

# Electric Railway Journal

Published by the McGraw-Hill Publishing Company, Inc.  
Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Vol. XLIX

NEW YORK, SATURDAY, MARCH 24, 1917

Number 12

## THE RIGHT TO STRIKE DENIED

The whole tenor of the decision of the Supreme Court on the Adamson law is that the right of the public to continuous service of such a necessity as steam railroad transportation is paramount to the private interests of either employer or employee. If these two can agree upon terms of service and wages, well and good; if not, Congress either directly or through a commission can specify such conditions as it considers just, and its decision is binding on both employer and employee, provided it does not violate the constitutional safeguards against confiscation of property or other act of such arbitrary power as to amount to a denial of due process. As for the right of the employee to strike, the decision clearly says that whatever he might do in a private business, the right to leave work either individually or in concert with others is subject to limitation when a man accepts employment in a business charged with public interest and where the rates and wages paid are subject to the power of Congress. This seems entirely to dispose of the claim which has been made by labor leaders that any strike prevention legislation for public utilities would be unconstitutional because of the restriction of personal liberty. It is a fitting reminder to unionism that it is not to be considered as being above the law.

## THE TRIAL YEAR OF THE SAFETY CODE

The year during which the national electrical safety code is being tried out, preliminary to its permanent establishment as an influential guide to regulatory bodies, is rapidly slipping away. The presumption is that the code is being carefully studied in its application to local conditions on individual electric railway properties. If this presumption is not correct it would seem to be wise to delegate to one or more individuals on each property the responsibility of making such a study now. A few months ago there was a great deal of activity in regard to the code. The Bureau of Standards certainly made a heroic effort to awaken interest in it. When first proposed the code was not taken seriously by the affected interests, as it did not seem possible that the work would assume such magnitude as developed later. In due time, however, they awakened to the necessity for co-operation in the preparation of the code, realizing that it was in a fair way to become established. There were meetings and conferences galore in the attempt reasonably to meet the ideas of the many interests involved and to conform the rules to the best existing practice. This stage is now past, and the rules have been published in tentative form as Bureau of Standards Circular No. 54. Copies can be

had from the government printing office, Washington, D. C., at 40 cents each. They should be distributed freely throughout the electric railway industry. Elsewhere in this issue will be found a notice of the publication of a twenty-six-page synopsis of the code by the Wisconsin Railroad Commission. This will be of great value as a syllabus of the longer treatise.

## PUBLISHING POLICY OF "AERA"

Another contribution to the discussion on *Aera*, begun in our issue of March 10, appears in our department of communications this week. It is from Frank R. Ford, who expresses the opinion that *Aera* in its present form is "too much of a magazine" for an association publication, and he recommends that its activities be restricted to those of a bulletin. The financial report of the association for the year ended Oct. 31, 1916, just issued, gives the present cost of the publication and emphasizes the point of Mr. Ford's remark. From less than \$1,000 a month, the cost during the first fourteen months of its existence, the expense for publishing *Aera* has increased for the year ended Oct. 31, 1916, to \$26,071, so that it is now more than \$2,000 a month. At present it constitutes 22½ per cent of the total expenditures of the association and exceeds by a considerable amount any other single operating item. So far as we know, no hope is held out that the expense of the publication will become less in the early future; instead there are many reasons to believe that it will grow larger, if the present policy is continued. This question of increasing cost and value received therefrom should be considered in addition to the other points against the present plan already advanced by Messrs. Williams, Tripp and Mortimer.

## COMPREHENSIVE IMPROVEMENTS IN DETROIT

The program of systematic improvement which is being carried out in Detroit, Mich., is typical of what in normal times will be going on to a greater or lesser degree on most of the progressive properties of the country. In spite of the fact that the Detroit United is operating without a franchise in the city the company is expending enormous sums of money in the endeavor to reduce operating expenses to the minimum. This involves, among other things, bringing repair and operating equipment strictly up to date in the best sense of that term. It so happens that Detroit has of late years been experiencing a decided boom. The expansion of the automobile and other industries has increased the pressure upon the transportation facilities and has furnished an unusual incentive for intensive development of the local railway system. Features of the develop-



ment program have been mentioned from time to time in this paper. In order to give its readers a comprehensive idea of part of it the results of a study of the car yard, maintenance and inspection shop and yard office building improvements are printed in this issue. The new freight terminal and the main shop enlargement will also be taken up in due course. Seldom has a car-yard layout problem been attacked with more thoroughness than has the one whose solutions are outlined here. The minimizing of dead mileage, the liberal supply of yard trackage, the facilitating of handling cars into and out of storage with due regard to air charging necessary with the storage system used locally, and the provision of bright, airy and yet inexpensive buildings for washing, inspection and light repairs, and for the comfort and convenience of the men, all had careful attention. The work is progressing rapidly, and already enough is completed to demonstrate its effectiveness. In these times of comparative stagnation in electric railway construction it is encouraging to know that some of our railways at least are getting in fresh capital and that they are spending it, if not lavishly at least liberally.

**AXLE-MOUNTED ARMATURES AND TRACK** A feature of particular interest was brought out at last week's convention of the American Railway Engineering Association in connection with a report, which is abstracted on another page, on the effect of electrification on maintenance cost of track. In this the definite statement is made that locomotives having a large proportion of their weight below the springs (obviously the type with axle-mounted armatures) require an increased strength of track, and that, although this increased strength means increased first cost, it ultimately tends to bring about decreased maintenance costs. This will no doubt come as a surprise to the majority of railway engineers, because there seems to have grown up a fairly well-defined idea that the axle-mounted armature pays a price—and a relatively large one—for its beautiful simplicity. Apparently, however, the price is not paid in the form of added costs in the maintenance of way, although it seems to be that closer attention to line and surface of track is required. Provided that this latter can be assured and the element of risk eliminated, a remarkably good case is made out for this type of locomotive drive. Its savings in power, because of its slightly higher efficiency than the geared drive, are more than sufficient to pay returns on the increased first cost entailed by the low armature speed, and there seems to be good evidence that the simplicity of the construction permits an appreciable decrease in the cost of locomotive maintenance, which when locomotive mileage is high runs into a lot of money at the end of the year. In brief, if the bogey of track maintenance cost is thus to be laid low, the axle-mounted armature should get a new lease of life, and it would be interesting if the American Railway Engineering Association's committee would elaborate its statements by publication of figures on which the opinion was based.

#### LESSONS OF THE WASHINGTON STRIKE

At this writing, March 21, the Washington Railway & Electric Company is operating 80 per cent service during the morning and evening rush hours and 100 per cent service or better during the mid-day hours. In fact, it is giving a service entirely adequate to handle traffic, which has been somewhat reduced by the non-riding of strike sympathizers. "Good for the Washington Railway; may it win out!" we can imagine our readers to be saying when they read this progress report. But while they are in the mood for congratulation, should not the electric railway managers of this country begin to ask themselves anxiously, "Who's next?"

The Washington strike is not over yet; and when it is the railway will have lost a great deal of money for the sake of maintaining faith with its loyal men and reasonable control of its business. In the meantime, it must make its fight alone against a nation-wide organization, with neither substantial nor spiritual aid from fellow managements.

In considering this strike it should be remembered that a year ago the company had already gone as far as it could in recognizing the principle of collective bargaining by making an agreement with its men as an independent body. But this did not satisfy the Amalgamated element. Instead of abiding by the spirit of the contract, it began a systematic boycotting and persecution of those who refused to join the union—exercising, in fact, an ostracism that extended to the wives and children of the recalcitrants. When the Amalgamated felt strong enough to stir up trouble publicly, war was declared on the company.

That electric railway employees should have the right to bargain co-operatively will not be denied, but that they should also have the privilege to shanghai into their ranks men who fail to appreciate the beauties of the Amalgamated system may seriously be questioned. Electric railway managers should know by this time that when they are dealing with the Amalgamated Association they are dealing with a shrewd, unscrupulous body which is conducting a strike somewhere pretty nearly every day in the year; which knows every trick and device for intimidating the timid and deceiving the sympathetic, and which has worked out almost to perfection among electric railway employees the policy of "Divide and conquer."

At present there are many and diverse opinions among electric railway managers as to the principles and methods of settling labor disputes. There is urgent need for getting together on these matters. It would be quite appropriate that a place be given to the subject on the American Association convention program this year, with ample allowance of time for discussion. The paper by Bentley W. Warren, presented at Boston last month, was very timely, but unfortunately was not discussed. Labor problems must be considered not as isolated, localized, sporadic occurrences, but as parts of a big economic situation. We do not know of any more important subject that is now before the industry for consideration.



**DAYLIGHT SAVING AND THE ELECTRIC RAILWAY**

We have referred once or twice in these columns to the daylight saving movement, which is likely to find favor here, perhaps in the coming season. Except for the pressure of business and filibustering in the Congress just closed, there was a fair chance that the bill for daylight saving which had been introduced might have pulled through. As it is, nothing can be done until Congress meets again, but if by that time we should be in a state of war, as seems probable, this among other measures supposed to tend to efficiency would stand a good chance of prompt adoption. There seems to be no organized opposition to it, the chief questions arising being concerned with details. The electric lighting industry has already discovered that no serious results to its revenues are likely to follow, but to the electric railway world it seems to us that the tangible results, if any, are likely to be rather beneficial than otherwise. Some of the effects have been previously alluded to, but others are worth mentioning.

In the first place there will be a certain tendency against a shift in the actual hours of activity whatever the clock may mendaciously proclaim. The mere instinctive tendency toward preserving the noon hour for labor at or near noon will tend toward change of the hours of labor to meet this requirement, and there will be many instances of a practical disregard of the new time in spite of its theoretical recognition. All this bears on the distribution of load throughout the day, tending somewhat to spread out the hours of dense traffic both in the morning and evening, a change not unwelcome to those suffering acutely from peak. The greatest difficulty with the urban railway business is the uniformity of hours of labor. When ten stories of people rush for accommodation in a one or two-story transit system and all insist on being carried at about the same time, the peak load becomes of a most uncomfortable character. Daylight saving might spread the hours of activity out a bit and bring a certain measure of relief on account of the diversity of transportation requirements of different lines of business, which would not all shift to the new schedule.

Aside from this the chief effect of daylight saving should be felt in the encouragement of pleasure riding. The most conspicuous part of the program is the apparent lengthening of the evenings, and this artificial prolongation of daylight will certainly encourage the freer use of parks and golf links all through suburban territory, as well as interurban riding in the outlying districts. The net result ought to be a very perceptible increase of traffic, as well as general improvement of the rush hour conditions. Whatever may be the result in general central station business, and we have no idea that it will be serious, the electric railways have nothing whatever to fear and some prospect of advantage. For this reason the electric railways can look with entire equanimity on the fateful night when the clocks may be shoved forward to remain there until the close of summer.

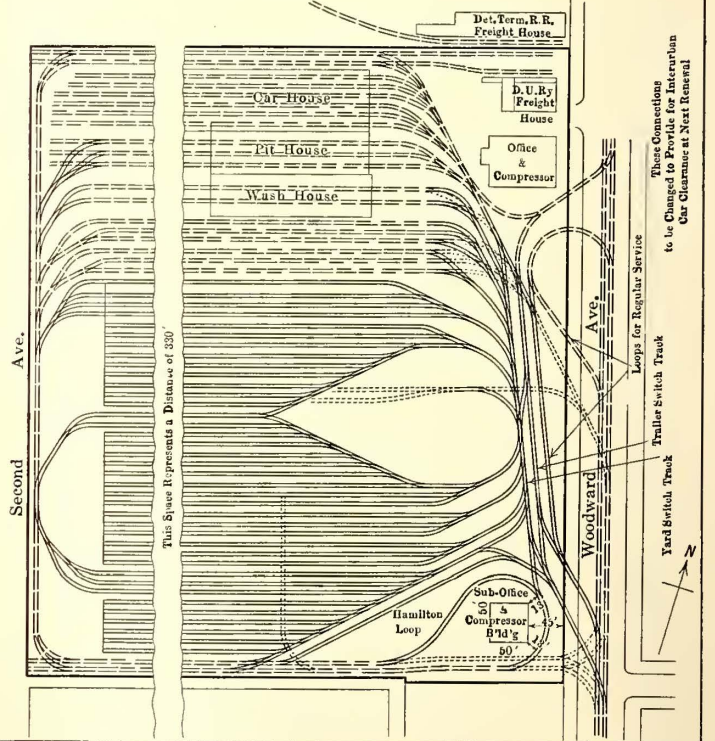
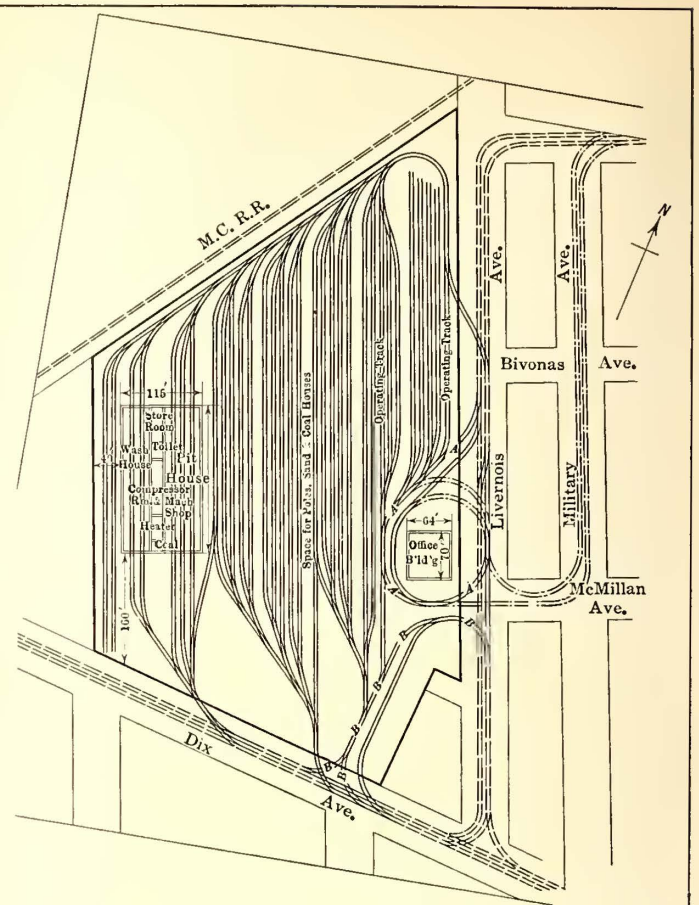
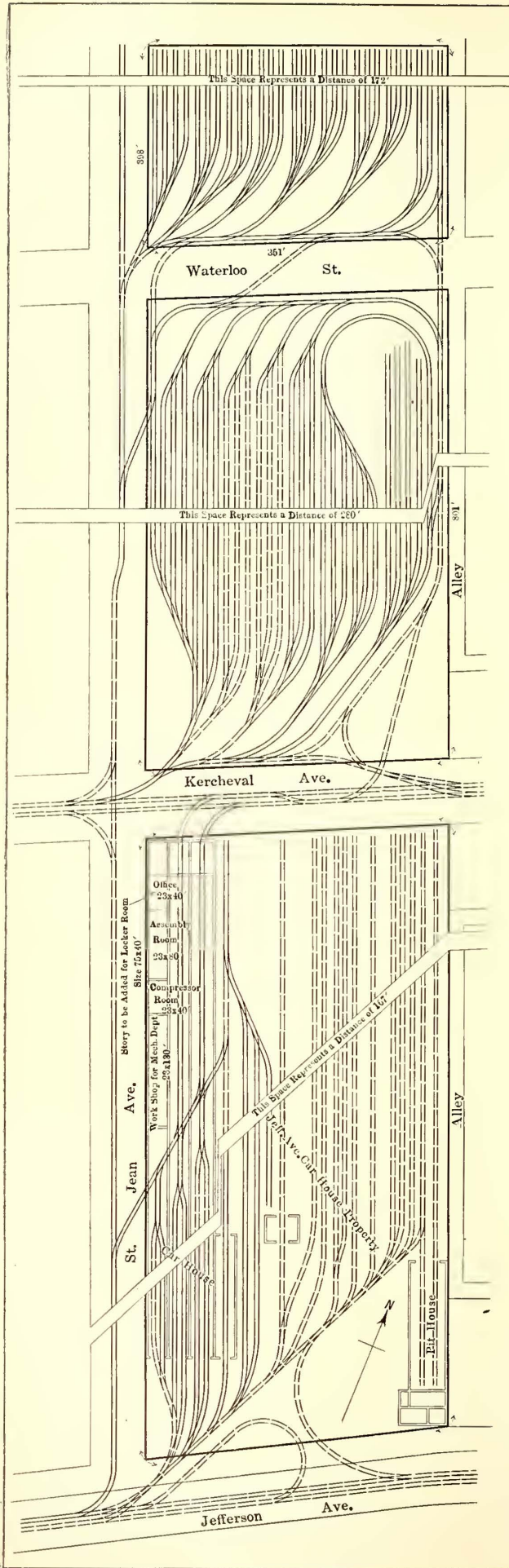
**WHAT WOULD BE THE BANKERS' VIEW?**

An explanation of the sometimes incomprehensible disinclination of railway companies to adopt standard designs may, perhaps, be found in the character of railway organizations generally. The difficulty is to some degree inherent, and it appears even more prominently on steam railroads than on electric lines. Its basis lies in the tendency of human nature (or, at least, of much human nature) to succumb to the fascination of fussing with details, and with the large and rather loosely-knit organizations that obtain in the transportation field, opportunity and authority are given to a good many officials to do such fussing without having to assume any responsibility for the final results in the broadest sense. It is doubtful whether any president or general manager or engineer of equipment or master mechanic really thinks that a slight change in the size of a gear fit, or the addition or reduction of a few inches in the length of a car, is going to make the difference between success and failure, but possibly all of these officials will have conceptions of certain details in design, and any one of them is generally able to put those conceptions across when new equipment is bought. No one of them assumes any direct responsibility for the economic result. Provided the equipment "works" there is no one to raise objections, and no one is interested in knowing whether or not such pet ideas as may have been introduced are bringing a return commensurate with their cost. In brief, there is, in the typical railway organization, no check upon the average official who wants the stamp of his individuality on the equipment that he assists in purchasing.

The most obvious and unfortunate example of the condition appears in the lack, until recently, of any great interest in a standard box car for steam railroads. Here the fact of interchange service makes even the fallacious "local conditions" argument an impossibility because equipment built for any road spends a large part of its time on other lines. Yet a new car's length and width are set in quarter-inches, and its metal fittings are cast or forged according to the ideas of some official whose beliefs may be revolutionized in a few years, even if he is not replaced earlier by someone else.

Exactly the equivalent of this is true of electric railways, although the results are not so marked because the organizations are smaller and the broad policies of practical economics do not have to be sifted through so many hands before reaching the active official who is supposed to apply them. Every railway man, for example, admits that standard cars would save 10 per cent in first cost, but the importance of the saving doesn't loom as large to him as it would if the money came out of his pocket instead of some banker's fund. Some day, perhaps, the bankers will find this out; then there will be a change. It will be hard to prove to the man who provides the cash for the equipment that minor differences in car lengths and other equipment dimensions are worth the thousands of dollars which they cost annually. Then, beyond a doubt, real standardization of equipment will begin.



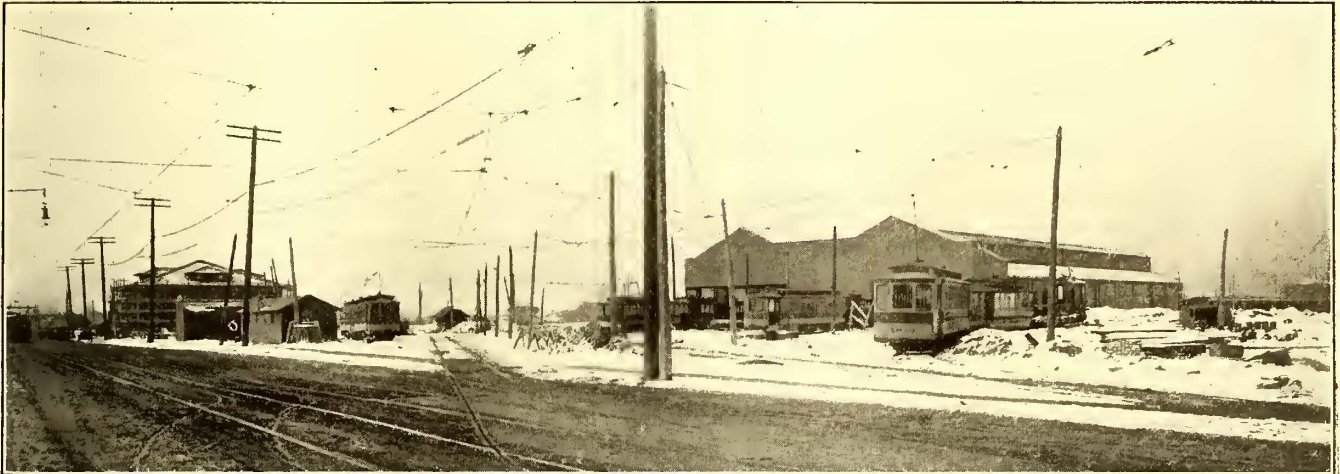


**Typical Car-Yard Layouts in Detroit**  
 (Solid lines, new track; dash lines, old track)  
 At left, remodeled yard at Kercheval and St. Jean Avenues. At right, above, new yard at Dix and Livernois Avenues; at right, below, remodeled Woodward Avenue yard.



# Standardizing Car-Yard Layouts in Detroit

Detroit United Is Carrying Out Systematic Program of Car Yard and Carhouse Improvements to Facilitate Inspection and Handling Into and Out of Storage



DETROIT CAR YARDS—GENERAL VIEW OF WEST JEFFERSON YARD

IN its city system in Detroit the Detroit United Railway has a total of twelve carhouse locations with storage capacity in varying amounts. At the present time the whole system of storage yards and carhouse layouts is being remodeled with a view to standardization and consequent economy. In some cases existing facilities are being revised to meet present and future requirements, while in others the installations are entirely new. In the latter, of course, the most has been made of the opportunity to approach ideal conditions.

In all of this work the purpose has been to provide for rapid turning and air charging of cars in regular service, and efficient handling of trail cars (of which a limited number are used), in addition to securing economical use of space for storage purposes and providing adequate facilities for inspection, maintenance, repairs and washing.

In the process of this work there has been evolved a flexible standard general arrangement, one adaptable to site limitations and local service conditions. In general it involves a yard provided with numerous loops, a standard service building or carhouse costing about \$50,000 complete, and an office and welfare building costing about \$35,000. While it is impracticable to describe all of the construction in the city, sample illustrations have been selected to show how the local problems are being solved.

## TYPICAL CAR-YARD LAYOUTS

One of the representative yards which is in process of remodeling is the Woodward Avenue yard represented in an accompanying illustration. In the drawing the solid lines represent the new track, the dash lines the original track which is to remain in place, and the dotted lines the track which is to be moved. In the drawing, to economize space, a 330-ft. section of the straight tracks has been represented by a blank space.

When this yard has been remodeled a loop will be furnished on the south side for the Hamilton Line cars which terminate at this point. A sub-office and compressor room for the service of this line will be constructed within the loop, as shown. As the storage air system is used on the Detroit lines, it will be understood that the accommodation of the compressors and facilities for charging the air tanks on the cars had to be considered in this as well as all of the other layouts. By charging when cars are at a terminal, the minute or less required for this purpose does not in any way interfere with the making of the schedule.

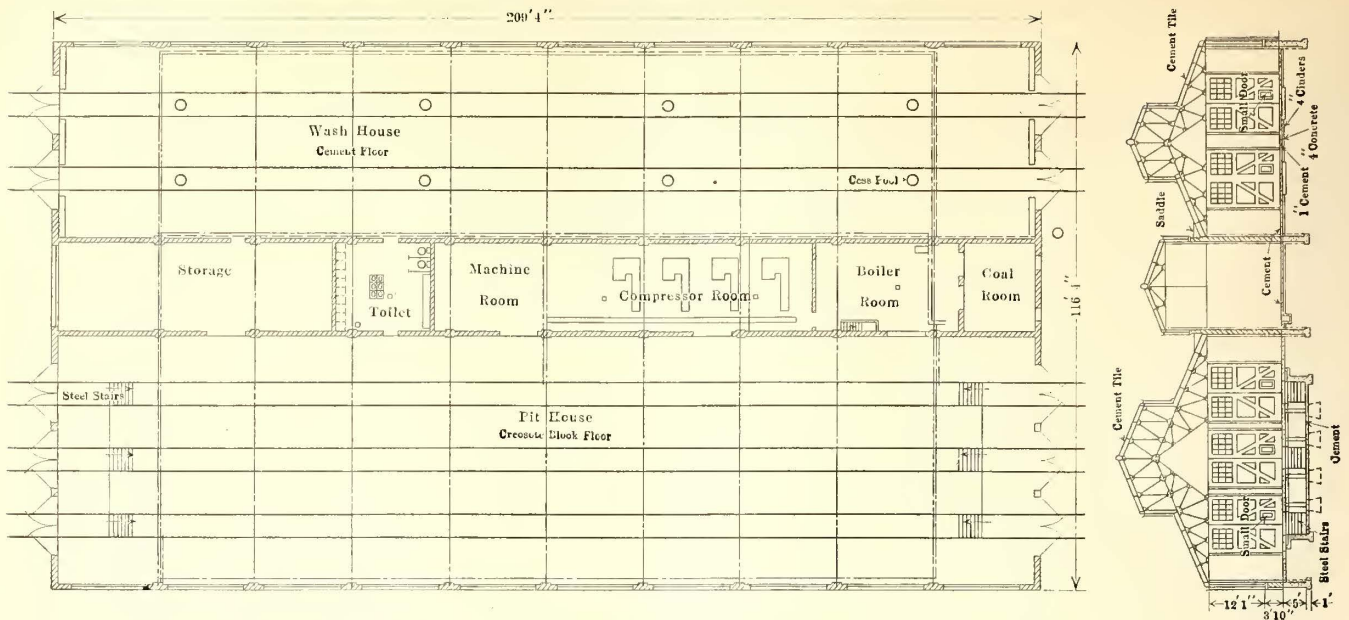
The loop used at present for turning Woodward Avenue cars will be increased as shown until it is sufficiently long to accommodate three two-car trains, all of which may be charged with air at the same time. Immediately back or west of the new loop the track for the handling of trailers will be installed. Entry to this track will be made at the north or south end of the property, and on it trailers will be picked up or dropped without interference with the regular service.

Next to the trailer track will be the switching track, connected with all the yard tracks, for the switching of cars from the yard to the inspection and wash-house building. All cars pulling into the yard will use the track on the south side of the property, heading west to Second Street, then north and into the tracks on which they are to be stored. All cars will be stored head-on toward Woodward Avenue.

The layouts as shown provide for thirty-eight additional tracks of an average length of 640 ft. and the yard will provide accommodation for 600 cars. There will be sixty-six switches and eighty frogs inside of the property lines, and six switches and nine frogs outside the lines. The minimum radius of curvature in the special work will be 40 ft.

Another remodeled yard, in which the same principles as those mentioned have been applied to a site of en-





DETROIT CAR YARDS—PLAN AND VERTICAL SECTION OF THE PIT AND WASH HOUSE AT THE WEST JEFFERSON YARD

tirely different character and quite a different original plan, is the yard at Kercheval and St. Jean Avenues. Here entry to the yard and tracks for storage purposes will in all cases be made by looping around the property with cars head-on to Kercheval Avenue. The service house for this yard will be south of Kercheval Avenue, an old storage building now used for the storage of summer and winter bodies being in process of conversion to accommodate this service. The ultimate capacity of this yard will be 300 cars.

Coming now to the entirely new propositions, the layouts at Dix and Livernois Avenues and at West Jefferson Avenue represent the application of the standard carhouse and office building plans to sites of different form without the hampering due to existing buildings and track. The same general provisions for air charging and trailer handling are made and, of course, the buildings are placed to the best possible advantage. Of these new yards the latter has been in operation for several months, and some photographs are reproduced to show its general appearance and that of the buildings. Some details of these buildings will be taken up later.

At Dix Avenue the office building is nearly complete and the center bay of the carhouse has been erected. This section was put up in advance of the remainder of the building to furnish heat for the office building and compressor service for the lines terminating at this

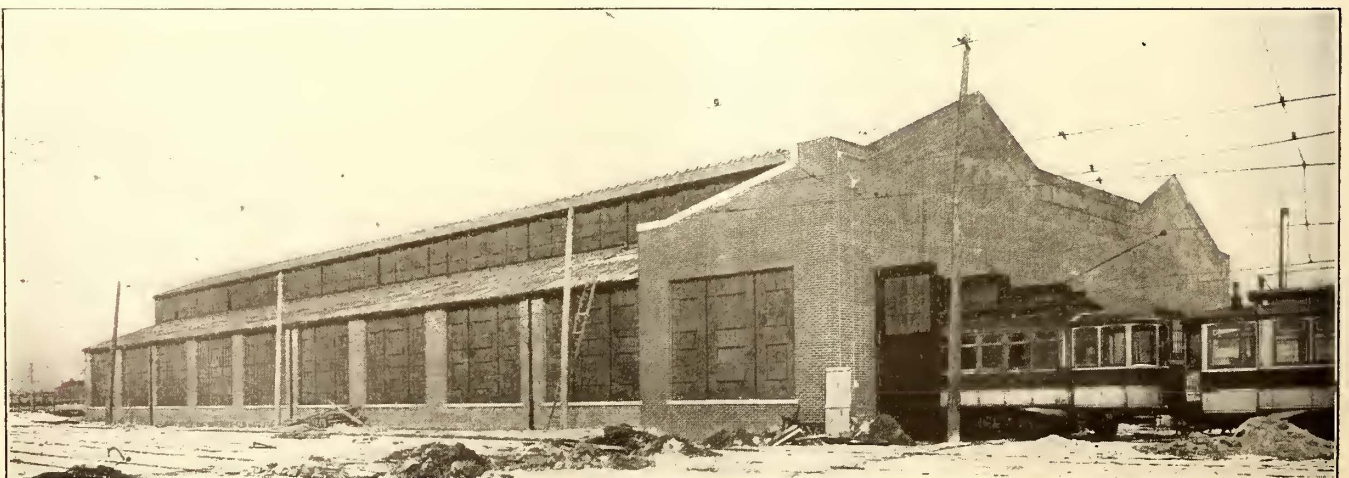
point. The company expects during the coming spring to complete the wash-house and pit-house sections, but not to install the yard tracks for the present. However, early in the spring the loops marked A and B will be placed. This will afford a safe means for turning cars which are now required to wye at Dix and Livernois Avenues.

In these new plans it should be noted that the fundamental idea of looping around the carhouse property with head-on storage has been carried out.

#### A TYPICAL OFFICE BUILDING

The office building at the West Jefferson yard is 60 ft. x 74 ft. in outside dimensions and contains two floors. The building is of steel, concrete and brick construction, the facing being vitrified brick with stone trimmings. It is roofed with red tile and presents a most attractive appearance. It is shown at the left in the photograph on page 535.

In the center on the first floor is a hall or assembly room about 29 ft. in width extending nearly the full depth of the building. On the side toward the left of the entrance are, from front to rear, a restaurant, 18 ft. x 28 ft. in size; a kitchen of the same width and 14 1/3 ft. deep; a storeroom of the same width and about 10 1/2 ft. deep, and two toilet rooms, one entered from the storeroom and the other from the hall. The restau-

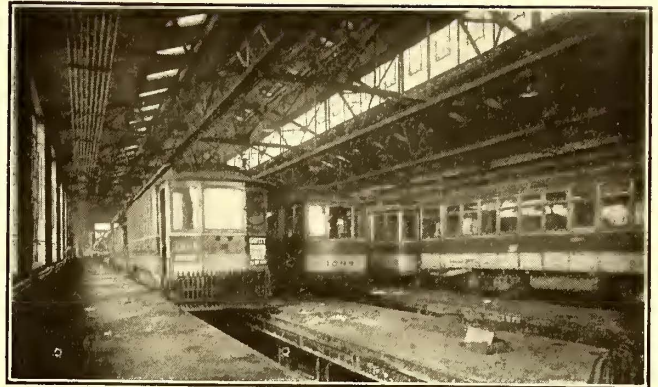


DETROIT CAR YARDS—PIT AND WASH HOUSE AT WEST JEFFERSON YARD





DETROIT CAR YARDS—OFFICE AND CARHOUSE AT KERCHEVAL AND ST. JEAN YARD



DETROIT CAR YARD—VIEW IN THE PIT HOUSE AT WEST JEFFERSON YARD

rant has a separate entrance from the front, and the kitchen one from the side. On the right of the entrance there are the following, from front to rear: A lobby opening on one side into the main hall and with a separate entrance on the side of the building opposite; a cashier's room, 18½ ft. wide x 12¼ ft. deep, with a counter on two sides, and with windows opening into the hall and into the lobby; a carhouse foreman's office of the same width and 34 1/3 ft. deep, with accommodations for his clerk and a counter with windows opening into the main hall. Opening from the carhouse foreman's office and at the back of the main hall is a small private office, 9½ ft. x 13 ft., for the division superintendent.

The public rooms on this floor are floored with terrazzo finish and the walls are plastered above tile wainscoting. At the back of the main hall broad stairs lead to the second floor, where are located the main toilet room, the dormitory accommodating forty men and a large locker room.

PITT HOUSE AND WASH HOUSE AT WEST JEFFERSON YARD

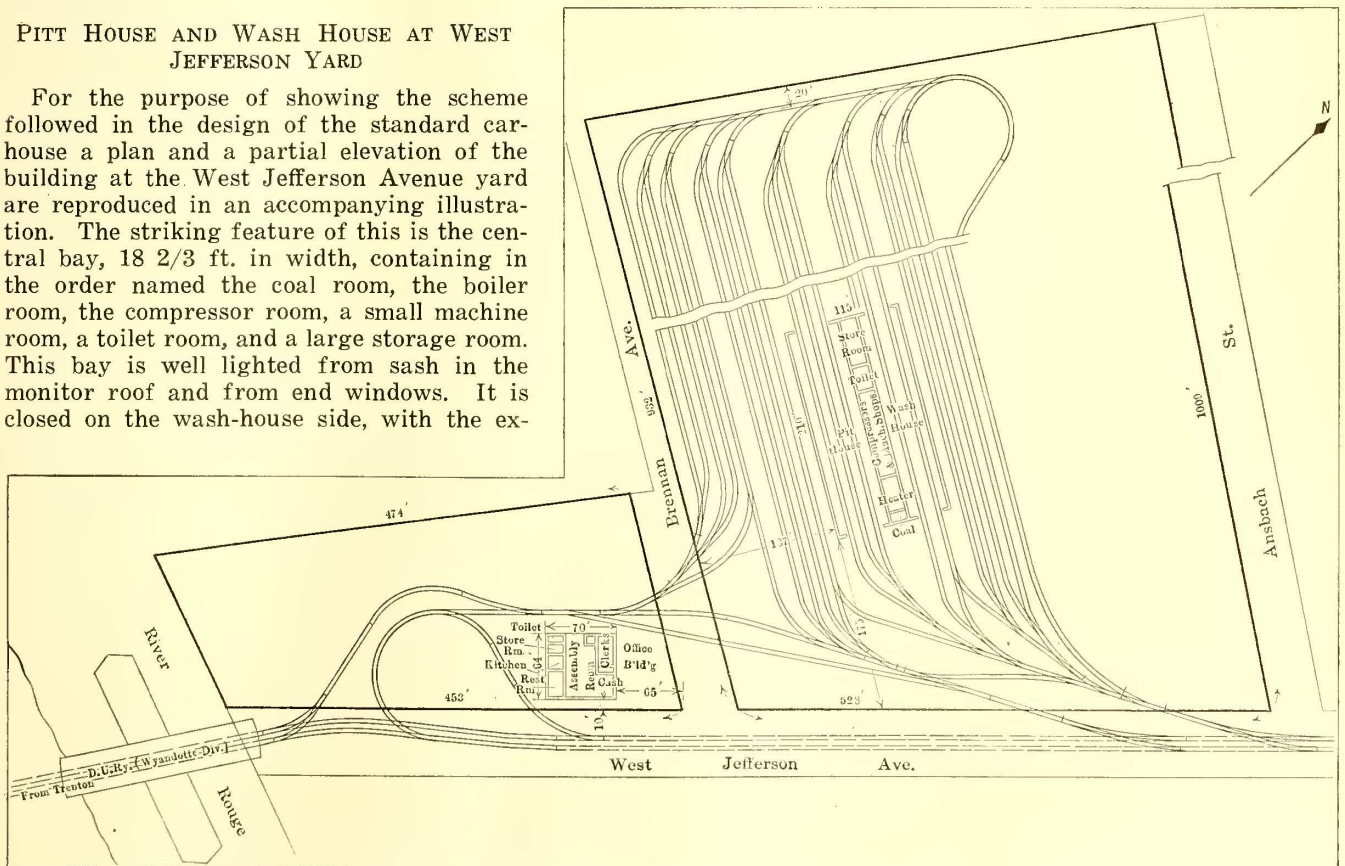
For the purpose of showing the scheme followed in the design of the standard carhouse a plan and a partial elevation of the building at the West Jefferson Avenue yard are reproduced in an accompanying illustration. The striking feature of this is the central bay, 18 2/3 ft. in width, containing in the order named the coal room, the boiler room, the compressor room, a small machine room, a toilet room, and a large storage room. This bay is well lighted from sash in the monitor roof and from end windows. It is closed on the wash-house side, with the ex-

ception of doors opening into the toilet room and the storeroom.

On one side of the central bay is the pit house with three tracks, providing space for twelve cars at one time for inspection and light repair. The wash house, with its two tracks, provides accommodations for eight cars.

This building has a light steel frame, brick walls with steel sash. The roofs are of the monitor type, with sash in the clerestory, and the roof is covered with cement tile. In the pit house the floor is of creosoted wood block laid on a concrete foundation, and in the wash house, storeroom and elsewhere there is a 1-in. cement floor laid on 4 in. of concrete.

At the top of this page is also shown a photograph of the office, assembly and shop building at one of the remodeled yards. A plan of this building, on a small scale, will be found in the drawing reproduced on page 534.



DETROIT CAR YARD—NEW YARD ON WEST JEFFERSON AVENUE—SEE OTHER ILLUSTRATIONS ON THIS AND PREVIOUS PAGES FOR DETAILS OF BUILDINGS



# Results of Steam Railroad Electrification

At Annual Electrical Meeting of New York Railroad Club Electrical Engineers of Two Recently Electrified Roads Give Valuable Operating Data

**T**HE New York Railroad Club held its annual "electrical night" on March 16. As is usual on electrical nights the attendance was very large, in spite of the threatened railroad strike which prevented the attendance of some members. E. B. Katté, chief engineer of electric traction New York Central Railroad, presided, and papers prepared by C. H. Quinn, chief electrical engineer Norfolk & Western Railway, and R. Beeuwkes, electrical engineer Chicago, Milwaukee & St. Paul Railway, were presented.

President L. E. Johnson of the Norfolk & Western had expected to describe the operating features of the electric division of that road, but he was prevented from doing so and Mr. Quinn delivered the paper in his stead. Mr. Quinn's paper is abstracted below. Mr. Beeuwkes prepared his paper and went to New York to deliver it but was called home on account of the labor situation. His paper was read by A. H. Armstrong, chairman electrification committee General Electric Company. The paper is abstracted elsewhere in this issue. Both papers were illustrated with lantern slides and moving picture films.

## Replacement of Steam Locomotives in Electrification\*

On the Norfolk & Western Railway More Than Four Mallet Engines Have Been Displaced by Each Electric Locomotive

BY C. H. QUINN

Chief Electrical Engineer Norfolk & Western Railway

**E**LECTRIC operation on the Norfolk & Western Railway was started on Jan. 1, 1914. With the introduction of the electric locomotive the increase in speed of tonnage trains from 7 m.p.h. to 14 m.p.h. up the grade, as well as the prompt handling of these trains through the Elkhorn Tunnel, had an immediate effect on the keying up of the entire traffic moved over this section of the line. With the exception of two through passenger trains, any of our electrically-handled coal trains can now keep out of the way of any steam movement in the same direction on the grade. The resulting elimination of delay incident to the necessary time to clear local passenger and time-freight trains represents a very considerable improvement over the time necessary to cover the same distance under steam operation. Further than this, the absence of delays incident to the taking on of coal and water for the three steam locomotives originally required on tonnage trains has not only materially reduced the running time but likewise has eliminated cause for delays to other trains usually found around main-line coal wharves and water plugs.

The inherent characteristics of the type of locomotive that is used on the Norfolk & Western Railway which permits us to maintain the constant speed of 14 m.p.h. up grade, as well as the same speed characteristics in regenerating and holding to a constant speed the trains moving down the grade, has enabled our telegraph operators, tower men and dispatchers to figure very closely on these tonnage movements. It is the daily practice to

handle these trains directly ahead of local passenger and time freight trains, as the case may be, giving the tonnage train a five-minute margin with which to clear the passenger or time-freight train at the single-track tunnel at the summit of the grade. With a speed of 14 m.p.h. the electric locomotive will clear the tunnel in approximately three minutes. This comparatively short time element, coupled with the total absence of stalled trains and the reliability of the electric service in both directions, as compared with steam, has eliminated this single-track tunnel as a factor governing train movement. The tower operators that handle the movement through this tunnel figure the time on these tonnage trains after they strike the track indicators to within one or two minutes, and with this advance information and the certainty of the movement, they will permit an east-bound or west-bound train the right of track, without preference, through the tunnel, and yet can avoid any interruption to the movements in either direction.

The result directly brought about by the improvement in movement of coal tonnage trains on the Norfolk & Western electric zone has been primarily a very marked reduction in the time necessary for the crews to get over the road. Under steam operation, the average miles per day approximated 60 per locomotive. For the electric engines this mileage has been increased to 100, with comparatively slight increase in time in service per day for the engine crew. The short terminal time layover for our electric locomotives, which will average forty-five minutes per engine, permits us very closely to double-crew these engines every twenty-four hours. As a direct result of this increased mileage per engine crew, as well as the short terminal time allowed the electric locomotive, we have been enabled to reduce the number of locomotives handled out of Bluefield from seventeen steam engines to five electric locomotives. The number of pusher engines on the ruling grade has been reduced from a total of seven steam locomotives to two electric engines.

In view of this great increase in schedule speed it may be of interest to explain why the railroad company selected running speeds of 14 m.p.h. and 28 m.p.h. for the equipment. Briefly speaking, the location of a large part of the electric zone is through a comparatively narrow valley with resulting encroachments, on either side of the right-of-way, from buildings, coal tipples, coke ovens, and the property lines of the mining companies. Approximately 60 per cent of the trackage in this particular section is on curves, and there are fifty-four localities for switching movements from the main line. Thus it is imperative that all trains handled through this section should be under control. With shifting crews working in and out of the coal operations, where the movements require them to cross over and flag against traffic, and with the limited amount of passing siding and middle track that exists, it is virtually necessary that all slow freight trains operating in this section should be handled practically under yard board conditions.

Fourteen miles an hour, we believe, represents the maximum safe speed at which these heavy trains can be handled through this particular section of the railroad. In selecting this speed, we are enabled to double

\*Abstract of a paper read before the New York Railroad Club, March 16, 1917.



the rate at which the movements were made previously with the steam locomotive. At a constant speed of 14 m.p.h. the electric locomotive does not have any difficulty in keeping out of the way of local passenger trains, as well as time-freight trains, particularly when moving up the grade. The 28 m.p.h. operating speed, which is used when double-heading passenger trains, as well as when handling the freight tonnage over the lighter grades, has likewise proved very satisfactory. By way of explanation, I should further state that over this latter section of the road, the absence of mine operations and the comparatively few points where main line switching can take place, permits us to use a running speed of 28 m.p.h. for a 3250-ton train.

With a fixed tonnage to be handled by these locomotives, the matter of horsepower developed per locomotive corresponds directly with the rate of speed in miles per hour. With a service requiring as much as 8000 hp. per train for the purpose of accelerating up to running speed and a continuous demand of 6000 hp. per train for operating at 14 m.p.h., it will necessitate the transmission of an equivalent amount of energy from the substation to the locomotive. With these requirements the running speed of 14 m.p.h. has worked out with great satisfaction, and even under 28 m.p.h. operation, with full load conditions imposed on these engines, the operation of the pantograph current-collecting system has been eminently satisfactory.

The following extract from the records of the train sheets, as well as the data collected from the car record office, will verify the wisdom of the railroad company in its decision to accept and install the electrical system now in use. The figures are taken from the operating sheets for the year 1914, which represented the last complete annual period of steam locomotive operation, and from the data covering the complete electric operation for the year ending Dec. 31, 1916:

	Steam 1914	Electricity 1916	Per Cent Change
Maximum east-bound tonnage for any twenty-four-hour day—gross tons .....	51,226	59,543	16
Maximum east-bound loaded cars for any twenty-four-hour day....	675	757	12
Total east-bound loaded cars for year .....	132,618	165,689	22
Total east-bound ton-miles for year (millions) .....	467	592	27
Maximum number of locomotives required for heaviest day.....	43	9	*79
Total locomotive-hours required for year's business .....	93,625	44,112	*53
Normal number of locomotives in service .....	24	7	*71

\*Decrease.

In this table note should be made of the great increase in traffic that was handled in 1916 as compared with 1914. Under the limited speed and track conditions previously referred to it is doubtful whether this volume of traffic could have been successfully handled with steam operation if only for one day of twenty-four hours. With nine electric locomotives as the maximum number that have been in service at one time and with an average of seven in use to handle the business as represented by the normal traffic in 1916, it is not difficult to understand whereby the capacity, without any increase in track facilities in this district of the Pocahontas division, may be considered to have been doubled, as compared with what we were able to do under our best steam operation.

In general, the cost of the electrification does not exceed, to any great degree, the value of such physical improvement to the roadbed and right-of-way as would have been necessary to put this division of the railroad in a position to handle the additional traffic with steam locomotives. The operating cost of the electric system is well within the original estimate. The production of

energy in our steam power plant has more than passed our expectations. The ability of the electric locomotive to stand up under the heavy and exacting duties in pusher service, requiring the use of full power to hold the train slack while at a standstill, and to handle its rated tonnage according to the specifications under which they were purchased, is being demonstrated in every-day service. The present rating of engine, after being in use for two years, is identical with the figures quoted in the contract. The electric engine has more than met our expectations in the way of giving us more engine-miles per twenty-four hours than was expected. The operation of the electric transmission system, the substations and the overhead trolley wire, has been entirely successful. Consequently, the general operating improvement as described, coupled with the data which I have given, can only indicate that the electric locomotive service on this portion of the Pocahontas division has not only increased the capacity of the track at least 100 per cent, with a very conspicuous reduction in operating costs, but is likewise paying a return on the net cost of the installation. Putting this in different language, I feel that we can safely state that the installation is an engineering, an operating and a financial success.

As a further evidence of the value of this installation as a factor in the development of the railroad necessary to handle an increased volume of business, we have authorized, and have under construction, the electrification of an additional 11 miles of double-track main line, and 12 miles of branch line. The authority includes the purchase of additional locomotive equipment, as well as substation and power-house apparatus, to take care of the increased load requirements.

## New Clearance Regulations Adopted by Illinois Commission

New clearance regulations have recently been issued by the State Public Utilities Commission of Illinois to supersede the former ruling as noted in the issue of the ELECTRIC RAILWAY JOURNAL for Aug. 7, 1915, page 228. The new rules relate to minimum clearances applicable to all new construction on railroads of the steam type, railroads of the electric type, and street railroads, but provide that no railroad shall be required to change existing track centers.

For street railroads the following provisions are among those included in the order: (1) Distance between centers of two main tracks shall give a clearance of not less than 2 ft. 6 in. between faces of cars; (2) distance between centers of main and subsidiary tracks shall give a clearance of not less than 3 ft. between faces of cars; (3) except where noted, subsidiary passenger tracks shall have centers spaced to give clearance of not less than 2 ft. between faces of cars; (4) lateral clearance at bridges between faces of cars and side of bridge shall be 2 ft. 6 in.; (5) lateral clearance between main track and adjoining buildings shall be not less than 2 ft. 6 in. to faces of cars; subsidiary tracks, 2 ft.; (6) distance between trolley poles and faces of cars shall be not less than 3 ft.; (7) building material or supplies shall be spaced not less than 3 ft. 6 in. from faces of cars on main tracks, 3 ft. on other tracks; (8) overhead clearances of electric circuits shall be as specified in the commission's General Order No. 30; (9) clearances are to be compensated for curves; (10) clearances stated are for cars of maximum width; (11) windows shall be equipped with bars or screens, and vestibule doors shall be kept closed when authority is given allowing clearances of less than 2 ft.



# Operating Data on the Milwaukee\*

The Author Submits Figures Covering Operation Under Steam and Under Electricity on the Electrified Divisions of the Chicago, Milwaukee & St. Paul Railway and Comments on the Experiences Obtained with the Locomotives and Power Distributing System

By R. BEEUWKES

Electrical Engineer Chicago, Milwaukee & St. Paul Railway

THE 440-mile electrified section of the Chicago, Milwaukee & St. Paul Railway is divided into two operating divisions, of which one has been in service long enough to permit the collection of reasonably reliable data regarding it. I may say, however, that on the other division we have been handling 3000-ton trains as a standard through the worst winter months and the entire operation is working out very successfully.

Although the figures for electric operation are very favorable, it should be remembered that they can hardly as yet be considered as final, because the steam figures represent the results of many years of effort and experience, while those for electricity are based on the use of apparatus that is entirely new in important respects, and on an operating experience of less than a year.

With regard to the operating organization, substation operating forces and line and locomotive maintenance forces have been added but, otherwise, no change, except in the way of reduction, has been made in the original steam organization and personnel. This includes the engineers and their helpers on the locomotives.

## OPERATING EXPERIENCES

The change from steam to complete electric operation was made in the course of a few months with remarkable facility, its rapidity being governed entirely by the rate at which the manufacturer was able to supply the electric locomotives. The instruction of the engineers was done by having on the ground four or five General Electric men who had assisted in testing the locomotives at the works and who were thoroughly familiar with the electrical details. These men spent all their time for some months riding the different locomotives and explaining their electrical operation to the engineers, this being done on trains in regular operation.

Harlowton, Mont., is the Eastern terminus of the Rocky Mountain Division and the station where electric operation begins. Here are located the usual round-house facilities, a portion of which has been partly reconstructed to accommodate the electric locomotives. Three Forks separates the division into the East and West subdivisions and was a former steam engine division point. Deer Lodge is the western terminus of the Rocky Mountain Division.

With the introduction of electricity we were able to double what I may call the cruising radius of our locomotives. As far as the railroad is concerned we have eliminated Three Forks entirely. All locomotives run the entire 226 miles from Deer Lodge through to Harlowton, with only a very light inspection at Three Forks for bearings and pantographs. The shop and round-house are entirely closed down, seven or eight miles of tracks have been removed from the yard, and the comparatively large round house force previously employed has been replaced by a single electrician. All locomotives and cabooses are pooled, the men being given suitable locker space to store their lanterns, flags, tools, etc. Through-freight trains do not leave the main track and

often are not switched at all. At Harlowton the engine is given a rough inspection and any light repairs made that are necessary. Detailed inspection and maintenance work is done at Deer Lodge.

The same change in operation has been effected on the Missoula Division, Avery to Deer Lodge; in this case Alberton being the steam engine division point eliminated.

Power consumption has been found on a typical day to vary from a maximum of 20,000 k.w., to a minimum of less than zero at times when regenerative braking is taking place to a sufficient extent to supply all the railroad system demands and actually return some power to the power company's supply system. How much this is we cannot tell as the curve-drawing meters do not register negative kilowatts.

Under the present conditions, we are running with a monthly load factor—ratio average load to maximum load—of about 40 per cent, but expect within a few months to have installed a so-called power-indicating-and-limiting system, which will automatically indicate to the dispatcher the exact amount of power which the whole system is drawing at any instant and will automatically within certain limits hold the maximum down to a certain, predetermined amount. This has the object of keeping as low as possible the maximum amount of power which we have to contract with the power company to furnish us.

## CAUSES OF TRAIN DELAYS

A comparison of passenger train delays for the Rocky Mountain Division for October, November and December under steam operation for 1915 and electric operation in 1916 indicates the comparative reliability of service under the two systems. The passenger service consists regularly of two through, heavy, steel, eight-car trains each way per day and one three-car local each way between Butte and Harlowton. In this connection it should be borne in mind that the schedule time of the through trains under electricity was reduced forty minutes from that under steam, and that during the months of electric operation the amount of freight business done was for one month 40 per cent and for three months 29 per cent greater than the corresponding months of steam operation, a circumstance which renders the electrical showing all the more favorable. The number of trains run under steam and electricity, respectively, is practically the same.

The records show a great decrease in operating delays. This indicates, among other things, that the dispatcher, as has been found to be the case, is better able, under electric operation to plan and predict train movements. This may be accounted for on the basis of less varying speed, lower number of trains for a given business (that is, freight trains), and fewer trains delayed. In any event, in these three corresponding months steam passenger trains waited for the right of way 1910 minutes as against 254 minutes for electric trains.

Delays on account of extra-heavy trains were only one-ninth as great under electricity as under steam. Our

\*Abstract of an address made before the New York Railroad Club, March 16, 1917.



electric engines will handle ten or eleven steel cars on the 2 per cent Piedmont grade very comfortably.

In speaking of bad weather conditions in our electrified territory we generally have in mind extremely low temperature, sometimes 50 deg. below zero in places for days at a stretch, or the heavy snows which occur in the Bitter Root Mountains. It might have been expected that such low temperatures would result in many trolley and transmission troubles due to contraction of wires and cables, but the construction is particularly suited to such conditions and we now have but little trouble on account of them. The records for the three months in question show 445 minutes delay to passenger steam engines, and none to electric engines, this bearing in mind that many of the trains during the cold weather had to be run double-headed. We have never, under any conditions, required the use of more than one electric engine on any passenger train.

Electric engine failures have caused more delay than steam engine failures. We have had more trouble with electric motor bearings than we expect to have ultimately as there has been some difficulty in obtaining proper lubricant and the packers have had to acquire new experience in handling the high speed bearings involved. In connection with the electric engines, much delay has been due to difficulties with the flash boiler and parts used for train heating. A great deal of experimental work has been and is still being done on this apparatus, which is the only portion of the locomotives not as yet entirely successful. However, on account of regenerative braking there has been a marked reduction in waits to repair brake rigging and change shoes.

Of the electrical troubles, exclusive of those on the locomotive, most are due to the pantograph in some way fouling the overhead construction either because of the trolley wires or the track getting out of alignment or one track rail being low. Failure of power, either on trolley or transmission side of sub-stations, except for the interval required to throw in an automatically opened circuit breaker, is practically negligible. The minutes of delay attributable to the electric system, outside of the locomotives, amount to about 8 per cent.

In this connection it might be stated that the best organization of maintenance forces and means of transporting these forces to the location of troubles has not yet been determined upon, and the percentage of delays due to trolley troubles is therefore considerably higher than we ultimately expect it to be. Also the troubles themselves should diminish, as not only were our poles set in all kinds of weather conditions, but also much new rail was laid and ballasting done during the process of electrification and it will take some time before the poles and track get finally settled into permanent position.

The total minutes of delay is about the same for the two systems, but the number of trains delayed is reduced about 40 per cent under electricity. Of the trains delayed under electricity about 85 per cent were delayed about the same length of time as the average steam train was delayed, the remaining 15 per cent suffered considerable delay mainly on account of accidents and derailments to other classes of trains. About the same number of trains ran in schedule time under steam and electricity while the number of trains making up time increased about 60 per cent and the time made up about 150 per cent under electricity.

Delays due to electrical features of the locomotives are comparatively slight, a rather surprising and gratifying fact considering the number of new features, such as the use of 3000-volt direct current and direct-current regeneration, which are incorporated in the locomotive and, further, considering that only a year ago the engineers operating these locomotives were all driving steam engines. I may add that the double

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY DATA ON OPERATION UNDER STEAM LAST THREE MONTHS IN 1915 AND UNDER ELECTRICITY LAST THREE MONTHS IN 1916  
Rocky Mountain Division

	Steam	Electricity
Passenger Service		
1—Train or train engine-miles.....	119,330	119,237
2—Helper engine-miles .....	24,752	.....
3—Number engines .....	13	7
4—Train-miles per engine.....	9,190	17,040
5—1000 kw.-hr. at power company's meters. ....	.....	34,785
6—Kilowatt-hours per train mile.....	.....	29.1
7—Coal, total tons .....	11,260	.....
8—Coal, pounds per train-mile.....	188	.....
Freight Service		
9—1000 ton-miles .....	282,862	364,087
10—Train-miles .....	176,937	186,010
11—Helper engine-miles .....	56,363	20,157
12—Number engines .....	43	15
13—1000 ton-miles per engine.....	6,745	24,260
14—*Number trains .....	792	855
15—Ton-miles per train-mile .....	1,600	1,960
16—Total time, hours .....	17,825	14,535
17—Minutes per 1000 ton-miles.....	3.78	2.39
18—1000 kw.-hr. at power company's meters .....	.....	14,343
19—Kilowatt-hours per 1000 ton-miles.....	.....	39.4
20—Total tons coal .....	39,050	.....
21—Pounds coal per 1000 ton-miles.....	276	.....

\*Trains over entire division of 226 miles.

trolley wire construction as used by us has proved very successful, absolutely sparkless collection of current being obtained under all conditions of speed and amount of current. Twenty-six per cent of the total minutes of delay was attributable to the electric system as a whole.

LOCOMOTIVE PERFORMANCE

The accompanying table shows for the Rocky Mountain Division a comparison of locomotive performance for October, November and December, under steam operation in 1915 and electric operation in 1916. It should be understood that the figures, while sufficiently correct for comparative purposes as they are taken from the same report forms, are not to be considered as strictly accurate when considered individually. The forms are those from which the data could most conveniently be obtained in the short time available.

The figures of item 3 give the number of engines actually assigned to passenger service, both on the road and in shops, by the District Master Mechanic. The electric engines include five double units and two split locomotives. The number can probably be reduced when train heating apparatus is gotten into shape and minor electrical improvements completed, which matters have required more shopping than will ultimately be necessary. The number of steam engines, on the other hand, is a minimum, as freight engines in helper service were often used to help passenger trains, a fact which is not taken into account in the figures shown. Therefore, less than half as many electric as steam engines are required for the passenger service.

The item 4, train-miles per engine, is derived from the preceding figures and, on basis of what has just been mentioned, the figures are high for steam and low for electricity. Our record for an electric engine is 9052 miles made in June, 1916.

Item 5, or thousands of kilowatt-hours recorded at power companies meters, shows the actual electric energy purchased and chargeable against this service. Every electric engine is equipped with a kilowatt-hour meter, which on each trip is read at points of commencement of motoring and again at commencement of regeneration, giving a record of the engineer's performance as regards use of power. The figures shown in the table are the net energy read as the locomotive increased by a suitable amount for line and substation losses. The efficiency of the system from the power company's meters to the locomotives is running now between 67 per cent and 70 per cent.

For freight operation item 9 shows an average increase in ton-miles during the months of electric operation of 28.8 per cent over that of steam. For the month of November the increase was 40 per cent. In this



connection the superintendent of the division has said that to handle the 1916 business either electrification or double tracking would have been necessary. The latter would still, of course, have required extra motive power. Possibly, the superintendent did not intend his statement should be taken literally, but, in any event, it is reasonable to assume that under the business conditions which existed during the electrical months, and the resulting congestion, the given figures would be, for steam, too favorable.

The figures of item 11 show that for the same ton-miles there would be over three times as many helper engine miles under steam as under electricity. No account is here taken of the return trips of helpers or their otherwise running light. This is a considerable item under steam, but is small for electricity.

Item 12 shows a number of engines that is possibly a little high for steam on account of some of these engines being at times used in passenger helper service. The number of electric engines given is the number purchased for this service and considered sufficient. We are, unfortunately, obliged to use only our judgment in this matter, as many of the locomotives purchased for the Missoula Division, not then under electrical operation, were available and used. Twenty-eight locomotives are now easily handling business for the two divisions.

Using the figures as they stand and deducing from them item 13—1000 ton-miles per engine—we find that the electric engine handles about three and one-half times as many ton-miles per month as the steam engine. From item 17, or minutes per 1000 ton-miles, it appears that the electric engine cuts 30 per cent from the time to do a given business, partly by faster running and partly by heavier trains.

Item 14 shows that there were an average daily number of trains involved of 8.6 for steam and 9.3 for electricity.

Item 15, ton miles per train-mile, is about the same as tons per train, and is 22 per cent greater for electricity than steam. The electric train, it might be considered at first glance, ought by comparison to be heavier, but it should be remembered that the steam train has two locomotives during a considerable part of the time. The tonnage of through-freight trains is greater than is indicated, the average figures shown being considerably reduced on account of the comparatively light local freights that are included.

Items 18 and 19, showing consumption of electric energy are derived in the same manner as previously described for passenger service. In conjunction with items 20 and 21 they give a comparison of relative amounts of coal and electricity used to handle a given business. Under present conditions we are paying for our electricity on a kilowatt-hour basis and it is costing considerably less than coal did.

As to the effects of regeneration on the power consumption, this varies more or less, but for the month of November, the amount of regenerated power measured at the locomotives was 11.3 per cent of the total power consumed at the motors. Tests on a 2 per cent grade with a passenger train have shown a return as high as 42.8 per cent of the consumption at the motors. Some of this power goes over the trolley direct to locomotives which are motoring, and the rest goes through the substations, reversing the motor generators and either flowing into the power company's transmission system or along the railway company's line to other substations. The power saving feature of regeneration, however, is not considered so important as the increased safety and ease with which trains are handled on the heavy mountain grades and the saving in wear and tear on brake shoes and equipment.

## Wisconsin Association Holds Annual Meeting

Papers on Fair Return on Investment and on One-Man Car Operation of Interest to the Railway Field

THE ninth annual meeting of the Wisconsin Electrical Association held at the Pfister Hotel, Milwaukee, on March 14 and 15 and presided over by President W. E. Haseltine, general manager Ripon Light & Water Company, was occupied principally with subjects of primary interest to the electric lighting properties of the State. Two papers were presented, however, of particular interest to electric railway men, one by Mr. Erickson on "What Constitutes a Fair Return on Utility Investment?" and one by Mr. Smith on "The One-Man Car," which was read by J. P. Pulliam, Oshkosh, in the author's absence. The paper by Mr. Smith was published in the JOURNAL last week. That by Mr. Erickson will appear in a later issue.

### FAIR RETURN ON UTILITY INVESTMENTS

R. B. Brown, Milwaukee, in discussing Mr. Erickson's paper, said that the financing of future extensions and replacements was the greatest problem before the utilities of the country and one which was becoming steadily greater. Investors were formerly willing to buy securities on the strength of the immediate return expected, but they now demanded to know not only the present status but great detail of the past earnings and future prospects of the company. This makes it practically essential to have surplus earnings so that any unforeseen contingency may be overcome or discounted by using this surplus to pay the dividends during a lean year. He said the public utility operators should see to it that the public knows more about this financing problem of the utilities.

In answer to a question as to what were the elements which go to make up a fair rate of return, Mr. Erickson replied that for rate making purposes, this included the cost new of the property, plus the going value, plus the necessary working capital. He said that depreciation was looked upon by many as a form of amortization and could therefore be deducted from the cost new when computing the investment upon which fair return should be expected. This, of course, was wrong, as a depreciation reserve is not made for that purpose and could not be so considered unless it was turned over to the investors. If a depreciation fund were turned over to the investors, then there would later be no funds available for replacements as equipment wore out. Taking a hypothetical case, Mr. Erickson said that if a 20 per cent depreciation reserve were deducted from the cost new, and the fair return was based on this investment, then the interest received would be a fair return on 20 per cent less than the capital invested, which would in reality be a confiscation of property.

Dean Treat, La Crosse, read some discussion on Mr. Smith's paper prepared by R. M. Howard, Winona. Mr. Howard said he had found a singularly unanimity of opinion among railway men as to the advantages of the one-man car. After three years' operation of these cars in Winona, he said that they had not developed any new classes of accidents and that the concentration of responsibility had had a tendency to lessen accidents. All his cars were equipped with air brakes, and he believed this had been of importance because of the advantage it gave the motormen in coping with the carelessness of automobile drivers, who were responsible for 60 per cent of the accidents. The betterment of service possible by using one-man cars through the improved schedule and reduction of accidents, he thought, war-



ranted the investment and upkeep of this type of equipment. This type of car is an advance in the electric railway business and he believed the railway men were guilty of failure to impress this fact on their patrons. This was especially true, taking into account their duty to produce a ride at the lowest possible cost consistent with good service. There are few properties, he said, where one-man car operation could not be used to a greater or lesser degree with a consequent reduction in average cost of transportation per passenger. He believed that if all cars were equipped to operate near-side, pay-as-you-enter, front-platform, that a host of conductors could be put at more effective work.

Mr. Treat added some discussion to what he had read and said that one of the disadvantages of one-man car operation was that it required a lower schedule speed than with two men, since 9 m.p.h. was about as fast as could be made, whereas it was possible to have a schedule speed of 11 m.p.h., or a 20 per cent. increase with two men. While 50 per cent of the platform expense per car was saved, this necessitated the slowing up of speed as the volume of business increased, and he was afraid that this was a very serious step to take, and one which should be very carefully considered.

Mr. Pulliam remarked that the first impression gained by the general public of the one-man car was that it was going to put one man out of a job for every car operated, and that this was looked upon with disfavor. He said that during the major portion of the day, at least ten or twelve hours out of the twenty-four, the traffic in the majority of cities could be very easily handled by one-man cars. An estimate of what this type of equipment installed completely in Oshkosh would mean had been made, and it was estimated that the saving in labor alone would amount to very nearly \$12,000 a month, using one-man cars on all lines during the major portion of the day.

W. J. Brooks, Westinghouse Electric & Manufacturing Company, called attention to the effort which has been made to eliminate the use of the name "one-man car" for this type of equipment, as it was believed that the trouble which had been experienced in its introduction had been induced by this name. His company had been endeavoring to substitute the name "safety car" as a better cognomen. He said that the physical nature of a city had a great deal to do with the savings possible with this type of car. It had not been designed with the idea that it could be used to decrease the operating cost for any railway company very much, but that it would permit a company to give more service and a better headway at the same cost.

W. H. Beattys, Westinghouse Traction Brake Company, reviewed some of the safety features of the newer type of cars designed to operate with only one man and made reference to the very great success with which these cars have met in Fort Worth, Tex. He also remarked that the manager of one property in a town of over 200,000 population, who had visited Fort Worth and studied the operation of one-man cars there, was seriously considering a large installation of them on his property. His plan included the use of conductors on the cars through a congested zone in the center of the city, using only one man over the remainder of each run. This would make it possible for one conductor to handle several cars.

#### OTHER SUBJECTS DISCUSSED

J. N. Cadby of the Wisconsin Railroad Commission engineering staff reviewed briefly the proposed national electrical safety code and pointed out the principal items requiring the consideration of the electrical company operators. He explained the twenty-six-page booklet of rules which the commission had made up based almost

entirely on the Bureau of Standards code, and which gave the gist of this voluminous work. This booklet was prepared with a view to reducing the code to essentials and to give a more readily comprehensible set of rules for the consideration of the electrical men at a hearing on the proposed code before the commission on March 16, the day following the association meeting.

C. W. McIver, Jr., Eau Claire, Wis., prepared a paper on "Transmission Problems," which in the author's absence was read by A. E. Pierce, general manager Wisconsin-Minnesota Light & Power Company. This dealt with the problems and costs of giving the small towns the privilege of electric service and maintaining the investment and rate on a basis profitable to the company. He showed that the ratio of earnings to operating expense, not including interest and depreciation, for ten small towns was 22 per cent.

Among the points brought out in the discussion of this paper was the manner of securing contracts with unincorporated villages. The experience recited showed that in a few cases such villages had been induced to incorporate; that the town board had in a few instances, where there was only one village in the township, signed the contract; and that in other cases a committee of the local merchants had bonded themselves to stand good for the payment of bills within the village. In one instance before service was granted, the company had insisted on all-night, every-night street lighting service, and a certain minimum use of current per capita per month.

B. F. Lyons, Beloit, chairman of the committee on associations, made a report to the association favorable to an affiliation with the National Electric Light Association as a geographic section. This affiliation would not affect the railway members of the association in any way, except to benefit them indirectly as the result of the enlarged income of the association by virtue of such affiliation. The report was referred to the executive committee for action.

A. C. Babson, Watertown, chairman of the committee on rural service, summed up the progress made over the State in supplying electric lighting service to farmers. This showed a slight increase in the amount of this class of service, and gave evidence to show that it was a profitable class of business in the State because of the \$2 to \$3 minimum charge maintained.

C. D. SeCheverell, chairman of the committee on taxation, made a report which was approved by the association, thus putting it on record as indorsing the State tax board and instructing its legislative committee to endeavor to get a bill passed by the State Legislature which would bring the assessments of the electric light and gas companies, as well as the electric railways, under the State board. The street railways of the State are at present assessed by the State board and have a better rate than the other utilities which are assessed by local tax assessors. It is desired to bring all these utilities under the one State board and eliminate the discrimination.

#### NEW OFFICERS

The following officers of the Wisconsin Association were elected for the current year: President, B. F. Lyons, vice-president and general manager Beloit Water, Gas & Electric Company; first vice-president, A. E. Pierce, vice-president and general manager Wisconsin-Minnesota Light & Power Company, Eau Claire; second vice-president, John St. John, secretary and treasurer Madison Gas & Electric Company; third vice-president, F. B. Ludden, president and manager Mineral Point Public Service Company; secretary-treasurer, George Allison, comptroller Clement C. Smith Properties, Milwaukee.



# B. R. T. Issues Efficiency Pamphlets

Weekly Departmental Bulletins Are Being Distributed to Employees for Daily Reference—  
H. A. Bullock Discusses the New Standard Courtesy Code for Platform Men

**T**HE joint efficiency campaign of the Brooklyn (N. Y.) Rapid Transit System, inaugurated Dec. 1, 1916, the plan of which was announced in the issues of the *ELECTRIC RAILWAY JOURNAL* for Jan. 13, 20 and 27, is now well under way. A number of weekly departmental bulletins, some of the title pages of which are herewith reproduced, have already been distributed among the employees of the surface transportation, mechanical and way and structure departments. In these bulletins the elements of personal efficiency are clearly set forth, and stress is laid upon these elements which are more or less directly related to the net earnings of the whole enterprise.

An encouraging and very helpful interest has been shown by employees in all departments where the efficiency campaign is under way, as is indicated by the fact that in the surface transportation department about 4900 out of 5200 conductors and motormen enrolled in the campaign by signing the enlistment blank. Participation in the campaign is conditional only upon the understanding that each bulletin shall be read once each day during the week following its date of issue. This feature was adopted, first, for the purpose of pledging a participant to one definite act in the interest of efficiency every day, and, second, for the purpose of getting a more thorough reading of the educational material.

## STANDARD CODE OF COURTESY

Of all the bulletins and the practices they recommend those explaining the new standard courtesy code of phrases for motormen and conductors in dealing with the public, reproduced herewith, have, perhaps, attracted the widest public attention. According to a statement made by Harry A. Bullock of the railway com-

pany to a representative of this paper, the announcement of the code was not received without a certain amount of raillery at first on the part of the Brooklyn newspapers. For example, one newspaper published a remark made by a conductor to one of its reporters that "You can't make an actor out of a conductor," in answer to the question as to what he thought of the B. R. T. code. The statement referred to a suggestion in a code bulletin, that if it was worth while for a minister or actor to consider the pitch of his voice so as to be pleasantly understood, it was doubly worth while for a street railway man to do so, as he has to speak to more people in a day than a minister or actor talks to in a week. In an ensuing bulletin the railway company retaliated with the observation that one might also say that it wasn't possible to make a trapeze performer out of a structural iron worker; but that wouldn't change the truth of the proposition that freedom from dizziness and a good balance, which are necessary for the trapeze performer working only a few feet from the ground, are far more necessary for the iron worker who has to work hundreds of feet in the air. In the same way, explains the bulletin, it is even more necessary for a street railway conductor to make himself easily understood in speaking to several thousand people every day on matters involving their safety as well as their convenience, than it is for the actor who speaks to a few hundred every night, or the minister who speaks to a thousand or two once a week.

Humorous heckling by certain newspapers, such as that quoted above, induced some of the platform men to regard the new code in rather a light vein at first, but this skepticism is wearing off and has been mitigated by the appearance of editorials in the *Brooklyn Times*, *Standard Union* and *Eagle* warmly commending the

**TO CONDUCTORS AND MOTORMEN SURFACE, AND TO ALL OTHERS CONCERNED.**

The Surface Transportation Department has adopted a B. R. T. Standard Courtesy Code for Surface Conductors' and Motormen's use in dealing with the public on the cars.

Issued herewith for your information are the phrases constituting the approved B. R. T. Standard Courtesy Code for Surface Lines, B. R. T.

The Code is divided into four general Subjects pertaining to the duties of Conductors, namely:

1. Cash Fares.
2. Transfers.
3. Protecting Passenger While Boarding and Alighting.
4. Handling Passengers on Car.

The Code contains one group of phrases for Motormen to use in giving instructions to persons in the street and to persons boarding or alighting by the front platform.

One of these Subjects will be taken up each week in an Efficiency Bulletin and all platform employes and inspectors or other supervising officials are required to learn the phrases presented in each such Bulletin during the week in which it is issued and to start using them on the cars at once.

When the entire Code has thus been taken up subject by subject, a Departmental Order will be issued making it effective as a whole and requiring its use throughout our surface operation.

Employees enrolled in the Joint Efficiency Campaign are particularly requested, as a personal effort, to co-operate in making the adoption of this B. R. T. Standard Courtesy Code successful.

WILLIAM SIEBERT,  
Superintendent of Surface Transportation.  
January 20, 1917.

**SUBJECT No. 1—CASH FARES.**

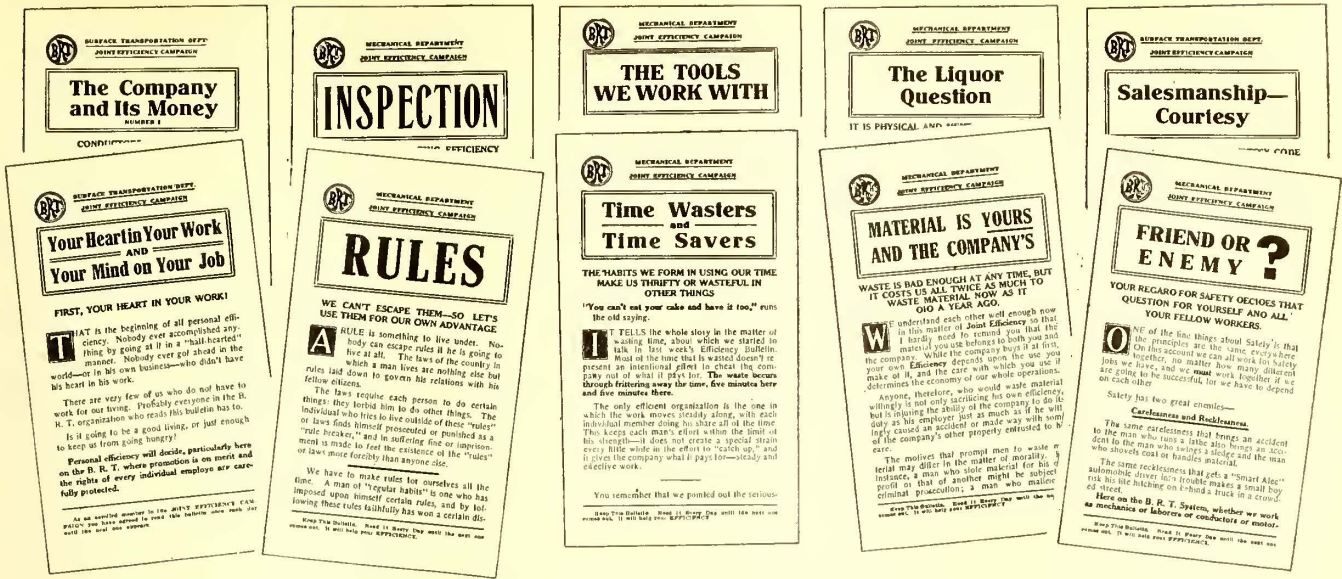
SITUATION.	WHAT TO SAY.
<b>A. COLLECTING</b>	
1. On leaving terminal.	1. Fares ready PLEASE.
2. On the line.	2. Fares PLEASE.
3. In case of doubt.	3. Excuse me, did I get your fare?
4. When offered bad money: Counterfeit, Mutilated, Foreign.	4. I AM SORRY, it appears to be: Counterfeit, Mutilated, Foreign, and not legal tender.
5. When a passenger refuses to pay.	5. I AM SORRY, you will have to pay or leave the car.
<b>B. WHEN MAKING CHANGE.</b>	
1. In changing any coin or bill.	1. How many PLEASE?
2. When complaint is made of improper change.	2. If you think a mistake has been made, PLEASE take my number and report it at 85 Clinton Street.
<b>C. FARES OF CHILDREN.</b>	
1. When age is in doubt.	1. What is child's age PLEASE?
2. When amount of fare for child is disputed.	2. Children from 5 to 12 years old pay half fare; children over 12 years old pay full fare PLEASE.

**SUBJECT No. 2—TRANSFERS.**

SITUATION.	WHAT TO SAY.
<b>A. WHEN A PASSENGER ASKS</b>	1. For a transfer to a line where direction is restricted. 2. For a transfer some time after paying fare.
<b>B. WHEN A PASSENGER OFFERS</b>	1. A transfer on which the time has expired. And in case the passenger asks for extra time allowance on such transfer. 2. A transfer improperly punched. And if passenger persists in offering the transfer.
<b>C. ....</b>	1. I AM SORRY, we do not transfer in that direction. 2. Next time PLEASE ask for transfer when paying fare.
<b>D. ....</b>	1. I AM SORRY, I cannot accept that transfer, as the time has expired. I AM SORRY, but it is against the rules to allow any more time. 2. I AM SORRY, I cannot accept this transfer. It is improperly punched. PLEASE pay your fare, take my number and report the matter at 85 Clinton Street. If a mistake has been made it will be corrected.
<b>E. ....</b>	3. I AM SORRY, I cannot accept this transfer as it is mutilated. 4. I AM SORRY, I cannot accept this transfer. My coupon is missing. PLEASE get your transfers from the agent.
<b>F. ....</b>	3. A transfer having the time or date torn off. 4. A transfer offered after 12 noon, with the P. M. coupon detached.
<b>G. ....</b>	When arrival at terminal or other points where transfers are issued on the street.
<b>H. ....</b>	When a passenger boards a car at other than the transfer point.
<b>I. ....</b>	When a passenger, after any of the above explanation has been given, tries to start an argument.
<b>J. ....</b>	When a passenger whose transfer cannot for any reason be accepted, insists on riding.

In all cases requiring ejectment from car for refusal to pay fare after void transfer has been rejected, trainmen must carefully observe rules 79 and 80 of Surface Transportation Department, that whenever possible, ejectment should be in the presence of a policeman or an inspector.





TYPICAL B. R. T. DEPARTMENTAL BULLETINS NOW BEING ISSUED WEEKLY IN JOINT EFFICIENCY CAMPAIGN

courtesy campaign. These editorials were subsequently reproduced by the railway company in a pamphlet, 150,000 copies of which were distributed to the public. It will doubtless be difficult for the older employees to adopt the new code, and allowance will be made in their behalf if it is found that they are successful in handling passengers ably and courteously in their own accustomed way. It is believed, however, that the training of new men in the usage of the code will gradually convince their seniors of the effectiveness of this uniform system.

**"THE WAGES OF THEFT"**

A striking appeal to the honesty of the conductor is contained in one bulletin entitled, "The Company and Its Money—The Wages of Theft—What Does It Pay?" As a typical answer to this question the folder quotes a letter from a former B. R. T. conductor to the superintendent of surface transportation, stating that the writer had been unable to obtain employment as patrolman in the police department because he could not get a satisfactory reference from the railway company.

Examination of the company's past correspondence revealed the laconic reply which it had been obliged to make to the police department's inquiry about the ex-conductor:

Dear Sir:

In reply to your inquiry of the 14th inst. concerning one B. . . . B. . . . beg to advise that we had a man of that name in our employ whose record follows:

- 1—31—04, appointed conductor.
- 3—7—09, discharged.

Yours truly,  
Brooklyn Rapid Transit System.  
Transportation Department, Record Branch  
Unsatisfactory service.

The company will be obliged to send a similar reply when B—B—'s name is reached on the eligible list of the New York Post Office, where the ex-conductor is being offered temporary employment. Upon looking up B—B—'s record as conductor it was found that he got seventy-one warnings in four years from his depot superintendent for being reported for "shorts" in collecting fares, and that twice before his final dismissal he was recommended for discharge and was given "another chance."

SUBJECT No. 3—PROTECTING PASSENGERS WHEN BOARDING AND ALIGHTING.		
SITUATION	WHAT TO SAY.	
<b>A. WHEN PASSENGERS ARE BOARDING.</b>	1. When cars are coming to a stop and passengers start to get on.	1. Wait until the car stops PLEASE.
	2. Whenever passengers are boarding car.	2. Watch your step PLEASE.
	3. Whenever passengers attempt to get on a moving car at the far side.	3. Do not board PLEASE. It is dangerous. Car stops at near side only.
	4. On center entrance cars.	4. S T E P I n s i d e P L E A S E, look out for the doors.
<b>B. WHEN PASSENGERS ARE ALIGHTING.</b>	1. When passengers start to get off a moving car.	1. Wait until the car stops PLEASE.
	2. Whenever passengers are alighting.	2. Watch your step PLEASE.
	3. When a passenger having gotten off walks around rear of car.	3. Look out for car on other track PLEASE.
	4. When passengers try to board, preventing passengers from alighting.	4. Passengers off first PLEASE.
	5. When traffic policeman flags a car and passengers try to alight.	5. We are flagged by a traffic policeman—it is dangerous to alight.
<b>C. WHEN CONDUCTOR IS AWAY FROM REGULAR POSITION</b>	1. When obliged to give starting signal inside.	1. All right back there, PLEASE?
	2. When passenger on platform attempts to give starting signal.	2. Do not give starting signal PLEASE, it is dangerous.

SUBJECT No. 4—DIRECTING PASSENGERS ON CAR.		
SITUATION	WHAT TO SAY.	
<b>A. TO PREVENT CONGESTION.</b>	1. When passengers crowd rear platform or block the door.	1. Step inside PLEASE, do not block passage.
	2. When passengers congest rear end of car having room toward the front.	2. Step forward PLEASE.
	3. When passengers spread out on seats excluding other passengers.	3. PLEASE make room for passengers who are standing.
	4. When passenger stands between controller and step on rear platform.	4. Will you PLEASE move a little, I am required to stand there.
	5. When conductor is going by passengers in crowded car.	5. Excuse me PLEASE.
	<b>B. GIVING DIRECTIONS AT TERMINALS AND IN CHANCE OF CARS</b>	1. When short line car arrives at destination.
2. At terminals where passengers are waiting to board (such as Brooklyn Bridge).		2. Leave by the front door PLEASE, or Use both doors PLEASE. (As required by orders.)
3. When requesting passengers to change cars due to disabled car.		3. This car is out of order. PLEASE take car ahead or car behind.
<b>C. GIVING MISCELLANEOUS DIRECTIONS.</b>	1. As to smoking.	1. No smoking PLEASE, by order of the Public Service Commission.
	2. Any special order or directions.	2. Begin or end order with "PLEASE."
	3. When passengers are riding on step, running board or bumper.	3. Step in off the (step running board, or bumper) PLEASE, it is dangerous and against the rules.

SUBJECT No. 5—FOR MOTORMEN.		
SITUATION	WHAT TO SAY.	
<b>A. GIVING INSTRUCTIONS TO PERSONS IN THE STREET.</b>	1. When forward end of car is crowded and persons attempt to board by front platform.	1. I AM SORRY there is no more room in front. PLEASE board at the rear.
	2. When car has stopped at the rear side and persons attempt to board at the far side.	2. Do not board, it is dangerous. Cars stop on rear side only.
<b>B. GIVING INSTRUCTIONS TO PERSONS ALIGHTING BY FRONT PLATFORM.</b>	1. When passenger starts to get off a moving car.	1. Wait until car stops PLEASE.
	2. Whenever passengers are alighting.	2. Watch your step PLEASE.
	3. When passenger starts to open gate.	3. Do not open gate PLEASE.
<b>C. . . . .</b>	4. To passengers waiting to stand on front platform. (Does not apply to persons riding on a pass.)	4. PLEASE step inside. Passengers are not permitted to ride on the front platform.

SECTIONS OF B. R. T. STANDARD COURTESY CODE



# American Railway Engineering Association's Convention

At the Meeting Held in Chicago During the Past Week Reports Were Presented by Committees on Electricity, Rail, Track, Ballast, Ties and Other Subjects Relating to the Equipment of the Right-of-Way of Steam Railroads

THE eighteenth annual convention of the American Railway Engineering Association was held in the Congress Hotel, Chicago, Ill., from March 20 to March 23, 1917, with a fourth day at the conclusion of the technical sessions that was devoted to an inspection trip along the south shore of Lake Michigan to Gary, Ind. A number of the reports submitted by the committees, although they dealt primarily with steam railroad matters, possessed special interest for the electric railway industry, and abstracts of these are published in the following paragraphs. In addition to the standing committee reports an extended preliminary statement from the American Committee on Electrolysis was presented, through the three members of the association that served on it. This statement, which is abstracted on page 549, had the character of a preliminary report and it dealt with the exposition of such facts regarding the subject of electrolysis as the committee could agree upon, a further, formal report embodying conclusions and recommendations being planned for a later date.

## RELATIVE COST OF TRACK MAINTENANCE ON ELECTRIFIED ROADS

The major part of the report of the standing committee on electricity was devoted to the subject of maintenance of permanent equipment on electrified railroads, the material presented being summarized from the answers to a circular sent to eighteen railroad companies that had electrified track. In connection with railway power distribution systems generally, the report stated that the tendency in the past eight years for long-haul traffic has been the use of the high-voltage system with an overhead wire for transmission of the propulsion current. However, all roads that have installed third-rail for this purpose have extended the use of the third-rail wherever extensions of electrified territory have been made.

Regardless of the type of the power distributing system, the introduction of electric traction has not necessitated any radical changes in the organization of the maintenance forces for the permanent structures. The maintenance of the power stations, substations and transmission systems has usually been placed under the supervision of the motive power department or of an electrical department organized especially for the purpose, while the maintenance of the working conductors, positive and negative cables, track bonding, etc., has naturally been placed under the maintenance of way department. The maintenance of the electrified track is, in general, performed as far as possible by the existing maintenance of way organization, with such additions thereto as the particular conditions on each railroad may demand. No material change in the length of track sections nor in the force employed has been required.

The presence of a third-rail results in noticeable precautions being taken by employees walking and working thereon. Ultimately the precautions become a habit. With the third-rail system a reduction of efficiency has

been produced both through fear of injury and through the physical obstruction. With the overhead system there is no physical obstruction nor danger opposed to the free movement of employees on the track, but these elements are transferred to employees working on top of cars and at stations and bridges.

The existence of a third-rail has increased the cost of renewing ties and relaying running rail by at least 15 per cent, and for ballasting by at least 10 per cent. The work of lining and surfacing track has been handicapped by the presence of the third-rail, but on the other hand the presence of convenient power close to the track has permitted the use of power-driven machines for much work formerly done by hand, as well as the use of portable electric lights and electric track heaters for melting snow at switches.

With the overhead system it is practically impossible to afford sufficient clearance at all points, and on two railroads all wires of less than 21 ft. 6 in. clearance are designated by illuminated signs. On another road warning of low clearance is given by bamboo poles extending horizontally over the track and supported by a hinged device which is attached to the poles supporting the contact wiring and which permits lateral upward movement. The life of the bamboo is considerably shortened by the blows that it receives from passing pantographs.

Opinion is that the rail wear from flanges, on curves where multiple-unit equipment is used, is greater than with steam equipment. This increased wear is estimated in one case to be 25 per cent. Corrugation of the rail with multiple-unit equipment is a noticeable detail, tending to shorten the rail life. The fact that trucks of multiple-unit cars are generally heavier than those of corresponding equipment in steam operation is believed to be the cause of this corrugation, which occurs during acceleration and retardation of the trains. On the other hand, with electric locomotives, as opposed to motor cars, the rail wear is believed to be no greater than with steam locomotives of equal weight and wheel-base.

Nevertheless, electric locomotives with axle-mounted armatures require the maintenance of line and surface of track in better condition than steam equipment. Axle-mounted armatures necessitate also the design of the locomotive so as to restrict its lateral movements, which otherwise might become of sufficient magnitude to injure or displace the track. These features, where they obtain, have brought about the strengthening of the details of spikes and tie plates. This has added to the cost of track construction, but it tends to reduce the cost of track maintenance.

No appreciable effect from the introduction of electric traction is observed upon the first cost or maintenance of frogs, switches, crossings and other special appliances. In general, the usual increase in traffic density, coincident with the introduction of electric traction, renders it difficult to segregate the increased cost of maintenance due to the change in the type of rolling equipment. For high-speed service, however, it is be-



lieved that there has been a decided decrease in the cost of track maintenance. Also, on electrical installations there is a decided advantage because of the elimination of corrosion from the locomotive gases, and because of the absence of cinders and ashes, the freedom from fires and the more cleanly condition of the ballast.

#### TESTS ON RAIL AND RAIL JOINTS

The committee on rail presented an elaborate report beginning with the statement that the average number of failures per 100 track-miles of rail rolled for several years, including both Bessemer and open-hearth, had been showing a steady decrease. Of rail that had been five years in service, that which was rolled in the year 1908 had been responsible for 398 failures per 100 track-miles; that rolled in 1909, 278 failures, and that rolled in 1910, 198 failures.

A paper on tests of rail joints presented as a part of this report gave a study of the effects on the strength and rigidity of rail joints resulting from various percentages of carbon in untreated and in quenched angle bars, and also as affected by the use of oil-quenched, minimum-carbon steel track bolts versus untreated, low-carbon steel track bolts. The tests indicate that the strength of the metal varies with the carbon content when other elements are constant and when the metal is handled in the same manner for both treatment and quenching. They indicate also that proper quenching of the metal raises both the yield point and the ultimate strength of the steel, and that the strength and rigidity of the joint is greater with oil-quenched minimum-carbon steel bolts than with untreated, low-carbon steel bolts.

Another paper was devoted to the subject of tests of rail by the quick-bend method, this giving the results of an investigation ordered by the rail committee of the Pennsylvania Railroad in 1915. The object of the investigation was to develop a substitute for the present drop test for rails which did not appear to give consistent results in that the deflection and number of blows required to break the heavier rail of modern type did not correspond with those which would normally be expected from the same height and weight of tup with an increased span. The quick-bend tests were made in a hydraulic forging press equipped to permit taking of indicator cards of the pressure and corresponding deflection, and they gave more consistent results than the drop tests. The principal advantages of this type of test are that data regarding the elasticity of the steel are obtainable, and it is possible more definitely to determine the ductility because a more detailed study can be made of the relations existing between the deflection and load at points between the elastic limit and the ultimate load. On the other hand, the quick-bend test is probably not as good for brittleness as the drop test. However, the committee in conjunction with the manufacturers' rail committee has taken under consideration the quick-bend test as a substitute for the drop test for rail.

#### SIGNS, FENCES AND CROSSINGS

The committee on signs, fences and crossings stated that it had not been able to find a style of surfacing for highway crossings that could be universally used, particularly one that would conform to the paving in the streets adjacent to the crossing. It has been quite fully demonstrated that a concrete base under and between the ties has not proved to be satisfactory because it is too rigid at first and because it frequently fails after being subjected for a time to the severe pounding of heavy rolling stock. With regard to current practice in flangeways the committee stated that an extraordinary diversity of practice obtained throughout the

country, the width and depth ranging on steam railroad tracks from 1 $\frac{3}{4}$  in. x 1 $\frac{3}{4}$  in. up to 2 in. x 2 $\frac{1}{2}$  in., and on a number of electric railways ranging from 1 $\frac{1}{8}$  in. x  $\frac{3}{4}$  in. up to 2 $\frac{3}{4}$  in. x 2 $\frac{1}{2}$  in.

With regard to signs the committee stated that railroads generally have too many permanent indications along their rights-of-way. The use of wood signs with elaborate inscriptions should be discouraged on account of the cost of repainting and renewal. Metal signs that consist of an old boiler-tube post set in concrete with an iron or steel plate of proper size riveted to it are growing in popularity. When this is painted white with black letters and border it produces a neat and durable sign.

To eliminate the expense of repainting signs it was suggested that the contour of the signboard without lettering could serve for the guidance of trainmen. This would eliminate a large item in the maintenance expense as well as in the first cost. The nearest approach to eliminating the cost of lettering on signs appears on the Canadian Pacific Railway, which makes use of iron plates of various sizes with the letters and figures punched out, allowing daylight to take the place of paint. The cost of such signs, according to a paper on the subject that was printed as an appendix to the report, ranged from one-half to four-fifths of the cost of a painted sign made of wood.

With regard to fencing the committee submitted a statement describing experiences with a concrete post to which the woven wire was attached by staples driven into composition in the center of the post. After four years of service of the most severe type this fence was found to be in good condition. Data were also submitted in regard to some concrete posts that displayed an average loss by breakage of only about 0.6 per cent per year, the first cost being approximately \$300 per mile of fence as against \$380 per mile of fence equipped with steel posts.

With regard to steel fence posts, the committee stated that the most complete information it had been able to obtain was a report from T. E. Rust, chief engineer Waterloo, Cedar Falls & Northern Railway, who had experimented on a large scale with both steel and concrete fence posts. He had had much better success with the steel post than with the concrete post, because the latter was subject to a considerable amount of breakage. Steel posts installed in the summer of the year 1911 had recently been lifted out of the ground to determine the condition of the lower portions, and were invariably found to be in excellent shape. This road's latest type of fence has line posts of No. 16 gage, galvanized steel, with a length of 7 ft. for use in soft ground and 6 $\frac{1}{2}$  ft. for ordinary conditions, the fence height being 4 $\frac{1}{2}$  ft. The end and corner posts are made of 10 gage and are 8 ft. long. The posts are 20 ft. apart on tangents and 16 $\frac{1}{2}$  ft. apart on curves. Line posts are driven and corner posts set in concrete.

Experience was cited also in connection with galvanized-steel posts which had been in service since the year 1902. In addition the committee submitted a complete abstract of laws relating to the provision of right-of-way fences and the installation of stock-guards in the various States of the Union.

Attention was called in the report to an investigation that is now being made on grade crossings by a committee of the American Railway Association in connection with the National Association of Railroad Commissioners. This will cover five specific practices that will be recommended for adoption by public service commissions and other authorities, as follows: (1) Uniform approach warnings; (2) uniform color or light for night indication; (3) uniform use of a circular disk



about 16-in. in diameter with the word "Stop" painted in large letters instead of the vari-colored flags now used by crossing watchmen; (4) uniform painting of crossing gates, and (5) uniform rules governing crossing watchmen while controlling or regulating street or highway traffic.

#### TRACK SPIKES

A design for a cut spike was submitted by the committee on track for formal adoption as standard by the association. This is similar to that which was proposed last year. It is characterized by the use of a head designed to take the blow of the hammer directly over the axis of the spike and thus minimize the damage to the head and danger of breaking during low temperatures. The nose is tilted downward to give a more rugged construction and to assist in the use of the clawbar when the spike is pulled. Reinforcement is provided on the back of the neck to force the spike forward against the base of the rail when driving, and also at the front of the neck to give additional metal for withstanding rail wear.

The committee also submitted as a matter of information a design of a so-called "dog-eared" spike. This is not provided with a flattened head, but has a nose like that provided on gib-head keys and has two ears at either side near the top to permit pulling the spike with the clawbar. Those who have used this type of spike report most favorably upon it. It is especially well designed for use with shoulder tie plates since it can be drawn more easily than the ordinary track spike. Furthermore, the additional metal in the head gives it a better resistance to corrosion. However, the committee added that where this type of spike is used it should have the same taper and general dimensions for the shank as the recommended standard design for cut spike with a flattened head.

In addition, a design for a standard screw spike was submitted because the committee considered that the present time, when comparatively few screw spikes are used, should be utilized to standardize screw threads before a number of different threads become prevalent. After a form of thread has once been adopted and generally used on any railroad, it would be a very serious thing to change the form or pitch of the thread since new spikes could not be placed in old holes without destroying the thread in the wood. The proposed standard thread has 15/32-in. pitch and 7/32-in. thickness at base. In the new design the root of the spike has been extended beyond the thread line to reduce injury to the wood fibers near the top of the hole in case the spike should be driven further than necessary with a hammer before applying the wrench. Also the head has been made oblong, with dimensions at the base of 13/16 in. x 1 3/32 in., instead of square, because it has been found that in the course of five or six years the ordinary square-head spikes will rust to a sufficient extent, when subject to salt drippings, to cause considerable trouble in removal, especially when the wrench is somewhat worn.

#### FLANGWAYS FOR CAR WHEELS

In connection with the subject of wheel flanges and flangeways the committee referred to the comments last year of the Master Car Builders to the effect that nothing would be gained in the interest of safety or economy by adding metal to any portion of the flange of cast-iron car wheels in such location as will in any way affect track clearances. In consequence, the committee made no further report regarding the effect of increasing the thickness of cast-iron wheel flanges by 1/8 in., in accordance with the plan that has been generally discussed during the past few years, and asked to be relieved from further consideration of the subject.

In connection with the recent proposals to reduce the taper of the tread of car wheels to one in thirty-eight, as well as to cant all rails inward, the committee stated that it would be necessary to secure further data. Several roads are now experimenting with canted tie plates, although some have always made it a practice to cant rails inward, and in consequence further time for consideration of the subject was requested.

The committee submitted also specifications for manganese special work and with this included a new drawing showing standard dimensions and contour for grooves in all crossings and frogs, this calling for a width of 1 3/4 in. and a depth of 1 7/8 in.

#### CHARACTER AND DEPTH OF BALLAST

In its report the committee on ballast submitted a statement to the effect that the various kinds of ballast now in use fall in the following order of effectiveness: (1) Stone; (2) washed gravel; (3) broken slag, not granulated; (4) pit run gravel; (5) chatts; (6) burnt clay or gumbo; (7) cinders. The committee recommended physical tests for both gravel and stone ballast, and stated that it had in hand the development of a "weathering test," owing to the fact that several serious failures of both stone and bank gravel had been reported on account of weathering. The committee also reported the results of tests where satisfactory results had been obtained with gravel having a content of 7 per cent or less of sand or small material that would pass through a 1/4-in. screen. In consequence, the committee considered that the percentage of sand in gravel ballast as ordinarily recommended could be reduced, and that a definite statement on this matter would be submitted in a later report.

Considerable attention was devoted by the committee to the increase in the use of mechanical tampers. It was said that roadmasters who have used the pneumatic tie tamper to a considerable extent are enthusiastic in regard to it. The mechanical tamper is considered as a coming necessary track appliance where stone ballast is used, both as a matter of economy and for obtaining the best results. There does not seem to be any question now as to the superior results thus obtained. On main-line sections formerly having an allowance of ten men, the general opinion is that the use of the mechanical tamper would take the place of three men.

With regard to an investigation on the proper depth of ballast of various kinds necessary to insure uniform distribution of load upon the roadway, the committee summarized its conclusions by stating that the depth of the ballast under the tie on roadbed material, such as clay, loam, etc., subject to deformation by the application of live load, should not be less than the spacing, center to center, of ties. On material that approximates the character of good sub-ballast (which will not be deformed by the application of live load), the minimum depth of ballast under the bottom of the ties should be 12 in. Good initial drainage is thus provided as well as protection against upheaval by frost action. The ballast thus serves as a cushion rather than as a means for distributing the load.

In most cases a sub-ballast blanket of cinders not less than 12-in. thick is effective in preventing mud and similar material working up into the ballast. However, proper drainage of the sub-grade is essential to success with any kind of ballast.

The committee on ties submitted a tabulation of replies received from requests for information regarding the effect of design of tie plates and track spikes upon the durability of cross ties, and from this deduced the following general conclusions: The principal cause of past failures of the tie plate to protect the tie has been an insufficient area and thickness of the tie plate. De-



signs of tie plates with an equal bearing surface on each side of the rail have proven unsatisfactory. If the tie is to be protected properly, movement between the tie plate and the tie must be eliminated as far as practicable. The committee does not believe that, in general, the plates that are now considered satisfactory have sufficient excess strength to prove satisfactory throughout their life under normally increasing wheel loads and traffic conditions. Projections on the bottom of the tie plate should not be greater than 3/16 in. in depth.

#### PROLONGING LIFE OF CROSS TIES

Sufficient data have not been collected by the committee to permit definite conclusions as to the effect of different types of fastenings upon the life of ties, but it is considered that the use of cut spikes that are driven without boring holes not only hastens decay but seriously impairs the strength of the tie by the destruction of the wood fibers. A properly designed screw spike is least destructive of any of the present forms of fastenings in general use.

The committee also submitted a complete statement in regard to trials of metal, composite and concrete cross ties in which information furnished by the various railroads that use substitute ties was abstracted and the results shown in tabular form. This statement included all installations on steam railroads in America reporting to the association and covered practically all substitute ties used so far in this country by steam railroads. No summary of the results was published, but approximately one-third of the test installations had resulted in failures generally by breaking under traffic. In a number of cases, however, substitute ties that were installed as early as 1905 appeared to be still giving satisfactory service.

In connection with the treatment of ties, the committee on wood preservation commented on the fact that the Public Service Railway of New Jersey had used straight water-gas-tar oil in treating a majority of the company's ties since the year 1911. All of the ties received a full-cell treatment of 10 lb. of water-gas-tar oil per cubic foot. Although it is too soon to draw any definite conclusions from the treatment of these ties, up to date not a single one has been removed, and in an inspection made late in November, 1916, none of them showed any signs of deterioration. Ties that were removed for examination were found, after sawing, to be in excellent condition.

#### BRIDGE AND TRESTLES CONSTRUCTION

A comparison of the merits of wooden, ballast-deck trestles and structures of reinforced concrete was made by the committee on wooden bridges and trestles. In this the committee stated that, although in certain locations there is little probability of fire loss in creosoted ballast-deck timber trestles, the very nature of the material gave to reinforced-concrete a decided advantage in this respect. Also, concrete is slightly superior to timber for bridging waterways that are subject to flood currents or wide fluctuations in elevation of water level. Although the concrete trestle may possibly afford better service qualities than wooden trestles, this matter is so intangible in character as to preclude a definite statement of relative merits. Where selection of type is optional and is not influenced by other considerations, neither type of trestle has the advantage of the other in the matter of appearance. The use of concrete is, of course, more in accord with the theory of conservation of natural resources and industrial economy. Creosoted timber trestles are more economical than concrete, except when the cost of the concrete structure is less than one and one-half times the cost of the wooden structure. Adoption of either type should be the result of care-

fully weighed consideration for each individual bridge, the greater economy of timber trestles being balanced against the several advantages of concrete that are not susceptible of mathematical demonstrations.

With regard to the relative merits of galvanized and plain iron and steel fastenings for timber trestles, especially in relation to their use on creosoted structures, the committee stated that creosoted timber has a tendency to protect from corrosion any plain iron or steel fastenings that are embedded in the timber. The durability of such fastenings is at least equal to that of the creosoted timber that is used in trestles. Where timber is treated with straight creosote and drift bolts or other fastenings are covered entirely by the timber, it is good practice to use plain iron or steel. Such fastenings as are exposed to the action of brine drippings may be galvanized, but in general the existing information as to the increased life of fastenings so treated is not sufficient to permit the definite statement that the expense of galvanizing is justified. It is not necessary to use galvanized fastenings in creosoted timber structures over salt water.

Concrete piles were discussed at length and specifications for them were submitted by the committee on masonry. In brief, their use was advocated on the grounds that they permitted lighter foundations because they were independent of ground-water conditions and had greater bearing power than wooden piles. They serve also to make permanent trestle structures at considerably less cost than pier bridges when the height is not great. Straight piles should be used where rock or hard-pan can be reached or where the intermediate material is subject to flow. Tapered piles can be used advantageously where skin friction serves as a factor in the pile's bearing power. The cost of constructing and driving pre-cast concrete piles ranges from 75 cents to \$2 per linear foot, with an average of \$1 per foot. To obtain good results piles should be seasoned for from thirty to forty days before handling.

### Preliminary Report by American Committee on Electrolysis

Statements of Fact Regarding the Problem of Electrolysis in the United States and Europe Are Submitted Without Recommendations

AT the convention of the American Railway Association, held last week in Chicago, there was presented through the members serving on the American Committee on Electrolysis a preliminary report of this national body. The report was printed with the advice that the draft contained only such statements of facts as the members agreed upon at this time and that it was the expectation ultimately to submit a further report embodying principles, rules and recommendations.

The report is the outcome of practically four years of work by the national committee, and it is extremely broad in scope, being divided into six general sections as follows: principles and definitions; methods of making electrolysis surveys; American practice; European practice; bibliography; and appendices containing tables of resistance for pipe and cable sheaths. The material contained in the first two sections is, of course, largely elementary and much of it has been outlined in various past issues of the *ELECTRIC RAILWAY JOURNAL*. In the section on American practice the report emphasizes the fact that there are no standards in the treatment of electrolysis problems in this country, and it outlines the various preventive measures that have been considered, beginning with those that have been applied to the electric railways themselves.

In part, under this sub-heading is included the plan of complete insulation whereby a separate insulated



return conductor is employed for the return circuit instead of the running track, as well as the so-called plans of substantial insulation whereby the rails are not in actual contact with earth as on interurban railways, and partial insulation where special provision has been made to insulate the rails in so far as they can be when below the level of the pavement in city streets. Comment is made in regard to the use of high-grade bonding to reduce track voltage drops, and in this connection the report states that buried bare conductors, although they reinforce rail conductivity, increase the contact area between the return circuit and the earth, so that the resulting tendency to augment stray currents offsets to a greater or lesser extent the benefits attained by the reduction of voltage drop.

A special point is made of differentiating between the use of return conductors that are in parallel with the rails, even though insulated from them, and the so-called insulated track feeder system, which has for its prime object the mitigation of electrolysis. Comment is also made in regard to the renewed interest in the use of three-wire systems of the sectionalized type, as opposed to the type known as the parallel system whereby one trolley of a double-track road is negative and the other positive, the tracks being neutral.

Reference is made to the arrangement now in use in New Haven, Conn., where the rails are the positive conductor and the return is the trolley wire. It is found in this instance that all potentials and currents that formerly existed when the rails were negative have now reversed in direction but have the same magnitude. It is also found that current leaves underground structures over a widely-scattered outlying area. This arrangement has not been in operation long enough to determine whether or not the danger from electrolysis at any one outlying point will become serious, but the reversal of polarity renders extremely difficult the effective drainage of underground structures, because there is no definite point of minimum potential to which to drain.

With regard to the effect of alternating current the report states that the metal removed during the half-cycles when a pipe is anode may be in part replaced when it is cathode. Hence the total loss of metal on a given pipe is less than one-half of what it would be with direct current. Experiments on a laboratory scale indicate that the effect is usually less than 1 per cent and in most cases is negligible. In practice, however, it has not yet been determined whether alternating-current corrosion proceeds at the relatively slow rate thus indicated.

Special attention is given in the report to a description of the previously-mentioned insulated track feeder system, because this is employed in a number of American cities at the present time, and because plans are being made looking to its installation in a number of other cities.

A rather extended description of current practice in regard to the use of insulating joints is also given, but it is stated that the method is expensive and, unless used with caution, may introduce serious trouble at many points. It is usually regarded as an auxiliary measure to be used in certain cases only. Considerable attention is given also to the problem of insulating pipe, cable and structural steel from the earth, as well as to the use of an auxiliary anode or shield for the purpose of protecting the pipe from electrolytic action. The difference in desirability of the use of drainage for lead-sheathed telephone and power cables and for pipe systems is pointed out at some length, since a drainage connection from an underground piping system generally causes a very much larger flow of current than on an underground cable system.

The section dealing with European practice is particularly interesting. In this it is stated that Germany, through voluntary co-operation, has probably remedied the former dangerous electrolysis conditions in all of its important cities. The instrumentality of agreements on definite technical standards was sought in preference to legislation. France has not been as successful in bringing about prompt results through legislation as has Germany through technical co-operation. England, which has had the benefit of government regulation for many years, has now no electrolysis troubles or disputes. In general, these satisfactory results have been obtained by the maintenance of good bonding, by liberal separation of pipes and rails, by the avoidance of bare copper returns and the use of insulated returns on all installation where the voltage drop in the rail is high, by the use of the insulated track feeder system, and by frequent substations to give close line regulation. It is thus evident that disputes on account of electrolysis troubles were prevalent in all countries before systematic co-operation was effected.

In Germany insulated return feeders are used almost universally. They are used also in England where it is necessary to bring the rail drop within the Board of Trade regulations, negative boosters being more extensively used than in Germany.

Over-all limits for voltage drop vary greatly in Germany, but in the majority of cases they are between 5 volts and 10 volts on systems that have not been modeled in accordance with the regulations of the Electrolysis Commission. On other systems the voltage drop is between 2 volts and 5 volts. In England, over-all voltage drop is generally very much lower than the Board of Trade requirements, averaging probably between 2.5 volts and 3 volts excepting at times of extraordinarily heavy traffic. Potential differences between pipes and rails are said to be generally less than 1 volt. In all cases negative feeders are designed for equal voltage drops.

Electrical drainage was formerly applied in one or two cases in Germany, but abandoned on account of damage that it produced because of corrosion at joints and damage to other underground structures. Neither is it approved as a general measure to afford relief from stray currents in England. It is pointed out in the report, also, that the tramway power demands are much less in Europe than in America, the difference in demand between Manchester and Boston being in ratio of 1 to 7, although the cities are of equal population.

Other comments on European conditions include statements that the trolley wire was originally made negative in two towns in Switzerland, but that the scheme has been abandoned in both cases, and that the three-wire system has been used in a very few cases in Europe. In general, insulating joints are not used at all for water pipes. In Germany it is held that insulating coverings do not afford protection against electrolysis as their effect is merely to concentrate escaping stray currents since perfect coverings cannot be maintained. Neither are they considered as a satisfactory protection in England. Insulating joints for telephone cables are used neither in Germany nor in England. In Germany a definite distinction is made between corrosion due to chemical action of the soil and that produced by stray current. The existence of chemical action also is accepted in England. Where German municipalities own the water, gas and street railway systems, they may prefer to assume the cost of damage rather than make larger expenditure for the protection of their pipes. Opinions differ in Germany as to whether the prevailing regulations constitute a hardship, but in England they are nowhere regarded as such.



## Successful Regulation Must Be Upward as Well as Downward

New England Street Railway Club Demonstrates Its Patriotism at Annual Dinner—Officers for 1917-1918 Were Elected

A BRILLIANT and candid analysis of the problems of public utility regulation was the striking feature of the seventeenth annual banquet of the New England Street Railway Club at the Hotel Somerset, Boston, Mass., March 22, set in patriotic surroundings and attended by about 500 members and guests.

The national colors formed the appropriate principal theme of the banquet hall decorations, and patriotic enthusiasm ran high throughout the evening. As the members and guests entered the room and took their places the hall was darkened and the figure of Columbia was thrown into relief in a corner under a spotlight amid great applause. The lights were then thrown into circuit, and hundreds of balloons with small American flags attached rose to the ceiling amid the strains of the "Star Spangled Banner." These incidents set the tone of the entire evening, which was sustained by the music of the Salem Cadet Band, coming to a climax in the passing of a resolution, presented by President-elect Ford, offering the support of the club to the national government in the present international crisis.

The menu was unusually original, being printed as a replica of the club "bulletin," and abounding in timely hits with cartoons and jokes appropriate to the occasion.

During the evening Hon. James M. Curley, Mayor of Boston, entered the banquet hall, accompanied by ten junior officers of the Argentine Navy, who have enlisted for service under the flag of the United States in case of eventualities. In a masterly address Mr. Curley pointed out this and other evidences of the entente cordiale between South and North America. Representatives of the sister republic to the south responded in kind. Upon motion of M. C. Brush a committee was appointed to draft a cablegram of appreciation to the President of the Argentine Republic, for his co-operation in placing these naval officers at the service of this country.

Arthur A. Ballantine, Boston, officiated as toastmaster, and in the absence of Governor McCall introduced Hon. C. L. Burrill, treasurer of Massachusetts, who extended the greetings of the State. The next speaker was Edward K. Hall, vice-president of the Electric Bond & Share Company, New York, who discussed public utility regulation. An abstract of his remarks follows:

### IS PUBLIC UTILITY REGULATION A SUCCESS?

Regulation has accomplished much, but it is not a success in the broad sense of the word. Rebates and discriminations have been cut out, with excessive and unreasonably high rates, which were relatively few in number. Duplication of facilities has been largely eliminated. Regulation has given the public right of appeal to another tribunal, but regulation of rates has in the past been largely downward. Rate regulation upward is a large problem to many commissions. The public expects the companies to be able to take care of themselves.

The value and quality of the service greatly exceed the importance of the rate itself. The importance of this branch of regulation (revision of rates upward) has not been sufficiently appreciated. Even if rates are 5 or 10 per cent too high it is not a serious matter compared with maintaining the highest quality of service. No public utility can be properly developed by merely putting a fixed sum into it. Rates must be high enough to draw new money into such enterprises. In future rate revision upward will occupy the attention of regulatory bodies to a far greater extent than in the past.

Companies must receive enough revenue so that they can do their work right. Ninety per cent of the public, of the commissions and the companies are fair-minded once they know the facts. The three parties need to appreciate still more their common interest to develop mutual confidence. The companies should not be afraid of the commissions, and the latter should stand up and decide all cases purely on their merits. Companies must inform the public that they are doing work as they should, as well as doing it as well as can be done. The surface hasn't yet been scratched in educating the public. Do not try to "bluff out" mistakes. Let the public help the commissions to render impartial decisions, and let the commissions' terms of office be as long and as secure as that of the judges in the courts. Prosperous companies giving the best service are the best possible tribute to commission regulation. Commissions are realizing their true function as mediators more than before and are coming to appreciate that burdens can be placed on companies more easily than they can be taken off, and they are less disposed to add burdens than heretofore. The Massachusetts law requiring a man of the requisite caliber of a public service commissioner to devote his entire time to this work is a crime. Constructive criticisms without undue publicity are helpful to the companies. Commissions should not make companies suffer for the sins of others or visit condemnation upon company officers for the wrongdoings of their predecessors. The punitive period of regulation is giving place to the constructive period, in which co-operation will be the key to successful supervision.

Other speakers were L. E. Wilson, manager American City Bureau, New York, and W. R. Balch, war correspondent of the Boston *Transcript*.

### NEW OFFICERS

The following officers for 1917-18 were elected at the business meeting in the afternoon: President, A. H. Ford, Portland, Me.; vice-presidents, J. E. Dozier, Massachusetts; Edward M. Graham, Maine; J. Brodie Smith, New Hampshire; W. F. Corry, Vermont; A. E. Potter, Rhode Island; R. W. Perkins, Connecticut; secretary, H. A. Faulkner, Boston; treasurer, Fred F. Stockwell, Cambridge, Mass.; executive committee, C. V. Wood, Springfield, Mass.; James H. Murphy, Taunton, Mass.; H. M. Steward, E. G. Young, A. P. Emmons, J. W. Belling and A. A. Hale, Boston; finance committee, A. H. Ford, C. D. Emmons, Framingham, Mass., and W. A. Gilman, Boston. F. F. Stockwell was chairman of the banquet committee. D. A. Belden, Haverhill, Mass., and W. W. Field, Cambridge, Mass., were chairmen of the reception committee.

## Standard Safety Code in Booklet Form

REALIZING the formidable appearance which the Bureau of Standards electrical safety code presents to the small electrical property, where the work of all departments is handled by two, three or four men, the Wisconsin Railroad Commission has made an exhaustive study of this voluminous work and prepared a small 26-page booklet which puts the code, reduced to lowest terms, before the utility operators in a form which will receive their attention. In the majority of cases, if the whole unabridged code were depended on for trial, it would be laid aside and overlooked by the smaller property officials, and the majority of the properties in Wisconsin belong to this class. The preparation of this condensed set of rules, covering as it does the points demanding attention, is indeed a valuable service to the electrical industry of Wisconsin.

The manner in which this booklet places the essentials of the code before the operators in so condensed



a form is interesting and valuable. For instance, it is divided under general subdivisions, as grounding, lightning protection, exposed current carrying parts, strength of line, supports, etc., and then under each of these there may be several paragraph rules. Each of these rules gives the substance of perhaps a number of paragraphs in the Bureau of Standards code, and then gives the numbers of the paragraphs from which points included in the rules were taken, or paragraphs in the

code covered by this condensed rule. In some cases the listing of the paragraph reference numbers consumes as much space in the booklet as the statement of the rule itself. At the very least, this bringing together under one head of all subject matter scattered through the code referring to that point, will be of great value to the operating men, for it will enable them to look up a point in question in the booklet and then turn to the listed references in the code for a full study.

## American Association News

Appointments of Manufacturers to Engineering Association Committees Completed—Meetings of Joint Committees on Overhead Specifications and Standardization of Insulator Threads, Committees on Fares and Transfers, and Valuation and T. & T. Executive Committee Were Held Recently

### Engineering Association Committee Appointments

As announced in the issue of the ELECTRIC RAILWAY JOURNAL for March 10, page 443, the technical committees of the Engineering Association are being augmented by the addition of representatives of the manufacturers. In addition to the appointments listed there, the following have been announced by Secretary E. B. Burritt:

*Committee on Way Matters:* Chester F. Gailor, Atlantic Welding Corporation, New York City; H. Fort Flowers, Differential Car Company, New York City; Nicholas B. Trist, Carnegie Steel Company, Pittsburgh, Pa.

*Committee on Equipment:* W. S. Adams, J. G. Brill Company, Philadelphia, Pa.; A. A. Green, Columbia Machine Works and Malleable Iron Company, Brooklyn, N. Y.; G. W. Lyndon, Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.; C. F. W. Rys, Carnegie Steel Company, Pittsburgh, Pa.; N. W. Storer, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.; E. D. Priest, General Electric Company, Schenectady, N. Y.

*Committee on Power Generation:* E. E. Gilbert, General Electric Company, Schenectady, N. Y.; Francis Hodgkinson, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.

### Joint Committee on Overhead Specifications Completes Revision Work

A second two-day joint conference of representatives of the Engineering Association and the Associated Manufacturers of Electrical Supplies, held in Chicago, on March 1 and 2, was devoted to the adjustment of differences in the specifications of the two associations for ears and other bronze fittings and pole line hardware. The work of revision and harmonization of the overhead specifications of the two associations was practically completed at the conclusion of this meeting and will be written into final form for a report to the power distribution committee of the Engineering Association and the line material section of the Associated Manufacturers at their next respective meetings.

The Engineering Association was represented by E. J. Blair, Chicago, chairman of the sub-committee; A. Schlesinger, Indianapolis, and C. E. Fritts, Kansas City. The Manufacturers' Association was represented by C. C. Beck, Ohio Brass Company, chairman; James H. Drew, Drew Electric & Manufacturing Company, and

William Schaake, Westinghouse Electric & Manufacturing Company. Carl L. Peirce, Jr., Hubbard & Company, and R. C. Boozer, Joslin Manufacturing & Supply Company, sat through this meeting at the invitation of the manufacturers' committee, in order that accurate information might be had concerning pole-line hardware.

### Standardization of Threads for Insulators and Insulator Pins

In an endeavor to standardize the threads for insulators and insulator pins, a joint committee representing several national organizations interested met at the American Association headquarters on March 6. Those present were: J. T. Barron, American Institute of Electrical Engineers; J. A. Brundige, National Electric Light Association; R. F. Hosford, American Telephone & Telegraph Company, and C. R. Harte, American Electric Railway Association.

A specification suggested by the manufacturers was considered in some detail and the following tentative conclusions were reached: (1) In view of the release turn requirement it is inadvisable also to fix diameter limits at pins or pinhole tops other than the nominal diameter. (2) Because of the liability to deformation and to rapid wear, the use of lead for the gage is inadvisable. Further, it is desirable to use a gage thread more nearly like the actual thread as formed. (3) The release turn to be prescribed should be decided upon after tests to determine the holding power of different amounts of engagement. Mr. Barron is to make these tests and Mr. Harte is to secure the necessary insulators and pins, the former with both glazed and unglazed pin holes.

Mr. Hosford exhibited steel pin and insulator thread gages for the telephone thread, and stated that he would secure details of wood pin manufacture with particular reference to the limits of accuracy which can reasonably be required.

### Fares and Transfers

A meeting of the T. & T. Association committee on fares and transfers, C. S. Ching, Boston, Mass., chairman, was held in New York City on March 8 and 9. The topics discussed were the use of cars of ordinary type as prepayment cars without fare boxes, and the use of prepayment cars on routes having more than one fare zone. Information which had been collected through the medium of a data sheet indicated great variation in prac-



tice in the matter of fare collection. It was evident that the fundamental principles would have to be formulated, and an attempt made to codify existing practice.

The committee also asked permission of the executive committee to file a supplementary report on a device for collecting fares on prepayment cars on systems having more than one fare zone. In view of experiments now being conducted by railways and others which the committee plans to conduct it was felt that the subject is of sufficient interest and timeliness to warrant discussion at the coming convention.

Those present at the meeting besides the chairman were: G. S. Brush, Portland, Me.; R. W. Emerson, Cleveland, Ohio; W. C. Harrington, Kansas City, Mo., and E. E. Strong, Rochester, N. Y.

### Other Recent Committee Meetings

The executive committee of the Transportation & Traffic Association met in New York on March 10. Those present were L. C. Bradley, Houston, Tex.; L. H. Palmer, Pottsville, Pa.; R. P. Stevens, Youngstown, Ohio; J. J. Dempsey, Brooklyn, N. Y.; H. C. Donecker, Newark, N. J.; H. B. Potter, Boston, Mass., and E. B. Burritt, New York City. The convention program was tentatively discussed, the personnel of the committee on standards and review was taken up with Mr. Palmer, and the revision of the code of instructions to committees was approved.

A meeting of the committee on valuation was held in New York on March 7. The principal work of the committee was to review the criticisms from member companies of the code of definitions. A number of these were incorporated in the code, but the committee will meet again before preparing its final report on the subject. Those who attended the New York meeting were P. J. Kealy, Kansas City, Mo.; J. N. Shannahan, Hampton, Va.; B. E. Tilton, Syracuse, N. Y.; C. G. Young, New York City, and Martin Schreiber, Newark, N. J.

### Meeting of Connecticut Company Section

There was a total attendance of 249 at the February meeting of company section No. 1. The meeting was at the Hotel Stratfield in Bridgeport, and was preceded by the usual dinner. Entertainment consisted of several vocal selections, and a musical program by the company section orchestra.

The principal speaker of the evening was Charles H. Chapman, manager Bridgeport division, who read a paper on the betterment of trolley service during the growth of the city of Bridgeport, and outlined the efforts of the Connecticut Company to provide adequate service. Following Mr. Chapman's paper, Mayor Wilson of Bridgeport, addressed the meeting on the subject of the relation between the city railway and the local industries. Other addresses were given by Public Utilities Commissioner Charles C. Elwell on the various duties of the commission tending toward better regulation, and also by a member of the Chamber of Commerce on the work of that body to improve relations between the city and the railway.

### Denver Tramway Section

The forty-third session of the Denver Section was held on March 15 with an attendance of 150. The feature of the meeting was a paper on "Publicity and Pay as You Enter," by J. C. Davidson, publicity agent and editor of *Tram-O-Grams*, the company publication. The appropriateness of the paper was due to the fact that the pay-as-you-enter system of fare collection is now being installed on the Denver Tramway System. The

paper was widely discussed and the discussion was closed by F. W. Hild, general manager. Mr. Hild showed how meetings of the kind can be of great benefit by bringing the attendants to realize how the company's affairs are handled.

The topic for discussion at the Feb. 15 meeting of the Denver Tramway Company section was "Trainmen's Records and Transfers," a paper on this subject being read by C. E. Buehler of the auditing department. It was followed by supplementary papers and remarks from a number of trainmen and by a general discussion. Secretary Mundhenk reported an exceptionally lively and interesting meeting with an attendance of 250.

## Methods of Giving Signal Indications Discussed

At the Meeting of the Railway Signal Association in Chicago Emphasis Was Laid Upon the Reliability of Light Signals as Opposed to Semaphores

A STATED meeting of the Railway Signal Association was held at the Auditorium Hotel, Chicago, Ill., on March 19, 1917. Among the various reports of committees was that of the committee on signaling practice in which there were discussed various methods of giving signal indications other than by means of the semaphore. The committee stated that colored and position-light signals for day and night use reduced the number of signal failures by eliminating all moving parts except the control relays, and that light signal aspects have greater visibility and range under adverse weather and background conditions than the semaphore, while the close conditions compare favorably. Also light signals give uniform indications at all times.

In general practice the number of aspects of any one arm of a semaphore is limited to three. With the position-light signal four distinctive positions may be used, while the number of indications given by colored-light signals is limited only by the number of colors available. Where power is obtainable the cost of operating light signals is less than that for operating motor-driven signals, the current consumption under normal automatic signal conditions being 20 watts per signal for the position-light type and from 35 watts to 50 watts for one of the colored-light type. The cost of maintenance of both types of light signal is considerably less than that of semaphore signals. The colored-light type has fewer lamps to renew than the position-light type, and therefore has an advantage in this respect.

In general, where power is available, the light signal is preferable to the semaphore. Position-light signals can be installed at any location where clearance will permit the present standard semaphore to be erected. The colored-light signal, however, can be used in more restricted clearances.

Comment was made also by this committee in regard to the desirability of having an overlap in automatic signaling. It was stated that overlaps are undesirable for following movements, because adequate advance information can be provided in the signal systems. However, overlaps are necessary for opposing movements where adequate advance information cannot otherwise be provided.

A feature of the report of the committee on standard designs was the submission of two new drawings to show a proposed standard location for the supports for highway-crossing signs, both of these drawings providing for the location of the warning sign over the



center of the highway. In one case the sign is mounted upon a pole set in a concrete base on the center line of the line and as close as conveniently possible to the track. The other design provides for the sign to be supported on a truss construction spanning the roadway between two poles, the sign, as before, being on the center line of the highway. In either case the drawing calls for a warning sign of the usual diagonal-board type but illuminated by a lamp in front of it, the preferred source of light being electric power.

## COMMUNICATIONS

### Standard Classification for Trucks

INDIANAPOLIS TRACTION & TERMINAL COMPANY

INDIANAPOLIS, IND., March 12, 1917.

To the Editors:

We have carefully gone over the matter of a uniform system of truck classification outlined in a recent article by S. A. Bullock and have no suggestions to make in regard to any changes or additions to the plan as proposed. It would seem that the adoption of a system of this character should largely simplify the ready identification of trucks of various types, and this would be a very great advantage to the street railway industry.

ROBERT I. TODD, President.

### Penalizing Travel on Electric Roads

UNION TRACTION COMPANY OF INDIANA

ANDERSON, IND., March 17, 1917.

To the Editors:

In your issue of July 29 you published an editorial under the heading "Accident Insurance Associations Penalize Travel on Electric Railways." This subject has interested me for several years, and so far as possible, I have endeavored to call attention to the injustice of the attitude of the accident insurance associations, to which you refer under the very fitting title above quoted. The matter was taken up in 1914 with one of the accident associations by our Central Electric Railway Association without results, except replies containing the argument about the insurance companies not desiring to take on additional hazard.

The by-laws of most of the insurance associations referred to provide that a double death benefit shall be paid if a member is killed ". . . while riding as a passenger inside a passenger car or passenger coach of a railroad train *propelled by steam*. . . ."

These words "propelled by steam" are unfair to the electric railway industry. They not only give the erroneous impression that traveling by steam trains is safer than traveling by electric lines, but they discourage the commercial traveler from patronizing our railroads. As you stated very clearly in your issue of July 29, the statistics of the electric interurban steam railroads in the principal central states, so far as the figures were available then in the published reports of the commissions up to 1914, show that the ratio of passengers killed or injured to the total number of passengers carried was small for the electric roads as compared with the steam railroads. Even as long ago as 1911, before the safety first campaigns were in full swing and accidents had been greatly reduced on the electric roads, there were handled on the steam lines in Ohio 41,912,468 passengers and on the electric roads 155,215,899. On the steam lines 56 passengers were killed and 741 injured, whereas on the electric lines, only 11 passengers were killed and 522 injured. Other years

and states show similar figures in favor of the electric lines.

Of course, I realize that every additional activity on the part of the insured to which the policy grants double payment in case of accident, costs the association money. For instance, if the association should extend the double liability to taxicabs, it would cover an additional hazard. But with the electric road there is a different situation. If the commercial traveler uses the electric road between two cities, he does not use the steam road for that journey, and as the electric road is safer, the association would actually save money by extending its double liability clause. Moreover, if double liability was granted on electric lines, it would be a very strong talking point.

As the double liability clause reads at present it is bad advertising for our industry, and it seems as though we should make every possible effort to have the discrimination removed.

S. R. DUNBAR, Purchasing Agent.

### The Advertising Policy of "Aera"

FORD, BACON & DAVIS

NEW YORK, March 19, 1917.

To the Editors:

I have read with much interest the report of the committee on the publishing policy of the American Electric Railway Association.

My discussion of this matter with electric railway officials has convinced me that there is a feeling among the members of the association that *Aera* in its present form is too much of a magazine for an association publication.

Among engineers I find that not nearly so much attention is paid to *Aera* as to the *ELECTRIC RAILWAY JOURNAL*, the general opinion being that the latter fully covers the field and they have not time to read *Aera* also.

The electric railway publishing field is necessarily limited, and it has always been a matter of surprise to me that your publication could afford so satisfactorily to serve its readers. A division of support between these two publications must eventually lead to weakening the *JOURNAL*, and this we would all very much regret.

My conclusion would be to restrict the activities of *Aera* to those pertaining to a bulletin of the association.

FRANK R. FORD.

### Publicity Conference Proposed

UNITED RAILWAYS & ELECTRIC COMPANY

BALTIMORE, MD., March 20, 1917.

To the Editors:

In view of the growth of interest among railway companies in publicity matters, the large recent increase in the number of company publications, and the development of systems of educating the public to a knowledge of the business of railroading and of promoting a kindly interest among employees for their employers, I take the liberty of suggesting that greater attention be given to this important branch of the electric railway business at the next annual convention. Surely the organization of a publicity branch would be of great mutual assistance in furnishing a means for the interchange of ideas that have been successfully tried by the publicity men in advancing the interests of their respective companies. It would also be most helpful if an exhibit of the work done by the various railway companies in a publicity line should be made in connection with this conference.

DWIGHT BURROUGHS, Publicity Manager.



## Practical and Economical Solutions of Problems in EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

### Car Axle-Changing Method Uses Pit with Inclined Floor

Axle Is Lowered and Carried Off by Truck After Jacks Raise Car Body, and 6-Ft. Rail Lengths Spanning Pit Recess Are Removed

BY A. WADE

Master Mechanic Rome Railway & Light Company, Rome, Ga.

An efficient method for changing single-truck axles is being used by the Rome Railway & Light Company. The walls of a pit which is built between track rails have been recessed at one point to allow the lowering of an axle. The length of the recess is such that removable rail splices, 6 ft. in length will span the opening, and rest on the jutting walls. The splices are held in place by the customary joint plates. The pit floor is on an incline to allow an axle truck to be easily pulled away. Thus by jacking up a car and removing the rail splices, an axle may be lowered by pit jacks to a truck resting on the inclined floor and carted off so as to allow another axle to be inserted by reversing the procedure.

When an axle of a car is to be changed the car is placed so that the axle will be directly above the jacks located in the pit. Other jacks then raise the end of the car body sufficiently high for the wheels to clear the rails and the axle is held by the pit jacks while the 6-ft. lengths of rail are removed. The axle is then lowered until it rests on a swiveled cradle which is attached to an axle truck placed between the pit jacks and resting on the inclined floor of the pit. The axle truck is mounted on three wheels and has a hand steering wheel operated from behind. The cradle of the axle truck is mounted on an old center bearing and will turn to any position.

The axle, on being lowered to the truck, is swung around lengthwise of the pit and the truck is pulled by

an extra car up the inclined floor to a point where the wheels will clear the rails. The axle is then swung around and the axle truck is allowed to roll down the incline thereby leaving the axle behind as the wheels are intercepted by the rails. The old axle is then rolled out of the way and a new axle placed under the car by reversing the above operation. To change the axle at the other end, the car is moved along the track until the other axle is in place over the pit jacks.

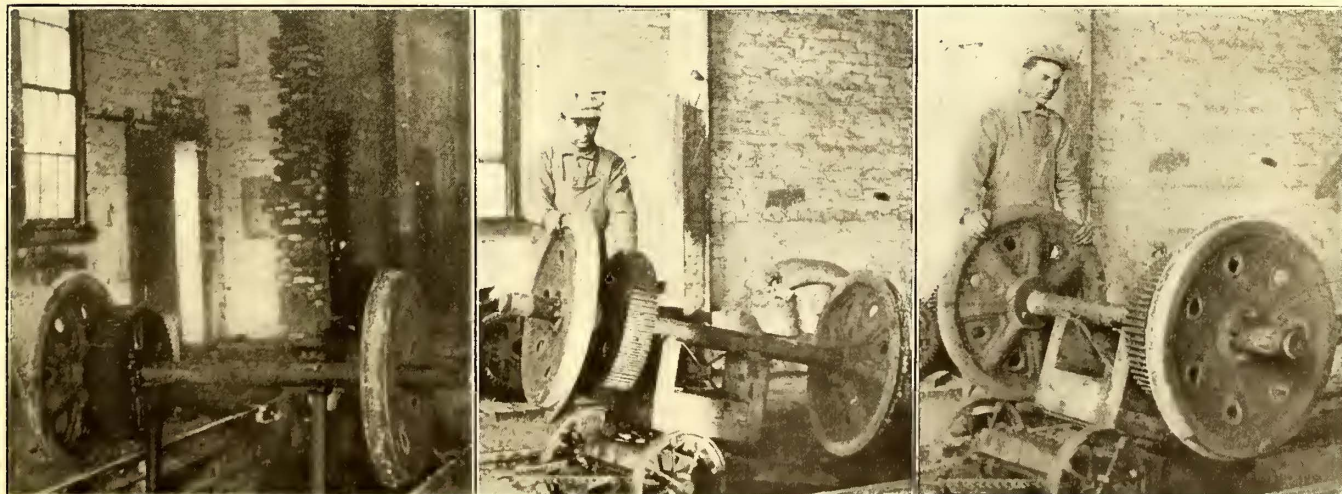
The pit jacks have a lift of 5 ft. necessitating wells in the pit floor for lowering the step bar. With this arrangement two men can remove worn wheels and place new wheels under a single truck car in one hour. The cost of equipping the pit complete was \$30.

### Killing Weeds by Chemical Treatment

Application of Chemical to 125 Miles of Track Per Day Accomplished with Large Sprinkling Train

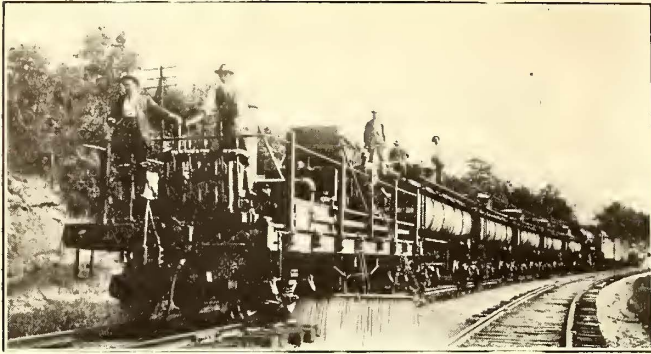
It is difficult to compare the results and costs of the three methods commonly used on interurban properties to kill weeds, namely, hand weeding, burning, and the application of chemicals. Different standards of maintenance are approved by different officials and the same items of expense may not be included in costs compiled for any one method. Practices of different roads vary with respect to the width of weeded area, and weeds on some properties are more difficult to eradicate than on others.

The use of a chemical weed killer is perhaps the most effective. It kills the vegetation by eating into the fiber, its effect is extended in a measure to the root of the plant and it sterilizes the soil so that further weed growth is not promoted. Due to the sterilizing of the soil, the effects are cumulative so that it can be used in



THREE VIEWS ILLUSTRATING AXLE-CHANGING METHOD SHOWING AXLE: (1) RAISED CLEAR OF RAILS; (2) PULLED UP INCLINE; (3) READY TO BE REPLACED ON RAILS





SPRINKLING TRAIN FOR EXTENSIVE APPLICATION OF WEED KILLER

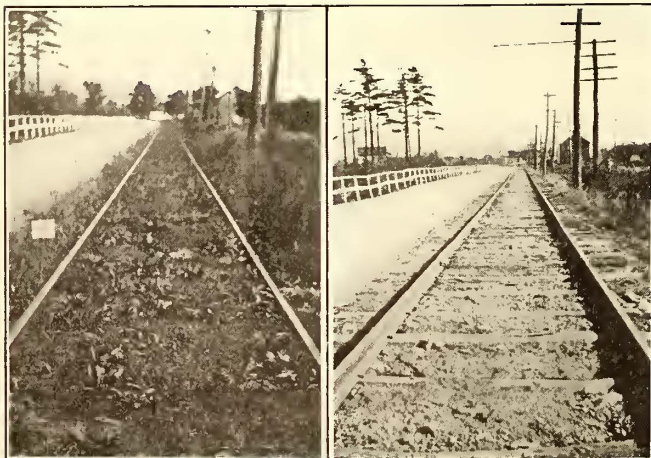
smaller quantities in succeeding years. The most economical application requires a study of prevailing conditions. It is claimed that the chemical also has a preservative effect on wood ties and metal equipment.

Good results have been obtained from the use of Atlas "A" weed killer of the Chipman Chemical Engineering Company, Inc., New York, formerly the Atlas Preservative Company. A description of this process was given in the issue of this paper for Aug. 30, 1913, page 345.

The use of the method on a larger scale than therein described involves employing a sprinkling train as shown in an accompanying illustration. The train consists of a tank car containing the chemical and others carrying water for diluting the chemical. A flat car with the sprinkling head has a gasoline engine and a centrifugal pump to fill the tank cars with water and to draw the mixture into the sprinkler at the necessary pressure through a common main into which all the tanks discharge. The train is propelled by a locomotive and a special car drawn in the rear sprinkles an odor compound to render the vegetation repellant to cattle. About thirty miles of track can be treated with one loading with this train, or a total of about 125 miles per day.

The sprinkling head of the flat car extends over a width of 14 ft. and is so arranged as to divide the width of track under treatment into five sections. The operator observes the distribution of weeds and operates the sprinkler divisions to treat particular sections of the tracks in the necessary quantities. The tank cars are equipped with devices using compressed air to agitate the solution. A meter is used to measure the amount of solution passing into the sprinkling head.

The best results are obtained by sprinkling in dry weather or when the vegetation is capable of absorbing



SECTION OF TRACK, SHOWING WEED GROWTH; SAME TRACK AFTER ONE APPLICATION OF WEED KILLER

the liquid. For ordinary conditions about 8 gal. of the chemical is recommended for the first treatment per foot of width of track one mile long. The amount used varies with the resistive qualities of the weeds, the fertility of the soil and the density of growth across the track. The application for the succeeding years depends upon the amount of regrowth. The amount of dilution with water is about 1 to 20 depending upon the condition of the soil, the water being used simply to convey the chemical. If the ground is dry and porous and apt to hold the moisture, more water is used to carry the chemical to the roots of the plant.

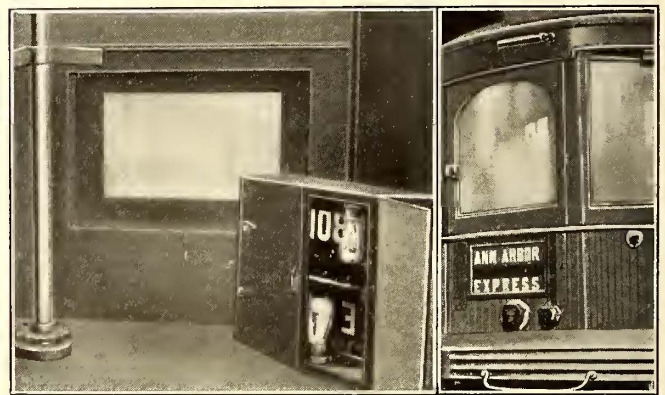
A second illustration shows a weedy track, and the same track seventy days after application of the weed killer on one of the Western New York & Pennsylvania Traction Company's lines.

## Interchangeable Interurban Destination Sign

BY C. L. KELLER

Assistant Master Mechanic Detroit United Railway

In order to facilitate the transfer of passenger cars from one division of the property to another, we have found it convenient to equip the cars with interchangeable destination sign boxes which may be easily and



INTERCHANGEABLE SIGN REMOVED FROM RECESS IN DASH, AND ON FRONT OF INTERURBAN CAR

quickly taken out of one car and put in another. These consist of a 25-in. x 17-in. wooden box, 6 in. deep, made standard for all interurban cars and containing two Electric Service Supply Company roll curtains and three electric lamps. These are designed to set in a recess in the dash and be flush with either side. A pane of glass over the opening in the dash protects the curtains from the weather. Sheet steel doors on the back of the box open so that the motorman can read the signs when setting them, which he does by means of two cranks extending through the back of the box.

When it is desired to transfer a car from one division to another, the trainmen have simply to take out one sign box and insert another or interchange the boxes in two cars when one is pulled off a run and another put on in its place. Two contact springs on the bottom of the recess and metal strips on the bottom of the sign box automatically connect the sign lamps in the lighting circuit when the box is put in place in the dash.

This destination sign scheme not only minimizes the trouble of changing a car from one line to another, but it reduces the number of signs required for each division or makes possible the use of a shorter curtain for each sign, avoids the necessity to resort to special makeshift signs, and generally facilitates the inter-use of equipment over the system.



# Maintaining Substation Efficiency

## Reduction of Substation Losses Offers Opportunity for Substantial Power Saving

BY D. E. CROUSE

Chief Engineer, Auburn & Syracuse Electric Railroad, Auburn, N. Y.

The introduction of automatic substations gives the railway field a vision of the time when something approaching ideal efficiency will be obtained from the rotary converter when used as a means for converting alternating-current power to direct-current power. Many of us will, however, be compelled to content ourselves with manual operation for the present, or at least until such time as the automatics have proved their reliability.

It is well understood that due to the misfit application of rotary unit sizes on many interurban railroads the machine load factor is very low, in some cases as low as 30 per cent. The machine load factor may be materially raised if integrating meters are employed to give the operator definite knowledge of the station input and output. When meters are not installed on both incoming and outgoing buses a really conscientious operator may not be loading his machines to their capacity without being aware of this condition.

The three substations of the Auburn & Syracuse Electric Railroad use power purchased at the alternating-current bus and therefore have always had wattmeters installed on the incoming lines. On Dec. 1, 1915, in addition, direct-current wattmeters were installed on the outgoing buses of each substation, and the result has been as described below.

A substation log sheet, as shown opposite, was adopted as a means of recording energy readings, and for the purpose of placing a graphic representation before the operator. The operators make their own records on the log sheets and plot their charts.

It is the firm belief of the writer that a very great part of the benefit which comes as a result of the meter installation is derived from the psychological effect on the operator which plotting his own record produces. The keeping of a log sheet causes him to concentrate his attention on the meters with the result that the machine capacity is more closely graduated to the load.

The form of record which we use is illustrated in the accompanying figure on which it will be noted in addition to the usual energy readings, etc., a line is drawn to indicate the machine capacity in service, and another to show the direct-current load. The machine load factor, in per cent, and also the efficiency of station in per cent are calculated and entered on the record.

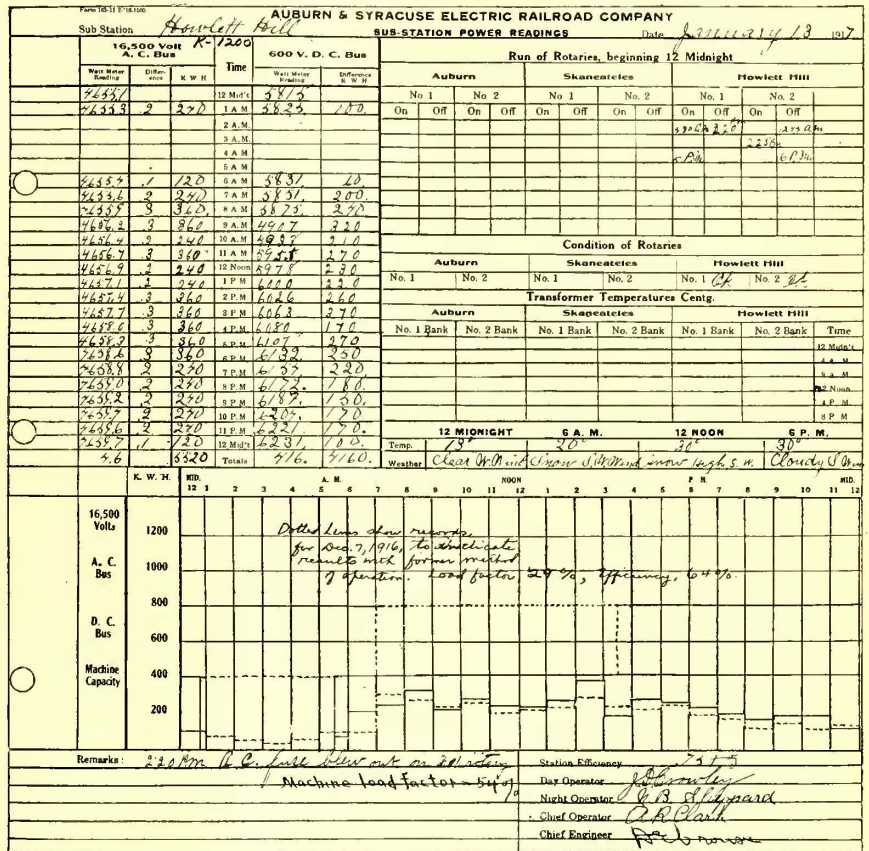
Our operators take pride in plotting their records neatly and are interested in the relative efficiencies of the several substations. They have also made many suggestions as to any change in service to permit them to load the machines more efficiently.

To illustrate the nature of these suggestions, I recall that the operator at Skaneateles substation mentioned the fact that if the Russell snowplow was spaced a certain distance from a passenger car he would be

able to handle the service with one rotary instead of two. Such suggestions as this which are constructive are immediately adopted and the operator is given due credit for them.

It is decidedly important that the transportation department give the substations all information possible regarding any change in service. This is particularly applicable to interurban operation. Our transportation men call up the substations whenever any extra cars, snow-fighting equipment, etc., are on the road, and thus prepare the operators to anticipate the time and duration of a peak.

Before the wattmeters and log sheets were placed in service it was a frequent occurrence that two 400-kw. rotaries in the interurban substations were run where one machine is now handling the service. As a matter of fact, after a graphic record was kept, the load at Skaneateles substation, which was formerly at some periods handled by two 400-kw. rotaries, was found to



SUBSTATION RECORD, AUBURN & SYRACUSE ELECTRIC RAILROAD

be just a well-balanced load for one modern 300-kw. machine. It is probable that the installation of such a rotary in this station will permit the handling of the load and, through its increased efficiency over the old-style 400-kw. unit will soon pay for itself.

As a result of the conforming of machine capacity in service more closely to the load we have secured the following improved substation efficiencies:

Substations	Average Efficiency, Per Cent	
	December, 1916	January, 1917
Auburn	90	93
Skaneateles	70	79
Howlett Hill	68	78

The difference in efficiency between the Auburn substation and the interurban substations is mostly accounted for by the fact that energy is purchased and measured at the low-tension alternating terminals of



the rotary converter at Auburn and at the high-tension terminals of the transformers at the interurban substations. In other words, the percentages at Auburn do not include static transformer loss while those at the other substations do include it.

The average machine load factor at the city substation has been increased to 63 per cent and the interurban substations to 51 per cent.

The following data of kilowatt-hours per car-mile furnish an indication of the material energy saving which has resulted from the campaign for more efficient substation operation:

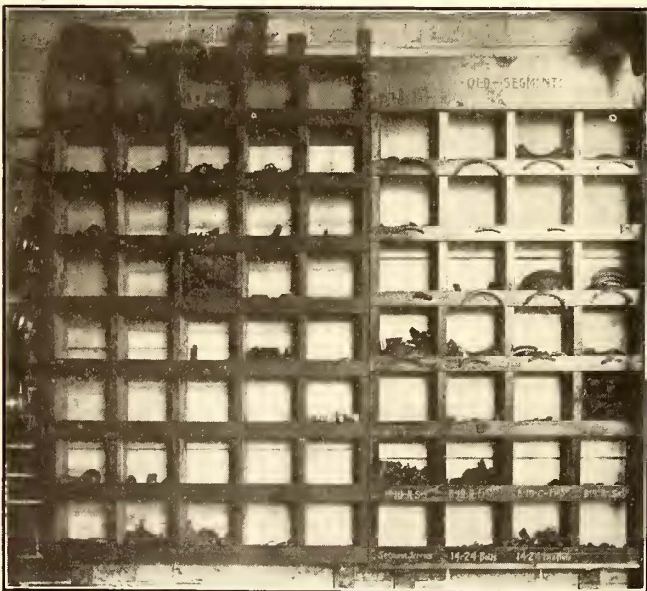
KILOWATT-HOURS PER CAR-MILE			
December, 1915	December, 1916	January, 1917	January, 1917
4.21	3.82	4.08	3.80

The decrease in kilowatt-hours per car-mile was made in the face of the fact that more ton-miles were operated in the December, 1916, and January, 1917, than in the preceding months mentioned.

It is estimated that the cost of three direct-current watt-hour meters, which was approximately \$700, was saved during the first two months of operation. Inasmuch as the operators plot the records themselves there is no need for an increase in the clerical force, and the only added expense was the cost of the record forms.

## Method of Reclaiming Old Controller Segments

In the shops of the Beaver Valley Traction Company, New Brighton, Pa., old controller segments which have been burned or otherwise damaged are saved and cut up into smaller parts. The illustration shows a rack which has been found convenient in working out this economy. The bin in the upper right-hand corner is the one into which the damaged segments are thrown when they are removed from the controller. When the bin is full the segments are cut up into the smaller sizes which are then sorted and placed in the boxes



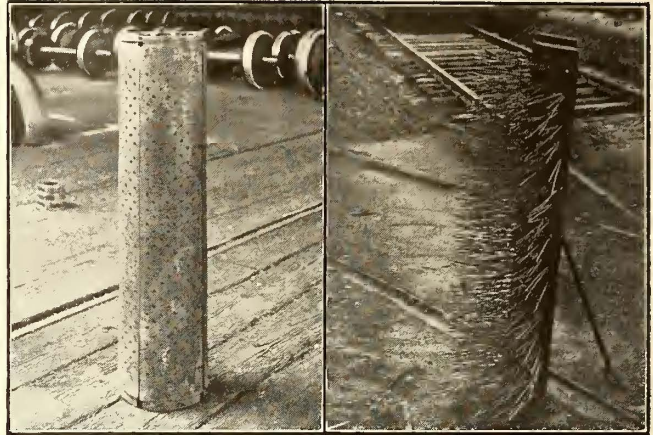
BIN FOR HOLDING CONTROLLER SEGMENTS

below. On the front of each box the class and catalog number of the part are given, and to make it easier to locate the part wanted, one of the segments is also fastened on the outside.

The bins on the left-hand side of the rack are used for holding carbon brushes and brush-holders. Trolley wheels are kept on pegs on the ends of the rack.

## Steel Wire for Sweeper Brooms

The International Railway, Buffalo, N. Y., has during the last few months used steel wire in sweeper brooms instead of rattan and is much pleased with the results. The wires are held in a slit cast-iron shell, like that shown in the accompanying photograph, being cut in



STEEL WIRED SWEEPER BROOM USED BY INTERNATIONAL RAILWAY, BUFFALO, N. Y.—CAST-IRON SHELL AT LEFT, ASSEMBLED BROOM AT RIGHT

about 18-in. lengths, bent into U-form in a simple former and slipped through the  $\frac{1}{4}$ -in. holes which are drilled about  $1\frac{1}{2}$  in. apart over the surface of the shell. The wire is No. 11 gage and the copper-covered variety is used to prevent rusting. Each hole accommodates four wires and the wires are held in place by means of a sheet of No. 16 gage steel placed inside.

## Use of Air Tools in Rhode Island Track Work

The increasing use of machine tools in road and track work is a feature of interest on the system of the Rhode Island Company. Among the recent additions to this class of equipment are eight "Imperial" tie tampers, supplied with air by two electrically driven Ingersoll-Sergeant compressors. The uses of these air tools are varied. The compressors are mounted on trucks running on standard-gage track and have been found especially convenient in cleaning up dirt and other debris in locations where new concrete has been joined to old, or in the pouring of concrete where the cement mixture is to abut against iron or steel beams, and in cleaning bridge construction. Each tie-tamping machine requires about 16 cu. ft. of air per minute at 80-lb. pressure, two machines operated together taking about as much air as a pneumatic riveting hammer. The use of the air tamper results in greatly increased thoroughness of work, especially in handling crushed stone.

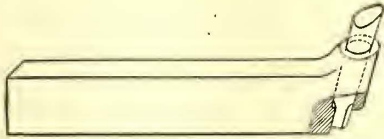
In thawing out ground for winter construction the company uses Hauck torches with nozzles about 6 in. in diameter, the air supply being obtained from the Ingersoll-Sergeant compressor outfit. Eight of these torches are now listed in the department's equipment, and their use in connection with street excavation in frozen ground has been remarkably successful. Municipalities are becoming more and more averse to the use of fires on the streets, with resulting spark and smoke troubles, delay to traffic, etc. The concentrated heat of these torches enables the ground to be thawed far more rapidly than with a fire, and practically eliminates traffic delays, besides doing away with sparks and smoke. In thawing out ground for work in connection with carhouse construction this winter, the Ingersoll compressor was used in connection with Hauck torches,



and lumps of frozen earth, 2 ft. to 3 ft. in diameter, were easily detached. A jack-hammer drill of Ingersoll make was successfully used in frost removal, holes in 2-ft. to 4-ft. squares, and spaced from 4 in. to 6 in. apart inside, being drilled in the earth. Another useful application of the air compressor is in blowing sand as fast as it is dried to the end of a heating pipe or cylinder. Air-operated hoisting is employed on a crane car used in the department.

### Drill Stubs Made Into Lathe Tools

A use to which drill stubs can be put has been suggested by the Cleveland Twist Drill Company. In order to use up this valuable high-speed steel, the com-

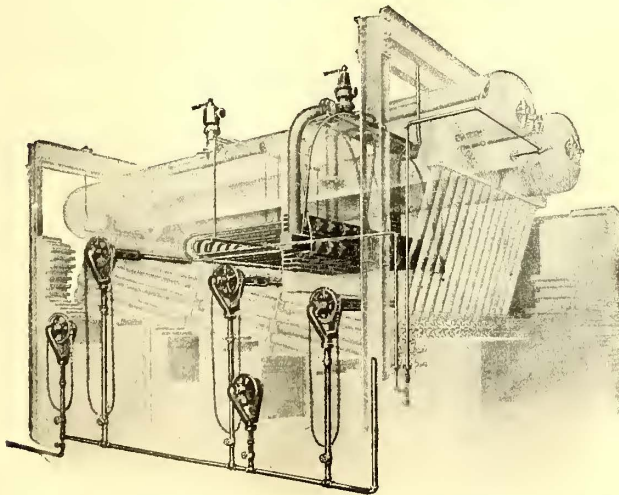


LATHE TOOL WHICH USES DRILL STUBS

pany cuts off the stub end of the drill, hardens it and grinds it to form a lathe tool. This is slipped into a tool holder as shown in the accompanying sketch, and it works as well as any manufactured lathe tool.

### Soot Blower Facilitates Economic Boiler Operation

The formation of soot on the fire surfaces of a boiler is one of the most troublesome sources of preventable waste in the boiler room. Other losses, such as air leakage, incomplete combustion, improper insulation and scale formation, can be eliminated permanently or corrected at infrequent intervals without great difficulty. The formation of soot, however, cannot be stopped by any permanent means. Its deposit on the fire surfaces of a boiler is a continuous process. It forms an injurious heat insulator, which in non-conducting proper-



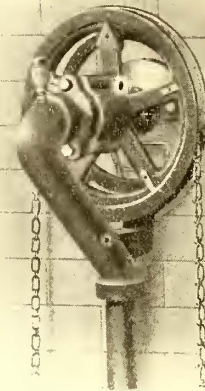
SOOT BLOWING SYSTEM ATTACHED TO HORIZONTAL WATER-TUBE BOILER, SHOWING FIVE SOOT BLOWING UNITS

ties has proved to be more than five times as effective as fine asbestos.

The losses which result from soot formation on the tubes are considerable as indicated by the following: With coal at \$3 per ton, and 1/32 in. of soot on the tubes, a loss of 29 cents per ton of coal results; with 1/16 in. there is a loss of 66 cents per ton; with 1/8 in.

of soot, \$1.45 per ton; and with 3/16 in. of soot, \$2.07 per ton.

From these figures it would seem that some effort to clean the soot from the fire surfaces of a boiler is almost essential. The Diamond Power Specialty Company of Detroit, Mich., has for several years been developing and manufacturing mechanical soot blowers of which its latest product, the model "G" unit for use on water tube boilers, is illustrated herewith. The Diamond mechanism for cleaning soot from the tubes is made up of a series of units, each of which consists of five different elements as follows: (1) A head through which the steam passes from the main soot blower supply line when the valve is opened and which forms the foundation element to which the others are attached; (2) A wall box which is bricked into the setting to support the unit and so constructed that the blower can be turned freely without admitting air to the furnace; (3) A blower element running cross-wise of the bank of tubes and consisting of a small header with nozzles placed to discharge steam vertically between the boiler tubes; (4) A sheave or hand wheel which is used to



HEAD OF SOOT-BLOWER UNIT, SHOWING GOOSE NECK AND HAND WHEEL

rotate the blower element; and (5) The bearings which support the blower elements and permit them to revolve freely.

Another feature is the use of steam nozzles designed like a Venturi tube, by means of which steam is discharged, it is claimed, at three times the velocity possible with a straight nozzle, with the same pressure and size of aperture. The use of a goose-neck of special design, and of air inlet valves which prevent furnace gases from being drawn into the blower piping when the steam is shut off and a partial vacuum created, are considered to be important features of the design of the blower.

This system of cleaning boiler tubes is claimed to effect a saving of from 4 to 8 per cent in fuel and an increase in boiler efficiency of from 4 to 8 per cent. Also, a considerable labor saving, an increase in the length of service of boiler flues through prevention of corrosion, and a saving in the steam used for cleaning, are claimed for the device.

#### RESULTS OF TESTS MADE ON OIL-BURNING BOILERS

Tests have been made by the superintendent of power, Pacific Gas & Electric Company, on the efficiency of the soot-blowing apparatus installed in the two 822-hp., oil-burning Sterling boilers at Station A. As shown in the following test results, the temperature of the gases in the stack was decreased 69.25 deg. Fahr. (13.05 per cent) and the temperature of the superheated steam in-



creased 3 deg. (0.6 per cent) by cleaning the tubes. Calling the efficiency of the boilers 70 per cent, this means a saving in fuel of 3.9 per cent due to dusting.

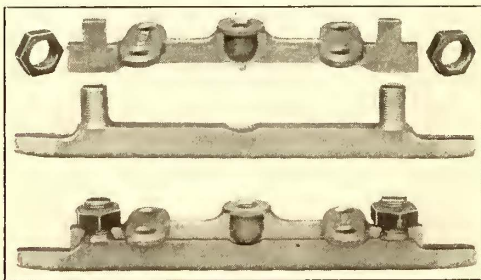
	Before Using Soot Blowers	After Operating Soot Blowers
Load meter .....	4.075	4.175
Per cent rating.....	101.88 per cent	104.38 per cent
Steam pressure.....	199.5 lb.	200.75 lb.
Superheated steam .....	499.5 deg. Fahr.	502.5 deg. Fahr.
Stack temperature.....	553 deg. Fahr.	483.75 deg. Fahr.

The soot that accumulated on the tubes of the oil-burning boiler was a sticky, gummy substance which clung with great tenacity to the tubes.

The Columbus Railway, Power & Light Company, Columbus, Ohio; the Toledo Railway & Light Company; the Sheboygan Railway & Light Company, Sheboygan, Wis.; the Detroit (Mich.) United Railway Company; the General Electric Company, and the Westinghouse Electric & Manufacturing Company, are companies in the electric railway field which have the Diamond soot blowers either in use or specified for plants now under construction.

## Strain Trolley Ear Which Requires No Soldering

A mechanical strain trolley ear which can be fastened to the wire without the use of a soldering torch for iron has been put on the market by the General Electric Company, Schenectady, N. Y. As shown by the accompanying illustration, the ear consists of two parts, a



TWO PARTS AND ASSEMBLY OF SOLDERLESS TROLLEY STRAIN EAR

runner shoe which holds the wire, and the body portion of the ear which bolts onto the runner and clamps the wire into it at the same time. The runner shoe is made of malleable iron or composition metal and is renewable, being easily replaced when worn out. By the use of this ear the detrimental effect which results from overheating an ear when soldering is avoided.

## Powdered Metals Used for Rust-Proofing

A new rust-proofing material and process called "Epicassit" has just been introduced by Hess & Son, Philadelphia, Pa. The material itself consists of a powdered metal, usually either tin, lead, zinc or their alloys. These are mixed with a suitable fluxing carrier to the consistency of a smooth, creamy paint which is evenly applied to the well-cleaned article. Heat is then used to melt the coat down.

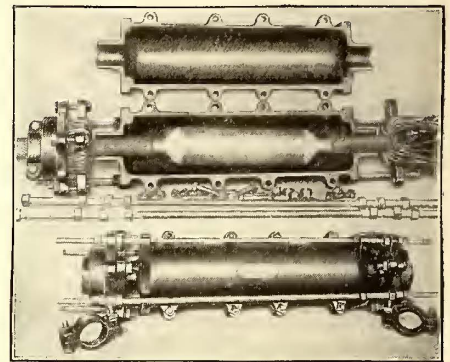
The cold paint may be applied with the brush just like ordinary paint, or the article may be dipped into it, drawn through it, or tumbled into it. Heat may be applied in any way which is most convenient. Cold painted articles may be placed on shelves or on racks in an oven, similar to an enameling oven. Small articles may be placed in heated tumblers that are stationary, until the

coating is melted down and are then tumbled to prevent sticking. Tanks, etc., that are built up of leaded or galvanized sheets and that are too large to be dipped are rust-proofed where exposed by applying the protective coating with a brush and melting it with a blow torch.

## Joint Box for Submarine Cables

A new and improved type of joint-box or housing for use on submarine cables has recently been developed by the Standard Underground Cable Company, Pittsburgh, Pa. It has been successfully used on submarine cables of the Wilmington & Philadelphia Traction Company and Pennagrove Light, Heat & Power Company for crossing the Delaware River at Wilmington, Del. It was also used in Canada on submarine cables of the Halifax Electric Tramway.

The joint box is so designed that all mechanical stresses resulting from the action of tides, currents, and the like, that usually tend to damage



BOX FOR PROTECTING SUBMARINE CABLE JOINTS

the cable at these points are taken off the joint proper by long take-up rods. These rods are parallel to the cable and thus transmit the stresses to the steel wire armor, to which the rods are rigidly connected by heavy iron clamps on each side of the joint. This construction is shown in the accompanying illustration.

As submarine cables even under normal conditions are subjected to severe mechanical stresses and have heretofore often failed first at the joints, this new device offers a solution for a serious problem in submarine cable laying.

## Air Drills Reduce Breakage in Tearing Up Brick Pavement

Two 25-lb. plug drills, supplied by a single-stage 15-hp. Sullivan air compressor, are being used by C. F. Crowley, commissioner of public works of Troy, N. Y., in tearing up brick pavements. The outfit also includes a hand brushing tool which cleans the brick after they are removed. Breakage is much less than by the old hand method and the cost of removing and cleaning the brick has been greatly reduced, amounting to \$5.96 as compared with \$24 per 1000 brick.

Old pavements can be torn up at the rate of 4 sq. ft. in fifteen minutes, one or more brick being pried up at a time as desired. With the new outfit, including oil, gasoline and the wages of four workmen, the cost of removing and cleaning an average of 2000 brick per eight-hour day is \$11.91, which is much less than formerly when the removal and cleaning of 1000 brick per day required ten men at a cost of \$24. Since the adoption of this method 767,000 brick have been cleaned with an estimated total saving to the city of \$13,810, or at least seven times the cost of the original equipment, which is still in good condition.

Employees of the Union Traction Company, Anderson, Ind., have formed a mutual protective association for the payment of sick and accident benefits.



# News of Electric Railways

Traffic and Transportation

Financial and Corporate

Personal Mention

Construction News

## Council Approves Cincinnati Lease

Electors of Cincinnati to Vote on April 17 on Ordinance for Leasing New Rapid Transit Loop to the Cincinnati Traction Company.  
Summary of Lease Provisions

The City Council of Cincinnati, Ohio, passed an ordinance at a special meeting on March 14, which provides for the lease of the proposed rapid transit loop to the Cincinnati Traction Company, which operates the Cincinnati Street Railway, and establishes new conditions for the company itself. There was only one dissenting vote. This ordinance will be submitted to a vote of the electors of Cincinnati on April 17.

The ordinance authorizes the Cincinnati Traction Company to operate the loop until April 21, 1946, and provides that the line shall follow substantially the course described in the *ELECTRIC RAILWAY JOURNAL* some months ago. The terms of the franchise thus granted for both the surface lines and the rapid transit loop may be revised at the end of fifteen years from April 22, 1916, and every fifteen years thereafter. The operation of the loop is to begin as soon after completion as power connections can be made and proper equipment installed. Provision is also made for the operation of a portion of the loop, when completed, if the Rapid Transit Commission believes this can be done to advantage.

### INTERURBANS TO USE LOOP

Provision is made for the use of the loop by interurban and other electric railways upon terms to be agreed upon between the companies. It is also specified that the roads which use the line shall interchange traffic. All contracts of this kind are to be subject to the approval of the commission. In case of disagreement as to terms, the matter is to be referred to the commission. Should the local company refuse to accept the terms made by the commission, the question is then to be referred to a court of competent jurisdiction. In the meantime, however, the interurban company may use the tracks subject to the provisions as ultimately fixed. The company may defend only on the charge that the terms are not considered proportionately equitable.

The loop is to be operated in connection with the existing surface lines and such extensions and changes as are made in the future. All improvements or extensions on surface lines must be made in compliance with the city ordinances and with the approval of the proper city authority.

The ordinance reserves to the city the right to control the service on both the surface and loop routes, including schedules, routes and routes of interurban cars, transfers and the various other items that go with such control. It may order changes in routes, the construction of extensions, etc., but care must be taken that such changes do not prevent the earnings from becoming too small to yield a return on the capital invested. An appeal may be taken from any order of the city or the commission to a competent court, but the only cause that can be alleged is that the conditions sought to be imposed may prevent a proper return on the investment.

### STREET RAILWAY COMMISSIONER PROVIDED FOR

A street railway commissioner is to be appointed by the Mayor, with the approval of the commission. The salaries and expenses of this office are to be borne by the city. The commissioner is to be the technical adviser of the city.

The company is to issue transfers on both the surface lines and the loop which will enable passengers to reach their destinations by the most direct route, or routes.

Transfers will be good for five minutes after reaching the transfer points and no transfer is to be issued that will enable a passenger to return to the vicinity of the point of starting. Rules governing transfers are to be posted in the cars.

Within the city limits the Cincinnati & Hamilton Traction Company's road, leased to the Ohio Traction Company, is to be operated as a portion of the regular city transportation system. This will give the people along the line the city fare and service. Receipts from this line are to be accounted a part of the gross receipts of the operating company, but nothing is to be done to prevent the operation of interurban service on the road.

### FIVE-CENT FARE PROVIDED

The rate of fare for adults is to be 5 cents, with free transfers. Children under ten years of age are to be carried for a cash fare of 3 cents, or two children traveling together for one fare of 5 cents, subject to transfers in both cases. Babies in arms are to be carried free. Inclined plane railway tickets are to be sold at the rate of ten for 25 cents.

There is to be an annual payment of \$416,000 as return on the capital invested. The city is to retain its percentage tax, which is to be \$325,000 a year after the present year. The 1917 tax is specifically divided into payments. For rental on the rapid transit loop the company is to pay an amount equal to the interest and sinking fund on the bonds required to build it. After the retirement of any of these bonds the proportionate amount shall be paid to the city. The company must also pay one-half of the rental on that portion of the Miami & Erie canal which is used for loop purposes.

In order to produce an amortization fund to aid the city in purchasing the property, the company is to pay to the city not less than \$120,600 a year, until the payments with accumulated interest equal \$5,000,000. This amount is to be paid to the company and the price to be paid by the city for the property is to be reduced accordingly. However, the payments allowed for return on investment are then to be reduced to \$116,000 annually thereafter. Should the city decide to purchase the property before the sum reaches this amount, the fund, whatever it may be, is to be used as a partial payment.

All payments provided for are to be cumulative, and if the receipts for any one year are not sufficient to take care of the payments, the balances are to be paid the next year, before any other payments are made. If there is a balance after making all the payments, it is to be divided, 55 per cent going to the city and 45 per cent to the Cincinnati Traction Company.

### CITY MAY ACQUIRE ALL PROPERTY FOR \$26,238,950

The city reserves the right to acquire all the property of the company at a fixed price of \$26,238,950, plus an amount necessary to discharge the reducible debt, if that has not already been done, or any refunding of the debt, plus such an amount as may be necessary to retire at the date of purchase the outstanding securities subsequently issued, minus the amount at the time of purchase in all reserve, depreciation and insurance funds accrued after Jan. 1, 1917, and in all sinking funds accrued after Jan. 1, 1917, for such securities as are now outstanding, and in all sinking funds for such securities as are issued hereafter, and minus \$5,000,000, if the aforesaid amortization fund has been paid, and minus a sum equal to the aggregate amount of payments made and judgments satisfied for injuries to or death of persons or damages to property after Jan. 1, 1917, in liquidation of injuries, death or damages occasioned prior to that date. The city will assume these obligations.



By the acceptance of this ordinance, the company agrees to sell the property to the city at the price named whenever the city sees fit to purchase it. The company is to furnish a bond of \$250,000 for the faithful performance of its duties under this ordinance.

The agreement is signed by the Board of Rapid Transit Commissioners, the Cincinnati Street Railway, the Cincinnati Traction Company and the Ohio Traction Company. The ordinance itself is signed by the proper city officials.

Public hearings will be held on the grant at once.

#### CITY TO ISSUE \$6,000,000 OF BONDS

In order to construct the loop line, the city must issue altogether about \$6,000,000 in bonds. It is the intention to acquaint the people with just what they are paying for in the issue of the bonds and endeavor to show them where the city will gain by providing an entrance for the inter-urban cars.

Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company, was present at the last conferences on the ordinance and stated that the completion of his road to Cincinnati depended upon the approval of the loop plan by the people of Cincinnati.

During the period in which data were being collected and preparations for drafting the ordinance were being made, thirty-three public meetings were held by the Council committee on street railways and fourteen public meetings were held by the conference committee, consisting of two members each from the Council committee and the Rapid Transit Commission.

## Washington Conditions Normal

### Washington Railway & Electric Company Fast Restoring Full Schedules and Building Up New Organization

There was little to indicate on March 22 that a strike was in progress on the lines of the Washington Railway & Electric Company, Washington, D. C. On that day the cars were well filled, the midday schedule exceeded normal and the rush schedules attained 80 per cent of the standard service. There were no policemen on the cars and only one bored officer was found standing in front of the P Street carhouse.

On the day in question Clarence P. King, president of the Washington Railway & Electric Company, was quoted to the effect that the real issue in dispute was not a question of wages but whether the company should be forced to enter into a contract with the Amalgamated against the wishes of its loyal employees. He reaffirmed the statement that trainmen formerly in the employ of the company and on strike were returning to work daily and taking their old positions on the cars. That this was so is borne out by the statement previously made in regard to the restoration of service to practically normal condition.

A statement made by the company on March 20 referred to the notice posted at all carhouses defining the status of conductors and motormen and referred to the terms of the individual contracts noted in the *ELECTRIC RAILWAY JOURNAL* of March 17. The signing of individual contracts was not made compulsory, but trainmen returning to work who failed to sign the contracts received the old wage scale. The company pointed out that the individual contract provided against strikes, but did not prevent any employee from resigning as an individual at any time if he desired. The company expressed the opinion that a public service corporation whose duty was to furnish uninterrupted and efficient service to the public should not be placed in a position where its employees may strike or quit work in a body without regard to public convenience. The management said that it was agreeably surprised at the large number of new applicants for work and expressed confidence that it could build up its permanent organization quickly. In concluding its statement the company said:

"The company feels that the strike is over for the reason that it is able to operate adequate service, and disorders and damage to its property have about ceased. The only thing now remaining to do is to build up a permanent organization, which is being done and will result in enabling

the company to maintain discipline and render a much more efficient service than it has under the intolerable conditions that have existed the past year."

The company, on March 22, placed advertisements in the Washington newspapers warning "all persons against committing or doing any act or thing that amounts to a boycott directed against the company." A statement was also issued by the legal department of the company in regard to the liability which attaches to any boycott.

## Municipal Plant May Be Abandoned

### Toledo Railways & Light Company Will Likely Supply Electric Service to Monroe

It is expected that within a short time the Toledo Railways & Light Company, Toledo, Ohio, will be supplying electric service to Monroe, Mich., under a thirty-year franchise. The city now has a municipal plant, but it was found that it would require large expenditures to enable it to care for the business, so a special committee of the Council was appointed by the Mayor to investigate the proposition as to whether it would be advisable to finance the municipal plant, or negotiate with the Toledo Railways & Light Company and the Detroit Edison Company for the supplying of electricity to the community. After going over the matter thoroughly, the committee has now unanimously recommended the sale of the municipal plant and the granting of a franchise to the Toledo Railways & Light Company. This recommendation must be ratified by a special vote of the people.

Monroe, the county seat of Monroe County, Mich., is situated a few miles away from Lake Erie, 25 miles north-east of Toledo, and 75 miles southwest of Detroit. It has a population of about 7500. The Toledo Railways & Light Company already has some consumers in Monroe which are supplied through a line connected to the city. At present the municipal plant has 1100 customers, including some large power consumers, and as the territory is virgin the Toledo Railways & Light Company anticipates a large future business.

## St. Louis Compromise Postponed

### Proposal of United Railways to City for Settlement of Differences Goes Over After Four Months of Consideration by the City

Action by the city of St. Louis, Mo., on the proposed compromise with the United Railways was deferred at a meeting of the public utilities committee of the Council on March 14 until the next session of the Board of Aldermen. The committee has had the compromise before it for about four months. One of the reasons given for delaying action until the new board meets is that Eugene B. Gregory, chairman of the committee, was beaten for renomination in the recent primaries, and that the present committee would be unable to complete a compromise plan in the few remaining weeks of this session.

A committee of directors of the United Railways proposed to the city last November that the city cease its attacks upon the company, reduce the mill tax, and allow payments of the tax now overdue to be made in installments. The company said it would acknowledge the legality of the mill tax, and cease resisting payment in the courts.

The compromise was turned over to the public utilities committee of the Council for recommendation, but the matter was considered at only one or two meetings. In December what purported to be a compromise plan tentatively agreed upon by the committee was published in the St. Louis papers, but since then virtually nothing has been done to push along negotiations. This plan was said to include provisions for the reduction of the outstanding securities of the company, a division of earnings between the company and city, representation by the city on the board of directors, and a probable subway.

The new public utilities committee of the Council will not be able to take up the compromise until late in April or early in May.



## Mr. Brush Before Committee

President of Boston Elevated Discusses Prospective Development Before Committee Considering Report of Commission Which Inquired Into Company

The prospective development of the Boston (Mass.) Elevated Railway system, treated purely as a problem in railroading, was discussed by Matthew C. Brush, president of the company on March 12 before the committee on metropolitan affairs of the Massachusetts Legislature. Mr. Brush said that due to the peculiar layout of the downtown district of Boston, the practice of endeavoring to run surface cars through the business districts from each and every outlying locality was manifestly impossible. Duplication of rapid transit and surface service for the same purpose was prohibitive from the standpoint of expense, and in addition was poor railroading. Efforts should be made to curtail surface car operation which duplicated rapid transit service, with eventual discontinuance of surface car service in certain narrow and crowded streets. The principle of a loop or distributing line to be touched by all radiating lines and covering as much of the business district as possible was sound, and must eventually be necessary for providing proper transportation facilities.

### SUBWAYS FOR TRAINS ONLY

Mr. Brush stated that the time had come when subways, to be handled to the utmost financial and traffic advantage, must be exclusively used by trains rather than by single car units. The proposed loop train service would enable the community to reap the full advantage of the East Cambridge Viaduct and would afford ample facilities for transfer between cross-town and north and south lines. At present 102 cars an hour were run through the Boylston Street subway in Boston, whereas with ten-car train service on a 1.5-minute headway, 400 cars per hour could be run. The Boylston Street subway would be exceedingly costly to extend downtown and it should not be constructed until the traffic demanded it.

An extension of the Dorchester tunnel to Upham's Corner was not justified at this time. It was planned to open the tunnel from the South Station to Andrew Square in the fall of 1917. The Boston Transit Commission should be asked to consider the possibility of using the Midland Division of the New York, New Haven & Hartford Railroad in connection with further rapid transit extension. Mr. Brush also pointed out the possible eventual extension of the Boylston Street subway into the wholesale district, with a tentative ultimate destination in the vicinity of Post Office Square. Mr. Brush urged third-track construction in reservations where feasible, for the use of rush-hour express trains. He recommended the installation of a third track between Kenmore station in the Back Bay and the junction of Commonwealth and Brighton Avenues, Allston, at an outlay of about \$100,000, the distance being about 7000 ft. Mr. Brush announced that it was the intention of the company to complete the Everett elevated extension as promptly as possible, thereby releasing a substantial number of surface cars and improving the service to that city and to Malden.

### CRUX OF THE BOSTON FARE PROBLEM

Mr. Brush did not believe that the criticism of hauling passengers from Arlington Heights to West Roxbury, 14, 16 or 18 miles was a serious problem, because the number of people who rode that distance was negligible. The man that the company hauled 300 days a year into Boston, 8.5 miles, and out again at night, was, however, a mighty serious matter, because the short-haul rider was really the man who paid the fare of the long-haul man. It was a financial impossibility to haul a man 8 miles for a nickel. It never could be done, and it was less likely to be done now than ever before.

The distance that passengers could ride was not ordinarily appreciated, and the gradual development of the outlying districts due to the construction of rapid transit thoroughfares had tended to increase the average ride. Mr. Brush submitted the following table showing the extent to which lines run out beyond the city to points beyond which pas-

sengers could not be carried for 5 cents without loss to the company:

Route	Miles
Post Office Square to Milton Lower Mills.....	6.08
Milk Street to Mattapan .....	6.82
Milk Street to Milton Lower Mills via Forest Hills.....	7.76
Milk Street to Dedham line.....	8.77
Milk Street to Charles River, Needham line.....	9.18
Park Street to Watertown via Brighton.....	7.11
Park Street to Arlington Heights.....	8.66
Summer Street to Middlesex Fells.....	7.89
Summer Street to Broadway, Malden.....	7.88

These are all regular rides, 300 days in the year.

Under the Milwaukee zone system, the fare from Mattapan to the city would be cash 9 cents, tickets 7.33 cents; Germantown, cash 15 cents, tickets 10.65 cents; Newton Corners, cash 9 cents, tickets 7.33 cents; Arlington Heights, cash 13 cents, tickets 9 cents; Middlesex Fells, cash 9 cents, tickets 7.33 cents, and other points in proportion. In conclusion, Mr. Brush reiterated his views regarding the transfer abuse in Boston, and pointed out that if the company received legislative authority to raise the money it would immediately contract for additional surface cars of the latest type to replace older equipment. He also discussed the recent rolling stock orders of the road, and briefly pointed out the great margin in the purchasing power of the passenger's nickel at Boston over other large cities of the United States.

## Doherty Men Meet

Men Connected with the Doherty Railway Properties Adopt Definite Recommendations

Certain definite recommendations for the operation of Doherty railway properties were adopted by the committee which convened in St. Joseph, Mo., on Feb. 8, 9 and 10. These recommendations are the outcome of suggestions put forth in papers read at the general gathering of Doherty railway men in Toledo during the last year. At that time a committee was appointed to review these recommendations with a view of their possible adoption for the railway properties. Track and paving problems were discussed and detailed recommendations drawn up. Advertising of railway facilities was reviewed as well as the advisability of starting a new-business department in conjunction with Doherty companies with a view of getting in closer touch with the riding public.

Financing of railway properties was another subject that received considerable thought and certain steps are being advised in this connection. A standard classification of all accidents on railways was presented and adopted by the committee.

Representatives of the Ohio Brass Company gave a practical and interesting demonstration before the gathering in the matter of bonding of rails.

Henry L. Doherty was present at the meeting on Feb. 10, and spoke on welfare work. Mr. Doherty approved of the methods used at St. Joseph in this regard, and stated he was in entire accord with any similar associations that might be organized in other properties.

At the close of the committee gathering it was suggested that a general railway meeting be held in Toledo just prior to the convention of the American Electric Railway Association at Atlantic City in October.

## References to Working Hours

The library of the Bureau of Railway Economics, Washington, D. C., has compiled, under date of Jan. 17, a list of references relating to the eight-hour working day and to limitations of working hours in the United States, with special reference to railway labor. This is supplementary to a similar publication of the Library of Congress in 1908. The new list does not include references to literature on the trainmen's wage controversy of 1916 or the Adamson act, except as such literature relates to the eight-hour movement in general. Under date of Jan. 26, however, there has been prepared by the same bureau a special list of books and articles which deal particularly with the provisions of the Adamson law.



## Sleet Damages Indiana Lines

### Recent Tornado Followed by Storm Which Wrecks Overhead Lines

Following the tornado on March 11, which caused great loss of life and property damage in the city of New Castle, Ind., a terrific sleet storm swept across the central part of the State on March 12 and 13, resulting in serious damage to the overhead lines of the Union Traction Company of Indiana. The storm carried down nearly 200 poles on the Northern Division, between Tipton and Kokomo, together with the high-tension lines and all overhead wires. Service on this line was interrupted until noon on March 16. Between Muncie and Hartford City about 150 poles were blown down, between Alexandria and Marion approximately 100 poles, and in the city of Marion all the pole lines were down on Washington Street from Thirteenth Street to Twenty-sixth Street, a distance of thirteen blocks. Lesser damage was done on other parts of the system. Service was restored on all lines except the Tipton-Kokomo section of the Northern Division on March 14. A large force of linemen was immediately put at work erecting the temporary lines, and the work of putting up the new permanent construction is now well under way. It is estimated that the property damage due to this sleet storm is between \$20,000 and \$25,000.

## Progress of Franchise Resettlement

The officers of the San Francisco-Oakland Terminal Railways, Oakland, Cal., have made formal application to the City Councils of Oakland and Berkeley for a resettlement of the various street railway franchises owned by this company in these cities under the terms of the plan outlined in the *ELECTRIC RAILWAY JOURNAL* for Nov. 18, 1916. A similar application will be made in the city of Alameda as soon as the new charter authorizing such application has become effective. These steps are being taken as promptly as possible after the ratification by the State Legislature of the re-franchise plan as approved in the three cities. The situation has been simplified by the fact that the State Railroad Commission has completed its valuation of all the property of the San Francisco-Oakland Terminal Railways. The city charter provides for the organization of a board of control on which the city and the franchise grantee shall both be represented, which board of control will supervise the adjustment from year to year of the basic valuation established in the franchise by adding thereto the costs of extensions, additions and betterments approved by the board and subtracting therefrom the book value of property sold or abandoned and depreciation as established by the board.

## Chicago Transit Considered

### Local Committee Hears Proposals for New Transportation Systems—Thirty-Twenty Year Grant Also Considered

The local transportation committee of the City Council of Chicago, Ill., on March 16 had a hearing for the formal presentation of the Jackson and Jarvis Hunt transportation plans. The latter of these was briefly described in this paper for March 10, 1917, and comprised principally the use of monorail cars in an elaborate subway and overhead system. At this meeting, Walter Fisher, counsel for the committee, asked Mr. Hunt to present to the committee comparative operating costs of the monorail and ordinary railway systems in Germany.

The Jackson plan, as presented, comprises an independent subway north and south on Halsted Street from Seventy-ninth Street on the south to Wilson Avenue on the north, with a loop running under Jackson Boulevard to State Street to Washington Boulevard and back to the main subway line on Halsted Street, to take care of the Loop transportation. This plan involved the building of a low-level subway which Mr. Jackson considered much more suitable to Chicago conditions. Such a subway he said, could be built for one-third less than the high-level subway proposed by the Chicago Traction & Subway Commission. The cost figure submitted by Mr. Jackson did not include any equipment in

the subway, or rolling stock, and upon questioning by Mr. Fisher, it was soon brought out that no provision had been considered for forcing the present transportation companies to occupy such a subway, and that if operated independently as planned, it would involve the paying of a 5-cent fare on this subway and another 5-cent fare when changing to any other transportation system. Neither the Jarvis Hunt nor the Jackson proposition was accompanied by a request for a franchise.

On March 17 the committee had a public hearing on the thirty-twenty year franchise bill. The time was consumed by W. J. Kerr, an attorney, who attacked the amortization feature of the bill, and by George Sikes, a municipal ownership advocate. The latter was opposed to this form of franchise or any other form other than those held by the companies at present, since the possibility of municipal ownership within ten years, which he expected, would be hampered by the granting of any new franchise rights.

The hearing on franchises was continued on March 20, but no great interest in the matter was manifested by the public.

## Capital Traction Agreement

The agreement of the Capital Traction Company, Washington, D. C., with the representatives of Division 689 of the Amalgamated Association of Street & Electric Railway Employees, under negotiation as noted in the *ELECTRIC RAILWAY JOURNAL* of March 17, was signed on March 20. It will run until March 20, 1920. The agreement provides for a minimum wage for motormen and conductors of 25 cents and a maximum of 30 cents. The present scale ranges from 23 cents to 27 cents. It formerly took ten years to reach the maximum. Under the new agreement the maximum can be attained after six years. The wage rate for motormen and conductors follows: First year of service, 25 cents an hour; second year, 25½ cents an hour; third year, 26 cents an hour; fourth year and fifth year, 27 cents an hour; sixth year, 28 cents an hour; seventh year and over, 30 cents an hour. The agreement with the company was ratified by the men at two meetings of the employees held on March 19.

The outstanding features of the agreement between the Capital Traction Company and its employees follow: No discrimination on either side. Grievances to be settled by conference with the District Commissioners acting as final arbitrators, both parties recognizing the interest of the public as a vital factor. Provisions as to the makeup of runs. Increases in wages from 1 to 3 cents, and attainment of maximum wage at the beginning of the seventh instead of the tenth year. The contract to run for three years, but wage adjustment may be made annually under definite provisions which do not reopen the contract as a whole. Men on the extra list to be paid half rate while on bench duty. Increases ranging from 15 to 25 cents a day for employees other than trainmen.

**Plan Outlined for Montreal Subway.**—Comptroller Ross explained to the Montreal (Que.) tramway commission recently a plan for the construction of subways in Montreal to serve Westmount, Verdun and the east and north ends of Montreal. The plan as outlined by Mr. Ross provides for about 12 to 15 miles of line.

**One Cent an Hour Advance in Philadelphia.**—The Philadelphia (Pa.) Rapid Transit Company made the following scale of wages effective on March 1: new men, 28 cents an hour; after first year, 29 cents an hour; after two years, 30 cents an hour; after three years, 31 cents an hour; after four years, 32 cents an hour; after five years, 33 cents an hour. This is an advance of 1 cent an hour in all grades.

**Electrification Bill Defeated.**—The committee on cities of the Minnesota House has recommended for indefinite postponement the bill for the electrification of the Northern Pacific Railway in St. Paul from Chestnut Street to the Minnesota transfer. Officials of the company and of other railroads contended that the cost of the work prescribed by the bill was wholly incommensurate with any advantage that would accrue to the city or the company through it being carried out at this time.

**Proposed Philadelphia Contract Discussed.**—Ellis Ames Ballard, counsel for the Philadelphia (Pa.) Rapid Transit Company, reviewed at a luncheon of the City Club on March



17 the program of transit development for Philadelphia which has received the approval at the polls of nearly three-fourths of the voters of the city, and discussed some of the objections that have been raised to the terms of the proposed contract under which his company would be willing to operate the lines when built.

**Constabulary Measure Passes New York Senate.**—The State police bill passed the Senate of New York on March 20 after prolonged debate. The vote was twenty-six to twenty-four. All the Democrats voted against the bill, and were joined by a number of Republicans. An amendment designed to subject the proposed bill to civil service regulations was lost by an adverse vote of twenty-seven to twenty-three. The bill, known as the Mills measure, will go into the Assembly, where it will be substituted for the Wells bill. It must, however, be referred to the ways and means committee first and then reported out.

**Report Presented on Work on Cleveland Subway.**—A report from the Cleveland (Ohio) Rapid Transit Railway was presented to the City Council on March 19. It explained the reason for the delay in expending \$500,000 on construction work, as required by the franchise to the company. The report declares that the company has spent much time and considerable money on the project, and is in position to proceed with the construction work when the labor situation clears up and prices of materials become stable. The report was referred to the street railway committee for consideration. Councilman Kedelcek had prepared a resolution declaring the franchise forfeited, but delayed presenting it on receipt of the report.

**I. T. S. Sues to Preserve Its Rights.**—A suit to nullify ordinance No. 188, passed by the City Council of Venice, Ill., recently, wherein the franchise rights granted to the Illinois Traction Company under ordinances 114 and 115 were withdrawn, has been filed by the company in the United States Circuit Court at Springfield. The company seeks to prevent carrying out of the threats of tearing up the tracks of the company in Venice, made by the city officials following the ordinance repeal. The contention arose over the cancellation by the company of the 5-cent fare between all points in the Tri-Cities and St. Louis, and the substitution of the 10-cent fare authorized by the Interstate Commerce Commission. The case will be heard at Springfield on March 16.

**More Strike Dynamiters Sentenced.**—James J. Merna and William Molsky, members of Local 731 of the Amalgamated Association of Street & Electric Railway Employees of America, were sentenced by Justice Tompkins on March 19 to terms of from six years and six months to thirteen years and two months for participating in the attempt to blow up the 110th Street subway station, New York, N. Y., during the street railway strike last fall. J. J. Herlihy, financial secretary of the local, recently drew a term of from ten to twenty years for the same offence. Later he turned State's evidence. George Pollock, treasurer of the local, was acquitted of complicity in the crime on March 16. Thomas McGuire, a fifth alleged conspirator, was placed on trial on March 19.

**Increase in Wages in Columbus, Ohio.**—The Columbus Railway, Power & Light Company will on March 30 increase the wages of its motormen and conductors, establish a minimum weekly wage of \$12, where extra men make all daily reports assigned them without a miss, and return about \$6,000 which the men have on deposit for badges. The new scale, based upon the period of service, shows increases as follows: First three months, from 21 to 22 cents an hour; next nine months, 23¼ to 24½ cents; second year, 25½ to 26 cents; third year, 26 to 27 cents; fourth year, 26½ to 27½ cents; fifth year, 27 to 28 cents; sixth year, 28 to 28½ cents; seventh year, 28 to 29 cents; eighth year, 28½ to 29½ cents; ninth year and thereafter, 29 to 30 cents. This is the second voluntary wage advance to be made within a year.

**Preparing to Pass Auto Traffic Bill.**—The Knight-Welsh traffic bill, which provides for the uniform regulation of vehicles and pedestrians in New York State, has been amended at the hands of the Assembly committee on inter-

nal affairs, and was expected to be placed on the calendar in the lower house for final consideration during the week ended March 24. The measure has the indorsement of the cities of the State, the New York State Automobile Association, the New York State Motor Federation, more than 125 local automobile associations in cities and villages, the City Club of New York, the Citizen's Union of New York, the National Highways Protective Association, and the special committee appointed by the Public Service Commission of the Second District, to represent the electric railway managers and the automobile interests of the State.

**Mobile Bonus Payment Restored.**—The Mobile Light & Railroad Company, Mobile, Ala., has recently paid a bonus to its employees. The company formerly paid a similar bonus, but the business depression brought about by the war made it necessary for the company to retrench and it abandoned the bonus plan. As business has picked up the bonus has been restored. The company pays all of its motormen and conductors a bonus of 1 cent an hour for each hour they work, the bonus being distributed on the first days of January and July of each year, for the previous six months, and is paid to all motormen and conductors in service and those who have received an honorable discharge. If an employee has resigned at any time during the six months' period and his record is good and he has not resigned to avoid being reprimanded he secures the bonus the same as those still in the employ of the company at the dates mentioned.

**Suit Threatened in Franchise Obligation Case.**—An ordinance was introduced in the Council of Seattle, Wash., recently, providing for suit to be brought by the city of Seattle against the Puget Sound Traction, Light & Power Company, to compel payment of the 2 per cent tax on the company's gross receipts during 1916. When the company tendered its check for \$64,387 to the city in January in payment of this tax, it did so under protest, and with the condition that the city should abandon legal proceedings to compel the company to pave its tracks with the same material used by the city on the rest of the street. The city declined to accept the check under the conditions attached, and it was returned to the company. The company contends that the obligation to pave its right-of-way is a provision of the franchise which it is seeking to have canceled by the Public Service Commission, and it refuses to fulfill the obligation until the hearing on its petition to the commission for relief from this requirement has been passed upon by that body.

**Downtown Operation of Municipal Cars Proposed.**—At a recent meeting of the City Council a plan to operate Lake Burien cars (Division C of the municipal line) over the tracks of the Puget Sound Traction, Light & Power Company, around the Columbia Street loop, was discussed and taken under advisement. Councilman R. H. Thomson questioned the advisability of increasing the monthly loss on the Lake Burien line. The plan proposed would not eliminate the double fare. The city would collect an additional fare between Riverside and the uptown terminus. The city cars would be operated on the lines of the Puget Sound Traction, Light & Power Company by the employees of that company. The advantage would be that the municipal cars from the Lake Burien line would be operated into the downtown district and no change of cars would be necessary for passengers to and from the end of the Lake Burien line. It has been estimated that under the plan proposed the cost of operation of the municipal line (Division C) would be increased from \$14,464 a year to \$17,680 a year, and to this would be added \$2,200 additional expense for the construction of needed trackage at the Riverside end of the line.

## Program of Association Meeting

### American Society of Mechanical Engineers

The spring meeting of the American Society of Mechanical Engineers will be held at Cincinnati, Ohio, May 21-24. The meeting will open on May 21 instead of May 22, as previously announced. A feature of the spring meeting will be a joint session on May 22, with the National Machine Tool Builders' Association.



# Financial and Corporate

## Annual Reports

### United Railways of St. Louis

The comparative income statement of the United Railways, St. Louis, St. Louis, Mo., for the twelve months ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Revenue from transportation..	\$12,548,859	99.3	\$11,589,488	99.2
Revenue from other railway operations .....	92,434	0.7	91,712	0.8
Gross operating revenue....	\$12,641,293	100.0	\$11,681,200	100.0
Current operating expenses...	\$6,953,124	55.0	\$6,837,982	58.5
Depreciation .....	1,516,955	12.0	1,337,309	11.5
Taxes .....	821,684	5.5	739,539	6.3
Total .....	\$9,291,763	73.5	\$8,914,830	76.3
Income from operation.....	\$3,349,530	26.5	\$2,766,370	23.7
Non-operating income .....	82,588	0.6	98,484	0.8
Gross income .....	\$3,432,118	27.1	\$2,864,854	24.5
Interest and miscellaneous charges .....	2,544,613	20.1	2,599,327	22.2
Net income .....	\$887,505	7.0	\$265,527	2.3

During 1916 the company carried more passengers than during any previous year in its history. The receipts, however, were slightly less than during 1913. If it had not been for the increased use of transfers, 1916 would have been the banner year in receipts as well as passengers. Owing to the smaller increase in expenses, etc., the net income showed a big gain.

The passenger revenue for 1916 was \$12,518,817, an increase over 1915 of \$1,002,951, or 8.71 per cent. Other transportation revenue decreased \$43,580 on account of the cancellation on Nov. 1, 1915, of the contract with the United States Government for carrying mail. Revenue from other railway operations increased \$722, and income from other sources decreased \$15,895. Gross earnings and other income amounted to \$12,723,882, an increase of \$944,197, or 8.02 per cent over 1915.

Operating expenses (including depreciation) increased \$294,788, or 3.61 per cent, and taxes increased \$82,144, or 11.1 per cent. Interest charges decreased \$54,712, or 2.10 per cent, owing to the retirement of \$500,000 of Southern Railway 6 per cent bonds, \$1,000,000 of St. Louis & Meramec River Railroad 6 per cent bonds, and \$200,000 of Southern Electric Railroad 5 per cent bonds, and the purchase of various underlying bonds. Net income increased from \$265,527 to a sum more than two and one-third times as much.

The amount of money paid out in wages was \$4,270,187, or 33.78 per cent of the gross earnings. The average number of employees in the service of the company during the year was 5385. The total number of passengers carried during the last two years was as follows:

	1916	1915
Revenue passengers—5 cents.....	247,706,094	227,863,250
Revenue passengers—2½ cents.....	5,340,492	4,908,140
Total revenue passengers.....	253,046,586	232,771,390
Transfer passengers .....	136,965,566	124,043,205
Total passengers .....	389,112,152	356,814,595

The percentage of revenue passengers using transfers during 1916 was 53.77, and during 1915, 53.29, an increase of 0.48 per cent. The average fare per passenger was 3.22 cents in 1916, as compared to 3.23 cents in 1915. The passenger-car mileage in the two years was 43,568,964 and 41,986,215, and the total car-mileage 43,649,328 and 42,205,802 respectively.

During 1916 there was expended and charged to capital account for added property \$283,420, as follows: Real estate, buildings, tools and fixtures, \$116,951; track and roadway construction, \$83,317; electric line construction, \$30,612; power plant—buildings and equipment, \$24,478; cars and electric equipment of cars, \$29,416; and sale of material

previously charged to capital account, \$1,355. The total mileage on Dec. 31, 1916, was 458.73 miles, 2.99 miles of track having been added and 1.80 removed during the year.

In discussing future power requirements, the annual report of the company states that during 1916 the peak of the load was about 55,000 kw. A conservative estimate of the power required for 1917 is 6 per cent in excess of this peak, or a maximum of 58,500 kw. It is now necessary, it is said, for the company to consider seriously plans for its future power requirements. The large investment required for a new power plant, the problem of finance, the present high prices of labor and material, and the long deliveries demanded by manufacturers, point to the purchase of power as more desirable, if satisfactory arrangements for such purchase may be made.

### Grosse Berliner Strassenbahn

The receipts of the Grosse Berliner Strassenbahn, Berlin, Germany, together with the street railway lines under its control, in December, 1916, amounted to \$1,330,725, in comparison with an income of \$1,127,405 in 1915. For the entire year 1916 the income of these lines was \$14,127,775, as compared to \$12,424,545 in 1915, an increase of \$1,703,230. The average daily income was \$38,700 in 1916, as compared to \$34,000 in 1915. The Grosse Berliner Strassenbahn alone took in, in 1916, \$11,371,910, as compared to \$10,008,700 in 1915, \$9,732,735 in 1914, and \$10,586,970 in 1913.

On the underground and elevated railway the income in 1916 was greater than in any previous year, the returns in late years having been: 1913, \$2,230,000; 1914, \$2,404,850; 1915, \$2,150,615; 1916, \$2,464,930. On the other hand, the Berlin General Omnibus Company presented an unfavorable report, with an income of \$1,130,005 in 1916 as compared to \$1,485,315 in 1915. The monthly returns of this company show that the introduction on Oct. 1, 1916, of the new minimum fare of 7½ pfennigs (1.79 cents), replacing the previous one of 5 pfennigs (1.19 cents), did not succeed in retarding the decline in receipts that marked the earlier months of the year.

## Tax Reductions Asked

### Massachusetts Street Railways Present Their Case Before the Joint Legislative Committee on Taxation

Reductions in taxation were advocated by representatives of Massachusetts street railways at Boston, on March 8, before the joint legislative committee on taxation. Five bills were under consideration relative to the abolition of the commutation tax, under which operating companies pay certain highway maintenance costs in proportion to their mileage and gross earnings in municipalities, and to the relinquishment of payments for construction, alteration and maintenance of highways occupied in part by street railway tracks.

James F. Jackson, for the Bay State Street Railway, said that the relief desired was essential to practically all the street railways of the State, but that in the Bay State case the failure of the 6-cent-fare unit, authorized on the suburban and rural lines, to meet expectations made the repeal of this class of taxation laws particularly important. Since 1914 wages had been increased twice on the Bay State system. The arbitration award of 1915 increased the cost of labor \$428,000 in two years, compared with 1914. The recent wage agreement meant a further increase of \$205,000 for 1917, \$379,000 for 1918, \$441,000 for 1919, and \$492,000 for 1920. Taking as a basis the \$39,104,340 Bay State Company investment established by the Public Service Commission in the rate case, the receipts and expenses for 1915 showed that the company needed \$836,695, and in 1916 \$965,937 to pay a 6 per cent dividend. Had traffic grown as expected in the earlier years, the Bay State revenue would have increased 5 per cent annually, and the company would have earned \$3,000,000 more in 1915 than was the case. Last year more than 100,000 private automobiles were registered in Massachusetts. The annual loss to the company on this account approached \$1,000,000. It was esti-



mated that jitneys were causing the company a loss of \$200,000 in annual revenue. Mr. Jackson contended that the existing laws amounted to double taxation.

Bentley W. Warren, for the Massachusetts Street Railway Association, said that the operating expenses of the Massachusetts companies, exclusive of the Boston Elevated Railway, increased by \$4,242,000 from 1911 to 1916. The operating ratio increased from 65.86 per cent to 75.77 per cent, the net increased cost being \$1,100,982. In 1916 the dividends paid were 2.4 per cent, compared with 4.3 per cent in 1911, and the surplus was \$160,000, compared with \$600,000 six years before. Maintenance of way and structures increased \$768,000; depreciation in equipment (I. C. C. requirement, 1913) was \$312,000 more; wages of conductors and motormen increased \$719,000, on the basis of the 1911 wages, and other transportation expenses increased \$316,000. The car mileage increased from 69,000,000 to 76,316,000. Platform labor per car-mile increased from 5.47 to 6.75 cents, or 23.4 per cent.

According to Mr. Jackson, the commutation tax was levied in 1898, and it was intended to take the place as a payment for the work which under previous acts the companies were required to perform in the street. The tax had not resulted in relieving the companies from the burdens of inter-track paving, and many companies were performing maintenance work in the original locations besides paying the tax for the municipalities to do the work also. The commutation tax was \$478,708 in 1916, the other taxes paid by the companies amounting to \$865,368.

Mr. Warren urged that the commutation tax should be removed. It was claimed by some street superintendents that the laying of a rail broke the crown of a street and hence increased the wear and tear somewhat. A reasonable allowance might be made for this, but in general the taxation complained against should be eliminated. Since 1899 the commutation tax had increased from \$100.84 to \$198 per mile of track, or from 0.37 cents to 0.63 cents per car-mile. General taxes increased from \$1,219,853 in 1911 to \$1,344,076 in 1916, an addition of \$124,233, while dividends decreased from \$2,253,667 to \$1,424,262, or a drop of \$819,000, taking all companies in the State except the Boston Elevated Railway. Even if the Public Service Commission relieved the companies to such an amount as the board found represented the cost of taking care of that part of the street occupied by the tracks, the burden would be excessive, in the companies' opinion. The hearing was continued.

## City-Long Island Operating Contract

The Public Service Commission for the First District of New York has received and filed a report from its committee delegated to conduct negotiations with the Long Island Railroad relative to the proposal to lease the tracks of the Whitestone and Little Neck branches of the railroad as extensions of the Corona Rapid Transit line. It is stated that the railroad and the committee have reached a tentative understanding covering several points at issue. This understanding includes a proposed lease with a fixed term of ten years, to continue until terminated by either party upon notice. The city will, under the plan proposed, pay a basic rental of \$125,000 the first year, the rental in subsequent years to be increased 6 per cent a year over preceding years, to and including the tenth year, which shall be the maximum amount. Only such proportion of the basic rental as may be earned by the city rapid transit activities shall be paid each year, but such amounts as may not be earned shall subsequently be paid, accumulation of any deficit, however, to be limited to the first five years.

The committee also states that if it is successful in coming to terms with the Long Island Railroad and the Interborough Rapid Transit Company and the New York Municipal Railway Corporation, which will operate the line, there must be a definite provision for charging an additional fare sufficient not only to make the line self-sustaining with a 10-cent fare, but also with a reduced fare. The committee will continue negotiations which will involve the preparation of a form of agreement with the railroad and with the Interborough and with the New York Municipal Corporation.

## \$16,000,000 Additional Needed

For Completion of New York Elevated Work Estimated in 1913 to Cost \$26,000,000

Reasons were presented to the Public Service Commission for the First District of New York on March 9 showing why the Interborough Rapid Transit Company needed an additional \$16,436,090 to complete the third-tracking of the elevated lines, for extending the elevated lines, for equipment, and for bettering and enlarging the power plants in Manhattan and the Bronx. Original estimates for this work, prepared in January, 1913, fixed the cost at \$26,953,702. That this estimate was inadequate was proved on Oct. 31, 1916, when a total of \$24,298,832 had been spent.

Estimates prepared then showed that an additional \$18,022,703 would be required to finish the work. According to statements made to the commission by E. F. J. Gaynor, auditor of the Interborough Company, and other officials of the company, the total cost, as indicated on Jan. 1, 1917, would amount to \$42,321,535, which meant that the total cost of the dual system of rapid transit would be about \$377,000,000. Mr. Gaynor pointed out that the increased cost of the improvements to the elevated lines would not fall on the city, because the company owned the lines. The additional millions needed will have to be raised by the company by an additional issue of the 5 per cent bonds under its first and re-funding mortgage of \$300,000,000, and before this can be done the consent of the commission will have to be obtained.

Mr. Gaynor said power plant improvements, which it was estimated in 1913 would cost \$3,000,000, were now estimated at \$5,390,927. He said the increase in plant was necessary in order to provide a reserve supply of power sufficient for any contingency. Mr. Gaynor said:

"The estimates of 1913 set the probable cost of the elevated railroad extensions with the stations at \$2,455,441 while the revised estimates indicate that the cost will be \$3,666,292. Additional rolling stock represents an increase over the 1913 estimates of \$530,884, while the sectionalizing of the third rail represents an expenditure of \$486,000. More than \$440,000 is represented by interest and tax payments and estimates payments not originally contemplated."

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—The Arkansas Valley Railway, Light & Power Company has purchased the electric light plants at Ordway and Sugar City, which plants have for the last three years been supplied electric current at wholesale by the Arkansas Valley Company. A new district of the company will be formed, to include Olney Springs, Crowley, Ordway and Sugar City, with headquarters at Ordway.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—It is reported that the Buffalo & Lake Erie Traction Company proposes to apply to the court for permission to issue \$400,000 of receivers certificates to meet the cost of expenditures which the company proposes to make for improvements in Erie and vicinity.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—The Chicago, North Shore & Milwaukee Railroad has obtained permission from the Illinois Public Utilities Commission to issue \$400,000 of promissory notes.

Duluth-Superior Traction Company, Duluth, Minn.—The Bankers' Trust & Savings Bank, Minneapolis, Minn., is offering at 95¼ and interest to net 5½ per cent a block of the general mortgage 5 per cent sinking fund gold bonds of 1910 of the Duluth Street Railway guaranteed principal and interest by the Duluth-Superior Traction Company, which owns the entire capital stock of the Duluth Street Railway. The bonds are issued to reimburse the treasury for expenditures made in extending the street railway to the new plant of the United States Steel Corporation. The Duluth Street Railway has authorized and outstanding \$2,500,000 of first mortgage 5 per cent bonds and \$910,000 of general mortgage 5 per cent bonds out of a total of \$2,500,000 authorized.

Empire United Railways, Inc., Syracuse, N. Y.—Through the Bankers' Trust Company, the one-year notes of Empire United Railways, Inc., of Feb. 16, 1915, have been called for payment thereon of the pro-rata amount of the net



proceeds of funds remitted to the trustee by the guarantors since Dec. 12, 1916, amounting to \$60.30 per \$1,000 note.

**Georgia Railway & Electric Company, Atlanta, Ga.**—The Georgia Railway & Electric Company has applied to the Georgia Railroad Commission for approval of an issue of \$54,000 of refunding and improvement, forty-year 5 per cent sinking-fund bonds to reimburse the treasury of the company for expenditures made by the company for additions and improvements to its properties during 1916. The commission will hear the application on April 10.

**Long Island Railroad, New York, N. Y.**—Justice Lehman, of the Supreme Court, decided on March 20 against a receivership for the Long Island Railroad in a suit of Evans R. Dick, of Dick Bros. Company, and other minority stockholders. Dick and the others entered suit against the Pennsylvania Railroad as majority stockholders, and the Long Island Railroad, and asked that a receiver be appointed for the latter company.

**Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.**—R. P. Stevens, president of the Mahoning & Shenango Railway & Light Company, is quoted as follows in regard to the reported purchase of the Youngstown & Suburban Railway: "The report is without the slightest foundation. There are no negotiations on and none are contemplated for a purchase of the Youngstown & Suburban Railway or for a merger."

**Richmond Light & Railroad Company, Richmond, S. I., N. Y.**—The Public Service Commission for the First District of New York concluded on March 12 the hearings on the application of the Richmond Light & Railroad Company and the Staten Island Midland Railway for permission to consolidate as the Staten Island Light & Traction Company under the terms reviewed in the ELECTRIC RAILWAY JOURNAL for March 3, page 407. The commission has reserved decision.

**Southern Public Utilities Company, Charlotte, N. C.**—E. H. Rollins & Sons, Boston, Mass., are offering at 96 and interest an additional block of first and refunding mortgage 5 per cent bonds of the Southern Public Utilities Company of 1913, due July 1, 1943, making \$3,953,000 of bonds outstanding.

**United Light & Railways Company, Grand Rapids, Mich.**—At the annual meeting of United Light & Railways Company, L. P. Hammond, formerly operating manager of Colorado Power Company, and now with William P. Bonbright & Company, New York, N. Y., and Charles H. McNider, a banker of Mason City, Iowa, were elected to the board to fill vacancies.

## Dividends Declared

**Asheville Power & Light Company, Asheville, N. C.**, quarterly, 1¼ per cent, preferred.

**Carolina Power & Light Company, Raleigh, N. C.**, quarterly, 1¼ per cent, preferred.

**Columbus Railway, Power & Light Company, Columbus, Ohio**, quarterly, 1½ per cent, preferred A.

**Illinois Traction Company, Champaign, Ill.**, quarterly, 1½ per cent, preferred.

**International Traction Company, Buffalo, N. Y.**, quarterly, 1¼ per cent, 7 per cent first preferred; quarterly, 1 per cent, 4 per cent preferred; quarterly, 1 per cent, common.

**Ottawa (Ont.) Traction Company, Ltd.**, quarterly, 1 per cent.

**Ridge Avenue Passenger Railway, Philadelphia, Pa.**, quarterly, \$3.

**United Gas & Electric Corporation, New York, N. Y.**, quarterly, 1¼ per cent, first preferred.

**Utah Power & Light Company, Salt Lake City, Utah**, quarterly, 1¼ per cent, preferred.

**Washington, Baltimore & Annapolis Electric Railroad, Washington, D. C.**, quarterly, 75 cents, preferred.

**West India Electric Company, Ltd., Kingston, Jamaica**, quarterly, 1¼ per cent.

## Electric Railway Monthly Earnings

BATON ROUGE (LA.) ELECTRIC COMPANY					
Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan., '17	\$20,445	*\$9,977	\$10,468	\$3,565	\$6,903
1 " " '16	17,827	*9,202	8,625	3,497	5,128
12 " " '17	214,312	*101,634	112,678	42,070	70,608
12 " " '16	193,045	*107,209	85,836	28,263	57,573
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.					
1m., Jan., '17	\$9,015	*\$10,246	†\$1,231	\$1,134	†\$2,365
1 " " '16	8,076	*7,546	530	1,104	†574
12 " " '17	123,554	*111,816	11,738	13,313	†1,575
12 " " '16	115,821	*96,500	19,321	13,452	5,869
CAPE BRETON ELECTRIC COMPANY, SYDNEY, N. S., CANADA					
1m., Jan., '17	\$38,581	*\$23,209	\$15,372	\$6,552	\$8,820
1 " " '16	34,120	*19,190	14,930	6,556	8,374
12 " " '17	398,127	*235,285	162,843	78,324	84,519
12 " " '16	362,280	*207,835	154,445	79,007	75,438
COLUMBUS (GA.) ELECTRIC COMPANY					
1m., Jan., '17	\$89,607	*\$33,181	\$56,426	\$28,520	\$27,906
1 " " '16	71,947	*30,745	41,202	28,683	12,514
12 " " '17	899,013	*353,668	545,345	343,407	201,938
12 " " '16	732,396	*325,913	406,483	344,440	62,043
DALLAS (TEX.) ELECTRIC COMPANY					
1m., Jan., '17	\$200,256	*\$115,783	\$84,473	\$40,908	\$43,565
1 " " '16	173,132	*101,619	71,513	36,813	\$36,700
12 " " '17	2,017,545	*1,221,777	795,768	455,982	†355,929
12 " " '16	1,822,267	*1,116,775	705,492	407,957	†300,735
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.					
1m., Jan., '17	\$79,352	*\$40,178	\$39,174	\$9,627	\$29,547
1 " " '16	66,094	*35,138	30,956	8,712	22,244
12 " " '17	839,571	*449,462	390,109	108,613	281,496
12 " " '16	735,658	*391,299	344,359	105,504	238,855
EL PASO (TEX.) ELECTRIC COMPANY					
1m., Jan., '17	\$116,343	*\$65,144	\$51,199	\$5,245	\$45,954
1 " " '16	105,282	*48,568	56,714	4,672	52,042
12 " " '17	1,121,778	*675,140	446,638	59,700	386,938
12 " " '16	994,769	*525,632	469,137	50,855	418,282
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.					
1m., Jan., '17	\$163,075	*\$113,216	\$49,859	\$36,910	\$12,949
1 " " '16	156,438	*106,102	50,336	36,590	13,746
12 " " '17	1,951,476	*1,243,222	708,254	439,312	268,942
12 " " '16	1,930,668	*1,210,549	720,119	433,690	286,429
HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.					
1m., Jan., '17	\$28,753	*\$18,683	\$10,070	\$5,225	\$4,845
1 " " '16	24,835	*17,041	7,794	5,522	2,272
12 " " '17	330,315	*188,101	142,214	63,618	78,596
12 " " '16	281,480	*158,552	122,928	66,434	56,494
JACKSONVILLE (FLA.) TRACTION COMPANY.					
1m., Jan., '17	\$59,161	*\$38,325	\$20,836	\$15,547	\$5,289
1 " " '16	53,047	*36,356	16,691	14,735	1,956
12 " " '17	633,307	*425,675	207,632	184,720	22,912
12 " " '16	609,855	*427,693	182,162	179,184	2,978
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO					
1m., Jan., '17	\$131,588	*\$95,926	\$35,662	\$36,457	†\$795
1 " " '16	113,369	*76,820	36,549	36,109	440
LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.					
1m., Jan., '17	\$198,165	*\$143,158	\$55,007	\$50,885	†\$15,638
1 " " '16	177,727	*118,064	59,663	51,895	†18,160
12 " " '17	2,558,565	*1,627,376	931,189	626,881	†452,434
12 " " '16	2,165,345	*1,275,693	889,652	654,495	†373,286
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO					
1m., Jan., '17	\$490,380	*\$282,843	\$207,537	\$84,008	\$123,529
1 " " '16	367,141	176,752	190,389	88,433	101,956
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.					
1m., Jan., '17	\$171,099	*\$105,215	\$65,884	\$29,232	\$36,652
1 " " '16	150,628	*94,614	56,014	29,086	26,928
12 " " '17	1,950,792	*1,167,680	783,112	347,075	436,037
12 " " '16	1,719,169	*1,057,053	662,116	332,638	329,478
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1m., Jan., '17	\$28,787	*\$21,394	\$7,393	\$7,309	\$84
1 " " '16	27,453	*16,615	10,838	7,473	3,365
12 " " '17	312,297	*218,381	93,916	86,510	7,406
12 " " '16	290,535	*178,916	111,619	90,946	20,673
SAVANNAH (GA.) ELECTRIC COMPANY					
1m., Jan., '17	\$75,053	*\$50,908	\$24,145	\$24,078	\$67
1 " " '16	66,135	*43,927	22,208	23,316	†1,108
12 " " '17	835,011	*560,676	274,335	233,517	†9,182
12 " " '16	789,758	*515,671	274,087	278,399	†4,312
TAMPA (FLA.) ELECTRIC COMPANY					
1m., Jan., '17	\$92,314	*\$47,579	\$44,735	\$4,255	\$40,480
1 " " '16	86,705	*43,840	42,865	4,298	38,567
12 " " '17	972,695	*531,457	441,238	52,372	388,866
12 " " '16	982,394	*505,770	476,624	52,216	424,408

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



## Traffic and Transportation

### Prepayment Areas Recommended

#### Public Service Commissioner Eastman Favors Right of Boston Elevated to Establish Means to Prevent Transfer Abuses

At a hearing March 9 in Boston by the legislative committee on metropolitan affairs relative to the finances of the Boston (Mass.) Elevated Railway, Joseph B. Eastman of the Massachusetts Public Service Commission discussed the benefits of prepayment areas in relation to transfer abuses and advocated granting the company the right of eminent domain to establish additional areas of this character under the supervision of the commission. Mr. Eastman called attention to the fact that over 200,000 paper transfers are at present issued daily by the Boston company. He pointed out that in crowded conditions of traffic it is practically impossible for the conductor to issue transfers properly or to make any adequate inspection of those which he takes in. The company cannot audit these transfers without prohibitive expense. The opportunities for abuse, Mr. Eastman said, are apparent.

#### FARE BOXES SAVE 5 PER CENT ON FARES

The speaker stated that it is estimated that the use of prepayment fare boxes saves the company probably 5 per cent on its fares. If only 5 per cent of the transfers is lost to the company, the loss is nevertheless over \$200,000 annually. In addition to the reduction of losses due to the use of prepayment areas, the convenience of being able to transfer under shelter and free from the dangers of street traffic was emphasized by the commissioner. The special commission reporting upon the Boston Elevated situation strongly recommends that the company establish a prepayment station at the Maverick Square entrance of the East Boston tunnel, not because there is any particular abuse of paper transfers at that point or for convenience, but because of converging surface lines whose cars enter the tunnel at this place. Mr. Eastman pointed out that if the company can bring into the transfer or prepayment area two or three cars, open all doors and unload and load rapidly without obliging the conductors to collect fares from all entering passengers, the traffic can be handled much more expeditiously than is possible at present. This in turn would increase the traffic capacity of the tunnel proper. The right of eminent domain, however, should only be accorded under commission supervision. That the 6-cent fare must come as the ultimate remedy for increasing cost of service in all its aspects, Mr. Eastman was not ready to admit, but he emphatically set forth the fact that the public must meet the cost of whatever service it requires, whether under private or public ownership. Later he underwent an unusually searching cross-examination at the hands of the committee, during which he urged on behalf of the public welfare that the state ought to do its part in reducing the burdens under which the Boston Elevated is struggling.

### Harrisburg Jitney Case Continued

By agreement of counsel for both sides, the Public Service Commission of Pennsylvania on March 14 continued the hearing of the Harrisburg jitney case for three weeks. The case was opened at 9.30 a. m., but was adjourned at 10 o'clock for a special conference between the attorneys representing the jitney men and the Harrisburg Railways. The attorneys after one hour's deliberation announced that an agreement had been reached, on the ground that all jitney men make application for a certificate of public convenience, without admitting that they are common carriers, or come under the jurisdiction of the Public Service Commission. At the next hearing testimony will be heard on complaint made by the Harrisburg Railways as to whether or not the jitney is a common carrier.

### Getting Publicity Through Complaints

"Getting Publicity" is the title of an article by Edward R. Kelsey, advertising manager of the Toledo Railways & Light Company, Toledo, Ohio, which has appeared in the March issue of *Doherty News*. The message of the article is to show that common sense, coupled with ordinary consideration, will place any corporation in friendly touch with the public.

Speaking of complaints as a fruitful source of securing much good publicity, Mr. Kelsey says:

"The moment you commence to advertise for complaints, just that minute will your complaints commence to diminish greatly.

"Answer all complaints that show by their form they were made in good faith. People believe what they see printed over and over again, and public utility companies which continually refuse to answer such complaints and leave the field of publicity to agitators and chronic faultfinders are but sowing the wind from which later they will surely reap the whirlwind.

"Some corporation lawyers may tell you that it isn't dignified for the company to take notice of such complaints. Probably more constructive things have been left undone by public utility companies on the plea that it isn't dignified than from any other cause."

### "Owl" Fare Case Decided

#### Superior Court of Pennsylvania Decides Pittsburgh "Owl" Fare Case in Favor of the Public Service Commission—Company Will Appeal

The Superior Court of Pennsylvania, in a recent decision, upheld the Public Service Commission in its decision that the Pittsburgh (Pa.) Railways could not increase its fares at night on the ground that it had not given the public proper notice of the proposed change. No opinion was expressed either by the commission or the court in regard to the authorization of an increase in rates.

On the night of June 22, 1916, the Pittsburgh Railways doubled its "owl" or night fares. Complaints against the proposed increase were filed immediately with the Public Service Commission by William Jacoby and the city of Pittsburgh on the ground that the increase was unjustifiable and that the public had not been duly notified. The commission made an order requiring the company to issue certificates of rebate redeemable if the commission decided against the company's action. On Sept. 28 the commission decided that the company had not complied with the Public Service Company Law, which states that no change in rates of fares shall become effective except after the commission and the public have been given thirty days' notice. The case was argued before the Superior Court in November, and in the decision just handed down the ruling of the commission is upheld. An appeal from this decision will be made by the railway to the Supreme Court.

### Boston Wants One-Man Cars

#### Public Service Commission of Massachusetts to Consider Use of One-Man Cars on Two Roads

The Boston Elevated Railway and the Brockton & Plymouth Street Railway have petitioned the Public Service Commission of Massachusetts for authority to institute one-man car service. In the case of the Boston Elevated Railway, M. C. Brush, president of the company, asks the board to permit the use of a Brill one-man car in East Boston, between the Maverick Square entrance of the East Boston tunnel and North Ferry. The car is of the double-end, single truck type, 27 ft. 9¼ in. long over all, and 17 ft. 9½ in. over corner posts; it has fourteen cross seats and a total seating capacity of thirty. The car body weight is 6000 lb., and the weight of the truck, exclusive of wheels and axles, is 1630 lb. The Brockton & Plymouth Street Railway desires to operate a car of the so-called Birney type, in general similar to the type selected for service on various other Stone & Webster properties, and described previously in the *ELECTRIC RAILWAY JOURNAL*. The commission will hold a hearing of the two petitions March 23 at Boston.



## Traffic Problems Discussed

At a meeting of the Worcester Polytechnic Branch of the A. I. E. E. held on March 16 in Worcester, Edward Dana, manager of surface transportation of the Boston Elevated Railway, delivered an illustrated lecture on the "traffic Problems of a Large Urban System."

Mr. Dana first called attention to the early, crude means of obtaining data upon which service was based. These means based on the number of passengers per half trip or trip, and not upon the largest number of passengers upon the car at any one time, resulted, of course, in an uneconomical operation of service. The speaker then reviewed the development of the very complete and efficient set of forms calculated to give traffic statistics from all possible angles. These forms, which included all types of regular traffic forms, from the original counts to simple graphic representations, were shown on the screen during the talk.

Attention was called to supplementing counts taken at traffic points by characteristic counts taken by riding the heavy routes passing those points to determine whether or not the riding was heavy at other points on those routes.

A re-routing problem was then taken up and special emphasis was placed upon proper publicity along definite lines to acquaint the public, improvement associations and governing bodies with the attitude taken by the company, and the reasons for that attitude. It was pointed out that this publicity usually resulted in the undivided co-operation of the community served.

The talk was concluded by the presentation of a series of slides, showing the types of cars from the very earliest horse car to the latest trailer train. As the pictures were thrown on the screen Mr. Dana related interesting anecdotes of each type as it was shown.

**Hearing on "Squealing" Brakeshoes.**—The hearing on March 19 by the Public Service Commission of New York, First District, on the subject of "squealing" brakeshoes on cars of the elevated lines, was adjourned for further testimony on June 4 pending results of experiments which are now being carried out.

**Boston Elevated Puts Ban on Liquor.**—A notice which has just been posted in all the carhouses, shops and other departments of the Boston (Mass.) Elevated Railway, and put in the hands of everyone connected with the service, virtually prohibits the use of liquor among all officials and employees. The order was signed by President M. C. Brush.

**Hearing on Inclosed Vestibules.**—The hearing by the Public Service Commission of the First District, New York, in regard to the proposed order requiring all electric surface cars operated in Greater New York to be equipped with fully inclosed vestibules, which was adjourned on Jan. 31 for further investigation, as reported in this paper for Feb. 3, page 228, was continued on March 14 and then adjourned for final hearing on March 28.

**Two-Car Trains for Montreal.**—More than \$1,000,000 will be invested in new equipment for the Montreal (Que.) Tramways, the major portion of which is to be expended for fifty two-car trains. Experiments with trailers hauled by motor cars in two-car units had been conducted for some time before the orders were placed, and the results were very satisfactory, especially as the public and the train crews quickly became accustomed to their use.

**Salesmanship in Railway Service.**—An editorial which appeared in the March 15 issue of the bulletin published by the United Railways, St. Louis, Mo., sets forth principles which, when observed, make the conductor a better company representative. It is entitled "The Conductor as a Salesman," and was written by Richard McCulloch, president of the company. Mr. McCulloch says the conductor is a salesman of rides. He regards courtesy at all times, especially in handling complaints, as very important in forming correct opinions about the service.

**Railway Folder Stimulates Interest.**—The city guide recently issued by the Kansas City (Mo.) Railways to instruct the citizens and out-of-town visitors on the important points of interest in Kansas City, Mo., and Kansas City, Kan., has been effective in stimulating a project of the Greeters, an

organization of hotel clerks, which was under way to inform themselves to answer all questions from guests regarding the city. At the monthly meeting of the Greeters a definite program was adopted and the railway folder will be supplied to the members as a basis of their new service.

**Skip-Stop Education in Baltimore.**—Following the request made by the United Railways & Electric Company, Baltimore, Md., through newspaper advertisements for expressions of opinion concerning the proposed skip-stop plan, hundreds of replies were received, 89 per cent of which expressed a desire for the change, and polls taken at the various city clubs resulted 312 to 19 in its favor. In order to inform the public about skip-stop operation, the company has described the plan in detail in a small folder using the question-and-answer method. More than 200,000 of these folders were distributed during the week commencing March 19. They were sent to civic bodies and distributed on the cars from the racks used for *Trolley News*, the company publication.

**Automobile Accidents on the Increase.**—Careless and indifferent driving, manifesting the lack of safety-first operation on the part of automobile drivers, is evidenced in the accident report of the Detroit (Mich.) United Railway for the year 1916, which shows a total of 8710 collisions between motor vehicles and street cars, or an increase of more than 65 per cent over the number for 1915. In each of these cases the motor vehicle was on the track or attempted to cross a track at the time when a street car reached the spot. This shows a condition over which the street railway has no control and, with the general increase in traffic, since the number of accidents of all kinds involving all other vehicles and pedestrians had increased less than 24 per cent during the same period, the major portion of the responsibility is placed upon the drivers of motor cars.

**Grade Crossings Opposed in Louisville.**—Agitation in Louisville, Ky., for the elimination of grade crossings, following the disastrous collision in February of which mention was made in this paper for Feb. 24, page 367, has resulted in the organization of the joint city survey and city plan committee, made up of representatives of about twelve commercial, professional and civic organizations of Louisville. It was formed under the auspices of the Louisville Engineers & Architects Club, with J. C. Murphy, chairman of the state and municipal committee of that organization, as chairman of the joint committee. There have heretofore been several organized attempts to obtain reforms in Louisville in the manner now contemplated, and it is believed that now the movement has been started on a permanent basis. Elimination of grade crossings is only one of the projects to which the joint committee will give its attention.

**Jitney License Fees Advanced in Los Angeles.**—The City Council of Los Angeles, Cal., has adopted an ordinance increasing license fees for jitney buses about 30 per cent. According to the new ordinance, which goes into effect on April 1, five-passenger vehicles must pay \$11.25 per quarter; seven-passenger, \$16.75; eight to ten-passenger, \$18; eleven to fifteen-passenger, \$23; sixteen to twenty-passenger, \$27; twenty-one to twenty-five-passenger, \$30; twenty-six to thirty-passenger, \$34. Interurban buses must pay approximately half as much as city buses. The Board of Public Utilities has recommended to the Council that brokers of interurban bus tickets be licensed. Many persons have been defrauded by purchasing tickets, which were later rendered valueless by retirement from business of bus companies which sold the tickets. A license fee of \$60 a year was recommended for such ticket brokers. The City Council has the matter under consideration.

**Quick Transportation for Carnival Crowds.**—It is estimated that during the recent Mardi-Gras festival in New Orleans, La., more than 600,000 passengers were carried daily by the New Orleans Railway & Light Company. This is 100 per cent more than the average maximum haulage and required extra precautions to prevent undue delays. A wagon with linemen and equipment preceded each parade in order to meet any emergencies, pitmen were stationed at strategic points to repair possible damages to cars and men in the power station gave special attention



to the apparatus during the hours of heaviest traffic. Traffic men were stationed along the lines, and a wrecker and motor trucks were in readiness to respond to any calls. The claim department was prepared to rush investigators in automobiles to the scene of any accident, and special facilities were provided to give immediate medical aid. Special supervisors directed the starting of cars and prevented passengers from riding where they would be in danger.

**Fare Reduction by Connecticut Company Improbable.**—After a conference with members of the Public Utilities Commission and officials of the Connecticut Company relative to the establishment of a 5-cent fare within the Shelton city limits and a total 15-cent fare to Bridgeport, Representative John B. Dillon reports that, in his opinion, such a reduction is not likely to be granted at the present time. He says he believes the company will do its utmost to remedy conditions considered to be unsatisfactory, but will oppose any move to secure a fare reduction between the two cities. The railway has urged the people to purchase books of tickets to secure a reduced rate, and its officials have cited instances where the conditions are similar and in which the railway was upheld in maintaining the prevailing rate of fare. J. K. Punderford, vice-president and general manager of the Connecticut Company, attributes the prevailing unsatisfactory condition on a number of lines to the scarcity of labor and cars, stating that the company is unable to get the right kind of men to operate the cars and that the difficulty in securing new cars is also great.

**Hitch Over Municipal Railway Extension.**—The negotiations between the city of Tacoma and the Tacoma Railway & Power Company, Tacoma, Wash., for the extension of the municipal railway on the tideflats from its present terminus, 1¼ miles outside the corporate limits, to the Todd shipyards, were complicated recently when Louis H. Bean, general manager of the Tacoma Railway & Power Company, told the Council his company would enter into an agreement for the operation of the line on condition that it be allowed to charge an additional 2-cent fare for carrying tideflats patrons on transfers. Mayor Fawcett voiced his disapproval of the proposal. Mr. Bean said that the extension was going outside the city limits, and that he believed it not unfair to charge an extra sum for patrons who board the line on transfers. Mayor Fawcett recently secured the passage of a resolution through the City Council by which the city agreed to build the extension to the Todd Shipyards under the terms of the existing contract, providing the funds could be secured that are necessary to finance the work. Comptroller Shoemaker estimates that the total cost of building the line will be about \$75,000, instead of the \$50,000 as estimated by the Council. The present municipal line across the tideflats cost \$35,000.

**Skip-Stop Urged in Chicago.**—Alderman H. D. Capitain, chairman of the local transportation committee, and R. F. Kelker, Jr., transportation supervisor, were authorized at a recent meeting of the City Council to prepare a form of ballot for submitting to patrons of two or three lines in order that they might signify their desire for a trial installation of the skip-stop system. If the riders on these lines vote to have the skip-stop plan tried out, it will be installed for a period of two or three months and they will then be given an opportunity to express again their approval or disapproval of the system. Cross-town lines which have a number of short stops, or lines on which all cars could be put in operation under the skip-stop plan, will be used for the trial. It is intended, if the riders approve the plan, to arrange about seven stops to the mile, whereas the number now is about fourteen. The skip-stop as a form of express service was suggested by city officials, as the transportation companies have felt that it is a matter in which the city should take the initiative. An approval of the skip-stop plan on certain lines was granted in the fall of 1915, and was to be put in operation on the day of the Eastland disaster which closed the Clark Street bridge. This caused a delay, and as cold weather soon followed the plan was abandoned. If the present trial is effected, no cars will be removed from service, but rather, if the schedule is materially speeded up, the extra cars will be employed for the purpose of giving additional service.

## Legal Notes

### MICHIGAN.—Conductor Must Be on Rear Platform When Car Backs.

Plaintiff, though knowing that a standing street car would have to be backed further before it could be turned, had a right to assume that it would not be backed till the conductor was on the rear platform to give notice and warning, as required by ordinance, and so was not guilty of contributory negligence, as matter of law, in not looking towards it after leaving the curb, five or six steps from the first rail, walking rapidly to pass in the rear of it to catch another car about to start. (*McManigle v. Detroit United Ry.*, 160 Northwestern Rep., 423.)

### NEW YORK.—Rule Limiting Transfers to Shortest Route Reasonable but Publication Necessary.

Under the transfer law, a rule of a company not to issue transfers between line A and B on the ground that otherwise a passenger could make a continuous trip from the point where he boarded the car, and that there was a shorter and more direct route to his destination, was a reasonable rule and within rights of the company. However, where such rule was known only by the company's conductors, and had not in any way been brought to the attention of the traveling public, it could not be enforced. (*Hickman v. International Railway*, 160 New York Supplement, 994.)

### NORTH CAROLINA.—Trespasser on Steam Railroad Freight Car Struck by Low Trolley Wire.

Deceased, while riding on the top of a freight car at the invitation of a brakeman, in consideration of his assisting in the movement of freight and with permission by the conductor to ride, was struck by a power wire of the defendant traction company stretched across the right of way and negligently allowed to sag so low as to threaten the safety of all persons on cars or trains of that character. As a result deceased was thrown from the train and killed. Held that, though as to the railroad company deceased was a trespasser, nevertheless recovery against the traction company could not be denied as a matter of law on that ground, for the wrong was not to the traction company but to the railroad company, and the traction company was guilty of negligence in allowing its wire to sag so as to endanger those on trains. (*Ferrell v. Durham Traction Co.*, 90 Southeastern Rep., 893.)

### PENNSYLVANIA.—Right of Entry over Private Property Appraised.

Where a street railway and the owner of land over which the railway constructed poles and lines entered into a written agreement, submitting to arbitrators the amount of compensation due the owner and making their decision conclusive, the arbitrators did not exceed their authority in considering the item of future damages to the land from the maintenance and operation of the line, nor in taking into consideration that the defendant was to have the right to enter and cross the land of plaintiff at any point they might desire, to maintain and operate the line of railway. (*Thornburgh v. West Penn Railways*, 98 Atlantic Rep., 894.)

### VERMONT.—Regulation by Public Service Corporation—Removal of Wires.

An order of the Public Service Commission, made on petition of a telegraph company, requiring a traction company, owning its right-of-way, to remove its high-tension power wires from dangerous proximity to telegraph wires, did not exceed the constitutional powers of the commission as being confiscatory of the traction company's property and a taking without "due process of law," in violation of federal Const. Amends. 5 and 14; private ownership of its right-of-way not giving the traction company the right to erect its high-tension line thereon without regard to the rule restricting every man against using his property to the prejudice of others. (*Western Union Telegraph Co. v. Burlington Traction Co.*, 99 Atlantic Rep., 4.)



## Personal Mention

**Harrison Williams** has been elected president of the Republic Railway & Light Company, New York, N. Y., to succeed Oren Root, resigned.

**Joseph Johnson** has resigned as chief of the transit bureau of the Public Service Commission for the First District of New York, effective on March 31. He will re-enter newspaper work.

**Francis T. Homer**, vice-president of The United Gas & Electric Corporation, New York, N. Y., has been elected president of the American Cities Company, New York, to succeed Hugh McCloskey.

**W. P. Allen** has resigned as assistant district attorney of New York to become a member of the legal staff of the Third Avenue Railway, that city. Mr. Allen was formerly Assistant United States District Attorney.

**Frank K. Bowers** has been appointed general inspector of the Public Service Commission of the First District, New York, to succeed James A. McQuade, who resigned to join his brother in the stock brokerage business.

**Frank Hedley**, vice-president and general manager of the New York Railways and the Interborough Rapid Transit Company, New York, N. Y., who on March 12 underwent an operation for mastoid trouble, is steadily convalescing.

**E. C. Foster**, president of the Manchester Traction, Light & Power Company, Manchester, N. H., was presented with a handsome gold-headed cane by the employees at a complimentary smoker and entertainment given recently in his honor.

**Harry H. Lyons**, who has been connected for the past five years with the Arkansas Valley Railway, Light & Power Company, Pueblo, Col., has been appointed district superintendent of the new division of that company, which includes Ordway, Sugar City, Crowley and Olney Springs.

**B. J. Arnold**, Chicago, Ill., has been engaged by the Harrisburg (Pa.) Railways to investigate street railway conditions in Harrisburg. Mr. Arnold was engaged a few years ago by the Municipal League of Harrisburg to report on street conditions in the heart of the city, and is, therefore, familiar with local traffic problems.

**G. A. Green**, superintendent of the Fifth Avenue Bus Company, New York, N. Y., and a director of the Motor Truck Club of America, has received an appointment as captain in the British Army and will leave on March 31 for the Somme front to take command of a gun company operating "tanks." Mr. Green is a British subject. He has been in this country six years.

**Sydney O. Swenson** has resigned as a member of the engineering force of Putnam A. Bates, consulting engineer, of New York. Mr. Swenson was assistant electrical engineer of the Detroit Tunnel electrification from 1907 to 1911 and from 1911 to 1916 was electrical engineer of the Kansas City Railway Terminal Company, which installed the union steam railroad terminal in Kansas City.

**W. H. Chilton** has been promoted to the position of division superintendent of the New York State Railways, Syracuse Lines, Syracuse, N. Y., to fill the vacancy made by the death of George A. Valentine. Mr. Chilton entered the employ of the Syracuse (N. Y.) Rapid Transit Railway in 1905 as a conductor, and has been connected with this company and its successor, the New York State Railways, since that time.

**Thomas E. Francis** has been appointed general attorney for the United Railways, St. Louis, Mo. Mr. Francis was born in Bevier, Mo., in 1878. At the age of fourteen he was employed as office boy by the Loomis Coal Company, and held different positions with that company for five years. He then began the study of law and was admitted to the Macon County, Mo., bar in 1899. After practising law in Bevier until 1906 he became a member of the legal staff of the United Railways and for the past eleven years has devoted his attention to the affairs of that company.

**B. F. Lyons**, vice-president and general manager of the Beloit Water, Gas & Electric Company, Beloit, Wis., and president of the Wisconsin Gas Association, has been elected president of the Wisconsin Electrical Association. Mr. Lyons was graduated from the University of Wisconsin in 1903, and upon leaving college became assistant engineer for the Laclede Gas Light Company, St. Louis, Mo. He remained in the employ of the Laclede Gas Light Company for three years, after which he served the Merchants Power Company, Memphis, Tenn., until 1907, when he began his present work.

**William Clayton**, vice-president and managing director of the San Diego (Cal.) Electric Railway and vice-president of the San Diego & South Eastern Railway, San Diego, Cal., was shot and perhaps fatally wounded on March 12 by Lorenzo Bellomo, an Italian bootblack, who, it is believed, sought revenge for an injury sustained six years ago in a street railway accident. After a hasty examination at the hospital, physicians pronounced Mr. Clayton's condition as serious. Bellomo stated at Police Headquarters that, since the loss of his foot in a street car accident, he has had difficulty in making a living, and, after asking Mr. Clayton several times for work, he decided to kill him.

**Oren Root** has resigned as president and a director of the Republic Railway & Light Company, New York, N. Y., which controls the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. The Republic Railway & Light Company is controlled by the Harrison Williams interests, with which Mr. Root became connected in November, 1912. Soon thereafter he was elected president of the Republic Railway & Light Company with offices in New York. Mr. Root had previously been connected with the Metropolitan Street Railway, now the New York Railways, for many years, and was general manager for the receivers of that property when he resigned to become associated with Mr. Williams.

**George W. Knox**, vice-president and general manager of the Oklahoma Railway, Oklahoma City, Okla., has contributed an article to the *Employer*, an Oklahoma magazine, entitled "Labor Troubles Unnecessary; All Due Entirely to Man's Inhumanity to Man." Mr. Knox in the article contends from his own successful experience that labor problems are easily adjusted when men get together in the right spirit, and that "if contentious humanity the world over—hardly ever free from strife and warfare—would but stop and consider, analyze and compare conditions and be generous and unselfish enough to be governed by even a small part of the sense of justice which all possess to some degree or other, the 'strike' and 'lockout' contingent along with the ever ready and gifted 'exponent,' writer or talker of how all social and industrial problems should be handled, would be lonesome for something to write, talk and fight about."

**Jiro Komiya**, electrical engineer to the Imperial Government Railways, Tokio, Japan, who has been in this country since last July, intends to spend one year studying American practices in electrical transmission and railroad electrification. He came by way of Seattle, Wash., and, after visiting several roads in the Pacific States, spent five weeks observing the operation of the electrified portion of the Chicago, Milwaukee & St. Paul Railway. He then visited the principal electric railways in the East and South, and hopes to see the electric division of the Norfolk & Western Railway in Virginia, and other lines in the Central States and Canada. Mr. Komiya will return home in August, going by way of Europe to investigate electric operation there, if possible. He is much impressed with the success of electricity for motive power in this country, and expressed to a representative of the *ELECTRIC RAILWAY JOURNAL* his appreciation of the courtesy shown to him by the many railway men whom he has met. Mr. Komiya is at present in New York.

**M. C. Sauerwein** has been appointed general manager of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., to succeed James P. Barnes, who resigned to become general manager of the Schenectady (N. Y.) Railway. Mr. Sauerwein comes to Rochester from the Maryland Electric Railways, Annapolis, Ind., where he was assistant general manager. He began his railroad career in 1906, when he was employed by J. G. White & Company, Inc., New York, in the construction of 25 miles of tidewater road between



Cochran and Tinkling, Va. A year later, when the same company began the electrification of the Maryland Electric Railways, between Baltimore and Annapolis, Mr. Sauerwein was appointed assistant to the superintendent of the line. When the electrified line was placed in operation, in June, 1908, Mr. Sauerwein was continued with the company as secretary to the general manager and purchasing agent. In September, 1914, he was appointed general passenger and freight agent of the company, and about a year ago he was promoted to the position of assistant general manager. In his new capacity as general manager of the Buffalo, Lockport & Rochester Railway, Mr. Sauerwein will have charge of this line between Rochester and Lockport, N. Y., which connects at Lockport with the Buffalo & Lockport division of the International Railway, Buffalo, N. Y.

Hugh McCloskey has been succeeded as president of the American Cities Company, New York, N. Y., by Francis T. Homer, as noted elsewhere in these columns. Mr. McCloskey's active connection with the affairs of the New Orleans Railway & Light Company and the American Cities Company, by which the New Orleans Railway & Light Company is controlled, dates from March, 1908, when he was elected chairman of the board of directors of the latter company. Later he was elected president of the company and the position of chairman of the board was abolished. Following the completion of the construction program which he laid down for the company in New Orleans Mr. McCloskey relinquished the office of president of the company, again became chairman of the board and in addition president of the American Cities Company. Mr. McCloskey has many interests in New Orleans. He is a vice-president of the D. H. Holmes department store, vice-president of the Hibernia National Bank and vice-president of the Hibernia Insurance Company. He was also the founder of McCloskey Brothers, one of the largest wholesale grocery and produce firms in the South. He has been active in nearly all the movements for the civic betterment of New Orleans, and received in 1913 the New Orleans *Picayune's* loving cup for his public-spirited efforts in helping to give the city its wharves and sheds.

A. H. Ford, the new president of the New England Street Railway Club, is a well-known figure in the field of public utility management. He was born in New York in 1859 and his early education was received at Evansville, Ind. At the age of sixteen Mr. Ford left school and entered the steam railroad field, serving as traveling auditor, auditor and treasurer of roads connecting with Evansville and Louisville, Ky. In 1893 he became secretary and treasurer of the New Orleans (La.) Traction Company, Ltd. This road at the time was being changed from mule power to give electric service. In 1900 Mr. Ford became manager of the New Orleans & Carrollton Railroad, under the control of the New Orleans banking house of Isidore Newman & Son, and for fourteen years was identified with interests controlled by this establishment. In 1902 he became a confidential adviser to the Newman interests, and in 1904 he removed to New York to become manager of the operating department of Ford, Bacon & Davis, engineers, and was also president of the American Cities Railway & Light Company at that time. In 1907 he resigned these positions to become president and general manager of the Birmingham Railway, Light & Power Company, Birmingham, Ala., and in June, 1914, was appointed vice-president and general manager of the Cumberland County Power & Light Company, Portland, Me., and of the Lewiston, Augusta & Waterville Street Railway, Lewiston, Me. Under Mr. Ford's management these large traction and central station properties have developed rapidly and now rank with the most important public utilities in New England.



A. H. FORD

J. P. H. De Windt, Jr., has been appointed chief of the transit bureau of the Public Service Commission, First District, New York, to succeed Joseph Johnson, who resigned to resume newspaper work. Mr. De Windt is a native of New York City and has had a wide experience with railway and electric lighting companies. During the eleven years prior to 1913, he was superintendent of the Connecticut Company, New Haven, Conn., general manager of the Shore Line Electric Railway, Norwich, Conn., and was also in charge of engineering and development work in the Canadian Northwest for E. S. Goldthwaite and associates, engineers and contractors of Springfield, Mass. In 1913 he became general manager of the Birmingham Railway, Light & Power Company, Birmingham, Ala., and was vice-president and general manager of that company for two and one-half years before 1916, when he was assigned, in addition to his regular duties, to some engineering work with the American Cities Company. In June, 1916, Mr. De Windt, Jr., resigned from these two companies and returned to New York, where he has since been actively engaged in engineering work.



J. P. H. DE WINDT, JR.

## Obituary

H. W. Cunningham, master mechanic of the Laurel Light & Railway Company, Laurel, Miss., died on March 1 at the Laurel General Hospital after a week's illness caused by a mastoid abscess. Mr. Cunningham had been connected with the company since the completion of the construction of the property in 1912.

Joseph L. Willcutt, for many years secretary of the Southern Pacific Company and also secretary of the Market Street Railroad in San Francisco, Cal., died Feb. 27 at his home in Oakland. Mr. Willcutt was born in Boston in 1829 and settled in San Francisco in 1852. Up to within about a month of his death Mr. Willcutt, in spite of his advanced years, had been in the habit of visiting San Francisco frequently. He retired from his association with the street railway interests in San Francisco in 1900, and from the steam railroad interests in 1908, but maintained a minor association with the Southern Pacific Company until the last. He was the father of George B. Willcutt, secretary and comptroller of the United Railroads of San Francisco, and of H. D. Willcutt, who is the auditor of the same company.

Ferdinand W. Roebling, Sr., died at his home in Trenton, N. J., on March 16. Mr. Roebling was born in Saxonburgh, Pa., in 1842, and was graduated from the Polytechnic College of Philadelphia, where he had specialized in chemistry. His father, John A. Roebling, was a pioneer in the manufacture of wire rope, and was the founder of the firm of John A. Roebling's Sons Company, bridge builders, of which Mr. Roebling became treasurer and general manager. In 1869 his father died after starting the construction of the Brooklyn Bridge, leaving it to be completed by his four sons, of whom Ferdinand was the second eldest. The firm branched out and specialized in wire rope manufacture, and developed the large plant now at Trenton, N. J. Besides his manufacturing interests, Mr. Roebling was vice-president of the Syracuse & South Bay Electric Railroad, Syracuse, N. Y., a director of the Trenton & Mercer County Traction Corporation, Trenton, N. J., and the Interstate Railways, Camden, N. J., and was also a director of a number of banks and electric lighting, insurance and water companies. His death means the loss to his community of one of its most active and public-spirited members, and he is given the credit of having done more than any other individual to increase its opportunities.



## Construction News

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

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

### RECENT INCORPORATIONS

**\*South Georgia Power Company, Valdosta, Ga.**—Application for a charter has been made by the South Georgia Power Company to supply electrical power and to operate electric railways in Georgia. Capital stock, \$25,000, with the privilege of increasing same not to exceed \$2,500,000. Incorporators: Mrs. Lily Roberts, Lilly B. Roberts, Alma Roberts, Anne Roberts, Frank Roberts, William Roberts of Lowndes County, Ga., and B. P. Rucker, Schenectady, N. Y.

**\*Bluff City Railway, Natchez, La.**—Incorporated with a capital stock of \$25,000. Incorporators: Mrs. Fannie McM. Rumble, Mrs. Emma C. Wendel, A. L. Rumble and David M. Dix.

### FRANCHISES

**Evanston, Ill.**—The City Council of Evanston has refused the request of the Chicago, Fox Lake & Northern Electric Railway for a franchise to build a line to connect with the Northwestern Elevated Railroad at Howard Avenue, and a new ordinance will be presented to the Aldermen for action at a future meeting. [Jan. 20, '17.]

**Harvard, Ill.**—The Chicago, Harvard & Geneva Lake Railway has been granted a franchise by the City Council of Harvard on West Front Street from Eastman Street to connect with its line at Diggins Street near the Lawrence crossing.

**Indianapolis, Ind.**—The Terre Haute, Indianapolis & Eastern Traction Company has asked the Board of Public Works of Indianapolis for permission to construct an additional track on its Terre Haute division from Holmes Avenue to Walnut Street and west from that point to Concord Street, thence northwest over the company's private right-of-way to the Indianapolis motor speedway.

**Kansas City, Mo.**—An ordinance has been introduced in the City Council providing for the routing of thirty-two car lines of the Kansas City Railways in Kansas City. Routings of eighteen of these remain unchanged, one new line is provided for and a new trunk line created. New routings are provided for the other lines when certain connections, loops or extensions have been completed.

**Richmond Heights, Mo.**—The Board of Aldermen of the City of Richmond Heights has granted a franchise to the United Railways for the construction of a line through the eastern part of Richmond Heights, north and south.

**Rochester, N. Y.**—The Board of Estimate and Apportionment at a recent meeting approved the ordinance adopted by the City Council on June 27, 1916, granting the New York State Railways additional franchise rights and extensions in Plymouth Avenue and across Brooks Avenue, where retracking has been in progress for some time.

**Columbus, Ohio.**—The Columbus Railway, Power & Light Company has asked the City Council for a franchise to double-track Grant Avenue from Chittenden Avenue to Eleventh Avenue, and to construct a line thence on Eleventh Avenue to the state fair grounds.

**Columbus, Ohio.**—The City Council of Columbus has instructed City Attorney Scarlett to prepare a franchise for a line connecting Chittenden Avenue and Eleventh Avenue on the payment of \$5,000 to the city. This provides for the first cross-town line in the city. It is now in the hands of the street railway committee.

**Johnstown, Pa.**—The Johnstown Traction Company has asked the City Council for franchises to construct a line in the Seventh Ward and another in the Seventeenth Ward of Johnstown. In return for the franchises the company is willing to give the city 50 acres of land for park purposes.

### TRACK AND ROADWAY

**\*Edmonton, Alta.**—It is reported that the Delta Copper Company, 703 Teglal Block, Edmonton, Alta., plans to construct a 3½-mile aerial tramway and power plant at Skeena Crossing. H. E. Clements, Skeena Crossing, engineer.

**Coal District Power Company, Fort Smith, Ark.**—In reply to an inquiry, Albert Emanuel Company, Dayton, Ohio, advises that the plans of the Coal District Power Company, recently organized at Fort Smith, do not include the construction of an electric railway, as noted in the *ELECTRIC RAILWAY JOURNAL* for Feb. 24.

**Visalia Electric Railroad, Exeter, Cal.**—This company's extension from Exeter to Porterville has been completed with the exception of 2 miles, near Strathmore. The line from Porterville has been built to a point 4 miles south and the right-of-way has been secured for 5 miles more. The company plans to begin construction work on this section in the spring, and it is expected the line will be completed next fall. The route from there as contemplated takes the line west 1 mile, and then south to a point directly east of Ducor. In all probability the line will connect with the Southern Pacific Company at or near Ducor.

**Los Angeles (Cal.) Railway.**—An application for authority to discontinue the operation of its cars on Vermont Avenue beyond the El Segundo branch of the Pacific Electric Railway and on Moneta Avenue south of the same line has been filed with the Railroad Commission of the State of California by the Los Angeles Railway. The company states that traffic does not warrant the continuance of service on these lines.

**Pacific Gas & Electric Company, Sacramento, Cal.**—The Sacramento electric railway system of the Pacific Gas & Electric Company will be increased by a short stretch of line built by the Southern Pacific Company, if an application is granted which is now before the California Railroad Commission, requesting permission to transfer the property. The application states that the line, which was built in 1905 by the Southern Pacific Company, the present owners, and has been operated since by the Pacific Gas & Electric Company as a part of its Sacramento system, has never paid operating expenses and fixed charges. The original cost of the road is given as \$37,447, and the present value is \$12,120, which is the price involved in the proposed transfer.

**San Diego (Cal.) Electric Railway.**—This company will construct a new track crossing at Fifth and Market Streets to cost about \$18,000.

**Denver (Col.) Tramway.**—Announcement has been made that engineers of the Denver Tramway are planning a survey of several routes into Denver's mountain park system over which tracks might be laid and a study will be made of the possible revenue for the purpose of determining the feasibility of giving complete tramway service between the city and the big municipal playground.

**Arkansas Valley Railway, Light & Power Company, Pueblo, Col.**—This company reports that during the next seven weeks it will award contracts for the construction of 12,000 ft. of new track, including special work.

**Capital Traction Company, Washington, D. C.**—Orders have been placed by the Capital Traction Company for the necessary material to construct about 1 mile of track on Eighteenth and Nineteenth Streets and Virginia Avenue, northwest.

**Miami (Fla.) Traction Company.**—A special city election will be held in Miami to determine upon which streets the Miami Traction Company shall extend its lines this year. Under the terms of the franchise, one mile of track is laid each year, and as there is dissension as to the direction in which this year's extension shall be built, the Council has passed the matter on to the voters for decision.

**Bloomington & Normal Railway & Light Company, Bloomington, Ill.**—This company reports that in connection with the repaving of Front Street it will reconstruct its track from Main to Gridley Street.

**Alton, Jacksonville & Peoria Railway, Alton, Ill.**—This company plans to reballast and lay new ties on its line between Alton and Jerseyville.



**Indianapolis Traction & Terminal Company, Indianapolis, Ind.**—This company will construct two extensions to its West Michigan Street line.

**Springfield (Mass.) Street Railway.**—Work will be begun in April by the Springfield Street Railway on its proposed extension on Carew Street from Chestnut Street to Liberty Street, about 1 mile.

**Columbus Railway, Light & Power Company, Columbus, Miss.**—This company is constructing an extension to the plant of the Columbus Lumber Company in the northeastern suburbs of the city.

**United Railways, St. Louis, Mo.**—Acquisition of a strip of land on Etzel Avenue, from Hodiament Avenue to the Hodiament right-of-way, by the United Railways, has disclosed plans of the company to remove the tracks from Hamilton north of Etzel Avenue. The intention is to operate the Hamilton cars north of Etzel Avenue over the Hodiament tracks. The company proposes laying tracks from Hodiament and Etzel Avenues over the purchased strip to the Hodiament tracks on the private right-of-way.

**Brooklyn (N. Y.) Rapid Transit Company.**—The Public Service Commission for the First District of New York has awarded to the Thomas Crimmins Contracting Company, New York, at \$165,409, the contract for the relocation of the street surface railroad tracks on New Utrecht Avenue, Brooklyn.

**Cleveland (Ohio) Railway.**—It was announced on March 15 that the Cleveland Railway will begin the construction of an extension of the Pearl Road line to Ridge Road on April 1. Since the line penetrates a new section, where new allotments are being developed, the property owners raised \$25,000 toward the cost of construction.

**Oklahoma Union Railway, Tulsa, Okla.**—It is reported that the Oklahoma Union Railway has purchased the Sapulpa Electric Interurban Railway and through interurban service between Tulsa, Sapulpa and Kiefer will be established about midsummer. Extensive improvements, both in Sapulpa and on the interurban line to Kiefer, will be made at once by the company.

**Portland Railway, Light & Power Company, Portland, Ore.**—Officials of the Portland Railway, Light & Power Company state that no immediate rerouting or diversion of traffic is contemplated under the act of the City Council in permitting the company to install a looping arrangement between First and Second Streets on Yamhill Street. The company merely desires to be prepared to handle traffic over this loop when conditions demand it, and also to be able to install the necessary turnouts and special work that may be needed in the future, at the time the present pavement is relaid.

**Phoenixville, Valley Forge & Strafford Electric Railway, Phoenixville, Pa.**—Work will soon be begun by this company on the construction of an extension to Norristown via Mont Clare and Jeffersonville.

**Eastern Pennsylvania Railways, Pottsville, Pa.**—This company plans to construct an extension from St. Clair or Fracksville to Ashland.

**Womelsdorf, Richland & Myerstown Street Railway, Womelsdorf, Pa.**—Work has been begun by this company on the construction of its line between Womelsdorf and Myerstown, via Newmanstown, Sheridan and Richland, and it is expected that operation between Womelsdorf and Sheridan will be begun by July 1. Leroy R. Valentine, Womelsdorf, president. [Oct. 28, '16.]

**Columbia Railway, Gas & Electric Company, Columbia, S. C.**—This company plans to construct an extension of its line on Hardin Street.

**Dallas (Tex.) Northwestern Traction Company.**—E. P. Turner, president of this company, accompanied by E. P. De Mayo, contracting engineer, and a party of fourteen Dallas business men, stockholders in the company, made an inspection trip over the route of the projected line, which is to extend from Dallas northwestward through Denton, Krum and Slidell. Meetings were held in the various towns and plans for building the line were discussed with the business men of the various sections through which the line will extend. [Feb. 17, '17.]

**Texas Electric Railway, Dallas, Tex.**—Officials of the Austin Chamber of Commerce have been in conference with J. F. Strickland, president of the Texas Electric Railway, with a view to offering sufficient inducements to bring about the extension of the Texas Electric Railway from Waco southward through Temple, Granger and Taylor to Austin. It is reported that a line is practically assured in that part of Texas to be built during the summer months.

## SHOPS AND BUILDINGS

**Interborough Rapid Transit Company, New York, N. Y.**—The Public Service Commission for the First District of New York has asked for the consent of the Sinking Fund Commission to the taking of a portion of the unused part of the Jerome Avenue reservoir tract in The Bronx for storage-yard purposes for subway cars in connection with the operation of the Jerome Avenue extension of the Lexington Avenue subway.

**Nipissing Central Railway, North Cobalt, Ont.**—The car-house of the Nipissing Central Railway at North Cobalt was recently damaged by fire. The loss to electrical equipment is placed at \$30,000, to cars \$60,000 and to the building \$40,000.

**Portland Railway, Light & Power Company, Portland, Ore.**—George M. Post, architect, of Salem, has been commissioned to prepare plans and specifications for a two-story building, 53 ft. x 90 ft., of brick and mill construction, to be built for Steusloff Brothers, Liberty Street, Salem. The first floor and part of the basement will be used as the general offices of the Portland Railway, Light & Power Company.

## POWER HOUSES AND SUBSTATIONS

**Arkansas Valley Railway, Light & Power Company, Pueblo, Col.**—The electric light plants at Ordway and Sugar City have been purchased by this company. A new district will be formed by the company to include Olney Springs, Crowley, Ordway and Sugar City, with headquarters at Ordway. Many improvements will be made in the two plants. The company contemplates an 11-mile extension of the transmission line from Avondale to Boone and from Boone to the ranch of the Thatcher Cattle Company, where power will be furnished for a 400-acre irrigation project. It is probable that a street-lighting system will be installed at Boone.

**Tampa (Fla.) Electric Company.**—This company plans to double the output of its West Jackson Street power house. The work will include an addition to the building and the installation of an additional 7200-kw. steam turbo-generator.

**Boston (Mass.) Elevated Railway.**—A contract has been awarded to the Westinghouse Electric & Manufacturing Company by the Boston Elevated Railway for a 25,000-kw. turbine, a 25,000-kw. turbine generator, and a 25,000-sq. ft. condenser.

**St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.**—It has been announced that this company will construct a \$50,000 power plant at St. Joseph.

**Atlantic Coast Electric Railway, Asbury Park, N. J.**—A report from the Atlantic Coast Electric Railway states that it expects to construct an addition to the boiler room at its power station, and will install four Badenhausen boilers, aggregating 2440 hp., stokers, etc.

**Columbus, Delaware & Marion Railway, Cincinnati, Ohio.**—In connection with the reorganization of the Columbus, Delaware & Marion Railway and its allied properties, it is stated that Frank G. Glosser, superintendent of the Marion lighting department, has submitted recommendations for a large power plant, to be erected as soon as the receivership is lifted and reorganization effected. Mr. Glosser, it is reported, suggests that the power station be located at Newman's, 8 miles south of Marion. The cost of the proposed plant is estimated at \$90,000.

**Scranton & Binghamton Railway, Scranton, Pa.**—This company contemplates the erection of a 66,000-volt electric transmission line from the present terminal in Tiany to Binghamton during the present year.



# Manufactures and Markets

Discussions of Industrial Conditions

A Department for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases

Business Announcements

Trade Literature

## Co-operation Among Manufacturers Brings Results

Associated Manufacturers of Electrical Supplies Hold Annual Meeting in New York—Review of Progress Made

The third annual meeting of the Associated Manufacturers of Electrical Supplies was held March 15 at Delmonico's, New York. This organization was formed during the early part of 1915 and according to President Robert K. Sheppard, "The impulse came to the manufacturers after the discovery by many simultaneously that an emergency could confront them suddenly and might be followed by serious consequences if they lacked machinery with which to bring their members together for collective action."

The objects of the association as given in the constitution are to advance and protect the interest of the manufacturers of electrical supplies and of the manufacturers of materials entering into electrical construction, in manufacturing, engineering, safety and other problems, to promote the standardization of electrical materials, to collect and disseminate information and to promote co-operation among the members.

In the absence of President Robert K. Sheppard, sales manager Simplex Wire & Cable Company, Boston, Mass., his report was read by the vice-president, H. B. Crouse, Crouse-Hinds Company, Syracuse, N. Y. He said, in part: "The promotion era of the electrical industry is over. For it the age of wonders still holds some secrets, but when disclosed they will constitute refinements of the art, rather than fundamental forces in this enormous business.

"In the last thirty years electric power, light, transportation, the telegraph, the telephone could not be provided too fast. The world was quick to speed up proportionately in the race for domination of nature's forces and the achievement of wealth and material comfort. Magical expansion was accompanied by almost uncanny prosperity, in which phenomenal profits completely buried the unsuspected losses due to waste and a total disregard of the ratio of cost to selling prices.

"But that period has passed. The spendthrift manufacturer, the blind adopter of his competitors' market values and methods, can no longer find shelter from the financial cyclone. Our industry has trodden the same historic path which has forced every other basic industry to a closer and closer study of the costs of production and the costs of distribution."

J. F. Kerlin, National Carbon Company, presented the report of the finance committee, which showed all indebtedness paid and a cash balance on hand. The committee felt that this report was due to the efficiency of the treasurer, J. W. Perry, of the H. W. Johns-Manville Company.

According to Charles E. Dustin, the general secretary, "Many lines of activities have been undertaken by the sections, of which there are fifteen, during the year, and after acting upon the ordinary topics of standardization of design, as well as matters of interest with the Underwriters' Laboratories, many of the sections have now specifically taken up the compilation of statistics pertaining to product handled by the members, figures being first submitted to the general secretary and tabulated by his office and the net results given to each of the members, without disclosure of the name of the individual manufacturer.

"Much progress has been made by co-operation of the manufacturers in the matter of a uniform basis for figuring costs. For this purpose articles manufactured by different members have been specified and costs submitted through the office of the general secretary. It is interesting to

note that these figures have shown a variation of from 25 per cent to 40 per cent, indicating an improper distribution of expense items, and proving conclusively the necessity of adopting a uniform basis of cost accounting.

### GOVERNORS RE-ELECTED

Five members of the board of governors whose terms expire were re-elected for three years from April 1, 1917, as follows: A. W. Beeresford, Cutler-Hammer Manufacturing Company; L. W. Downes, D & W Fuse Company; E. B. Hatch, Johns-Pratt Company; B. E. Salisbury, Pass & Seymour, Inc., and R. K. Sheppard, Simplex Wire & Cable Company.

At the banquet on the evening of March 15, T. M. Debevoise was the toastmaster and the speakers were Edward N. Hurley, retiring chairman of the Federal Trade Commission and the Hon. Job E. Hedges, who made a stirring patriotic address. Mr. Hurley said in speaking of the duty of business men to safeguard their own interests:

"One of the real needs among American business men to-day is a broad view of business and a comprehensive grasp of industry as a whole. Too many American manufacturers and merchants center all their energy and attention upon their particular establishment and the work of making profits for it. Men at the head of factories need the point of view of what might be termed as the 'statesmanship of business.' They need to appreciate the fact that their plant is only a part of a great industry; that their individual welfare depends very largely upon the welfare and progress of the whole industry and of industry in general."

## Save Profits Instead of Making Them Buying in War Market Costly—Economies Effected in Saving—Right Buying a Study

BY W. H. SMAW

Purchasing Agent, Georgia Railway & Power Company

Everyone interested can see how the accompanying figures affect the cost of every article used by this company, as these metals enter in some way into the manufacture of every piece of apparatus used. This page could easily be filled with comparisons. Not one single item bought by this company has gone down in price. Not one has remained stationary. Every solitary one has gone up from 25 per cent to 300 per cent.

Regulated and right buying is a study in economics, but economy can be effected in other ways: By saving, by using what we have instead of ordering new material where the old will do, and by careful inspection of everything before it is consigned to the scrap heap.

TABLE SHOWING INCREASE IN PRICE OF METALS AND IRON AND STEEL PRODUCTS SINCE THE BEGINNING OF THE WAR

Metals	Increase in Per Cent	Pig Iron	Increase in Per Cent
Lake copper	160	No. 2 foundry, Birmingham	92½
Electrolytic	173	<i>Iron and Steel Products</i>	
Casting	156	Bars	152
Tin	37	Plates	204
Lead	95	Shapes	161
Spelter	169	Pipe (¾ in. to 3 in.)	62
Aluminum	271	Wire (nails)	94
Antimony	164	Sheets	122
Sheet copper	127	Tin plates	112
Copper wire	184		
Sheet zinc	200		

If one looks over the field of endeavor connected with production and manufacturing and observes its tendency during the past decade, it will be noted that intensive economical operation is applied more closely as time goes



on, until the condition exists with many concerns that they save their profits instead of making them. General bulletins have been issued by many of the steam and electric roads and other industries, calling attention to the conditions now existing, demanding the practice of the strictest economy in the use of materials and recommending that all changes and repair work be held in abeyance until prices change.

When some careful thought to the prevailing conditions is given, one can understand why our managements wish us to practice economy. We suffer as does the individual, since we are consumers, strictly speaking. It is obvious that this increased cost is being absorbed by us and cannot be placed on the shoulders of our customers, as is being done by every other line of business. Our car fare is still a nickel, and our charges for electric current remain the same. Until recently we were pretty well protected by contracts made long ago and by heavy purchases that anticipated the enormous increases in cost. Now, however, we are face to face with the new conditions. From now on we are buying in the war market.

### Increased Prices in Cleveland

#### Unit Prices Given for Three Years with the Per Cent Increase for the Period 1910-1916

In the recently issued annual report of the Cleveland Railway Company attention is directed to the "continual advance in wages and in the prices of materials." These figures, which were prepared under the guidance of John J. Stanley, president of the company, no doubt are representative of similar changes which have been effective on other properties. The following table shows the average rate of wages paid during 1910, when the "Tayler franchise" went into effect; the rate paid during 1913, which was the year before the war, and the rate paid during the latter part of 1916. The prices of different materials used in large quantities by the Cleveland Railway Company during those years are also given.

TABLE SHOWING RATE OF WAGES, PRICE OF MATERIALS AND PERCENTAGE INCREASES DURING 1910, 1913 AND 1916

	1910	1913	1916	Percentage Increase	
				1916 Over 1910	1916 Over 1913
Wages of trainmen, per hour	\$0.25	\$0.29	\$0.33	32	14
Track labor, per hour	.18	.20	.22½	25	12½
Shopmen, per hour	.24	.26	.32	33	26½
Brass, per pound	.18½	.21	.29	56½	38
Steel car wheels, each	14.00	17.50	25	25	25
Cement, per barrel	1.20	1.49	1.84	53	23½
Copper, per pound	.14	.18	.44½	217½	147
Galvanized span wire, per 100 ft.	1.62	1.53	3.35	100½	119
Gears, each	12.10	26.35	27.53	127½	4½
Rail per ton, f.o.b. Cleveland	39.55	50.55	..	..	27½
Bar iron, per hundredweight	1.80	2.10	2.50	38½	19
Paving brick, per thousand	13.00	16.50	18.00	38	9
Pinions, each	1.75	2.84	4.63	164½	63
Steel, per hundredweight	1.90	2.24	6.80	257½	203½

### Uniform Size for Catalogs and Advertising Literature

BY W. L. CHANDLER

Assistant Treasurer, Dodge Manufacturing Company, Mishawaka, Ind.

I have been interested in Mr. Dunbar's communication in your issue of March 10, and appreciate the cooperation of the ELECTRIC RAILWAY JOURNAL in helping to bring about a reform in the catalog field.

The particular size of the master catalog is not so important just at this moment. To my mind, the most important phase of the whole matter is to get the buying and selling interests of the country together and get them to decide upon that which is best.

Using a vertical letter file, there is nothing to prevent us putting in that file printed matter of sizes smaller than the size of the file, so that the principal concern will be that of having the file large enough to take the largest size pamphlet. However, if they could all be of one uniform size

the convenience of the buyer would be very largely increased. If I were a salesman or sales manager, and knew that a buyer had a file of this kind, I should promptly forget the cost of the paper for my little troubles, and bend every effort to place my printed matter in such form and size that it would best serve the convenience of the buyer, so that when he went to the file looking for material in this line, my printed matter, being most convenient for him, would be likely to be used by him.

The cost of getting out printed matter consists of the gathering of the information, printing, cost of distribution, and waste when it reaches the buyers' hands. When a sales manager considers all of these various factors he will very quickly realize that the cost of paper and the labor of enclosing sink into insignificance in comparison with the chance of loss through failure to command the respect of the buyer when in the market.

I am preparing an article now which I shall send you very shortly, showing what can be done in one industry toward preparing a standardized index, which is one of the most important features of a master catalog. I am hoping that this suggestion will result in considerable discussion, because the index is an item which will require a great deal of thought before it is perfected.

I have received samples of Mr. Montgomery's folder file. This is quite along the plan I had in mind, although no great value will result from the use of this form of printed matter until the standards are finally established, so that the buyers are all equipped to handle them.

### CURRENT PRICES FOR MATERIALS

Quoted Wednesday, March 22

Copper (electrolytic)	New York, 36 cents per pound
Rubber-covered wire (base)	New York, 42 cents per pound
No. 0000 feeder cable (bare)	New York, 42 cents per pound
No. 0000 feeder cable (stranded)	New York, 39½ cents per pound
No. 6 copper wire (insulated)	New York, 39½ cents per pound
No. 6 copper wire (bare)	New York, 42 cents per pound
Tin (straits)	New York, 56 cents per pound
Lead	New York, 9½ cents per pound
Spelter	New York, 10½ cents per pound
Rails, A. S. C. E., O. H.	Mill, \$40 per gross ton
Rails, A. S. C. E., Bess.	Mill, \$38 per gross ton
Wire nails	Pittsburgh, \$3.20 per 100 pounds
Railroad spikes, 9/16 in. and larger	Pittsburgh, 3.65 cents per pound
Steel (bars)	Pittsburgh, 3¾ cents per pound
Sheet iron (black, 24 gage)	Pittsburgh, 4.85 cents per pound
Sheet iron (galv., 24 gage)	Pittsburgh, 6.55 cents per pound
I-beams over 15 in.	Pittsburgh, 10 cents per pound
½-in. galv. extra high strength steel wire	New York, \$7.04 per 100 ft.
¾-in. galv. high strength steel wire	New York, \$3.52 per 100 ft.
¾-in. galv. Siemens-Martin wire	New York, \$2.60 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York, \$2.00 per 100 ft.
Galvanized barb wire and staples	Pittsburgh, 4.05 cents per pound
Galvanized wire (ordinary)	Pittsburgh, 3.85 cents per pound
Cement (carload lots) with rebate for sacks	New York, \$2.02 per barrel
Cement (carload lots)	Chicago, \$2.06 per barrel
Cement (large lots)	Seattle, \$2.60 per barrel
Sand in large lots	New York, 50 cents per ton
Waste, No. 1 white	New York, 14 cents per ton
Linseed oil (raw, 5-bbl. lots)	New York, \$1.01 per gallon
Linseed oil (boiled, 5-bbl. lots)	New York, \$1.02 per gallon
White lead (100-lb. keg)	New York, 10¼ cents per pound
Turpentine (bbl. lots)	New York, 47½ cents per gallon

### OLD METAL PRICES

Copper (heavy)	New York, 29 cents per pound
Copper (light)	New York, 24¾ cents per pound
Red brass	New York, 20 cents per pound
Yellow brass	New York, 19 cents per pound
Lead	New York, 8 cents per pound
Zinc	8 cents per pound
Steel car axles	Chicago, \$38 per net ton
Iron car wheels	Chicago, \$21 per gross ton
Steel rail (scrap)	Chicago, \$26.50 per gross ton
Steel rail (relaying)	Chicago, \$34 per gross ton
Machine shop turnings	Chicago, \$9.50 per net ton

### ROLLING STOCK

Reading Transit & Light Company, Reading, Pa., is reported to be in the market for fifteen city cars.

Alabama City, Gadsden & Attalla Railway, Gadsden, Ala., has ordered one double truck car from The J. G. Brill Company.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., has ordered six cars from the Wason Manufacturing Company. They will be equipped with G. E. motors and the Philadelphia Holding Company's Radial trucks.

New York State Railways, Rochester Lines, Rochester, N. Y., has placed an order with the Cincinnati Car Company, through W. R. Kerschner, 50 Church Street, New York, for



twenty-five 50-ft. Peter Witt cars. These cars will be similar to the fifty cars purchased from this company in 1916.

Charleston (W. Va.) Interurban Railroad has purchased one 45-ft. baggage-express car from the Cincinnati Car Company. This car will be equipped with four Westinghouse 306 motors and HL control, Westinghouse AMM brakes, Tomlinson couplers and Baldwin K-76 trucks.

Stone & Webster Management Association, Boston, Mass., has purchased eight Birney cars from the St. Louis Car Company, and has practically closed contract for twenty-four similar cars, for service in Bellingham and Tacoma districts, on the lines of the Puget Sound Traction, Light & Power Company.

Lehigh Valley Transit Company, Allentown, Pa., has ordered from The J. G. Brill Company twenty-four 47-ft. center-entrance, front-exit, double-end closed passenger cars, which will be used in suburban service to Catasauqua, Northampton, Bethlehem, South Bethlehem and Allentown. The cost of these cars will be approximately \$10,000, as against \$6,500 for the same type of car ordered three years ago.

Citizens Traction Company, Oil City, Pa., has ordered from the J. G. Brill Company three single-truck, all-steel, one-man cars for use in Oil City. The cars will have the Safety Car Appliance Company's dead man features and will be air operated. They will be equipped with Westinghouse No. 514-A motors with double-end K-36-J control and with Brill type 21-E trucks.

New York State Railways Syracuse Lines, Syracuse, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of March 17 as having placed an order with the G. C. Kuhlman Car Company for twenty-five double-truck cars, has specified the following details for this equipment:

Type of car,	Journal boxes . . . . .	Brill
Front End-Center Exit (Peter Witt)	Lightning arresters,	Westinghouse
Seating capacity . . . . .	Motors, type and number,	West, 506A
Weight (total) . . . . .	Motors, outside or inside hung,	Inside
Bolster centers, length, . . . . .	Paint, varnish or enamel,	Flood & Conklin
Length over bumpers, 47 ft. 7 in.	Registers . . . . .	International
Width over all, . . . . .	Sanders . . . . .	Ohio Brass
Height, rail to trolley base, . . . . .	Sash fixtures . . . . .	Kuhlman
11 ft.	Seats, style,	Cross and Longitudinal
Body, wood, semi-steel or all steel . . . . .	Seating material, . . . . .	Seat cane
Interior trim . . . . .	Step treads . . . . .	Feralun
Cherry	Trolley catchers or retrievers,	Earl
Headlining . . . . .	Trolley base . . . . .	U. S. 13
Agasote	Trolley wheels or shoes, . . . . .	Wheels
Arch	Trucks, type . . . . .	Brill 67 F
Control, type, . . . . .	Ventilators . . . . .	Automatic
West-HLD	Wheels (type and size),	26 in. cast iron
Couplers . . . . .		
Tomlinson		
Designation signs, . . . . .		
Keystone		
Door operating mechanism,		
National Pneumatic		
Fare boxes . . . . .		
Johnson		
Fenders or wheelguards, . . . . .		
Eclipse		
Gears and pinions, . . . . .		
Tool steel		
Hand brakes . . . . .		
Peacock		
Heaters . . . . .		
Peter Smith		
Headlights . . . . .		
Crouse Hinds		

TRADE NOTES

Southwest General Electric Company, Oklahoma City, Okla., will move its branch office from 402 Insurance Building to 301-302 Terminal Building.

John L. Fay, sales manager for the Paducah Pole & Timber Company, is back at his work after six weeks confinement in the St. Louis Hospital, where he had an operation performed.

Wendell & Mac Duffie Company, New York, N. Y., announce that an order has been received from the Public Service Railway for fifty sets of H. B. Life Guards for its fifty new cars now under construction.

William E. Copeland, for the past several years in charge of the New Orleans office of the Westinghouse Lamp Company, has been transferred to the New York office and in the future will have charge of the company's sales in the uptown district of Manhattan.

Mathias Klein, having attained the age of ninety years, has retired from business and transferred his interest in the firm of Mathias Klein & Sons to his sons John M. and Joseph A. Klein who will continue the business under the present title of Mathias Klein & Sons.

W. S. Rugg, formerly district manager of the New York office of the Westinghouse Electric & Manufacturing Company, has succeeded Charles S. Cook as manager of the railway department with headquarters at East Pittsburgh. Mr. Rugg is a graduate of Cornell University and has been with

the Westinghouse company for many years. At one time he was connected with the Chicago office but has been associated with the New York office since 1901. E. D. Kilburn, manager of the power department of the Westinghouse New York office, has been appointed district manager to succeed Mr. Rugg.

Combustion Engineering Corporation, New York, N. Y., announces that Walter H. Wood, mechanical engineer, has become associated with its staff of combustion experts. Mr. Wood has been associated with his brother, A. C. Wood, consulting engineer of Philadelphia, for a number of years. He was also engaged by the American Writing Paper Company, Holyoke, Mass., to make a special study of combustion problems, and was later made superintendent of power plants of the Baltimore & Ohio Railroad Company, which connection he severs to enter the employ of the Combustion Engineering Corporation as engineer of tests and research. This latest move on the part of the Combustion Engineering Corporation, which in the last three years has four times doubled its capacity for output of the various kinds of stokers that it manufactures, further emphasizes its policy of service and equipment to handle any combustion problems that may be presented.

Horne Manufacturing Company, Brooklyn, N. Y., announces the receipt of the following orders: Fifty Q-P trolley catchers from the Kuhlman Car Company for the International Railway and fifty direct from the International Railway; ninety air cleaners from the Westinghouse Air Brake Company for the following properties: International Railway, Ogden, Logan & Idaho Railway, Conestoga Traction Company, Roanoke Railway & Electric Company, and the Bay State Street Railway; 100 Giant brakes from the Cincinnati Car Company for the new cars of the Public Service Railway, twenty direct from the Public Service Railway, six from the Johnstown Traction Company, and six from the Norfolk & Bristol Street Railway; 312 hydrogrounds for the Sao Paulo Tramway Company, Union Electric Light & Power Company, and Binghamton Light & Power Company. The company has also received orders for miscellaneous copper spinnings from the Third Avenue Railway Company, the principal ones being for twenty-five storage battery car headlights, and 200 indicator lamp shades.

ADVERTISING LITERATURE

Drew Electric & Manufacturing Company, Indianapolis, Ind., has issued a bulletin on its protective and reclaiming pole sleeves.

American Engineering Company, Philadelphia, Pa., has issued a bulletin describing and illustrating the Taylor power dump.

Automatic Ventilator Company, New York, N. Y., is distributing a pamphlet illustrating its renewable steel bushings used in reclaiming old controller handles.

Hess-Bright Manufacturing Company, Philadelphia, Pa., is distributing an illustrated bulletin descriptive of ball bearings in machine tools.

Day & Zimmermann, Philadelphia, Pa., have issued a map of the United States showing the location of engineering projects constructed or managed by this company.

Chicago (Ill.) Steel Post Company is distributing catalog No. 17 on its steel fence and fence-posts. In addition to illustrations of this type of fence, methods of fence building are described in detail.

Ohio Brass Company, Mansfield, Ohio, is distributing a well illustrated and prepared bulletin, "Steam Road Electrifications." Seventeen of the most important electrifications, including the Chicago, Milwaukee & St. Paul Railway and the Norfolk & Western Railway, are illustrated and described.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has just issued catalog 5-B on accessories for use on railways, including circuit breakers, fuse boxes, resistors, connectors, etc. This catalog is issued as a section of its general supply catalog. In addition to these accessories, illustrations are also given of the Rico coasting time recorder which records actual number of minutes an electric car or train is operated while coasting, without the use of power or brakes.