of minor importance. In some cases copper wire was laid between the rails and joined to the track at frequent intervals, but with heavier cars and longer circuits the cost of this became prohibitive, especially in view of the large carrying capacity of the rails. Track joints were electrically connected with pieces of trolley wire riveted into holes drilled in the rails at each end of the fish-plates. This work was left to the track department, which usually assigned it to the cheapest paid workmen on the road. They followed instructions as nearly as they were capable and mechanically they did a good job, but electrically the bonds had a very short life. I have known water piping to return 20 per cent and a new concrete pipe line 2000 ft. long to return 5 per cent of the total current. The longer the route taken by the electricity the higher the cost of power to run the car.

Bonds should be very flexible, easy to attach and not be liable to deterioration. The terminal should be made of one piece; that is, have no soldered or brazed joints between body and terminal. Bonds with welded terminals are very liable to break off where the flexible shank joins the terminal.

In switchboard work it has been found desirable to allow 100 amp per square inch of contact surface. The ordinary No. 0000 copper bond terminal has about 1 1/3 sq. in. of contact. This limits the carrying capacity of a good bond to not over 150 amp, or somewhat less than the carrying capacity of the copper itself. The splice bars if in good condition will carry from one-fifth to one-third of the total current. Therefore under normal conditions a No. 0000 bond and joint should not carry over 200 amp or 400 amp per single track. Very often a single track will have three or four large cars taking an aggregate of 600 amp to 1000 amp or three times the normal capacity of the joints. This is sure to have a bad effect on the life of bonds, for we usually find that when we run any kind of machinery at such large overloads the life of the machine is very short.

In brazed bonds the joint between the bond and the rail is formed by pressing the copper and iron into each other in a molten condition, giving a contact of very enduring and high conductivity and one not affected by moisture and changes in temperature.

I have often noticed that the first car in the morning had poor power, whereas the second could make schedule time easily. I attributed this to moisture creeping in on poor joints and oxidizing the contacts. The vibrations of the first car would wear off some of the oxidation of the joint and the rail so that the next car had less resistance in the return circuit.

The Peltier effect is a peculiar thermoelectric property of iron to copper contacts by which heat is generated when the current flows from the iron to the copper and the joint is cooled where the current flows from the copper to the iron. This effect is so small as to be negligible and practically I have found the opposite ends of the bond to be the warmer, showing that it is almost entirely a matter of contact. With soldered and brazed bonds on track carrying heavy currents a poor contact is often indicated in winter by melted snow around the terminal. A great many poor joints will melt in a day as much as 5 lb. of water,

*Abstract of paper presented at meeting of Central Electric Railway Association, Indianapolis, Sept. 24, 1908.

equivalent to an expenditure of 1 hp. I believe the average road wastes enough power through poor joint connections to run from 10 per cent to 20 per cent more cars.

Brazed bonds have been in use quite extensively for several years and have demonstrated their value. The bond is similar to the solder type and is usually applied to the ball of the rail. The process for putting on brazed bonds has been developed until it is the easiest, cheapest and most quickly applied bond now on the market. The equipment can be easily handled and removed from the track or run 40 m.p.h. with its own power if desired. In addition to the brazing outfit the car carries a copper welding outfit for putting on cross bonds and heavy cables.

The great enemy of good bonding is oxidation. This is aided by moisture, heat and cold. The slightest crevice is dangerous to the life of the bond. Soft soldered contacts underground in wet streets are not to be trusted though above ground they should be durable. Amalgamated steel surfaces are not durable and soon rust. Brazed joints seem to be free from trouble. The bonds are light and hard to remove and have therefore little temptation for thieves. If desired they can be painted with a mixture of oil, lamp-black and shellac to decrease their market value.

The efficiency of the return circuit depends entirely on how well the track is electrically bonded and how tight the splice bars are kept, and this again depends upon the quality of the roadbed. The life of the rails is limited by the life of the track joint. The condition of the track joints electrically and mechanically is therefore very important.

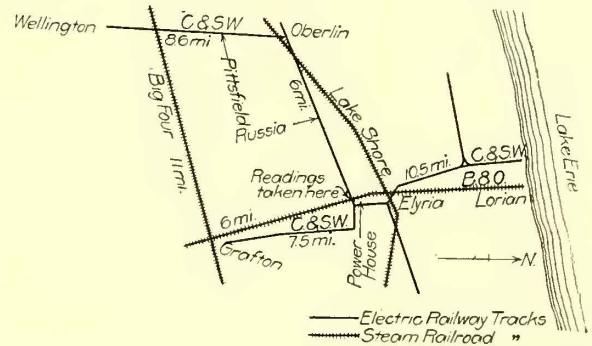
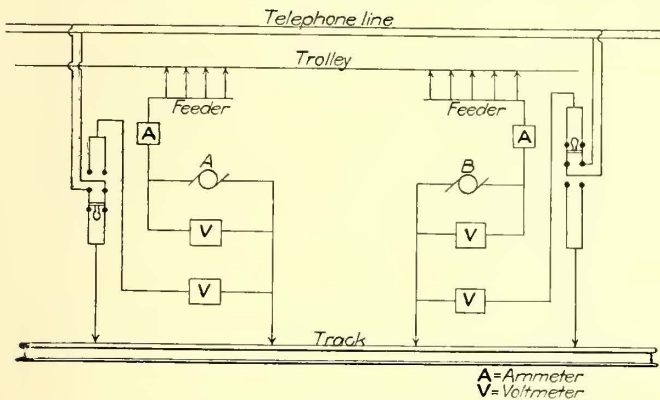
The life of the rail is also limited by the quality of the return circuits. Many managers may not realize that their

0.0000145 ohm per foot, while the other had 0.0000139 ohm per foot, a difference of 4 per cent. This gave a resistance of 0.0366 ohm per mile not considering the joint resistance. The joints increased the resistance to 0.0402 ohm per mile, or a ratio of 12 to 1. One joint without bond but the splice bars, rusty and bolted tight, had a resistance of 0.000108 ohm. One 300,000-circ. mil soldered bond reduced the resistance to 0.000065 ohm and two 300,000-circ. mil bonds reduced it to 0.000045 ohm. The measurements of the joint included 27 in. of rail.

The next day I again measured the joint and found the resistance to be 0.0000657 ohm. I removed the splice bars and found the resistance to be 0.000066 ohm. I removed the bonds and found that owing to the difficulty of applying two adjacent solder bonds I had a total contact surface equal only to that of one bond. Oxidation had taken place and raised the bond joint resistance to an equivalent of what one bond was the day before. On the same basis a 60-lb. rail has a resistance of 0.046 ohm per mile.

Authorities differ as to the proper ratio of resistance between steel and copper, but it is usually given as between 10 and 12 to 1, including the bonding. Roughly, the higher the percentage of carbon and manganese the higher the resistance, but to have a rail that will wear well and have minimum resistance the following proportions have been recommended:

	Per cent.
Carbon	0.55 to 0.58
Silicon	0.10 or under
Phosphorus	0.08 or under
Sulphur	0.06 or under
Manganese	0.83 or under



Electric Railway Return Circuits—Figs. 1 and 2. Diagram for Fall of Potential Method and Map of Lines Tested

rails are wearing out faster on the base than on the tread, due to the electrolytic action of the return current going through the earth to the power house. A single track represents about 25,000 sq. ft. of surface per mile, from which leakage may take place. The leakage is considerably increased by the presence of salts in the earth. The chlorides are most active. It is hard to estimate how much the practice of putting salt on curves and switches to melt snow and ice hastens this form of track depreciation. I have seen rails that had been in service eight or ten years with the base almost entirely eaten away while the tread was still in good condition.

The ohmic losses between the different substations of the power house can be measured by the fall of potential method (see Fig. 1). This test must be conducted at night when the current is off the line. In substation A the armature leads of the rotary should be bolted together and the shunt leads of the d.c. ammeter should be reversed. All feeder switches at A and B should be closed. The telephone at A should be connected across the line and that at B also across the line, but through the voltmeter. The rotary converter at B can then supply current through the circuit, while the telephone wires will serve to measure the voltage of the track between A and B. This method was described by me in the *Electric Traction Weekly* of March 19, 1908. The results of a test made on the Cleveland & Southwestern system were much better than I expected considering the condition of the bonding.

To check these results accurately I measured two lengths of 70-lb. rail and found that one gave a resistance of

Very frequently I found the track resistance very low, due to the track being wet or dry and cold, and also to the condition of the routes over which the current was returning.

In February, 1907, I made numerous tests of the track return between Wellington and Elyria. The following tests show the variations very strongly:

Distance, miles.	Feeder resistance, in ohms.		Track resistance, in ohms.		
	Measured.	Calculated.	Measured.	Calculated.	
Wellington to Elyria power house	15	1.99	1.782	.325	.69
Wellington to Elyria, dry and cold.....	15	2.02	....	.409	..
Wellington to Elyria, raining	15	1.95	....	.147	..
One mile from Wellington to Elyria power house..	14	1.35	1.334	.49	.644
Pittsfield to Elyria power house	10.25	.87	.784	.4302	.4715
Russia to Elyria power house	6	.522	.445	.4406	.276
Lorain to Elyria power house	10.5	1.16	1.11	.85	.483

The bonding between Wellington and Oberlin was very bad. One rail between the Oberlin and Elyria power house was also very bad and the other had solder bonds in fair condition. The accompanying chart showing the geographical location of the points will explain in a measure why the measured and calculated resistances do not agree, as apparently the nearer the power house the higher the measured track resistance.

At the first opportunity I measured the return current in the Baltimore & Ohio steam track near the power house.

and found that all the current that was going out on the feeder to the Wellington division was coming back over the Big Four steam road to Grafton and from there to Elyria on the Baltimore & Ohio. This current at times measured as much as 240 amp. Russia and Lorain were evidently not favored by a steam road track return, as their track resistance was very high. Measurements of the resistance of the return circuit on cold, dry nights showed about double the values obtained during rainy weather. The following are results of tests made during each autumn of the past three years:

Place.	Track losses			Track and feeder losses		
	1906, ohms.	1907, ohms.	1908, ohms.	1906, ohms.	1907, ohms.	1908, ohms.
Rockport to Brunswick.....	...	...	...	2.78	2.66	3.15
Brunswick to Chippewa Lake..	.365	.29	.46	2.03	1.93	2.15
Chippewa Lake to Madisonburg	.5	.3	.475	3	2.8	3
Birmingham to Norwalk.....	...	.182	.2	3	2.96	3.2
Elyria to Birmingham.....	.284	.324	....	2.11	2.25	2.36

During the summer of 1907 all the bonding except on the Birmingham-Norwalk division was repaired and noticeably lower resistances were obtained. The bonding depreciated considerably during 1908, as shown by the measurements.

I have tried several individual bond testers side by side. One built on the principle of a millivoltmeter gave a deflection of one division on the scale for 1/2 ft. variation in the length of rail when about 500 amp flowed in the rail. I then tested an adjoining rail with about 75 amp flowing in it and found that it required about 4 ft. of rail to give the same deflection. I adopted the R. C. Conant instrument built on the telephone receiver principle because of its higher sensitiveness, which is very important when testing between two substations with but little or no current in the rails. If there is no operating current on the line I use a water rheostat with about 75 amp. Quite often we would find an open joint and no current in one rail. The following are the results of some individual joint tests made on the Cleveland, Southwestern & Columbus Railway:

Division.	Year.	Style of bond.	Age.	Number of joints tested.	Per cent of defective joints.
Oberlin Wellington....	1902	Crown	3	2,600	25
Oberlin Wellington....	1908	Brazed	1	2,427	1.45 off 1.45 broken
Oberlin Norwalk.....	1902	Crown	1	2,450	.5
Oberlin Norwalk.....	1907	Crown	6	1,300	1.2
Oberlin Norwalk.....	1908	Crown	7	350	20
Oberlin Norwalk.....	1908	Solder	1	60	43
Oberlin Elyria.....	1907	Repairs	1	850	1 broken
Elyria Grafton.....	1902	Crown	2	1,500	33
Elyria Cleveland.....	1903	Solder	1	3,200	6
Elyria Cleveland.....	1902	Crown	5	2,100	75
Elyria Lorain.....	1902	Crown	4	350	9
Creston Wooster.....	1907	Solder	4	4,130	56
Creston Wooster.....	1908	Solder	5	4,130	10 1/2
		Repairs	1		

The results show widely different efficiencies, nearly all of which show how well the bonds had been put on. For instance, on the Grafton division I found that the hole in the rail was too large and that the copper had not been expanded enough. On the Elyria-Cleveland division the splice bars were of very poor design and did not support the joint. There was not enough space for the bond and the splice bars clamped the plug of the bond rather than the rail. The Oberlin-Norwalk division was bonded very carefully and has endured better than any of the other divisions. Where soldered bonds were properly put on they gave good results. Mechanically they were weak and where the road-bed is poor the bonds soon showed a high percentage defective.

The main track at the Elyria power house is one-quarter of a mile from the switchboard. The return consists of three No. 000 cables and one 40-ft. rail single track. This is entirely too small. The earth at the power house is positive and varies from 40 volts to 50 volts to the negative lines on a 1400-amp load. In England the track voltage losses are restricted so that no section of the track shall have more than 7 1/2 volts difference of potential from the earth. It would be very expensive and usually unnecessary on suburban roads to keep the voltage at such low figures. With three of our large cars we could expect with track in good repair a drop of nearly 20 volts per mile. If the return current is 700 amp at the power house from one direction with a distributed load, we should expect about 125 volts difference of potential between earth and negative bus instead of 50. This would tend to show that roughly the resistance of the earth absorbs 75 volts. The

earth returns from 30 per cent to 60 per cent of the current, depending upon the condition of the earth and track return. Poor return circuits at times severely tax the power department to supply the demand. This is especially noticeable during very cold dry weather. Rainy weather usually lightens the power house load considerably, due to the track return circuit having less resistance. The effect of poor track returns is very noticeable on the life of the rails and in itself should pay for the cost of keeping the bonding in good repair.

Another much neglected point in the return circuits is the switches and railroad crossings. Switches are much abused and in every case should have double the number of bonds possessed by the rail joints. Railroad crossings receive very rough usage and cables should be put in sufficiently large to carry all of the return current under ground without loss. Generally I find the cables less than half as large as they should be. For instance, a No. 0000 copper wire 15 ft. long was put on a very bad crossing with an average of about 600 amp return current.

Cross bonds on suburban work are often neglected or stolen. To guard against stealing I have recommended putting in pieces of old rail with bonds brazed to each end. Second-hand 25-lb. or 30-lb. rails can be bought, spiked to a tie and connected for nearly same cost as copper cross bonds.

Every electric railway should have a track return bonding department thoroughly organized and composed of conscientious and reliable men well equipped with instruments for testing the track and the joints and tools for putting on the bonds. They should keep systematic records of all work done. Unless well done this work is time and money wasted.

For open-track suburban service I believe that 60-ft. rails with the continuous type of rail joints and with rails electrically joined by brazed bonds should be used. The rails must be laid on a good and well-drained and ballasted road-bed. A company which has a road of this character with ample feeder system will find that the repairs and maintenance and operation of every department will be so low and the dividends so large for the stockholder that everybody will be using the smile that won't wear off.

THE MECHANICAL APPLICATION OF WIRELESS OR RADIO-TELEGRAPHY TO RAILROADS*

BY F. H. MILLENER, UNION PACIFIC SHOPS, OMAHA, NEB.

During the past 10 years the possibilities of wireless telegraphy have been brought to the attention of the general public as a means for intercommunicating over long distances without wires, but by many practical engineers it is even yet looked upon as an experiment, an experiment out of the laboratory but an experiment still. This has been due largely to the fact that more attention has been given to determining at how great a distance these signals could be accurately interpreted than how much copper wire could be saved. However, it is interesting and encouraging to know that during the 17 years since its discovery greater advances have been made and more money has been invested in wireless telegraphy than during twice the same period of wire signaling.

The art of telegraphing or signaling without wires comprises a number of different basic methods. The principal ones are: (1) those based on dispersion or the leakage of electric currents when grounded in the earth or water; (2) the induction method, in which magnetic lines of force are created in space by induced magnetism; (3) the electrostatic method, or that of creating electrostatic stresses, in the intervening dielectric, air or other medium separating the instruments; (4) the method of radiating electromagnetic waves or waves of invisible light.

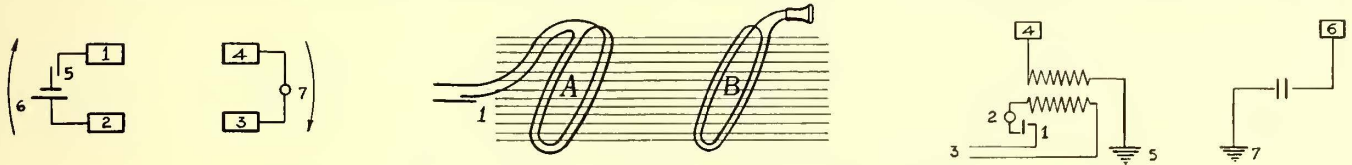
In the first method, that of dispersion or leakage, we arrange our instruments as in Fig. 1. Nos. 1 and 2 represent the grounded plates of the sending station, 3 and 4 the ground plates of the receiving station, 5 and 6 the key and battery of the sending station, and 7 a galvanometer for detecting the current of the receiving station.

*Abstract of paper read before the Central Electric Railway Association, Indianapolis, Ind., on Sept. 24, 1908.

The induction method (see Fig. 2) is very simple, being merely two coils of wire parallel with each other. When the key, 1, is depressed so as to connect a direct-current source of energy with the coil *A*, a direct current will flow through it, and a magnetic field will be produced around the coil at right angles to it and extending a considerable distance. A part of this field penetrates coil *B*, and if the circuit in *A* is made and broken, alternating currents of corresponding amplitude, phase and frequency will be generated in *B*. The distance at which this method will act

into the transmitter, and also some form of coherer or detector in the receiving end.

In wireless telegraphy the function of the sending end is to radiate electric or ether waves, as they are sometimes called. These waves are produced at the spark gap of a high frequency, high potential secondary, and are propagated through space at the speed of light. When they reach the aerial wire of the receiving station they are retransformed into electric oscillations of the same frequency as those of the second circuit, affect the detector, and the



Figs. 1, 2 and 3. Methods of Wireless Telegraphy

depends upon the size of the coils, the distance they are apart, the amount of wire on each coil and the power.

In the electrostatic method of signaling (see Fig. 3) the primary winding of an induction coil is connected in series with a telegraph key at the sending station, 1, interrupter, 2, and source of energy, 3. The secondary terminals of the coil are connected to the aerial wire, 4, and the ground, 5. The receiver is an electrostatic telephone receiver, made of two thin diaphragms of metal, which are placed very close

together to form an air condenser, and are connected to the aerial and ground capacities, 6 and 7.

The theory of this method is that when the instruments are being operated the earth is charged at the sending station to a positive potential, and the receiving apparatus to an equal negative potential, producing a difference of potential between the two stations. A current will then flow from one to the other, and the receiver, or indicating device, will respond as the difference of potential is equalized.

By the use of a mechanical selective system, and to a less extent by a chemical one, I have been able to control the movement of the storage battery car shown in Fig. 5, giving it four speeds ahead, stop it, and make it run in the reverse direction at the same number of speeds. I have also been able to ring a bell as I desire, without interfering with the other signals, and I can see no reason why gates or bells at a crossing, as well as moving trains, may not be so operated and signaled. The wireless telegraph operates better in a storm and before and after meridian than at meridian or in the absence of a storm.

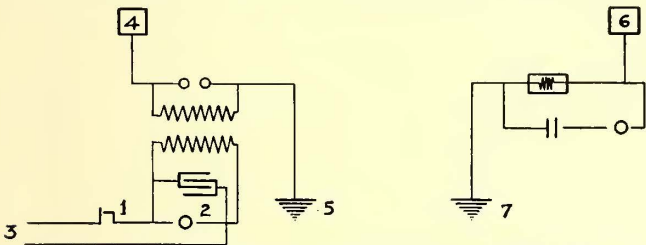


Fig. 4. Electric Wave Method of Wireless Telegraphy

together to form an air condenser, and are connected to the aerial and ground capacities, 6 and 7. The theory of this method is that when the instruments are being operated the earth is charged at the sending station to a positive potential, and the receiving apparatus to an equal negative potential, producing a difference of potential between the two stations. A current will then flow from one to the other, and the receiver, or indicating device, will respond as the difference of potential is equalized.

TRANSPORTATION AND TRAFFIC ASSOCIATION CONVENTION AT ATLANTIC CITY

C. Loomis Allen, president of the American Street & Interurban Railway Transportation & Traffic Association, has addressed the following letter to members of the American Street & Interurban Railway Association and its affiliated and allied associations, calling attention to the Atlantic City, N. J., conventions:

I am sending you this special bulletin for the purpose of urging your attendance at the first annual convention of the American Street & Interurban Railway Transportation & Traffic Association, which will be held in the Greek temple of Young's Million-Dollar Pier at Atlantic City, N. J., Monday, Oct. 12, to Thursday, Oct. 15, inclusive.

The Transportation & Traffic Association was organized in January, 1908, for the purpose of bringing together general managers, managers, superintendents, general passenger agents, general freight agents, express agents, advertising managers and other officials and employees engaged in, or connected with, the actual operation of street and interurban railway companies, for the exchange of ideas and the consideration of operating and transportation problems and discussion of methods for promoting traffic.

In a broad way this association has for its consideration the growth and development of traffic and the methods to be employed to secure the best results; the relations of companies to the press; summer parks and amusement resorts and in general the best methods to be employed to increase the amount of business for the best benefit of the public at the most reasonable expense to the company.

You have been advised by the association's secretary-treasurer, B. V. Swenson, regarding all details of the forthcoming convention, but the point I want to impress upon you is, that it will pay your company handsome dividends to have at least one of your company's representatives present at this most interesting session that the new association's convention promises.

On the other side of this sheet you will see a detailed

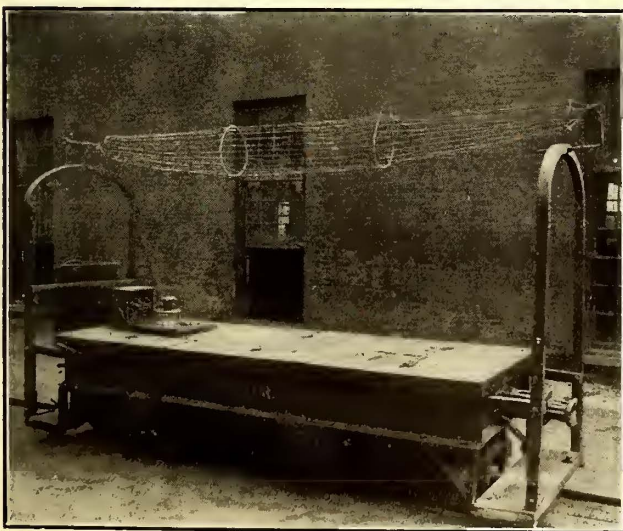


Fig. 5. Storage Battery Car with Wireless Control

The fourth and last method is that used in long distance telegraphing to-day and is called the electric wave method. A simple apparatus for the emission of these waves can be made like that in the electrostatic method, but in addition is equipped with an apparatus to give a disruptive discharge

program, and I am confident you will find that it promises ideas and suggestions for every traffic official.

I earnestly hope that you will give most serious consideration to this convention, and that your company will be represented at the meetings. Will you come?

The program has been published in previous issues of the *ELECTRIC RAILWAY JOURNAL*.

SPECIAL TRAIN TO ATLANTIC CITY

W. C. Hope, general passenger agent of Central Railroad of New Jersey, issued the following announcement on Sept. 12 relative to the train service from New York:

"We take the liberty of calling your attention to our through train service between New York and Atlantic City, and invite your patronage en route to the American Street & Interurban Railway Association and the American Street & Interurban Railway Manufacturers' Association conventions, Oct. 12 to 16, 1908. All of our trains are vestibuled with Pullman buffet parlor cars, and run through solid via Red Bank and Lakewood, the famous fall and winter resort. Time table of trains is enclosed herewith. Passengers holding tickets via our line have the privilege of returning via Philadelphia.

"The one-way fare from New York to Atlantic City is \$3.25, and the regular round-trip fare, tickets good for six months, \$5.

"Parlor car reservations may be made and tickets procured from P. W. Heroy, eastern passenger agent, 1300 Broadway (telephone 6272 38th St.), at the Liberty Street and West Twenty-third Street stations, or of the undersigned."

LIFE AND MAINTENANCE OF CAR EQUIPMENT*

BY M. STAHL, MANAGER OF THE MUNICIPAL RAILWAYS AT DUSSELDORF

More than 90 companies replied to the data sheet sent out by the committee on the Life and Maintenance of Car Equipment.

AXLES

The design of axles is properly a question of the strength of materials, but until we know all of the strains to which electric railway axles are subjected, a theoretical study of the subject only will not prove sufficient. Of the 91 companies replying to the data sheet, 46 reported not less than 768 cases of broken axles or an average of 16, with a maximum, in one case, of 153 during the year. This corresponds with a minimum of 0.3, a maximum of 18 and an average of 3 per 1,000,000 car-km (625,000 miles). Of the 46 companies reporting broken axles, 29, or 63 per cent, were narrow-gage roads. Breakages are not due in all cases to a poor quality of steel. Insufficient section or poor design is also a cause. A prevalent error is the weakening of the axle by the keyway. The diameter of the axle should be increased at points where the keyways are cut. In general Bessemer or Siemens-Martin steel is used for axles. Nine companies have adopted nickel steel, which is more costly. The increase of price is about 30 per cent for each per cent of nickel. Some specifications provide for 3 per cent of nickel, but 2 per cent seems sufficient. No fractures are reported among the nickel-steel axles.

The author recommends for ordinary service an axle 110 mm (4.37 in.) in diameter; but 125 mm (5 in.) in the gear seat and 116 mm (4½ in.) in the wheel seat.

WHEELS

The standard wheel employed is the steel-tired wheel with tires generally of cast or Siemens-Martin steel. Chilled wheels are used to some extent on trail cars, but rarely for motor cars. Solid steel wheels are still more rarely employed. The average life of tires is 99,000 km (60,000 miles) for standard-gage lines with wheel treads of 60 mm to 70 mm (2.4 in. to 2.8 in.) tread. Narrow-gage lines average 85,000 km (53,000 miles) for wheels.

JOURNAL BOXES

A few companies have introduced ball bearings and roller

bearings, but their practical utility is doubtful. The standard journal box is lubricated by oil, usually from below with packing. The Basle tramway box has a reservoir at the top of the box filled with packing from which the oil drops onto the journal and is collected in a reservoir below. In the Korbuly box, the wicking turns with the journal. This device is used by a number of roads. In Dusseldorf, the base of the box is fitted with receptacles into which square plugs of wicking are inserted. In general, the boxes of most simple construction have given best results. Where a bath of oil is used it has been found difficult to keep the box so tight as to prevent the loss of oil and the entrance of dust. The average consumption of oil is about as follows:

For standard-gage motor cars, 0.73 kg per 1000 car-km, or 2.6 lb. per 1000 car-miles; for standard-gage trail cars, 0.63 kg per 1000 car-km, or 2.2 lb. per 1000 car-miles; for narrow-gage motor cars, 1.79 kg per 1000 car-km, or 6.27 lb. per 1000 car-miles; for narrow-gage trail cars, 0.96 kg per 1000 car-km, or 3.36 lb. per 1000 car-miles.

TRUCKS

Single trucks are those most generally employed, but semi-elliptic springs have been substituted for spiral springs at the ends of the side frames. Sometimes the two are combined with very satisfactory results, as at Dusseldorf. The hope that a satisfactory radial truck could be developed has not yet been realized. Eighteen companies have been experimenting during the year with radial trucks for motor cars and 13 others with radial trucks for trail cars. Of the companies using radial trucks for motor cars, three report a reduction in expenses of operation and more easy entrance into curves; seven others did not express themselves on their value; eight find the wear of tires much greater and state that the radial trucks brake badly, often become derailed and are very noisy. Of the companies using radial trucks for trail cars, five are satisfied with them, seven have not reached a decision and one complains of poor braking and noise.

GEARING

The following table gives the average life reported for gears and pinions by the companies replying to the data sheet. In this table the roads have been divided into three classes as follows:

TABLE SHOWING LIFE OF GEARS AND PINIONS.

	Life of gears.		Life of pinions.	
	Km.	Miles.	Km.	Miles.
Class I, standard gage.....	236,000	147,000	69,000	43,000
Class I, narrow gage.....	166,000	104,000	60,000	37,000
Class II, standard gage.....	195,000	123,000	67,000	42,000
Class II, narrow gage.....	145,000	90,000	54,000	34,000
Class III, standard gage.....	.....	.....	65,000	41,000
Class III, narrow gage.....	75,000	47,000	24,000	15,000
Class IV, standard gage.....	.....	.....	.....	.....
Class IV, narrow gage.....	46,000	27,000	13,000	8,100

Class I, those of which more than 75 per cent of the line is on level track; Class II, those of which more than 75 per cent is on grades of 3 per cent or less; Class III, those of which 25 per cent is on grades not exceeding 3 per cent; Class IV, those of which from 40 per cent to 50 per cent is on grades of 5 per cent or more.

Considerable difference exists as to the practical effect of using hardened cast pinions. Among 35 roads with standard gage and the 27 roads with narrow gage, replying to this question on the data sheet, 12 favor this kind of pinion, stating that the life was increased 30 per cent; 20 were opposed, believing that they wore the gears out rapidly and were noisy; 27 were satisfied with the non-hardened pinions which they were using, and 3 preferred bronze pinions, which had an average life of 38,000 km.

MISCELLANEOUS

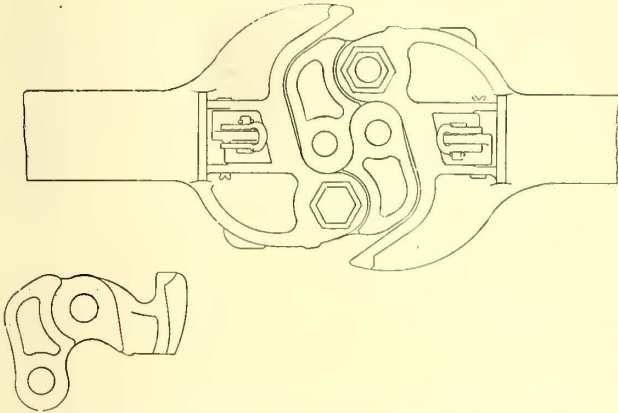
Cross seats are giving place to longitudinal seats and seem more popular with the public. Resistances are usually constructed of nickeline, kruppine, or maillechort; the latter alloy seems to be most favored. The car lightning arresters are of the horn type as a rule.

The American legation at Havana, Cuba, has forwarded to the Department of Commerce and Labor at Washington a copy of the decree granting and describing in detail the proposed improvements to the Havana Electric Railway. This copy will be loaned by the Bureau of Manufactures to interested contractors or dealers in electric railway material.

*Abstract of a report presented at the Munich Convention of the International Street & Interurban Railway Association, Sept. 7-10, 1908.

NEW COUPLER HEAD

Considerable attention recently has been shown the M. C.B. type of coupler for interurban use. It seems to meet the very severe demands of electric railway service with the exception of one point—the lack of rigidity when coupled when a radial bar is used. A number of attachments have been made which are designed to hold the M.C.B. coupler heads rigidly together, so that there will



Coupler with Knuckle for Any Standard Head

be no chance of buckling when one car pushes another around sharp curves. This precaution, of course, is quite unnecessary in couplers used on steam railways, because the anchorage permits little side movement of the heads.

Edwin C. Washburn, Minneapolis, Minn., has designed the coupler knuckle illustrated herewith, which is made

WORK OF THE CENTRAL ELECTRIC RAILWAY AND TRAFFIC ASSOCIATIONS

The executive committee of the Central Electric Railway Association held a meeting at the Claypool Hotel, Indianapolis, Ind., on Wednesday, Sept. 23. F. D. Carpenter, president of the association, requested that publicity be given to the following announcements:

The delay in placing the new Central Electric Traffic Association interchangeable mileage ticket on sale is caused by the fact that the roads which are parties to these tickets have not filed concurrences as required by Interstate Commerce Commission tariff circular No. 15A. Members should file concurrences without further delay because the United Commercial Travelers of America are continually demanding the issuance of the mileage ticket.

A. L. Neccreamer, secretary of the association, is not able to comply with requests for general information about association work because various roads do not give answers to his letters. This hinders the work of the Central Electric Traffic Association. The secretary requests the ready co-operation of all companies in his efforts to assist the members in order that his office may be of the utmost value to the member companies.

REPAIRING DUMMIES AT THE SCHENECTADY TESTS

An interesting auxiliary of the fender and wheel-guard tests now being conducted at Schenectady by the New York Public Service Commission of the First District, is the shop built for handling the dummies used in the trials. As mentioned in the article on these tests published in the issue of



Dummy Repair Shop Built for the Schenectady Fender and Wheel-Guard Trials

to take up all the play and side motion in a joint between two M.C.B. couplers. The new device is a simple knuckle, which is made to fit any standard coupler head. It is so designed that it is interchangeable with the regular M.C.B. knuckle. An electric railway which has its cars fitted with these new knuckles can handle steam cars without changing the coupler head or using special coupling bars.

Sept. 19, the dummies are fully clothed. The limbs are of wood, but the feet are of iron forms partly filled with lead; so that experiments with the dummies in standing positions can easily be made. The figures are being furnished by the Elmer P. Morris Company, of New York, and, as it would be too expensive to employ new dummies every time one was damaged, this company also keeps them in repair.

INTERURBAN AND CITY CARS FOR THE JOPLIN & PITTSBURG RAILWAY COMPANY

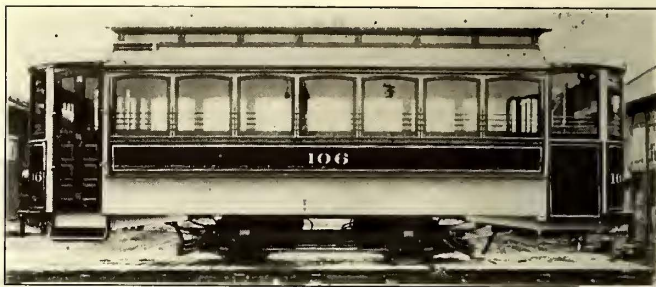
The Joplin (Mo.) & Pittsburg (Kan.) Railway Company has recently placed in service five combination type interurban coaches and one express car, notable for their substantial construction and handsome outlines.

The combination cars are 53 ft. 9 in. long over all, 9 ft. 6 in. wide over all, 9 ft. 3 in. wide over the posts, and 13 ft. 7 in. high over all from the rail. The bottom framing consists of six yellow pine sills. The side and center sills are of compound construction, the former having a 7-in. I-beam and the latter a 6-in. I-beam. The bolsters are extra heavy and have pressed steel fillers for their full length. The body framing throughout is of white ash and the construction follows the steam coach type.

The cars are divided into three compartments as follows: Baggage compartment in front, smoking compartment in center and main compartment in the rear. The main and smoking compartments are finished in selected figured mahogany and the baggage compartment in ash, painted white. The finish in the main and smoking compartments is inlaid with neat marqueterie. The ceiling is of the full Empire style and is painted green with gold decorations.

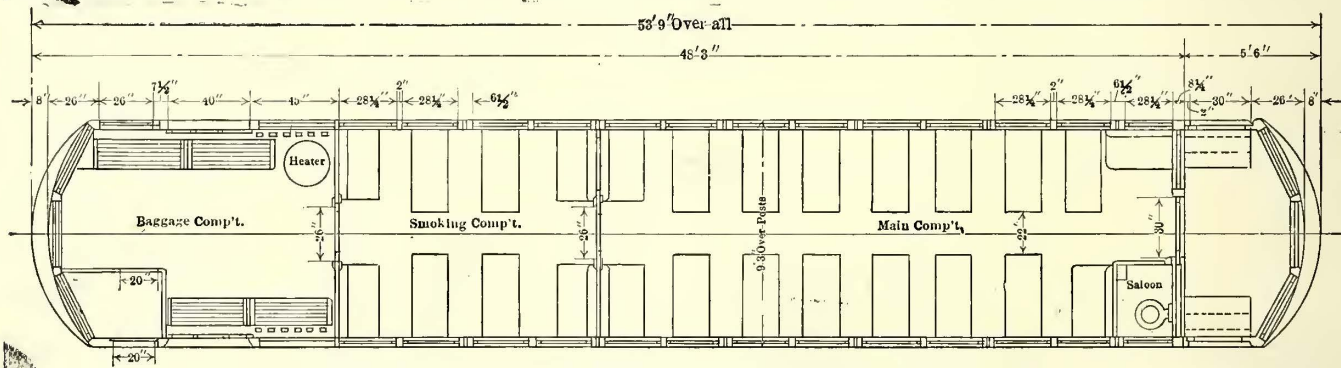
inside furnishings. The cars are heated by the Peter Smith hot-water heater system. The operating equipment consists of Westinghouse air brakes and electrical equipment, Newark air sandboxes, Tomlinson couplers and the Lintern signal system. The bodies are carried on Baldwin trucks.

The single express car is 53 ft. long over all and has an



City Car for the Joplin & Pittsburg Railway

extreme width of 9 ft. 3 in. This car is built along the same general lines and specifications as the passenger coaches, with the same trucks and power equipment. All of these cars were built by the Jewett Car Company, of Newark, Ohio, from which point they were shipped to desti-



Floor Plan of Joplin & Pittsburg Interurban Combination Car

The seats in both the main and smoking compartments are of the stationary type, with high rolltop backs, and are upholstered in leather. The clearance conditions permitted the installation of seats as wide as those in standard railroad coaches, thus giving more comfort for long riders.

Polished plate glass is used throughout the car, except the

nation on their own wheels, via St. Louis and Kansas City.

Previous to the shipment of the six interurban coaches, the Jewett Car Company sent to the same railway one 44-ft. express car and six city cars for the lines of Pittsburg, Kan., and Joplin, Mo. The city cars are 20 ft. long over body and 30 ft. long over all, and 8 ft. 4 in. wide. They are



Interurban Car for the Joplin & Pittsburg Railway

gothic and deck lights, which are of leaded art glass. All trimmings are of solid bronze and the curtains are of double-faced Pantasote with Forsyth No. 86 fixtures. The cars are lighted by 45 incandescent lamps, which are so placed that they form arches of five lamps each across the ceiling. Push buttons and parcel racks form desirable features of the

finished in cherry and have walkover seats upholstered in rattan, double sliding doors at each end, Pantasote curtains with Forsyth No. 86 fixtures, Consolidated Car Company's electric heaters, illuminated signs, etc. A. L. Register & Company, of Philadelphia, are the engineers and contractors for the Joplin & Pittsburg Railway Company.

ELECTRIC RAILWAY LEGAL DECISIONS

FRANCHISES, ORDINANCES, ETC.

Minnesota.—Injunction—Powers of Court—Restraining Publication of Ordinance—Street Railroads—Statute Governing Incorporation—Minnesota Statute—Contract with City—Effect of Change of Motive Power—Effect of Subsequent Contracts.

The general rule that a court of equity will not restrain the enforcement of an ordinance or other legislative act until it has been fully completed so far as legislative action can go does not apply to an ordinance which has been finally passed by a city council and approved by the Mayor, and nothing remains to be done to render it immediately effective except its publication, which is merely a ministerial act, and in such a case upon a proper showing made the court has power to enjoin the publication.

Gen. St. Minn. 1866, c. 34, relates to the formation of corporations. Title 1 provides generally for corporations which are or may be authorized to exercise the power of eminent domain, and specifies certain public service corporations, such as those formed for the construction of railways, canals and works of like character. Title 2 provides for all other corporations for pecuniary profit, all those specified therein being for the conducting of purely private enterprises. Held that, while street railroad companies are not specifically mentioned under either title, the nature of their business is such as to render them quasi public corporations, which might properly be authorized to exercise the power of eminent domain and to bring them within the generic term "railways," and that a street railroad company organized under said chapter came within the provisions of and derived its powers from title 1, having the right as therein provided to fix the term of its corporate existence at fifty years.

A city ordinance granting a franchise to a street railroad company and accepted by the company reserved the right to the City Council after five years to fix just and reasonable fares provided they should not be reduced below 5 cents per passenger on any continuous line. It provided for the use of animal or pneumatic power on the company's lines, but permitted it to connect with other lines using power "similar to that authorized to be used on street railways by the City Council," subject to the restriction that it should not allow locomotives or ordinary railroad cars to be run over its tracks unless with the consent of the council. Held, that the fact that after a number of years the company changed its motive power to electricity, with the consent of the council, did not terminate the contract made by the ordinance so as to give the city the right to reduce fares below 5 cents in violation of its provisions.

A provision in a contract between a city and a street railroad company that the city should not reduce fares below 5 cents was not abrogated by a subsequent contract providing that "in the construction, maintenance and operation" of its lines the company should be subject to all present or future ordinances of the city.—(Minneapolis St. Ry. Co. v. City of Minneapolis, 155 Fed. Rep., 989.)

New Jersey.—Street Railroads—Turnouts—Resolution Authorizing—Validity—Certiorari—Right to Prosecute Writ—Diligence—Interest of Prosecutors—Street Railroads—Construction—Limited Consent of Property Owners—Effect.

Under Act April 21, 1896, requiring permission to construct, etc., a street railway to be granted by ordinance, after public notice and hearing and upon the filing of certain consent of owners of property fronting upon the street to be used, a resolution authorizing a company to construct turnouts, adopted without such notice, hearing and consent, is invalid.

Act April 21, 1896, requires the consent of abutting property owners before an ordinance granting permission to construct a street railway may be adopted, and under section 1 the city council may either, when such permission is given, or afterwards, fix by resolution the location of the rails or tracks, etc. Held, that such section did not authorize a council to grant permission by resolution, and without property owners' consent, to a street railway company to construct turnouts, where a previous ordinance permitting the road to be constructed fixed with precision the location of the tracks, turnouts, etc., and did not include the turnouts covered by the resolution, and where between the acceptance of the ordinance and the adoption of the resolution the membership of the council was changed.

Owners of property abutting upon a street should not be denied the benefit of certiorari to review a city council's resolution granting a street railway the right to construct turnouts in the street, because one of the turnouts was constructed and in use before the writ was allowed, where the

resolution was adopted the 18th, construction work was commenced that day and completed the next, and the writ issued the 21st.

Owners of property abutting upon a street near a point where the city has by resolution granted permission to a street railway to construct a turnout have sufficient interest in the subject matter of the resolution to entitle them to prosecute certiorari to set it aside for illegality not appearing on its face; it appearing that they will be inconvenienced in the use of the street to a greater degree than the general public, and that the public convenience will be promoted by having the illegal resolution set aside.

Under Act April 21, 1896, providing that permission to construct, etc., street railways shall only be granted on consent of owners of at least one-half the property fronting on the streets to be used, limitations embodied in such consents are valid, and the city council is bound thereby.—(Specht et al. v. Central Passenger Ry. Co., 68 Atl. Rep., 785.)

LIABILITY FOR NEGLIGENCE

Alabama.—Street Railroads—Duty to Trespassers—Lookout—Infants—Railroads Not Flush with Surface of Street—Right of Public to Use of Roadbed—Railroads—Injuries to Persons On Track—"Trespasser"—Street Railroads—Operation—Duty to Keep Lookout—Persons Rightfully on Tracks—Actions for Injuries—Actionable Negligence—Trespasser—Duty to Trespassers—Lookout—Actions for Injuries—Questions for Jury—Contributory Negligence—Infants—Street Railroads—Injuries to Persons on Track—Injuries Avoidable Notwithstanding Contributory Negligence—Instructions—Applicability to Evidence—Actions for Injuries—Questions for Jury.

The general principle that a railroad company owes to a trespasser no duty to keep a lookout for him, which is of equal force, as to adults and infants, except where infants are enticed upon the track, applies to railroads in city streets as well as elsewhere, in the absence of certain conditions, known to the railway company, making it a duty to look out for persons liable to be on the tracks at certain points.

Where a railway is built in a street or public road, so as to be incorporated with and become a part of the roadbed of the street or road, and the rails are level with the surface, the public has not only the right to cross it, but also to pass along and use it as any other part of the street or road, being careful to look for and avoid approaching trains or cars, and the operatives of trains and cars on such a railway are under a duty to keep a lookout for persons exercising their right; but where the railway is not level with the surface of the street or road, but the rails are placed on ties laid on the surface of the highway, the public has no more right to use it than if it were not in a street or road at all.

While a person may, for the purpose of merely crossing a railroad, do so without becoming a trespasser, if he lingers on it, or walks along it at a place where he is not entitled to walk, he is a trespasser, and the company owes him no duty to keep a lookout for him.

It is the common-law duty of a motorman running a street car in a populous town or city to keep a lookout for persons rightfully on the track and liable to be run over by the cars.

Even though a street railway company owes the duty to keep a lookout for persons rightfully on the track, if it owed no such duty to a plaintiff because she was a trespasser, no action would lie; actionable negligence being a failure to discharge a legal duty to the person injured.

Where a street railway company's tracks were not level with the surface of the street, but its rails were placed on ties laid on the surface of the street, a child 16 months old, sitting or lying on the end of one of the ties is a trespasser.

If, in view of the locality where a street car is running and all the attending circumstances, those in control of the movement of the car have no reason to apprehend that there may likely be a person on the track in front of it, they are under no duty to a trespasser who may be there, until they actually discover his presence, but if from the locality or circumstances known to the company there is reason to apprehend that the track may not be clear from human beings, then it is the duty of the employees to keep a lookout; hence, in an action against a street railway company for injuries to a trespasser, it is error to instruct that if defendant's motorman was not keeping a proper and diligent lookout, and the accident occurred within the limits of an incorporated city, the motorman would be guilty of negligence.

In an action against a street railway company for injuries to a trespasser, whether the locality and surrounding

circumstances were such as to make it the duty of defendant's employees to keep a lookout held for the jury.

If a motorman discovers the presence of a trespasser on the track in time to avoid injury, the company is liable for his failure to use the means and appliances at his command to prevent the injury, irrespective of whether it was the motorman's duty to keep a lookout for the person injured or not.

A charge embracing that principle would not be appropriate, in the absence of testimony showing that the motorman was looking ahead, if the conditions were not such as to make it his duty to keep a lookout for plaintiff, but, if the duty to keep the lookout existed, it would be proper, irrespective of other circumstances; hence, where the question of duty to keep the lookout is for the jury, such an instruction is proper.

In an action against a street railway for injuries to a trespasser, whether the motorman discovered the plaintiff in time to prevent the accident, and whether he promptly used the means at his command to prevent it, held for the jury.—(Birmingham Ry., Light & Power Co. v. Jones, 45 S. Rep., 177.)

Massachusetts.—Carriers—Carriage of Passengers—Personal Injuries—Actions—Evidence—Question for Jury—Death—Right of Action—Grounds—Gross Negligence.

In an action against a street railway company for personal injuries, evidence held not sufficient to go to the jury on the question whether defendant was guilty of gross negligence.

Revised Laws, chapter 111, section 267, provides that if a corporation operating a railroad or a street railroad by the gross negligence of its agents or servants while engaged in its business causes the death of a passenger, it shall be punished by a fine, etc., to be recovered for the use, etc. Held that, while the gross negligence mentioned in the statute does not include wanton or wilful misconduct which would warrant criminal prosecution or a suit for damages by a trespasser or one guilty of negligence on his own part, yet it is something more than mere ordinary negligence.—(Lanci v. Boston Elevated Ry. Co., 83 N. E. Rep., 1.)

New York.—Street Railroads—Collision with Vehicle—Contributory Negligence—Instructions.

Plaintiff was injured by a collision between his wagon and a street car while he was crossing the track diagonally, going away from the street crossing, and intending to drive by the side of the track. He did not look for an approaching car until his horses were on the track. It did not appear that it was necessary that he should cross the track at that precise point. Held that, in an action for the injury, it was error to instruct "that when one attempts to cross the track of a street car, and has approached a track at such a distance from the approaching car that he has reasonable ground to suppose that he will be able to cross the track, it is the duty of the motorman to give him a reasonable opportunity to cross, . . . and the person crossing the track has the right, without being charged with contributory negligence, to assume that that duty will be performed."—(Geisendorfer v. Union Ry. Co. of New York City, 109 N. Y. Sup., 68.)

New York.—Street Railroads—Collisions—Misconduct of Motorman—Scope of Employment—Question for Jury.

Where, in an action for injuries to a horse and carriage in a collision with a street car, there was evidence that the motorman intentionally ran the car into the carriage, it was for the jury to determine whether the motorman acted within the scope of his employment; and a charge authorizing a recovery if the motorman intentionally ran the car into the carriage was erroneous.—(Ahrens v. Union Ry. Co., 108 N. Y. Sup., 590.)

New York.—Street Railroads—Persons on Track—Injuries—Evidence.

In an action against a street railroad for the death of one struck by a car while attempting to pass in front of it, evidence held to show contributory negligence.

It is contributory negligence for a pedestrian to attempt to pass in front of a moving street car six or seven feet away, irrespective of the speed of the car.—(Long v. Union Ry. Co. of New York City, 107 N. Y. Sup., 401.)

New York.—Carriers—Carriage of Passengers—Personal Injuries—Actions—Presumptions—Trial—Judgment—Dismissal on the Merits.

In an action for injuries to plaintiff while a passenger on a S— Ave. car when on a bridge, it will not be presumed, in the absence of proof, that the defendant had exclusive possession of the tracks over the bridge.

Where the evidence showed that plaintiff was injured in an accident while a passenger on a street car, plaintiff was entitled to invoke the doctrine of "res ipsa loquitur."

Where the evidence showed that plaintiff was injured while a passenger on a street car, but did not show that the car belonged to defendant, and the case was dismissed without any evidence

being offered by defendant, while the suit was properly dismissed, it was error to dismiss it on the merits.—(Meschneck v. Brooklyn, Q. C. & S. R. Co., 109 N. Y. Sup., 594.)

Texas.—Witnesses—Examination—Leading Questions—Carriers—Personal Injuries—Instructions—Evidence to Support—Application to Issues—Carriers—Personal Injuries—Leaving Conveyance—Instructions—Trial—Instructions Assuming Facts—Action—Instructions—Undue Prominence to Particular Facts.

In an action for personal injuries, a question to a witness stated the manner in which plaintiff had alleged that the accident occurred, and then said, "Please state whether you are acquainted with plaintiff, how long you have known her, and where"—whether or not plaintiff met with the accident "at the time and place and under the circumstances above mentioned, and if you say she did, please state whether or not you were present at the time." Held, that the question was not bad as leading, and calling for the conclusion of the witness.

In an action for personal injuries from a street car accident, an answer by a witness that "the car moved ahead in obedience to the signals. It started with a jerk, as I have stated, and threw plaintiff off into the street," was not objectionable as stating conclusions and not facts.

In an action for injuries from being thrown from a street car, plaintiff testified that "I had signaled the conductor"; "the bell was rung to stop the car. When I raised up he was standing . . . at the back end of the car." "I gave the signal to let him know we were where I wanted to get off." Held, that an instruction on the hypothesis that plaintiff signaled the motorman to stop the car was not without support in the evidence.

In an action for personal injuries to a street car passenger, the court instructed that if the jury believe that it was negligence on the part of plaintiff to have so taken up her position, if she did so, upon the running board, and to have so attempted to step from said board to the ground while the car was moving, etc. The jury were elsewhere instructed that if she took a position on the running board before the car stopped, and this was negligence, the verdict must be for defendant; and, also, that if she left the car while in motion, and this was negligence, to find for defendant. Held, that the instructions must have conveyed to the jury that negligence in either one or the other of said acts would require a finding for defendant, and the instruction first given did not require reversal on the ground that where the doing of a single act on the part of plaintiff may constitute negligence, it is error for the court to charge that, to render plaintiff guilty of contributory negligence, the jury must find that she did two or more acts, and that in doing each of them she was negligent.

An instruction that, though plaintiff requested the conductor of the street car to let her off at S— St., and he failed to do so, and plaintiff was taken beyond the usual stopping place on said street, "such fact would not authorize or justify the plaintiff in leaving said car while in motion, and if she voluntarily so left the car, and such conduct was negligence which caused or contributed to her injury," they should find for defendant, was erroneous in leaving the question of her negligence to the jury, after telling them that she was not justified in leaving the car while in motion, though she was being carried past her stopping place.

An instruction that if a street car passenger, when she handed her transportation to the conductor, informed him that she desired to leave the car at S— St., and that when the car approached said street she signaled said conductor, but the car did not stop at the usual place, was not objectionable as assuming that the conductor saw or heeded the signal.

Said instruction continued that "if the car proceeded moving forward slowly and carried plaintiff beyond the place where such car should have stopped, and that plaintiff, while said car was still slowly moving, attempted to alight from the footboard, but by reason of the car having so continued to move, and not having stopped to permit plaintiff to alight on S— St., and plaintiff was thrown to the ground, and that it was negligence to have permitted said car to move eastward, and not to have stopped the same at the usual place on S— St. to permit plaintiff to alight, and that if such negligence was the proximate cause of plaintiff's injury, the verdict should be for the plaintiff." Held, that the instruction was not objectionable as giving undue prominence to the conductor's failure to stop the car at S— St.

In an action for injuries to a passenger, defendant requested an instruction that, "though you may believe that plaintiff was injured, yet, unless you believe that she was injured by and through the negligence of the defendant in suddenly starting or lurching the car forward, you should find for defendant," was erroneous, where the case was submitted, not only on the theory stated in the instruction, but also on the theory that the car did not come to a stop, but that it slowed down, and plaintiff, thinking it was about to stop, attempted to alight, and was thrown to the ground.—(El Paso Electric Ry. Co. v. Ruckman, 107 S. W. Rep., 1158.)

News of Electric Railways

Cleveland Traction Affairs

Although asserting that their own plan is the best that can be devised, the directors of the Municipal Traction Company have yielded to the suggestion of F. H. Goff, arbitrator for the Cleveland Electric Railway in the valuation proceedings, and will hold conferences with citizens chosen by Mr. Goff for the purpose of securing some method of trusteeing the stock. The directors were almost forced to take this step by the popular approval of Mr. Goff's idea of the matter. The proposition of the Municipal Traction Company was that Mr. Goff should treat directly with the attorneys of the company or through representatives chosen by him. As he could not give up the time necessary to the work at this time, Mr. Goff named Judge Robert W. Taylor of the United States District Court, Attorney John G. White and Attorney S. H. Tolles, the latter being a law partner of Mr. Goff. These men were accepted by the company as satisfactory and each accepted the duty.

This step was taken after objections had been expressed both by the traction company and Newton D. Baker, city solicitor. In the reply of the company, it is asserted that the directors are not aware that anything has occurred since the settlement to make a change of any kind necessary; that the situation is the same as it was at that time, and that there can be no danger of the stockholders using their positions for their own benefit. "The legal possibility," the statement says, "that if all of the present stockholders or their successors could conspire to abuse their trust, it might be done, is not in their (the directors') opinion a moral possibility."

The authority of the City Council to govern matters is referred to again. The tenor of the statement is that the people should trust in the present management to take care of the business properly. At the end, however, the company agrees to have its attorneys meet with Mr. Goff or his representatives and devise some other means of handling the stock and make a report to the directors.

This statement was made in reply to a letter from Mr. Goff to Mr. Baker. One paragraph from this letter, containing a number of pertinent questions, is as follows:

"Assuming that all that has been done is in proper legal form, as to which I have no doubt whatever, does the scheme which has been adopted constitute a trusteeing of the stock of the Municipal Traction Company to public use? Have the directors done anything that they cannot undo at any time without so much as asking the public leave? Has the public acquired an estate or interest in the stock, which would be protected, enforced, or even recognized, in a court of equity? Is it not misleading, and justly subject to criticism, to speak of the stock as having been trusteeed if no vested interest has been created in the public, and if the public is given no power, through the courts or otherwise, to control the conduct of those who are supposed to act in its behalf?"

Mr. Goff further says that the only obligation resting upon the stockholders at this time is one of faith, but that it should be in the form of a written contract. He holds that the promises of the stockholders to each other and to the public are not enough, since it would be possible for them to do as they like with their stock if they are not legally bound to act along certain lines. Mr. Goff suggests that unissued stock might be issued and sold at any time, and this act would or might result in a change in the control of the company. He suggests that the capital stock be reduced from \$10,000 to \$1,000 and the value of the shares from \$100 to \$1, and all shares not required to qualify directors be transferred to seven or nine trustees, with instructions to pay all dividends to some public or municipal purpose. He says he is willing that the Mayor, President duPont of the company and Mr. Baker should be trustees and that the others be reputable citizens, with one or two of the strong trust companies represented. The Mayor, however, should be succeeded on the board by his successor in the office of Mayor.

Mr. Baker replied to this letter in a friendly manner, but objected to the plan principally because there would be two managing bodies. He said that plainly no other source of appointment of trustees could be countenanced than the directors of the Municipal Traction Company. Otherwise, Mr. Baker says that the trustees and directors would be at variance with each other all the time.

Mr. Baker admits that the stockholders are pledged in honor only, but says that he does not see how any further

publicity can be given the character of the pledges. The people, he said, understood the settlement at the time, as well as all the safeguards that were thrown around the stock. He intimates that all the objections and suspicions come from those who do not want to see the company succeed under the present management, or who for pecuniary reasons want to have the properties revert to the old company without the lease.

Both Mr. Baker and the company speak of the likelihood that the Legislature will authorize the city to make some arrangement with the company at its next session, but Mr. Goff does not feel so sure about anything of this kind being done at an early date. He states further, in regard to the City Council having authority to annul the franchise at the end of each 10 years, that 10 years is a long time to wait to correct an abuse.

Mr. Goff's representatives and the attorneys for the traction company will begin work at once. They are allowed unlimited latitude in their discussions and determinations, and both Mr. Goff and the company have agreed to accept whatever decision they may make. Mr. White has never been favorable to the plans of Mayor Johnson, and Mr. Tolles has already had experience in treating railway problems in Cleveland.

Mr. Goff has informed Mayor Johnson that he will be unable to accept the invitation to become a member of the board of directors of the Municipal Traction Company, because of his connection with the Cleveland Trust Company and the work that the position of president of that institution imposes.

The form of the agreement of the stockholders of the Municipal Traction Company as to mutual options, which has been made public, is as follows:

"This agreement, made this twenty-eighth day of April, 1908, between A. B. duPont, party of the first part, and Edward Weibenson, F. C. Howe, C. W. Stage, Ben T. Cable, Tom L. Johnson, N. D. Baker and William Greif, parties of the second part, witnesseth:

"That the said party of the first part, in consideration of the sum of \$1 in hand paid, receipt whereof is hereby acknowledged, doth hereby give to the parties of the second part the exclusive right or option at any time within 18 months of the date hereof of buying his 20 shares of capital stock of the Municipal Traction Company, a corporation organized and existing under the laws of the State of Ohio, for the sum and price of \$200, payable in cash, which right or option may be exercised at any time within the said 18 months by the said parties of the second part or a majority of them, or of the survivors of them, notwithstanding the death or insolvency of the said party of the first part in the meantime.

"Witness my signature and seal the day and year first written above."

Under the leadership of A. L. Behner, vice-president of the Amalgamated Association of Street & Electric Railway Employees, the labor interests of Cleveland are being organized to oppose the franchise at the referendum election. It is said that all labor organizations will be asked to aid the street railway men in this fight, and that President Samuel Gompers of the American Federation of Labor will be invited to come to Cleveland and take part in the campaign.

A meeting of the attorneys who are to discuss the suggestions of Mr. Goff was held at the Mayor's office on Sept. 21. Those chosen by Mr. Goff discussed ideas which might be worked into the plan that would guarantee the people against a breach of faith, while D. C. Westenhaver, counsel for the Municipal Traction Company, and City Solicitor Baker persisted in asserting that the present arrangement is as good as can be made and that it should stand.

Judge Taylor was made chairman of the committee, and will thus be the deciding factor in case of tie upon any question. In the discussion Mr. Tolles suggested that instead of turning over the profits on the stock to hospitals or other municipal or public institutions they be used to repair streets on which car lines are operated. Another suggestion was that the money be used to purchase stock of the Cleveland Railway Company, so that if the city is ever in position to take over the properties the trustees would already have accomplished something in that direction.

All the attorneys agreed that the corporation itself, or the directors, as trustees for the stockholders, cannot, under the law, agree not to make profits, and that the voting power of the stock cannot be permanently separated from the ownership. The future discussions, then, will be on

the point as to whether the stockholders may agree to turn over their profits so that no personal gain may result.

The discussion brought out the fact that all the stock has been issued, but that only 10 per cent has been paid on it, so that it is subject to a 90 per cent assessment. Three of the seven directors have 20 shares each and the other four have 10 shares each. The three thus hold a controlling interest. Each stockholder has given an option on his holdings for 18 months from the date of issue, and it was shown that after the expiration of that time nothing exists to compel a renewal of that option. The attorneys for the traction company at first stated that the by-laws provided for a renewal, but Mayor Johnson himself corrected the statement. The next meeting will be called by Judge Taylor at some time when it will be convenient for all to attend.

President duPont has stated that indications point to a surplus of \$10,000 for August. This would be about \$9,000 less than for July.

Rank of Damage Claims Against New York System

In accordance with the ruling of Judge Lacombe, of the United States Circuit Court, giving it the right to intervene in the suits brought by the Morton Trust Company and the Guaranty Trust Company against the Metropolitan Street Railway Company, and by the Pennsylvania Steel Company against the Metropolitan Street Railway and the New York City Railway for the foreclosure of the mortgages on their property, the committee representing persons who have claims against the Metropolitan Street Railway for injuries has filed its bill. In it are named as respondents the Guaranty Trust Company as trustee under the mortgage of Feb. 1, 1897; the Metropolitan and its receivers, the New York City Railway and its receiver, William M. Ladd; the Morton Trust Company, John D. Crimmins, Samuel A. Megeath and Daniel M. Brady, as a committee of contract creditors; the Pennsylvania Steel Company, the Degnon Contracting Company, and the Central Crosstown and Central Park, North & East River Railways.

When receivers were appointed, Benjamin S. Catchings, who is now a member of the committee of creditors having damage claims against the company, tried to file a claim for \$30,000 damages for the killing of his father in a collision between a car and an automobile. Judge Lacombe held that it was impossible to consider such claims separately, and directed the formation of a committee of each kind of claims and said the court would consider them in classes. Since the receivership, N. L. Turner has been appointed a special master by Judge Lacombe to adjudicate these claims, but actions which were begun in the State courts before a jury have been continued, and the master has recognized the findings in them. Mr. Turner reported last March that already there had been filed with him 3201 claims for personal injuries, 362 claims for injuries to property, 225 judgments, 7357 claims for failure to furnish transfers and 381 claims arising out of contracts. It has been estimated that the suits represent claims for \$20,000,000, but the question of settlement depends entirely upon the amount of preference allowed by the Federal Court and the extent of the resources of the Metropolitan Street Railway.

The committee of creditors with accident claims against the company at first asked that the same amount of preference should be granted to claims for personal injuries as was given to claims under contracts. Judge Lacombe had ordered preference to be allowed to all contract claims which arose within the four months preceding the appointment of the receivers. These amount to \$771,693, and they will rank before the claims of the bondholders. The committee contends that there were several important decisions which hold that compensation for personal injuries is to be reckoned as part of the operating expenses of a railroad. The injuries, they argued, were incidental to the operation of the road and all expenditures incurred in running the cars must be settled before the bond and stockholders received anything. Judge Lacombe, however, took a different view. He said that injuries are the result of accidents, and that it cannot be maintained that accidents are necessary for the operation of a street railway.

The committee then applied for leave to intervene in the suits brought by the Morton Trust Company and the Guaranty Trust Company against the Metropolitan Street Railway, and by the Pennsylvania Steel Company against the Metropolitan Street Railway and the New York City Railway for the foreclosure of the mortgages on their property, and Judge Lacombe granted this petition last month.

It will be alleged by the committee that for some time before Feb. 14, 1902, the date of the lease of the Metropolitan Street Railway to the New York City Railway, the former company had not earned enough to pay the fixed charges and the dividends on its own stock and the stock

of its leased companies. To do so, it is asserted that it "wrongfully diverted gross operating revenues of said properties from the payment of operating expenses and accumulated a large floating indebtedness." Consequently it found it necessary to raise about \$23,000,000 to meet its debts to carry on new construction, to pay its dividends and to continue the interest on the bonds.

It was to procure this sum that, according to the complainants, the New York City Railway's lease was executed. Under this the New York City Railway took over the entire Metropolitan Street Railway, undertaking to operate it and to provide a dividend of 7 per cent on the Metropolitan's \$52,000,000 of stock and another \$23,000,000 to pay off its floating debt. The committee will contend that the lease was contrary to public policy and illegal, as its object was to accomplish unlawful purposes. These purposes are set forth as a compounding of felony through providing money to meet a floating debt illegally contracted, the concealment for the sake of the money market of the true state of the Metropolitan Street Railway and the evasion of the just claims of contract creditors and claimants for personal damages. The court will, therefore, be asked to hold the lease invalid.

It will be argued next that the New York City Railway incurred certain expenditures in the operation of the street railway system. Among these are a number of claims for personal injuries which have already been allowed by Special Master Turner. The Guaranty Trust Company, the Morton Trust Company and the other companies which have claims on the street railways were aware that the railway must incur such expenses, it will be argued, and consequently should agree to payment of these claims.

The committee will contend also that the receivers of the Metropolitan Street Railway had no right to continue to operate the street railway under the lease, and that now they should pay over to William M. Ladd, receiver of the New York City Railway, the sum of \$607,291, the cash in hand at the time of their appointment, \$13,000,000 which the New York City Railway expended in the operation and maintenance of its property and other sums.

The committee asks that the claimants for damages may be paid from these, and that their demands may take precedence over the mortgages and all others.

Car House Safe Robbed in Massachusetts.—The safe in the car house of the Boston & Worcester Street Railway at Wellesley, Mass., was broken into on Sept. 19 and about \$1,000 in cash was stolen.

Philadelphia Council Report Delayed.—The report of the special committee of councils of Philadelphia on the street railway situation, which was to have been presented on Sept. 17, has been delayed on account of the illness of Edwin O. Lewis, chairman of the committee.

Toledo & Western Power Plant Closed.—Hereafter the Toledo Railways & Light Company will furnish current from its power stations for operating the cars on the Toledo & Western Railroad. The power house of that road at Sylvania has been closed. The substations along the line will be improved and new stations added as they are needed.

Transfer Change in Philadelphia Contested in Court.—City Solicitor Gendell, of Philadelphia, has begun suit against the Philadelphia Rapid Transit Company to test its right to refuse transfers to passengers offering exchange or six-for-a-quarter tickets. This action was taken by the City Solicitor on the authority of a resolution of Councils, approved by Mayor Reyburn on June 9.

New York Tunnel of Pennsylvania Railroad to be Opened in 1910.—The Pennsylvania Railroad has formally announced through Samuel Rea, third vice-president, that the tunnel and terminal station in New York will be opened in 1910. The tunnels will be completed this year, but it will require a year or more for laying the main tracks and the tracks in the yards and completing the terminal station in New York.

Brooklyn Company Explains Paving Agreement.—The Brooklyn Rapid Transit Company will not pay the city \$322,000 for paving which Bird S. Coler, president of the Borough of Brooklyn, says it has failed to do in the streets of Brooklyn in the last five or six years. According to the company, an agreement was made years ago whereby the company was not to be compelled to pave strips 2 ft. on each side of its tracks. The work done by the city since the date of this agreement amounts to \$322,000.

New Offices for Interborough Rapid Transit Company.—The Interborough Rapid Transit Company, New York, has taken a 10 years' lease of the entire sixth and twelfth floors in the new City Investing Building, Broadway and Cortlandt Street, to be used for its general and executive offices, now in the Park Row Building and at 115 Broadway. The lease

covers about 36,000 sq. ft. of floor space. It dates from May 1, 1909, although the Interborough Company will probably take possession before that date.

Subway Construction Claims in New York.—The City of New York has filed with the arbitrators its counterclaims to the claims of the Rapid Transit Subway Construction Company for about \$6,250,000 for extra work under Contract 1 of the present subway. These are for alleged failures on the part of the company to live up to the terms of the contract, and are between \$2,000,000 and \$4,000,000. The arbitrators resumed their hearings on Sept. 22. They have not met since July, but in the interval the engineers on each side have been preparing an agreed statement, which will lighten the labors of the arbitrators.

Officers Elected by Cincinnati, Dayton & Toledo Railway.—Stockholders of the Cincinnati, Dayton & Toledo Railway, whose property has been leased to the Cincinnati Northern Traction Company and is operated by the Schoepf syndicate, recently elected the following directors: George B. Cox, Charles Richardson, N. S. Keith, F. R. Williams, L. A. Ireton and J. B. Foraker, Jr., Cincinnati, and O. V. Parrish, Peter Schwab, Sr., and W. C. Shepherd, Hamilton, Ohio. The board organized by the election of George B. Cox as president; W. C. Shepherd, vice-president, and F. R. Williams, secretary and treasurer.

Meeting of Society of Mechanical Engineers.—The season of professional meetings of the American Society of Mechanical Engineers will be opened on Oct. 13 by a meeting of the gas power section in the Engineering Societies Building, New York. H. L. Doherty, chairman of the meetings committee of the section, will present a report for discussion outlining plans for future work and there will also be a discussion of standards to be used in gas power work. Two papers will be read, one by D. A. Harvey on gas-producer plants, with data upon costs, performance, etc., and one by N. T. Harrington giving the results of tests to determine the loss of fuel weight in a freshly charged producer, due to increase of ash contents in the fuel bed.

Chicago's Rapid Transit Plans.—The reports of Dr. Milo M. Quaife and Dr. Howard M. Woodhead, of the University of Chicago, who were appointed to obtain for the City of Chicago information regarding the manner in which the subway systems in Europe and the United States were built and are being operated, will probably be submitted to the committee before Oct. 1. The reports will contain a description of the subways in London, Paris, New York, Philadelphia and Boston, together with full information on how the plans were financed in those cities. Preliminary work on the proposed subway for Chicago is being pushed by Alderman Milton J. Foreman, as the entire rehabilitation of the traction system in the downtown district is largely dependent on the subway.

Proposed Electrification of the Illinois Central Railroad.—James T. Harahan, president of the Illinois Central Railroad, on his return to Chicago from New York on Sept. 17, announced that the company would take up at once actively the question of electrifying its lines out of Chicago. The problem is complicated as the company has eight tracks into its downtown terminal, two for suburban local service, two for suburban express service, two for through passenger trains and two for freight. Not only this, but the fact that the trains of four other steam railway companies enter Chicago over the tracks of the Illinois Central Railroad still further complicates the proposed work. The electrified lines would have to take care of local suburban and express service, heavy freight traffic and provide terminal facilities for the heavy through passenger service of five important trunk lines. The intention of the company is to engage a board of engineers to report on the problem. The personnel of the board has not been decided.

Chester Traction Company Agrees to Reinstate Strikers with Clean Record.—J. A. Rigg, president of the Chester (Pa.) Traction Company, has agreed to reinstate as many of the employees of the company who are on strike as he can find places for. He is ready to take back 25 of the men at once, an additional 25 in a week's time and 11 more the following week, making 61 in all, at 17 cents an hour, the scale of wages paid by the company at the present time. No man against whom criminal charges had been made, and certain others against whom the company has evidence of unlawful acts, will be reinstated, nor will any man who has stood by the company or who has returned to work be disturbed under any circumstances. President Rigg would not agree to meet any committee of the union as such, but announced his willingness at any time to meet the employees and to give them a full hearing upon any question of employment or other matters which might arise. Mr. Rigg says the matter of membership or non-membership in a union will not influence the company in its relations with its men.

Financial and Corporate

New York Stock and Money Markets

SEPT. 22, 1908.

Whether a political scare or the unloading of large bull manipulators is responsible for the heavy decline in prices in the stock market is a matter upon which opinions differ. The facts are that for 10 days the market has been weak, prices have declined almost steadily, and net losses of from 4 to 12 points have been recorded. From the beginning of the upward movement last spring the advance in stock prices has been largely the result of professional operations. It has been easy for large financial interests to support and advance prices by being ready to buy every share offered of certain selected stocks. As the supplies of these stocks were not large and they were cheap as investments when compared with the low rates prevailing for money, the securities were certain, with the return of prosperity, to reach higher levels. This buying advanced the leading issues and carried the general market upward also. It attracted many traders, whose occasional selling for profit caused slight reactions.

Many authorities in Wall Street believe that the decline represents merely a selling movement resulting from an attempt to make capital out of possible political uneasiness. The warning during the past week from various prominent men that the Republicans were apathetic must have had some effect on timid speculators. Whether or not increasing campaign activity was the prime reason for the decline, it probably contributed to the desire to sell.

The practical conditions of business are unchanged from recent weeks. In neither industrial nor commercial circles has there been material change. The satisfactory reports regarding the crops and the superabundance of low money should inspire confidence. The public does not seem to be much interested in the stock market, however, and the outside buying amounts to little. Money continues in light demand, with call loans quoted, Sept. 22, at 1@1¼ per cent and 90-day funds at 3 per cent.

Other Markets

Traction stocks in the Philadelphia market were distinctly stronger and on Sept. 22 recorded general advances. Rapid Transit rose 1¾ points and closed at 18¾, after having reached 19¾. Thus the fully paid stock has almost recovered to the point at which it was selling during the previous week. Union Traction sold up to 46¼.

In the Boston market few transactions were recorded in traction securities. A few shares of Boston Elevated changed hands at 133¾, and some sales of Fitchburg preferred were recorded at 123½. There was little interest in bonds.

In the Chicago market tractions were quiet. Subway stock has appeared in the market to some extent and several hundred shares have changed hands at prices ranging from 18½ to 19.

In Baltimore the bonds of the United Railways were the only active issues. These were fairly active, the 4s selling at 84½ and the funding 5s at 79.

While none of the electric railway stocks was active on the Cleveland Stock Exchange, Cleveland Railway gained a few points over the previous week, although very little of it changed hands. Washington, Baltimore & Annapolis pooling certificates have remained around 11½.

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

	Sep. 15.	Sept. 22.
American Railways Company, Philadelphia.....	44½	44½
Boston Elevated Railway.....	134	133¾
Brooklyn Rapid Transit Company.....	51½	46¾
Chicago City Railway.....	41.80	41.80
Cleveland Railway.....	88	88
Consolidated Traction Company of New Jersey.....	a69	a67½
Consolidated Traction Company of New Jersey, 5 per cent bonds.....	a104	105
Detroit United Railway.....	318	38
Interborough-Metropolitan Company.....	11½	10¼
Interborough-Metropolitan Company (preferred).....	32¾	29½
Manhattan Railway.....	135	135
Massachusetts Electric Companies (common).....	9½	9
Massachusetts Electric Companies (preferred).....	49	48
Metropolitan West Side Elevated Railway, Chicago (common).....	a15	a13½
Metropolitan West Side Elevated Railway, Chicago (preferred).....	a46	a44
Metropolitan Street Railway.....	30	30
North American Company.....	64	60
Philadelphia Company, Pittsburg (common).....	39½	38½
Philadelphia Company, Pittsburg (preferred).....	40	40
Philadelphia Rapid Transit Company.....	14	19
Philadelphia Traction Company.....	88¾	88½
Public Service Corporation, 5 per cent collateral notes.....	a98	—
Public Service Corporation, certificates.....	a71	—
Twin City Rapid Transit Company, Minneapolis (common).....	86	86
Union Traction Company, Philadelphia.....	47	46½
a Asked.		

Annual Report of the Philadelphia Rapid Transit Company

Although the total number of passengers carried by the Philadelphia Rapid Transit Company in the year ended June 30, 1908, increased 4.2 per cent over the preceding year, the increase in gross revenue from passengers was but 1.1 per cent. Of the increase in gross revenue, aggregating \$204,577, chartered cars contributed \$1,333 and the balance represented direct receipts from passengers. The principal figures of earnings compared with the previous year as follows:

Year ended June 30,	1908	1907	Increase
Number of passengers carried	512,869,023	492,137,038	20,731,985
Receipts from passengers	\$18,300,080	\$18,095,503	\$204,577
Operating expenses.....	9,794,508	10,095,098	*300,590
	\$8,505,572	\$8,000,405	\$505,167
Miscellaneous receipts, interest, etc.....	257,422	245,187	12,235
	\$8,762,994	\$8,245,592	\$517,402
Taxes and licenses, paid and accrued	1,394,127	1,120,683	273,444
	\$7,368,867	\$7,124,909	\$243,958
Fixed charges, paid and accrued	7,460,916	7,488,958	*28,042
Deficit	\$92,049	\$364,049	*\$272,000

*Decrease.

In the report for the fiscal year 1906-07 the Willow Grove Park earnings of \$48,611 were deducted from operating expenses, but in the figures for the last year the earnings from this park, amounting to \$48,206, were included in miscellaneous earnings.

It will be observed that, on account of a reduction in operating expenses, the increase in net earnings was much larger than the gain in gross revenue. Some changes in the method of accounting affected the financial results, which, although showing a deficit of \$92,049 after provision had been made for all expenses, charges and taxes, indicated improvement over the greater deficit of the previous year. The report explains in part the decrease in operating expenses of \$300,590 and the net increase of \$243,402 in the charges on account of licenses and fixed charges by stating that the increase in the latter items was due principally to the fact that the \$500,000 "which is paid annually to the City of Philadelphia in lieu of paving, licenses on cars, etc., is treated as a license charge, while the cost of the paving item in the past was included in the operating expenses."

The saving in operating expenses, as compared with the preceding year, was in the general and the maintenance expenditures. The operating ratio was 53.52 per cent, as compared with 55.79 per cent in the year ended June 30, 1907. Expenditures for maintenance were reduced \$391,610 from the corresponding expenses for the previous year. This reduction was divided between \$300,310 in the maintenance of way and buildings accounts and \$91,300 in the maintenance of equipment accounts. The total maintenance expenditures aggregated 10.8 per cent of the gross passenger revenue, or 20.2 per cent of the operating expenses. The operating expenses were divided as follows:

Year ended June 30,	1908	1907	Increase
Maintenance of way and buildings	\$1,060,425	\$1,360,735	*\$300,310
Maintenance of equipment	915,287	1,006,587	*91,300
Transportation	4,822,472	4,749,107	73,365
Power	1,280,213	1,034,824	245,389
General expenses	1,716,111	1,943,845	*227,734
	\$9,794,508	\$10,095,098	*\$300,590

*Decrease.

Figures of the passenger earnings by months show that the largest increase during the year was reported in July, 1907. Decreases, which began in December, continued, with the exception of February, through the remaining months of the fiscal year. The increase in February was due to the fact that the weather in February, 1907, was extremely stormy, and that there was one day additional in February, 1908. The following statistics of passenger traffic are presented: Total passengers carried, 512,869,023; 53.92 per cent used passenger tickets; 14.82 per cent paid cash fares of 5 cents each; 14.46 per cent used exchange tickets; 16.27 per cent used transfer tickets; 0.53 per cent were carried free.

John B. Parsons, president of the company, says in his report to shareholders:

"The results in the accident department for the year give substantial evidence of the close supervision which was kept. The payments in that department are \$120,261 less than the amount charged to the operation of this department in the previous year.

"No new lines of railway were constructed during the year, but 37.88 miles were rebuilt, using the 141-lb. rail. This makes a total of 149 1/3 miles of your system now rebuilt with this heavy rail.

"Your car equipment has been increased during the year by the addition of 40 double-truck steel cars for the elevated division and 11 freight cars which are being used in the handling of the coal supply for your power houses and in the hauling of ashes. This makes a total of 3879 cars of all kinds. Your equipment has been maintained at the highest standard of efficiency.

"All of the double-truck, four-motor cars are being equipped with solid steel wheels (the total cost of the same being charged to the maintenance account), the life of the steel wheel being at least eight times that of cast chilled wheels, which have been used in the past.

"During the year the management has been trying to produce a car which will lessen the possibility of accidents and enable the conductor to collect fares more readily. After some experiments it has been decided to change 50 cars to the type mentioned above, and work is progressing at this time and the cars should be in operation at an early date.

"The directors ordered the closing into profit and loss account of all debit balances in accrued accounts at the end of the fiscal year. The company's system of bookkeeping provides for the charging of certain percentages of gross receipts to cover certain of the regular expenditures. For example, 6 per cent of the gross receipts was charged off each month of the past year to take care of the accident account; like charges have been made for fire insurance, power, maintenance of way, etc. The actual expenditures in these accounts necessarily vary from year to year, but the percentages are fixed to meet as nearly as possible the average for a period of years. During the past year the debits in these accounts exceeded the credits by \$125,544. The debit balances in these various accounts at the end of the fiscal year were all carried into profit and loss.

"The accident account showed a large debit balance; this, however, is all the result of former years' operations, the current year having shown a credit of \$22,006. On the other hand, the company has accumulated a surplus in conducting its own fire insurance of upward of \$800,000 in the past six years, which has been built up by monthly payments out of receipts and income from investments; of this increase \$700,000 is now credited to profit and loss.

"The stockholders will understand this does not in any way lessen the fire insurance fund. The entry is a mere bookkeeping entry so far as that fund is concerned, which will stand on the books hereafter at \$1,550,000, and is represented by securities which are of a present market value of upward of \$100,000 in excess of this amount."

The detailed statement of receipts and disbursements shows, among the receipts, \$118,028 on account of advertising and \$43,362 for United States mail. The disbursements included \$7,606,841 for pay-rolls and \$50,000 for special legal services on account of the new franchise.

American Railways Company Annual Report

The annual report of the American Railways Company, of Philadelphia, for the fiscal year ended June 30, 1908, shows total gross earnings of the subsidiary companies of \$2,927,437, an increase of \$59,280, or 2.07 per cent over the previous year. The total number of passengers carried was 68,762,586, an increase of 1,137,855, or 1.68 per cent. The earnings of the American Railways Company compared with the previous year as follows:

Year ended June 30,	1908	1907	Increase
Gross income.....	\$498,758	\$527,063	*\$28,305
Expenses, taxes, interest, etc.	171,645	142,504	29,141
Net income.....	\$327,113	\$384,559	*\$57,446
Dividends	305,706	304,392	1,314
Surplus	\$21,407	\$80,167	*\$58,760

*Decrease.

In his statement to stockholders J. J. Sullivan, the president, states:

"For the first five months of the fiscal year under review the increase in gross earnings amounted to almost

\$84,000, or at the rate of about \$200,000 for the year. The business depression which swept over the country, beginning in October last, stopped the growth of our business, and it continued to shrink down to the close of our fiscal year, reducing the gain to a little over 2 per cent for the period. While we deplore business depression, the management believes that some satisfactory results were obtained thereby, as owing to the more plentiful supply of competent labor we were more easily able to obtain better service from those in our employ, and it enabled us to dispense with the less efficient and to fill the vacancies with more competent men.

"In the matter of supplies, a substantial reduction in prices has been made in all kinds of electrical apparatus and other machinery, also in the price of lumber. Late in the fiscal year we succeeded in having made a reduction in the wages of many of our employees and reduced the working force to correspond with the reduction of the receipts of the company.

"The fire insurance fund has increased during the year \$22,805, making the sum to the credit of that account now stand \$168,880.

"The accident insurance fund has increased during the year \$8,231, making the sum to the credit of that account now stand \$33,726. The average percentage in the cost of accident claims to gross earnings was 2.37 per cent. The American Railways Company purchased 6000 shares of treasury stock from the Bridgeton & Millville Traction Company at par, \$50 per share, thus enabling that company to pay its floating debt to us and furnish the Bridgeton Electric Company, under its contract of March, 1900, the money to enlarge its power station and extend its lines.

"The sum of \$19,166.67 was paid as an assessment on the shares of the Chicago Union Traction Company and the stock was surrendered, this company receiving in exchange the participation certificates of the new Chicago Railways Company.

"The large sums expended for machinery at Dayton, Ohio; Springfield, Ohio; Tyrone, Pa., and Bridgeton, N. J., were made at a considerable loss of interest on the sums invested since October, 1907, to the close of our fiscal year without any benefit from operation being received therefrom except about one month of the new power plant at Dayton, Ohio. All of the new plants, I am glad to be able to state, will be working in July, 1908, when it is expected a substantial saving in the consumption of coal will be effected besides the satisfaction that a considerable surplus of power is held in reserve for emergencies and for the future growth of the properties."

During the year the company sold \$717,000 collateral trust bonds due in 1917 and \$200,000 bonds of the Altoona & Logan Valley Electric Railway. Of the proceeds of these securities \$150,000 was applied in reduction of the floating debt of the controlling company and the balance was expended on subsidiary properties.

Developments in the subsidiary companies are described at length by Mr. Sullivan. The Chicago & Joliet Electric Railway raised the fare between the two places named in its title from 14 per cent to 15 per cent on June 15. "This move," Mr. Sullivan states, "has increased our earnings on the north [Chicago] end and no complaints have been received relating thereto, our patrons believing that for the excellent service given them we were entitled to the small additional charge made."

Boston & Northern Street Railway, Boston, Mass.—The Boston & Northern Street Railway and the Old Colony Street Railway, subsidiaries of the Massachusetts Electric Companies, have filed with the Massachusetts Railroad Commission petitions supplementary to those filed on April 1, 1908. They ask the approval of issues of new preferred stock, \$1,250,000 by the Old Colony Street Railway and \$750,000 by the Boston & Northern Street Railway. Stockholders of the companies desire under the acts of the recent Legislature to issue the new stock at \$110 per share.

Columbus (Ohio) Railway & Light Company.—The shareholders of this company on Sept. 18 ratified the proposition to take over under a 50-year lease the properties recently purchased by the new Columbus Light, Heat & Power Company from the Columbus Public Service Company. —The Columbus Railway & Light Company has declared a dividend of one-half of one per cent, payable on Oct. 1 to stockholders of record of Sept. 18. In this connection the Columbus Light, Heat & Power Company has declared its first regular quarterly dividend of 1½ per cent, payable Oct. 1 to stock of record of Sept. 25. This dividend is paid under the terms of the lease by which the Columbus Railway & Light Company takes over the properties of the Columbus Public Service Company. The Columbus Light, Heat & Power Company

will also pay, at a date to be fixed, a dividend on its preferred stock for the five months preceding July 1 of this year, when the properties passed into the hands of the Columbus Railway & Light Company.

Philadelphia, Bristol & Trenton Railway, Philadelphia, Pa.—Judge Holland, in the United States Circuit Court, has appointed John A. Rigg and George Blackstone temporary receivers of the Philadelphia, Bristol & Trenton Railway, upon the application of the Interstate Railways Company and the United Power & Transportation Company, creditors, with claims of \$29,051 and \$80,453, respectively. The bill of complaint alleged that the earnings of the company were insufficient to meet fixed charges, and that default had been made in the payment of the semi-annual instalment of interest on the bonds.

Philadelphia (Pa.) Rapid Transit Company.—At the annual meeting of stockholders of the Philadelphia Rapid Transit Company on Sept. 16 a resolution was carried to increase the indebtedness of the company from nothing to \$5,000,000. This loan is to be made with the unencumbered assets of the Union Traction Company as collateral, which include securities of the various underlying companies. It will first be necessary to secure the consent of the Union Traction Company, and a special meeting of stockholders of that company will be called. It is stated that the proposed loan is needed for the installation of the new pay-as-you-enter cars, for new tracks and possibly for new construction on the elevated system.

Seattle-Everett Electric Railway, Seattle, Wash.—Stone & Webster, Boston, Mass., have secured control of the Seattle-Everett Electric Railway and will consolidate it with the Seattle Electric Company, of which they are managing directors. The Seattle-Everett Electric Railway is an interurban line projected between Seattle and Everett and partly constructed.

Second Avenue Railroad, New York.—Judge Lacombe, in the United States Circuit Court, Sept. 17, denied the application of the Guaranty Trust Company, trustee of the first consolidated mortgage, for the appointment of a separate receiver, without prejudice, however, to its renewal in a State court. Judge Lacombe says that in the recent investigation by the receivers of the Metropolitan Street Railway they found that the Second Avenue Railroad is run under the existing lease at a loss of \$200,000 a year and that nearly \$800,000 will be required to put it in good condition. Negotiations were begun for a reduction in compensation so that improvements could be made. The court says: "This application for the appointment of an independent receiver indicates the termination of such negotiations. The mere circumstance (in the absence of diversity of citizenship) that the Second Avenue Railroad has remained in the hands of the receivers of the Metropolitan Street Railway during the pendency of these negotiations should not be controlling as to the form in which complainant may obtain relief, since the receivers have offered to return the property and are ready to deliver to owner or owners' representatives at any time." On Sept. 19, Justice Bischoff, in the State Supreme Court, on application of the Guaranty Trust Company, appointed Geo. W. Lynch receiver of the company.

Sterling, Dixon & Eastern Electric Railway, Sterling, Ill.—The annual meeting of the Sterling, Dixon & Eastern Electric Railway stockholders was held at Dixon, Ill., Sept. 15. The following officers were elected: John I. Beggs, president; Clement C. Smith, vice-president; Robert Camp, secretary and treasurer, all of Milwaukee, and Edwin E. Downs, general manager, Dixon, Ill. The above refers both to the railway and the Lee County Lighting Company. The directors made an inspection of the property and the earnings of the railway company showed an increase of 10 per cent over last year.

Yonkers (N. Y.) Railroad.—Leslie Sutherland, receiver of the Yonkers Railroad, will make application in the Supreme Court in New Rochelle on Sept. 26 for an order authorizing the payment of the Oct. 1 interest on the first mortgage bonds of the company. The payment will call for \$25,000.

New York City Railway.—Judgment for \$4,964,000 and interest was ordered on Sept. 22 by Judge Ward of the United States Circuit Court against the Metropolitan Securities Company. This was the amount sued for by Messrs. Joline and Robinson, receivers of the New York City Railway. The money recovered is the balance of \$8,000,000 which, it was alleged, according to the written agreement entered into on May 27, 1907, between the City Railway and the Metropolitan Securities Company, the latter was under contract to furnish the former to enable the New York City Railway to carry out its obligations to the Metropolitan Street Railway according to the terms of the lease of Feb. 14, 1902.

Traffic and Transportation

Pay-As-You-Enter Service in St. Louis

The United Railways Company, St. Louis, placed in successful operation on the Olive Street line on Sept. 20 the first of its new pay-as-you-enter cars under license from the Pay-As-You-Enter Car Company. The entire line is eventually to be equipped with the cars, and the company has announced that if they prove satisfactory in operation the Broadway, Jefferson, Page, Wellston, Suburban, Park and Compton lines will be equipped with them. Standing on the rear platform of the cars is prohibited, and smoking is also prohibited except on the three rear seats when the windows are removed for the summer. A pamphlet instructing the public in the use of the cars was issued by the company in anticipation of the new service. The instructions to passengers follow:

"The first consideration of a street railway should be the safety, comfort and convenience of its passengers.

"Mindful of all this, beginning Sunday, Sept. 20, 1908, it is proposed to modify slightly the method of entering and leaving the car on all Olive lines.

"Entrance will be over the rear platform only.

"Entrance under no circumstances over front platform.

"Exit will be over both front and rear platforms.

"The smoking privilege will be on front platform only, not on rear, and smoking also on three rear seats when the windows are lowered.

"The conductor will remain always on rear platform.

"Fares will be collected and transfers issued as the passenger passes the conductor.

"The rear platform will constitute a reservoir for receiving passengers so that there may be no delay in taking on large numbers of passengers at one stop.

"Passengers will pass into car immediately fare is paid.

"Motorman will control door on front platform and will open the door for exit of passengers after car is stopped, and will close the door immediately after starting car.

"If passengers will have exact fare their own comfort will be greatly enhanced.

"Disputes as to payment of fare or issue of transfer will be obviated.

"Passengers will be free from the annoyance of the conductor passing through car.

"Both conductor and motorman will be able to know that all persons are safely on and off before starting car.

"The courtesy of free transportation is extended to policemen and firemen in full uniform; they will not be required to pay fare.

"Employees of the company in full uniform and wearing company badges will not be required to pay fare.

"All others must pay in passing the conductor.

"Persons desiring information, presenting bills to be changed, or with question as to transfer, will be requested to step out of line until others on the platform have passed into the car.

"Conductors and motormen will be patient, polite and watchful, and will be careful that no one is injured in entering or leaving car.

"East-going, registers will be reversed at Broadway, which will be beginning of west-going trip.

"Passengers boarding car west of Broadway for west-going trip will pay going east and another fare going west.

"East-going passengers have the privilege of remaining in car around loop."

Central Electric Traffic Association Interchangeable Mileage Ticket

The United Commercial Travelers of America has requested the Central Electric Traffic Association to increase the mileage covered by the interchangeable mileage ticket, and to arrange to check baggage through from one line to another. In the territory covered by the Central Electric Traffic Association there are about 10,000 United Commercial Travelers, and the money that they expend for transportation amounts to a large sum in the course of a year. While most of these men are now using the steam lines for the reason, among various reasons, that they get their baggage checked free and to or from any point on various combinations of roads, many would prefer to travel on the electric lines, because of the frequency of trains, if they could get the same consideration that they receive from the other transportation lines. Additions have been made to the exceptions and limitations on the Central Electric Traffic Association interchangeable mileage ticket, as published in the *ELECTRIC RAILWAY JOURNAL* of Sept. 12, 1908, page 640. The additions are as follows:

"Indiana Union Traction Company.—On the lines of the Indiana Union Traction Company, 150 lb. of legal baggage, not to exceed \$50 in value, will be checked on this ticket for each adult passenger. A minimum of eight miles will be detached when used on limited trains.

"Lake Erie, Bowling Green & Napoleon Railway.—On the line of the Lake Erie, Bowling Green & Napoleon Railway no free baggage will be allowed. A charge for 150 lb. will be 25 cents; 15 cents per 100 lb. excess. Coupons will be drawn equal to our regular rate for passengers.

"Terre Haute, Indianapolis & Eastern Traction Company.—On the lines of the Terre Haute, Indianapolis & Eastern Traction Company no extra charge will be made for use of this ticket on limited trains."

Pennsylvania Commission to Consider Speed, Signals and Standing on Platforms

The State Railroad Commission of Pennsylvania has fixed Sept. 29 as the date for a hearing on the issuing of a recommendation to the street railway companies of the State relative to the occupancy of front platforms of open and closed cars by passengers, and also relative to the speed and signals to be observed at curves. All operating street railway companies in Pennsylvania have been invited to be represented at this hearing. Arrangements have also been made, through F. B. Musser, president of the Pennsylvania Street Railway Association, for the appearance at the hearing of the officers and executive committee of the association. A copy of the communication sent to all companies in the State, except those which are members of the Pennsylvania Street Railway Association, notice being given to the latter by officers of the association after correspondence with the commission, follows:

SEPT. 19, 1908.

DEAR SIR: By reason of disclosures resulting from an investigation of certain accidents which have recently occurred on street railways of the State, this commission is considering the advisability of making a general recommendation to operating companies relative to the carrying of passengers on the front platforms of cars and the speed and signals to be observed at curves.

The commission has fixed Tuesday, Sept. 29, at 11 a.m., at this office, for hearing on this matter.

Arrangements have been made with the Pennsylvania Street Railway Association to have in attendance at that time the officers and executive committee of said association, but inasmuch as the commission is informed that your company is not a member of said association we should be glad to have your representative at the conference.

Will you kindly advise me at your convenience whether your company will be represented at that time.

Very respectfully,

HARRY S. CALVERT, Secretary.

Through Service Between Kokomo and Bluffton.—The first through car was run between Kokomo, Ind., and Bluffton over the lines of the Kokomo, Marion & Western Traction Company and the Marion, Bluffton & Eastern Traction Company on Sept. 12.

Westfield Fare Case to Be Reopened.—The Selectmen of Westfield, Mass., have petitioned the Massachusetts Railroad Commission to reduce the fares between Westfield Square and the Holyoke line, on the Western Massachusetts Street Railway. It is contended that most of the passengers from Westfield on the Holyoke line take and leave cars at the Square, and owing to the establishment of a fare limit in the town at St. Mary's Cemetery are obliged to pay 10 cents for a ride of about 5.5 miles. The Selectmen consider this excessive. A public hearing will be held on Wednesday, Sept. 30, 1908. The principle involved concerns the right of an operating company to charge two fares on a single line within the same town and calls for a definition of transfer requirements under such conditions.

Public Service Commission Seeks to Restore Service on Fulton Street, New York.—On the complaint of several steamship and railroad companies and a number of business men, the Public Service Commission of the First District of New York has called upon the Fulton Street Railroad to answer by Sept. 24 the complaint that the company has abandoned its service. The complaint to the commission was in the form of a petition asking that the horse-car service be restored, even though the transfer privileges to connecting lines are not continued. Service was discontinued on July 1 by order of Adrian H. Joline and Douglas Robinson, receivers for the Metropolitan Street Railway, of which the Fulton Street Railroad was a subsidiary. Gilbert Montague is receiver and the bondholders are seeking to foreclose the mortgage.

Personal Mention

Mr. A. S. Bentz has been appointed chief engineer of the Valley Traction Company, Lemoyne, Pa., to succeed Mr. J. M. Reich.

Mr. H. S. Preston has been appointed electrical engineer and master mechanic of the Farmington (Conn.) Street Railway, to succeed Mr. J. Gerry.

Mr. E. W. Farnham has resigned as president, general manager and electrical engineer of the Twin City & Lake Superior Railway, Minneapolis, Minn.

Mr. S. S. Straub has succeeded Mr. William H. Hoover, deceased, as superintendent of the Lykens & Williams Valley Street Railway, Williamstown, Pa.

Mr. W. L. Cairns has been appointed assistant general freight and passenger agent of the Lackawanna & Wyoming Valley Railroad, Scanton, Pa., to succeed Mr. B. F. Wyly, Jr., resigned.

Mr. J. Walter Ackerman has resigned as chief engineer of the Ithaca (N. Y.) Street Railway and the New York, Auburn & Lansing Railroad. He will be succeeded by Mr. James Wadsworth.

Mr. W. E. Van Frank, superintendent of the Petaluma & Santa Rosa Railroad Company, has been elected president of the company to succeed Mr. W. A. Catel, resigned, who will look after his private business interests hereafter.

Mr. Martin J. Binkley has been appointed auditor of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., to succeed Mr. E. H. Stichel, resigned. Mr. Binkley was formerly connected with the auditing department of the International Railway, Buffalo.

Mr. W. G. McDole has resigned as auditor of the Municipal Traction Company, Cleveland, and Mr. J. B. Tanner, formerly auditor of the Cleveland Water Department, has been appointed to succeed him. Mr. McDole was in the employ of the Cleveland Electric Railway for 15 years.

Mr. Edward Weibenson has resigned as a member of the board of directors of the Municipal Traction Company, Cleveland. Mr. Weibenson is the president of the United Banking & Savings Company of Cleveland, and stated that, on account of lack of time, he could not give street railway matters the attention they deserved.

Mr. H. M. Littell has been appointed assistant to Mr. J. McMillan, general manager of the Pacific Electric Railway, Los Angeles, Cal. Mr. Littell was recently general manager of the Barr Contracting & Construction Company and formerly was general manager of the New Orleans Traction Company. In 1896 Mr. Littell was president of the American Street Railway Association.

Mr. L. H. Cushing has been appointed general manager of the Lowell & Fitchburg Street Railway, Ayer, Mass., to succeed Mr. C. V. Mills. Mr. Cushing began his railway work 10 years ago as a conductor for the West End Street Railway, Boston, Mass. He has since been in the service of the Brockton, Bridgewater & Taunton Street Railway, Taunton & Providence Street Railway and Boston & Worcester Street Railway in various capacities. In May, 1905, Mr. Cushing accepted the position of superintendent of the Taunton & Pawtucket Street Railway, from which company he resigned to become general manager of the Lowell & Fitchburg Street Railway.

Mr. Dana Stevens, heretofore vice-president and general manager of the Cincinnati Traction Company, has assumed the duties and title of acting general manager of the Ohio Electric Railway. A number of other important changes in the personnel of the Ohio Electric Railway have recently been made. The system is divided into Eastern, Western and Northern districts. The Eastern District, including the lines from Dayton to Columbus and Zanesville, is in charge of Mr. W. A. Gibbs, with headquarters at Columbus; the Western District, comprising the lines from Dayton to Cincinnati, Dayton to Union City and Dayton to Richmond, Ind., is in charge of Mr. F. J. J. Sloat, with headquarters at Dayton, and the Northern District, embracing the lines from Lima to Fort Wayne, Lima to Defiance and the newly completed lines from Lima to Springfield and Lima to Toledo, is in charge of Mr. T. F. Hepburn, with offices at Lima. Each of these districts had a separate passenger and freight agent who reported direct to Mr. D. G. Edwards, in charge of traffic matters, with headquarters at Cincinnati, but since the resignation of Mr. Edwards, the district passenger and freight agents have come under the jurisdiction of the district managers. In this way Mr. W. S. Whitney, as previously stated in the *ELECTRIC RAILWAY JOURNAL*, has been transferred from Columbus to Cincinnati, with the title of general passenger

agent, and Mr. John G. Forrester has been appointed general freight agent. These officials now report to Mr. Stevens as acting general manager. The placing of the freight and passenger agents of the several divisions under the district managers was brought about by the differences in the traffic conditions of the several districts, the rulings and practices in one district not fitting well in some cases with those of another.

Mr. Thomas Penney, a prominent attorney of Buffalo and member of the law firm of Norton, Penney & Sears, counsel for the International Traction Company, is to be elected president of that company to succeed Mr. Henry J. Pierce, at the meeting of directors of the company on Sept. 29. Mr. Penney is one of the most prominent and able lawyers of Buffalo and has become intimately acquainted with the affairs of the International Traction Company through his membership in the law firm which has been the company's counsel. Mr. Penney was born in London, Eng., and came to this country when a boy. He prepared for college at Williston Seminary, East Hampton, Mass., and after completing the academic course of four years at Yale University he took the law course of two years, graduating with the degree of Bachelor of Arts and Bachelor of Laws, and was admitted to the bar in the State of Connecticut. In 1889 he began the practice of law in Buffalo, and in 1895 became first assistant to the District Attorney, occupying that position for four years. A vacancy then occurred in the office of the District Attorney and Mr. Penney was appointed to fill that office by Theodore Roosevelt, at that time Governor of the State of New York, and was elected to the office the following year for a term of three years. During Mr. Penney's incumbency of this office, President McKinley was assassinated in Buffalo. As District Attorney, Mr. Penney prosecuted the assassin, Czolgosz. At the expiration of his term Mr. Penney declined a renomination and resumed private practice, having become a member of the firm of Norton, Penney & Sears, among whose clients was the International Railway Company and other public service companies, and has been actively engaged in the interest of these companies since that time.

Mr. Henry J. Pierce will resign the presidency of the International Traction Company at the meeting of the directors of the company on Sept. 29 and Mr. Thomas Penney, of the law firm of Norton, Penney & Sears, counsel for the company, will be elected to succeed him. Mr. Pierce will relinquish the presidency owing to the demands upon his time of the Amsterdam Corporation, New York, an expert advisory company on railroad and other large engineering projects, formed last spring by Mr. Pierce and Mr. W. J. Wilgus, formerly vice-president of the New York Central Railroad and its engineering expert, and of which Mr. Pierce is vice-president. For several months Mr. Pierce has found it necessary to spend three days of the week in New York in the interest of the Amsterdam Corporation and three days in Buffalo attending to his duties as president of the International Traction Company. This division of time and the constant traveling proved unsatisfactory, so he decided to resign as president of the International Company and devote his time to the interests of the Amsterdam Corporation. Mr. Pierce will, however, retain his financial interest in the company and continue as a member of the board of directors of the International Company. Mr. Pierce was born in Bath, Me., on Aug. 29, 1859. When only 17 years of age he removed to Buffalo and soon thereafter became interested in the manufacture of wood alcohol products. Subsequently the company which he established became the Manhattan Spirits Company and is now known as the Wood Products Company. Mr. Pierce was one of the organizers of the Buffalo & Niagara Falls Electric Railway and the Buffalo & Lockport Railway, and in 1902 became a director of the International Traction Company. In 1906 he was elected as president of the company to succeed Mr. W. Caryl Ely. Mr. Pierce is a director in the Marine National Bank, the Securities Safe Deposit Company, the Lumber Life Insurance Company and J. G. White & Company, Inc., of New York. He was a member of the board of directors of the Pan-American Exposition and was chairman of the concessions committee. In 1905 he was president of the Chamber of Commerce of Buffalo.

OBITUARY

Henry Tower, for several years treasurer of and a director in the Concord, Maynard & Hudson Street Railway, is dead. Mr. Tower was a prominent citizen of Hudson, had held many town offices and had represented his town in the State Legislature several times. Mr. John W. Ogden, assistant treasurer of the company, is performing the duties of the office until a new treasurer shall be elected.

Construction News

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

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

FRANCHISES

Red Bluff, Cal.—The City Trustees have granted a franchise to the Northern Electric Railroad for the extension of its lines through the main street of Red Bluff. The company has again made application to the Board of Trustees at Redding to grant a franchise permitting the use of several streets for its line.

Waycross, Ga.—An extension of six months has been granted for the street railway proposed by Burdette Loomis, Harley Pettibone and G. W. Deen. [S. R. J., June 22, '07.]

St. Paul, Minn.—The Assembly has passed an ordinance accepting in every detail the proposition submitted by the Twin City Rapid Transit Company in regard to a Randolph-Snellling line. By the provisions of the ordinance the company cannot be compelled to build a crosstown line within five years, it cannot be ordered to give service more frequently than 15 minutes and upon completion of the proposed line is entirely relieved from building a Dale Street crosstown line.

***Missoula, Mont.**—An application has been made to the City Council by Messrs. Costello and Weisberger, of Spokane, Wash., for the privilege of operating a street railway through the streets of Missoula. The firm has offered to donate \$12,750 toward the construction of a bridge across the Missoula River at Higgins Avenue to be built of concrete.

West Orange, N. J.—The Orange Mountain Traction Company has been granted a 50-year franchise to lay its tracks across Valley Road, near Walker Road.

Roslyn, N. Y.—New York & North Shore Traction Company, of Roslyn, N. Y., has applied to the Public Service Commission, Second District, for permission to extend its line from Mineola to Hicksville, a distance of 6¾ miles. A hearing on the subject will be had at Albany on Thursday, Sept. 24, and if permission is secured the company will immediately purchase all of the necessary equipment for the construction of this line and will begin work this fall. Charles H. Clark, formerly engineer of maintenance of way of the International Traction Company, of Buffalo, is chief engineer of the New York & North Shore Traction Company, and will have charge of the construction.

Gastonia, N. C.—A franchise has been granted to W. S. Lee and L. C. Harrison for an electric street railway. Mr. Lee is vice-president and general manager of the Charlotte Power Company and Mr. Harrison is assistant secretary of the same. The company proposes to build an electric railway connecting various points. [E. R. J., Sept. 19, '08.]

McConnellsville, Ohio.—The Zanesville & Meigs Valley Traction Company has petitioned the Board of Commissioners for a franchise through Morgan County over its highways. The company proposes to build an electric railway from Zanesville to Beverly, Ohio, via McConnellsville. H. D. Blodgett, Zanesville, general manager.

Springfield, Ohio.—The Springfield & Washington Railway has made an application to the City Council for a franchise to construct and operate a street railway within the city limits.

Astoria, Ore.—The Oregon Coast Railway has applied to the City Council for a franchise to build electric lines on a number of streets in the city limits. The company desires the franchise to eventually be tendered to the Astoria, Seaside & Tillamook Railroad Company. [E. R. J., Aug. 22, '08.]

Pendleton, Ore.—The City Council has granted a 25-year franchise for an electric street railway system to the Oregon & Washington Traction Company, of Walla Walla, which company is now operating street cars at Walla Walla and an interurban line to Freewater and Milton. By the terms of the ordinance the company may use any and all of the streets of the city for a term of 25 years, and must have 3 miles of track completed and in operation within 18 months. [S. R. J., May 2, '08.]

Bellingham, Wash.—The Nooksack Valley Traction Company, which is preparing to build an interurban electric railway between Bellingham and Blaine and Bellingham and Sumas, has applied to the City Council for a franchise to construct a line 4 miles long in Bellingham. [E. R. J., Sept. 12, '08.]

La Crosse, Wis.—The Common Council has granted the La Crosse City Railway a franchise to extend its lines on Main Street from Sixteenth Street to Twenty-third Street and on Twenty-third Street to Market Street. It also gives the company permission to take up seven blocks of its tracks on Market Street from Sixteenth to Twenty-third Street.

Milwaukee, Wis.—The State Railroad Commission has granted the Milwaukee Light, Heat & Traction Company authority to extend its line from Waterford to Lake Geneva.

RECENT INCORPORATIONS

***Lethbridge (Alta.) Radial Tramway.**—Incorporated by the Alberta Legislature to construct an electric railway from Lethbridge to Raymond, Alta.; Lethbridge to Stafford. Capital stock, \$100,000. Headquarters, Lethbridge. Provisional directors: W. Henderson, C. F. P. Conybeare, M. Freeman, F. H. Newburn, H. T. Cherry, W. Hardy and B. M. Jones, Lethbridge.

***Reed Deer (Alta.) Railway.**—Incorporated to construct a railway to be operated by electricity in the town of Reed Deer, and thence eastward to Content, with a branch to the coalfields on the Red Deer River; from Content northeasterly to Nevis, and from any point in Reed Deer to such points outside as may be approved by the Minister of Public Works. Capital stock, \$100,000. Headquarters, Reed Deer. Provisional directors: G. W. Smith, J. J. Gaetz, F. W. Galbraith, W. A. Moore, J. C. Moore, all of Reed Deer.

***Crow's Nest & Prairie Electric Railway, Coleman, Alta.**—Incorporated to construct an electric railway from near the western end of Crow's Nest Lake easterly through or near to Coleman, Blairmore, Frank, Bellevue, Lundbreck and Cowley, to Pincher Creek. Capital stock, \$150,000. Headquarters, Coleman, Alta. Provisional directors: A. Cameron, D. J. McIntyre, W. R. McRae, Colman; T. Smith, Frank, Alta.; J. H. Schofield, Pincher Creek, Alta.

***Kendallville, Ligonier & Goshen Traction Company, Kendallville, Ind.**—Incorporated in Indiana to construct an electric railway between Goshen and Kendallville, through Ligonier, and with spurs to Albion and Rome City, and connecting with the main line at Brimfield. The road will connect at Goshen with the Chicago, South Bend & Northern Indiana Railway Company's line and at Kendallville within a short time with the Toledo & Western Railroad. Capital stock, \$10,000. Incorporators: Frank P. Abbott, Haines Egbert, Harvey A. Banta, H. I. Park, C. C. Beyer, E. E. McCray, Fred Green and Frank Bothwell. Officers: Elmer E. McCray, president; Haines Egbert, vice-president, of Goshen; C. C. Bayer, secretary-treasurer, of Kendallville.

***Greater New York Traction Company, New York, N. Y.**—Incorporated in New York for the purpose of operating a mile of street railway track by electricity from Chambers and William Streets through William Street to Maiden Lane to Broadway to Cortlandt Street to West Street to Fulton Street to South Street. It is the intention of the promoters to charge a 3-cent fare. Capital stock, \$15,000. Incorporators: C. F. Thum, 60 Wall Street; Arthur G. Still, Joseph W. Spencer, Frank S. Burns, Charles M. Koop, John A. Gallagher, A. C. Austin, Jr., E. M. Fuller and R. W. Alexander, all of New York City.

TRACK AND ROADWAY

British Columbia Electric Railway, Vancouver, B. C.—It is reported that this company will expend about \$112,000 during the present year dating from July 1, 1908. The following improvements will be made: Cemetery extension, \$35,000; lighting extension, \$30,000; railway feeders, \$15,000; new buildings, \$12,000; relaying tracks, \$10,000; Gorge Park, \$10,000; total, \$112,000. In addition to this will be an appropriation for additional rolling stock.

Northern Electric Railway, Chico, Cal.—This company has begun constructing its freight line in Sacramento. It will branch off from the main line on C Street, near Eighteenth and Nineteenth, running out to C to Thirty-first, along Thirty-first to X, to Front, and along Front to M Street. It is expected that the Northern electric bridge will cross the river at M Street. The franchise only gives the road four months more in which to build the road.

Connecticut Company, Woodbury, Conn.—It is stated that this company has been authorized to extend the line from its present downtown terminal to a point nearly a mile north in North Woodbury. It is said that work will begin at once.

Miami (Fla.) Street Railway.—It is announced that this company will begin at once the repairing of its tracks on Twelfth Street, continuing the work until the entire line

is put in first-class order. The line is to be extended to the north as far as the cemetery at once. It is probable that during the winter the line will be extended north to Lemon City, where the company owns a considerable tract of land. It is said that the old electrical equipment will be discarded and gasoline motor cars will be used instead. Albert Ogle, superintendent.

Chicago (Ill.) Consolidated Traction Company.—Judge Grosscup, of the Federal Court, before whom the receivership proceedings for this company are pending, has authorized the expenditure of \$25,000 for the improvement of its track and roadway. David A. Forgan and John M. Roach, receivers, are given authority to use funds from the earnings of the lines or borrowed money.

Chicago & Milwaukee Electric Railroad, Chicago, Ill.—The lines of this company are completed to and including connections in Milwaukee, and it is stated by Clement C. Smith, of the Columbia Construction Company, that cars can be operated on the system at any time. Work on the car house and substation on Grove Street, near the southern city limits, is well under way. This will be ready as soon as the ballasting is finished. The work of stringing wires between Milwaukee and Racine is well along.

Ferdinand Railway, Indianapolis, Ind.—Thomas Glynn has been awarded the contract for the construction of this company's line between Huntingburg and Ferdinand. This is a short distance out of Evansville. It is proposed to begin work next month. D. H. Morgan, Indianapolis, secretary. [E. R. J., Sept. 5, '08.]

Wichita (Kan.) Railroad & Light Company.—The ELECTRIC RAILWAY JOURNAL is advised that this company will place contracts during the next month for the construction of 2 miles of double track. W. R. Morrison, superintendent.

Southwestern Interurban Railway, Winfield, Kan.—The ELECTRIC RAILWAY JOURNAL is advised that this company expects to award contracts during the next six months for the construction of an interurban line in Arkansas City, Kan., and Winfield, with track for local lines in both cities. The work of electrifying the present line in Winfield has already begun.

Maysville (Ky.) Street Railway & Transfer Company.—An order has been placed with the Lorain Steel Company by this road for 250 tons, 7-in., 70-lb. T-rails and other special work. R. A. Cochran, manager.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Maine.—This company has just completed and begun operating its new line from Sabatis to Winslow.

Washington, Baltimore & Annapolis Electric Railway, Annapolis, Md.—This company has asked permission of the Arundel County Commissioners to construct undergrade crossings near three of the principal stations along its line from Annapolis to Academy Junction, the terminal between Baltimore and Washington. The county roads where the undergrade crossings are desired are Millersville, Gott's and Iglehart. The plan of the company is for the county to secure the right of way of the land, and the expense of constructing the crossings be borne by the company. The commissioners are considering the proposition.

Washington, Frederick & Gettysburg Railway, Frederick, Md.—The directors of this company met and organized by electing D. Columbus Kemp, president; Alexander Ramsburg and Charles Wertheimer, vice-presidents; Charles C. Waters, secretary, and Dr. Franklin B. Smith, treasurer. The road is now completed within 1500 ft. of the connection with the Monocacy Valley Railroad, which runs from Catocin to Thurmont, a distance of 5 miles. It is said that the entire road from Frederick to Thurmont will be built and put in operation by the middle of next month. From Thurmont the road will be built to Emmitsburg, a distance of 5 miles, and from Emmitsburg to Gettysburg, its terminal, a distance of 10 miles. With the building of the link from Emmitsburg to Gettysburg the Frederick County end of the line from Washington to Gettysburg will be completed.

Jackson (Miss.) Electric Railway, Light & Power Company.—It is said that this company will make a number of improvements to its railway system which will include extensions to the southwestern and northeastern sections of Jackson. F. G. Jones, Memphis, Tenn., president.

Billings & Cooke City Railway, Billings, Mont.—George H. Savage writes that surveys are now being made for the route of the proposed electric railway which is shortly to be built from Cooke City via Nye, Dean, Joliet, Laurel and Billings. Cooke City is located within 6 miles of the northwest corner of Yellowstone Park. The company is planning to begin work on the road about Oct. 1. Power for the operation of the lines will be furnished by the Stillwater Power Company from a station which is to be built

at Stillwater Canyon. Capital stock, \$2,000,000, of which \$100,000 has been issued. Headquarters, Babcock Building, Billings, Mont. Officers: J. B. Clayburg, Helena, Mont., president; A. L. Babcock, Billings, vice-president and treasurer; George H. Savage, Billings, secretary and general manager. [E. R. J., Aug. 29, '08.]

***Kearney, Neb.**—Some time ago the Kearney Commercial Club took action on the plan for a proposed electric railway from Kearney to the northwest through the village of Pleasanton and on up the Loup Valley, with a branch line running to Ravenna. W. L. Rand was appointed to investigate the feasibility of the scheme. As a result W. L. Rand, Eugene Morey, a civil engineer of this city, and others are preparing articles of incorporation for the Kearney & Loup Valley Railway, which will be filed with the Secretary of the State in a few days. A survey has been under way for some time and grade stakes are now set to a point about 10 miles out of Kearney.

Hudson & Manhattan Railroad, New York, N. Y.—William G. McAdoo, president of this company, has awarded a contract to Post & McCord, of 44 East Twenty-third Street, New York, for 100 tons of structural steel, to be used in the construction of a coal-conveying plant to be erected in Jersey City.

New York, N. Y.—Judge Lacombe, in the United States Circuit Court, last week granted the petitions of Frederick W. Whitridge, receiver of the Third Avenue Railway and the Union Railway, in the Bronx, for permission to inquire into the advisability of obtaining additional franchises for extensions of these lines. In the order Judge Lacombe specified that Receiver Whitridge be required before accepting any of the proposed franchises to submit their terms to the Central Trust Company, trustee of the Third Avenue Company, and to the bondholders' committee for approval. The three extensions proposed for the Third Avenue Company include connections over the Blackwell's Island Bridge and over the new Manhattan Bridge, and a loop in Amsterdam Avenue. The specifications for the proposed extensions of the Union Railway are as follows: The Clason Point Road, extending from Westchester Avenue, in the Bronx, along the Clason Point Road to Clason Point; Pelham Avenue extension, an extension of the present Fordham line from the terminus at Fordham along Pelham Avenue to the Southern Boulevard to the entrance of Bronx Park; 207th Street bridge, an extension running from the double-track line of the Union Railway on Fordham Landing Road, westerly on 207th Street to Broadway, connecting with the rapid transit station at 207th Street and Eleventh Avenue, and with the Kingsbridge Company's lines on Broadway; 230th Street extension, an extension of the tracks of the Union Railway on 230th Street from Bailey Avenue to Broadway, a distance of about 800 ft.

Interborough Rapid Transit Company, New York, N. Y.—This company is in the market for 1800 tons of structural steel.

Western New York & Pennsylvania Traction Company, Olean, N. Y.—The Public Service Commission, Second District, has granted the application of this company for an overhead crossing of the Erie Railroad in the town of Little Valley. The overhead bridge to be constructed shall entirely clear the right of way of the Erie Railroad, and the clearance of the overhead structure shall be at least 22 ft. above the top of the rail of the Erie tracks. The entire cost of the bridge will be paid by the traction company.

Goldsboro (N. C.) Traction Company.—This company, which proposes to construct a street railway 2 miles long, is said to have purchased construction material and will begin work shortly. E. T. Oliver, owner of the franchise, has acquired all the land belonging to the East Goldsboro Land & Improvement Company, known as East Goldsboro, for the purpose of opening and maintaining a park and places of amusement. [S. R. J., May 2, '08.]

***Goldfield, Nev.**—It is stated that preliminary surveys and all other necessary work have been done preparatory to constructing an electric railway in Goldfield which is eventually to extend to Diamondfield. It is estimated that the cost of installation and equipment will aggregate \$125,000. At the next meeting of the Board of County Commissioners a petition will be presented asking that a franchise for the street railroad system be duly advertised. Among those interested are: George Wingfield, Denny Sullivan, T. F. Manning, M. T. Merwin and Senator H. V. Morehouse.

Oklahoma, Kansas & Missouri Interurban Railway, Miami, Okla.—Construction work on this proposed standard-gauge railway has already been started according to a report recently received from F. O. Freeman, secretary of the company. The road is being built from Miami to Hattonville, a distance of 5½ miles. Gasoline motor cars will be operated. The line, when completed, will reach River

View Park. Capital stock, \$100,000. Headquarters, Fribley-Babcock Building, Miami, Okla. Officers: Franklin M. Smith, president; D. W. Cooter, vice-president and general manager; F. M. Freeman, secretary; R. H. Holtan, treasurer; John Hall, superintendent and Electrical engineer. [E. R. J., Sept. 12, '08.]

Dunnville, Wellandport & Beamsville Electric Railway, Wellandport, Ont.—It is said that this company will let construction contracts about Sept. 25. Plans, etc., are at the office of George Dunstan, 43 Scott Street, Toronto, who is handling the project. The line will be about 23 miles long and will connect Dunnville, Wellandport and Beamsville, across the Niagara peninsula from Lake Erie to Lake Ontario. Surveys are made and right of way partly secured. James A. Ross, Wellandport, Ont., president; R. T. Gough, chief engineer, Bank British North America Building, Toronto, Ont. [E. R. J., Aug. 8, '08.]

***Carlisle, Pa.**—It is said that several local business men, headed by Willis E. Gladfelder, will apply next month for a charter to build an electric railway running east along the Harrisburg, Carlisle & Chambersburg turnpike from Carlisle to Balfour, a distance of 3 miles. The company is to be known as the Cumberland Railway.

Pennsylvania & Maryland Street Railway, Elk Lick, Pa.—It is reported that this company, which now operates lines from Meyersdale to Salisbury and from Meyersdale to Garrett, will shortly build an extension from Garrett to Johnstown. H. H. Manst, Elk Lick, general manager.

Johnstown & Gallitzin Street Railway, Johnstown, Pa.—This company has just been organized to build an electric railway about 32 miles in length from Johnstown to Gallitzin via Walnut Grove, Geistown, Lovett, South Fork, Summerbell, Wilmore, Portage, Lilly and Cresson. This project will entail an expenditure of at least \$1,250,000. Wallace Sherbine, of Wilmore, is president, and H. H. Storey, of Johnstown, general counsel of the new company, which succeeds the late Johnstown, Ebensburg & Northern Railroad. Several surveys have been made and a desirable route selected. A charter will shortly be applied for at Harrisburg.

Pittsburg, Harmony, Butler & New Castle Railway, Pittsburg, Pa.—It is stated that this company will obtain entrance to Pittsburg by means of a new bridge to span the Allegheny River at Eleventh Street.

York (Pa.) Railways.—Bids are wanted until Sept. 30 by L. C. Mayer, chief engineer of this company, at York, Pa., for grading $4\frac{1}{2}$ miles of line, involving the handling of 80,000 cu. yd. of earth.

Interstate Consolidated Street Railway, Providence, R. I.—This company has just completed its extension between Attleboro and South Attleboro, Mass. This line, constructed at a cost of about \$75,000, will give Attleboro a shorter and more direct route to Pawtucket, and, in addition, connect the center with South Attleboro. The new line is an extension of the County Street branch from Attleboro toward Pawtucket. About 3 miles of new track were laid. The company has applied to the Railroad Commission for a certificate of operation.

Austin, Tex.—Governor Campbell is said to be in favor of the construction, by the State of Texas, of an electric railway to connect the town of Bryan and the State Agricultural & Mechanical College. It will be about 7 miles long. It is estimated that it will cost the State about \$100,000 to build and equip the railway. It is planned to transport the students and members of the faculty of the college at a reduced rate of fare. The line will also be used to haul freight and supplies for the institution.

Corsicana (Tex.) Transit Company.—J. W. Carpenter, general manager, writes that this company will ballast all track not ballasted in the near future. The company will also take up all the 35-lb. rails and relay with a heavier steel rail.

Gainesville, Whitesboro & Sherman Interurban Electric Railway, Gainesville, Tex.—It is officially announced that this company has awarded the general grading contract to O'Reilly, Callahan & Given, of Chicago. The Tenny Construction Company, Silver City, N. Mex., is the sub-contractor. The line is completed 12 miles out from Gainesville. As projected, the railway will connect Gainesville and Sherman and will be 39 miles long. John King, Gainesville, president. Surveys are made and right of way secured.

Houston (Tex.) Electric Company.—It is announced that this company intends to extend the Harrisburg extension of the Houston system on down to the bay shore to La Porte, Seabrook and other bay shore points. David Daly, manager.

Marshall (Tex.) Traction Company.—The ELECTRIC RAILWAY JOURNAL is advised by Marvin Turney, of Marshall, that this company proposes to construct a standard-gage line, about 3 miles long, within the corporate limits of Marshall. The company has not yet been fully organized, neither has a State charter been taken out. It is intended to start preliminary work within 90 days. [E. R. J., Sept. 12, '08.]

San Antonio (Tex.) Traction Company.—Contracts were recently made by this company for 7500 yd. of asphalt paving and 2300 yd. of cement roadbed.

Idaho Railroad & Navigation Company, Spokane, Wash.—This company, recently incorporated with \$100,000 capital, is making surveys along Tucannon River from a point near Grangeville, Wash. The line is an alternative to the route recently covered by a survey up Deadman Creek, which joins the Snake River at a point northwest of Pomeroy, Wash. G. Van Arsdale, president; S. M. Tate, secretary; C. W. Hadley, general manager. The office of the company is in the Hyde Block, Spokane, Wash. [E. R. J., Sept. 12, '08.]

***Thunder Creek Transportation & Smelting Company, Tacoma, Wash.**—It is announced that this company, recently incorporated in the State of Washington, proposes to build an electric railway about 22 miles long. Plans, it is expected, will be finished by January, 1909. A. M. Richards, president, and H. J. Fuller, chief engineer, both of Tacoma, Wash.

Seattle, Wash.—It is stated that Stone & Webster, who have just purchased the Seattle-Everett Interurban Railway, will extend the line from Everett to Bellingham, where it will shortly form the north end of a proposed through electric road from Portland to the Canadian border, in connection with the Puget Sound Electric Railway from Seattle.

Potomac Valley Railway, Keyser, W. Va.—Work was commenced last week on the line of this company, which is to be built from South Keyser to Piedmont and thence to Bloomington, Md. A large force is at work on Piedmont Street, Keyser, where the first track will be laid. L. S. Kirker, engineer. [S. R. J., Apr. 18, '08.]

POWER HOUSES AND SUBSTATIONS

Rochester Railway & Light Company, Rochester, N. Y.—It is announced that this company will reconstruct its storage battery plant at the station at the foot of Factory Street, on the river flats north of Platt Street, at a cost of about \$10,000.

Fayetteville (N. C.) Street Railway & Power Company.—This company is reported to have contracted with the Ideal Electric Company, of Charlotte, for the placing of poles and trolley in connection with its system, preparatory to operating its cars by electricity instead of gasoline motors, used now. Wm. D. McNeil, president.

Chatham, Wallaceburg & Lake Erie Electric Railway, Chatham, Ont.—By an agreement recently concluded between this company and the Chatham Gas Company the latter will supply from its own power house all the power necessary for the running of the entire railway system from Wallaceburg to Lake Erie. The gas company will install additional machinery and equipment for the purpose of this contract, the work being commenced at once.

Wausau (Wis.) Street Railway.—The Wausau Iron Works has been given the contract for the structural steel for the company's proposed power plant, foundations for which are now being put in by the Concrete Block & Supply Company at Wausau.

SHOPS AND BUILDINGS

St. Joseph (Mo.) Railway, Light, Heat & Power Company.—This company is building a new storage and operating car house at Sixth and Oak Streets. The dimensions of the building are 256 ft. x 142 ft.

Metropolitan Street Railway, New York, N. Y.—A. V. Porter and J. R. Spelman, architects for Receivers Joline and Robinson of the Metropolitan Street Railway, have filed plans with Building Superintendent Murphy for a new car house to replace the barn at Ninth Avenue and Fifty-fourth Street. The new building is to be of brick and stone, fireproof construction, with a frontage of 135 ft. 10 in. and a depth of 298 ft. 10 in. on the street. It will be five stories high, with a three-story addition. It will cost \$450,000 to complete it, but it is intended to build only two stories at present, costing \$300,000.

York (Pa.) Railways.—This company has advertised for bids for the removal of its old car house in York preparatory to replacing it with a new fireproof structure. The building will be 230 ft. x 33 ft., with 690 ft. of track room, capable of storing 20 or more cars.

Manufactures & Supplies

ROLLING STOCK

San Diego (Cal.) Southern Railway has recently received from the Niles Car & Manufacturing Company six open-end cars. Details of the cars follow:

Seating capacity,	Over all	8 ft. 5 in.
28 inside, 24 outside	Height inside	8 ft. 6 in.
Weight	Sill to trolley base,	9 ft. 8 in.
Wheel base	Height from track to sills,	3 ft.
Length of body...18 ft. 4 in.	Body	Wood
Over vestibule.....45 ft.	Underframe	Wood
Length over all...46 ft. 4 in.		
Width inside.....7 ft. 11 in.		

Special Equipment

Air brakes,	Headlights,	
Westinghouse AMM	Arc, General Electric	
Axles	Interior finish ...	Mahogany
Bolsters, body	Journal boxes.....	Brill
Bolsters, truck	Markers, Adams & Westlake	
Brake rigging	Motors, type and number,	
Brakeshoes	GE, 202 Interpole	
Car trimmings	Paint.....	Standard yellow
Center bearings....	Seats, Hale & Kilburn, 14	rattan, 12 slat.
Control system.....	Side bearings.....	Baltimore
Couplers,	Springs	Brill
Tomlinson automatic	Steps	Stanwood
Curtain fixtures,	Trolley poles and attach-	
Curtain Supply Company	ments, Base, Milloy, harp,	
Curtain material...Pantasote	Kalamazoo.	
Destination signs,	Trucks, type and make,	
Ground glass, made in shops	Brill, 27-E	
Fenders		
Hand brakes,		

Niles Car Works

Capital Traction Company, Washington, D. C., has placed an order with the Cincinnati Car Company for 12 double-truck, semi-convertible cars. Details of the cars follow:

Seating capacity	40
Weight...18,500 lb. body alone	
Length of body.....	28 ft.
Over vestibule	40 ft.
Length over all.....	41 ft.
Width inside, 7 ft. 7 in. at seats	
Over all	8 ft. 7 in.

Special Equipment

Bolsters, body,	Motors, type and number.
7/8 in. x 9 in., 7/8 in. x 8 in.	Two No. 101 Westinghouse
Car trimmings	Roofs, Monitor type, detach-
Couplers,	able hoods.
Van Dorn, No. 5, double end	Sanders.
Curtain fixtures	Cincinnati Car Company's
Curtain material...Pantasote	standard.
Destination signs,	Seats, Heywood Brothers &
Hunter Illuminated, end	Wakefield rattan.
Gongs, 12 in. Dedenda, one at	Steps, Stanwood, single tread
each end.	Trucks, type and make, Balti-
Hand brakes	more Car Wheel Company
Heating system,	Ventilators.
Consolidated Electric	Cincinnati Car, twin hinged
Headlights...Dayton, No. 1561	Special devices, etc.—
Interior finish.....Mahogany	No overhead trolley de-
	vices, plow system used.

TRADE NOTES

Western Electric Company, Chicago, Ill., announces a change in address of its advertising manager, H. M. Post, from 259 South Clinton Street, Chicago, to 463 West Street, New York.

American Concrete Pole Company, Richmond, Ind., has received a contract from the Terre Haute, Indianapolis & Eastern Traction Company for between 20 poles and 30 poles for a short section of street in Richmond on the Terre Haute, Indianapolis & Eastern Company's line for the purpose of testing the poles to determine their value for use in electric railway work.

Sterling Electric Company, San Francisco, Cal., announces that Frank J. Quinn, who for the past 15 years has been associated with the Pacific Telephone & Telegraph Company as purchasing agent, and subsequently with the Western Electric Company as buyer, has associated himself with the Sterling Electric Company and will act as a director and treasurer of the company.

General Electric Company, Schenectady, N. Y., has received an order from the Kobe (Japan) Electric Railway for two 500-kw, 25-cycle, engine type, three-phase alternators; two 20-kw, 125-volt marine sets to be used as exciters; one 40-kw, motor-generator set intended for use as

a spare exciter; four 40-kw transformers; 100 GE-78 railway motors, complete, and a complete switchboard equipment for the power house.

National Electric Lamp Association, Cleveland, Ohio, through its engineering department, announces that Dr. Edward P. Hyde, now of the Bureau of Standards, after Oct. 1 will organize and direct a department of physical research under the auspices of and at the expense of the association. Dr. Hyde with a staff will operate his department with entire freedom from commercial suggestion and with the same publicity which has characterized his work at the Bureau of Standards.

John C. Liggett has become connected with the Ohmer Fare Register Company, Dayton, Ohio, and after Oct. 1 will represent that company on the Pacific Coast, with headquarters at Los Angeles, Cal. Mr. Liggett, although still a young man, is a veteran in the electric street railway business, having developed, organized and constructed several interurban properties in the Middle West, among them the Detroit, Ypsilanti & Ann Arbor Railway and the Toledo, Fremont & Norwalk Railway. Before entering the railway field Mr. Liggett was engaged in the construction of electric lighting central stations. He became connected with the Detroit Citizens' Street Railway in 1894 in the capacity of electrical superintendent, and later developed the properties previously mentioned.

ADVERTISING LITERATURE

Wickes Brothers, Saginaw, Mich.—The monthly stock list of boilers, engines, dynamos, motors and machinery, dated Sept. 15, offered by Wickes Brothers, has been issued.

Wagner Electric Manufacturing Company, St. Louis, Mo.—This company has issued Baragain List No. 8 of motors subject to order before Oct. 15. The ratings and prices are given.

Elliott Brothers, London, S. E., Eng.—Pamphlet D20 has just been issued by Elliott Brothers. It describes the company's portable and switchboard ammeters, voltmeters and wattmeters for alternating and continuous current.

Arthur S. Partridge, St. Louis, Mo.—Schedule No. 24 of second-hand electric and steam machinery offered by Mr. Partridge has been issued under date of Sept. 19. Among the railway equipment listed are direct-connected generators, belted generators, 16 No. 56 Westinghouse motors, 20 No. 49 Westinghouse motors, 11 K-12 controllers, 18 K-11 controllers, 24 K-2 controllers, 4 45-ft. interurban cars with 45-ft. bodies and 4 motor equipments and a single-truck rotary snow plow without motors.

Wheeler Condenser & Engineering Company, Cartaret, N. J.—This company has issued a 16-page bulletin, No. 101, the first of a series which outlines the company's facilities and products, including Wheeler-Admiralty surface condensers, Wheeler jet and barometric condensers, Wheeler-Edwards patent air pump, Wheeler-Volz combined condenser and feed-water heaters, Wheeler feed-water heaters, Wheeler improved reheaters and receivers, Wheeler vertical engines, Wheeler centrifugal pumps, Wheeler rotative dry vacuum pumps, Wheeler-Barnard water-cooling towers, Wheeler vacuum pans and multiple effects for sugar and chemical works, etc. Succeeding numbers of the series will contain useful and practical information, tables, etc., on condensing work and allied branches of engineering, thus becoming not only a continued catalog, but a record of progress in condensing, vacuum, distilling, feed-water heating and pumping apparatus.

The Scherzer Rolling Lift Bridge Company, Chicago, Ill.—The many good qualities of the Scherzer rolling lift bridge are so well known that it is not surprising that its designers should have given equally careful attention to producing so fine a descriptive publication as the company has just issued in gold-stamped heavy cloth binding. It is an interesting fact that the rolling lift bridge was invented by William Scherzer specifically as the solution of a difficult problem encountered by the Metropolitan West Side Elevated Railroad of Chicago. This great departure in bridge construction was soon widely appreciated, and to-day a remarkable number of these bridges are used both for railway and highway traffic. In this publication the Scherzer Company has gone very thoroughly into the merits of different types of bridges, taking up the subject from the trunnion bascule bridge used in the castles of mediæval times. A large number of excellent illustrations are presented of rolling lift bridges in service throughout the United States, together with a number of drawings showing several of this type in operation or under construction as the movable spans in bridges crossing wide waterways. The booklet also explains the business policy of the company regarding the planning and construction of bridges according to its methods.

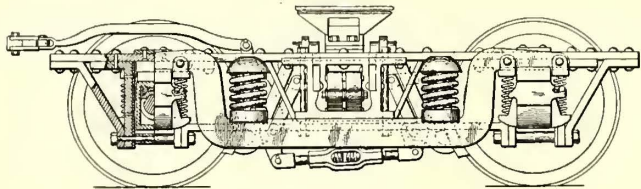
ELECTRIC RAILWAY PATENTS

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

UNITED STATES PATENTS ISSUED SEPTEMBER 15, 1908.

Electrically Conductive Railway Rail Joint or Connection, 898,430; Bancroft G. Braine, of New York, N. Y. App. filed Oct. 25, 1907. Provides a joint with connecting plates, each one of which contacts with the under side of the heads of the rails and also with the base flanges of the rails, and the connection between the connecting plates and the rails is made by welding, causing a molecular union at one of the contacting points, and providing an adjustable contact at the other contacting point.

Car Truck, 898,440; Edmund A. Curtis, of Decatur, Ill. App. filed August 28, 1907. The combination of side frames comprising upper and lower wheel pieces and pedestal



Car and Truck—Pat. No. 898,440

frames, all rigidly united with each other, end sill members extending across each end of the truck and rigidly uniting the two side frames, pairs of equalizers arranged to extend one at each side of each of the side frames, a spring supporting each end of each equalizer from the corresponding journal box, saddles arranged to lie across the intermediate parts of the equalizers, and main coiled expansion springs interposed between the saddles and the overlying wheel pieces and supporting the said frames free from and above the top sides of the journal boxes.

Railway Crossing, 898,466; Ferdinand Halley, of Chicago, Ill. App. filed May 21, 1908. A rail crossing comprising the intersecting grooved rails, the treads of said rails being in the same horizontal plane and unbroken throughout their extent and the grooves and inner flanges tapering gradually upward from a point adjacent to the ends to a point adjacent to the crossing rail.

Railway Signal, 898,473; John Hoffer, of Louisville, Ky. App. filed Jan. 14, 1908. A signal system for use at the curves of a railway and including mechanically operated tappets depressed by the wheel flanges and mutually connected together to set appropriate signals at each side of the turn. Includes a form of semaphore signal which is operated by an electro-magnet.

Device to Prevent Trolley Wheels from Jumping, 898,485; William O. Lane, of Cleveland, O. App. filed Dec. 20, 1907. The trolley harp has a rigid yoke fixed thereto, the arms of which embrace the trolley conductor. A pair of longitudinal guides are attached thereto to avoid any rigid corners which might become entangled in the guy wires and damage them.

Means for Operating Car Fenders, 898,582; Robert L. Kellett, of San Francisco, Cal. App. filed Feb. 10, 1908. Means for operating the fender by compressed air.

Movable Point Crossing, 898,645; William M. Henderson, of Steelton, Pa. App. filed Oct. 2, 1907. Consists in cutting away the head of the track rail for some distance on each side of the "knuckle" and securing to the web of said track rail a hard metal wear-plate having a head portion taking the place of the cut-away rail-head, the said hard metal wear-piece forming the usual apex or knuckle at a point adjacent to the points of the movable point rails and taking the wear.

Metallic Tie, 898,652; Elmer Hudson, of Camp Point, Ill. App. filed Oct. 7, 1907. Has a clamping plate freely movable under a rail on the tie, said plate having jaws to engage the respective flanges of the rail, a bolt pivotally connecting the plate with the tie at one side of the rail, and means engaging said bolt and the clamping plate for locking the latter in normal position.

Amusement Device, 898,674; Lawrence O'Donnell, of Scranton, Pa. App. filed Jan. 31, 1908. Imitates, mechanically, a chariot race in which the vehicles are propelled by pedals by the operator.

Switch Lock, 898,737; Edward T. Hardin, of Hot Springs, Ark. App. filed March 6, 1908. Has an arm projecting laterally from the switch-point and formed of spring metal, a roller carried by the arm, and a co-operating roller carried by a stationary support.

Aerial Railway, 898,739; Francis Hooker, of Toronto, Can. App. filed Sept. 16, 1907. Consists of an elevated trackway centrally supported on arms between vertical poles and formed in the shape of a double loop having a gap therein intermediate its length and being bent downwardly at one end toward the gap, and an elevator located in the gap.

Metallic Tie and Rail Joint, 898,810; William F. Wilson, of Jeannette, and Charles K. Barnhart, of McKees Rocks, Pa. App. filed Jan. 28, 1908. The tie has integral abutments at each end adapted to embrace the outer sides of the rail web and base. The inner sides of the rails are engaged by fish-plates held in place by abutments keyed to the tie.

Electric Railroad Signal, 898,862; Timothy C. Fogarty, Frank W. Brock and Frank A. Bowdle, of Chatham, Ill. App. filed Jan. 13, 1908. A block signal system designed for protecting a car on a curve both in front and rear. When the car enters a curve it will raise a semaphore at the point of entering, and at the same time will raise a corresponding semaphore at the other side of the curve, and these semaphores will both stay in elevated position until the car passes out of the curve.

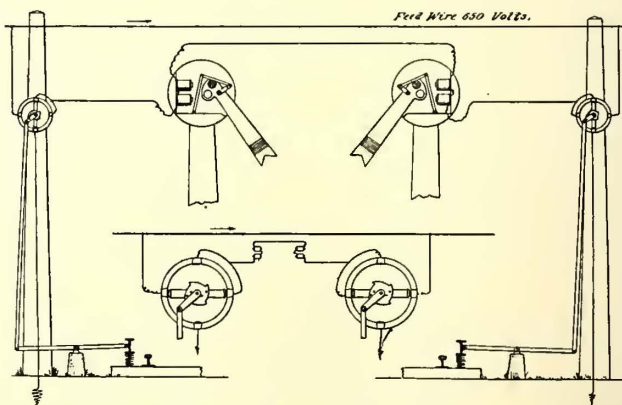
Means for Forming Joints and Bonds in Rails, 898,869; Horatio G. Gillmor, of Bath, Me. App. filed Dec. 4, 1905. Details of construction.

Automatic Switch, 898,870; Francis M. Hall, of Potomac, Ill. App. filed March 9, 1908. Relates to automatic railway switches of the class which are adapted to be thrown mechanically in advance of a moving train. Provides a direct connection between the tappet and switch-throwing mechanism.

Fluid Pressure Brake, 898,885; Herbert T. Herr, of Roanoke, Va. App. filed Dec. 23, 1903. Provides a valve device for supplying air directly from the main reservoir to the brake cylinders and operated by the same movements of the engineer's brake valve as used in operating the automatic train brakes in the usual way, thereby dispensing with the auxiliary reservoirs and triple valves.

Car Structure, 898,952; John Edward Anger, of Preston, England. App. filed July 29, 1907. Relates to the manner of stowing the sashes in a convertible car.

Combined Railway Rail and Bed Plate, 898,986; John C. Phillips, of Akron, O. App. filed Dec. 2, 1907. A railway track having an integral bed plate extending between and forming a support for the opposite track rails, longitudinally disposed side flanges on the bed plate, sleeper rails adapted to be bolted to the side flanges, and track rails connected to and supported by said flanges and sleeper rails.



Electric Railway Signal—Pat. No. 898,862

Rail Tie, 898,982; William H. Mayer and Ira O. Burch, of Kansas, Ill. App. filed March 7, 1908. A metallic rail tie comprising a hollow element having a rounded top provided with flattened rail receiving portions, outwardly inclined sides, a flat base, and partially closed ends.

Means for Attaching Bolts to Concrete, 899,002; William E. Beilharz, of San Francisco, Cal. App. filed Aug. 8, 1907. Has a metallic housing having in its lower portion a long, narrow box-like chamber adapted to receive the head of a bolt, and having parallel walls extending upwardly from the box-like portion and a sufficient distance from each other, for the main portion of their length, to receive the stem of a bolt but to exclude its head, and having at the center offset portions at a sufficient distance to receive therebetween the head of the bolt. Is particularly useful for securing rails to concrete railway ties.