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THE PERENNIAL FUEL-SAVING HOAX

At almost regular intervals there come before us circulars descriptive of fuel-saving schemes of one kind or another which seem to be designed solely for testing the credulity of a trusting public. Some few years ago we were advised that a pinch of powder scattered over the ash pile would convert it into fuel with a thermal value rivaling the pick of the Pocahontas field, and now comes a statement that the introduction of a tube directing a stream of cold air downward along one side of the stack will secure from the fuel all the heat units that are in it, saving from 10 per cent to 35 per cent of the coal bill. The alleged principle by which the latter result is accomplished is that the stream of air is separated into its two constituent gases, the heavier oxygen falling upon the burning fuel, and thus producing perfect combustion, while the lighter nitrogen rises up the stack, which is thus kept cool and free from fire hazard. This might be a first-rate explanation of the action of the apparatus were it not for the beneficent law of nature which makes the separation of diffused gases by mechanical means as impossible as "settling out" the salt in sea-water, and which thus provides humanity with an atmosphere that is breathable. Nevertheless, the explanation sounds well, and in all likelihood a part of the public will fall for it, conscientiously proclaiming, because of the power of imagination, the savings that the device has effected. The electric railways, it is to be hoped, will not be afflicted with any efforts that may be made to exploit the apparatus, but if they are we offer a reminder of the great ash-burning hoax that was exposed less than ten years back.

MOUNTAIN RAILWAY ELEC- TRIFICATION

One of our correspondents, in commenting upon the article by F. Castiglioni printed in the issue of the *ELECTRIC RAILWAY JOURNAL* for Oct. 23, calls attention to the danger of considering the electrification problem without taking into account all of the factors involved in steam railroad operation. He mentions the matter of train tonnage as having an all-important bearing upon consideration of grade reduction and as leading to a conclusion different from that reached in the article in question. Another correspondent, William Arthur of New Haven, Conn., criticises the method that was used in estimating the tractive effort available for regeneration, namely, the assumption that this is 80 per cent of the grade resistance. While it would be interesting to bring out a discussion on these and other points, the subject is too large for the space limitations of a technical journal.

We understand, however, as far as the first point is concerned that, in writing the article, as indicated by the modest title "Notes on Railway Mountain Electrification," the author did not intend to consider electrification as a whole but only to present some phases which, from observation of three-phase Italian railways, he thought had not been sufficiently emphasized in this country. On the second point, we understand that the approximation used was intended merely as a general guide to the power available for regeneration, the actual power available being dependent upon several factors not discussed in the article but covered by the figure of 80 per cent taken in the article as the regeneration efficiency.

BROADENING A CORRESPONDENCE COURSE

Facilities for collateral reading are widely used in university work for emphasizing the points made by the instructor and for broadening the student's knowledge of the subject. Indeed, it is recognized that the student's acquaintance with the literature of the subject and the sources where any desired information can be found is more important than the exact information that can be memorized only in limited form from the lectures. It is in connection with this fundamental precept that correspondence courses often prove unprofitable, for even when those in charge are sufficiently conversant with sound educational theory to devote careful and extended study to the presentation of a proper course of collateral reading, many and probably most correspondence students are unable to do the outlined reading on account of the unavailability or expensiveness of the suggested books. In cases, therefore, where employees desire to become better educated through a correspondence course along the line of their corporate duties, a corporation can, at comparatively small cost to itself, perform a real educational service by establishing a company library of all required books. We observe with pleasure that The Connecticut Company has shown its firm belief in this policy by establishing an accounting library to be used in connection with the correspondence accounting course. Only a cursory glance at the list of books already purchased, as noted elsewhere in this issue, will suffice to show the value of the authoritative library placed at the employees' disposal. The result is bound to be not only a more substantial interest in the course itself, but also much more permanent results in the way of wider knowledge and increased efficiency in the accounting department. The act might well be emulated by other companies, for it involves only a small investment with a large return.

COMPETITION FROM THE PRIVATE AUTOMOBILE

We have referred in several recent issues of this paper to the competition and consequent loss of revenue which the electric railways have suffered from the private automobile. The electric railways, however, are not the only sufferers among the transportation companies from this cause. During the past summer, as everybody knows, a very large number of persons who formerly visited the mountains or seashore by train for their vacations took an automobile trip instead, often to the same places to which formerly they would have traveled by train. The splendid roads which have been built in all sections of the country, coupled with the large number of automobiles now owned by those who formerly took railroad trips, have made the automobile tour very popular but to the manifest disadvantage of the railroad receipts. No part of the country has been exempt in this particular. Even the Southern Pacific Company, whose lines stretch over the vast expanses of the Far West, has felt the effect to such an extent that this competition is mentioned particularly by Chairman Kruttschnitt in the last annual report of the company.

To the steam railroads the question is probably not as serious as to the electric railways. The inroads of the pleasure automobile have been entirely in the direction of passenger traffic, and this the steam railroad companies have always declared has been the least profitable part of their business. Many of them have even declared that it has been conducted at a loss. On the other hand, automobile trips of the kind to which we refer do not decrease the amount of freight which the steam railroads have to haul. The consumption per capita is just as great as it was before this new means of transportation was introduced. Indeed, the freight business may be more, if a general ownership of automobiles tends to distribute the population and encourages many people, who would otherwise live in the city, to take up residence in the country.

But with the electric roads the situation is different. Their principal business is the transportation of passengers, and the question arises, what can be done in regard to it? Admittedly the matter is discouraging, but it is by no means hopeless.

In the first place, we must admit that the competition cannot be eliminated although we believe that it may be reduced. The automobile manufacturer has added an important, valuable and permanent means to our methods of transportation. At the same time there are certain things which can be done and which in the interest of the public as a whole should be done. There is no doubt that the automobile, with all its benefits, has brought certain evils, and the electric railway official as a citizen and the electric railway company as a taxpayer, in common with other citizens and taxpayers, have a right to protest that their interests should not be subordinated to those of the automobile owner.

Thus it ought to be possible to do a great deal in showing the public that the interests of the community as a whole will suffer if private automobile traffic takes so large an amount of business from the local railway

company that the local railway service has to be curtailed. This point was brought out very clearly in an article by John A. Beeler, published on pages 590 and 591 of our issue of Sept. 18, 1915. This article, which was prepared for general circulation in Denver, declared that after all the only permanent and continuous means of city transportation was the local electric railway. But, as the article then very clearly explained, "the less the patronage, the less frequent the service. The auto owner who picks up a stranger waiting for a street car and transports him, gratis, to or from the residence district, may labor under the delusion that he is doing a kindly act. But the apparent favor is in fact no favor at all but a detriment to all concerned if the reduced patronage to the railway results in reduced car service, with consequent reduced realty values and curtailment of the ability of the company to make extensions." The injury, therefore, is not confined to the local transportation company, but extends to the community as a whole. The man whose neighbors generally use their own cars in going to and from business can hardly expect that the railway company can give as frequent service on the line which he patronizes as if all the residents on that route patronized the trolley line, nor can the real estate owner, who is anxious to have the railway company make extensions to bring his property within the reach of car lines, expect that it will be in a position to do so when the "rides per capita" of the community have been lessened by the general use of automobiles. These are economic facts which deserve more general recognition than they receive.

Another move which the railway company and its officials can make is to advocate a higher license fee for automobiles. This ought to be done in fairness to the community at large. The automobile is the most destructive agent known to-day to road pavement of the "semi-permanent" class and, in consequence, has probably done more to raise the general tax rate during the last ten years than any other one agency. We realize that from time immemorial it has been customary for the man who walks to pay a larger proportion of the taxes than the man who rides. The latter has nearly always been successful in transferring a large part of his taxes to the former. Nevertheless the proportion of taxes which the owner of the automobile pays as an owner of an automobile, in proportion to the direct damage which his car inflicts upon the roadways, is ridiculously small. Usually it is but a small license fee of say \$10 or \$15, whereas, if he paid his fair proportion of the cost of maintaining the roads the license fee would probably be more than \$100 a year. This cost of maintaining the roads in every community is becoming a very serious problem. None of the comparatively inexpensive methods of road paving, which were formerly adequate, now seems to last long under the tire suction of high-speed automobiles. Engineers of country roads especially are in a quandary as to what to do, and, in the meanwhile, automobile associations are continually lobbying for greater and greater expenditures for roads by city, county and State. If the automobile

owners desire and require these large expenditures for road making, they should pay the costs or the greater part of them, as they are the principal beneficiaries, and they should not attempt to saddle the expense upon that part of the community which does not directly benefit from these improvements. This is a matter in which the electric railway company, as a taxpayer, has a vital interest and in which it should receive the cordial support of those in the community who are not owners of buzz-wagons.

HOW RAILWAY ISSUES FARED

Election day this week brought answers to a number of pending electric railway questions in various places, chiefly in New York State, Philadelphia, Cleveland, Detroit and Toledo. In New York State the commendable section of the new constitution providing for making public service commissions constitutional bodies was literally buried under the avalanche of opposition created by other clauses in the proposed fundamental law of the State. In Philadelphia the constitutional amendment giving the city the right to increase its borrowing capacity for the purpose of raising funds for its transit and other permanent developments, was ratified by a large majority, but the placing of another party in municipal office would seem to reopen the whole transportation program adopted by the outgoing administration. The city is, of course, committed by the approval of the citizens to an elaborate subway construction plan, but no definite arrangement was made with the Philadelphia Rapid Transit Company for subway operation by the Blankenburg administration. The rise of local utility stocks on the Philadelphia Stock Exchange the day after election apparently indicates that the outlook for successful adjustment is good.

Perhaps the greatest interest in election results, as far as public utility matters are concerned, centers in Cleveland, Detroit and Toledo. In Cleveland the ill-advised ordinance initiated by the Socialists and providing for city purchase of the street railway lines was lost. In Detroit the municipal ownership proposal was also soundly beaten, while in Toledo a franchise favorable to the city, drafted by municipal representatives and indorsed by representative business organizations in the hope of removing the franchise question from politics, was rejected. Judging by the vote, it appears to us that the Detroit electorate would gladly have adopted what Toledo citizens defeated. We rejoice to see the turning-down of the costly and inefficient municipal ownership proposition in Detroit, and we trust that the same calm good judgment will be exercised by the citizens in handling subsequent questions involving the operation of the city lines. The Detroit United Railway kept strictly out of the election fight, and as a reward to it for this action as well as in the interests of the city itself, some sane and fair plan of settling the franchise question in Detroit should be adopted. The citizens there evidently do not consider municipal ownership the proper solution.

The rejection of the Toledo franchise is lamentable from the viewpoint of the city. Here was an earnest

effort on the part of the city franchise committee to settle a question which had long been an impediment to the city's growth. Eighteen months had been spent in drafting the franchise, and while it would not be considered elsewhere favorable to the utility, the latter had agreed to accept it. Yet through confusing and frightening the voters by misinterpretations of the terms, certain elements brought defeat to the measure, although no word of constructive criticism was offered by them when the instrument was being formulated. Mr. Doherty said before the election that if the measure did not pass the company would do the best it could and it would not sulk. But, naturally, it will not be able to secure the money needed to put the system in first-class shape until some definite agreement is reached. Months and months of progress have undoubtedly been lost, but nobody is at fault except the people of Toledo.

THE PASSING OF A GREAT POWER PLANT

The shutting down of the Ninety-sixth Street power plant of the New York Railways Company is the most striking recent illustration of the operation of the laws of power generation economics. Here is a once world-famous plant, still in its prime as far as physical condition is concerned, put out of commission because it has been out-distanced in the race for low energy-generation cost. The New York Railways load, superimposed upon that of the Interborough Rapid Transit Company, can be carried for a much lower cost by the great plants of the latter than in a separate power plant. The saving is in fuel, labor, maintenance, water, administration; in fact, in all elements of cost. While this is the most conspicuous instance of the practical abandonment of a large plant in favor of purchased power the same principle has been in process of application for a long time in various power systems. The gradual absorption of railway power business by the Commonwealth Edison Company of Chicago is a matter of contemporary history.

We have recently directed attention to the tendency toward the purchase of power, particularly where large plants are involved. A recent example is furnished by the New Haven Railroad, which now receives power for the New York, Westchester & Boston Railway and for part of the electrified steam road from the United Electric Light & Power Company. If we accept as a general principle the assumption that one plant can generate energy more cheaply than two, then it follows that economy results from combining the loads of two plants serving the same territory, provided reliability is not sacrificed by consolidation. Events seem to justify the above assumption. We anticipate, therefore, that in the largest cities particularly there will be larger and fewer power plants. At the same time, as we pointed out editorially last week, the small plant still has a large field in the railway industry. Its problems come nearer to the every-day life of the large number of railway engineers than do those referred to above. There is, however, a great deal that these men can learn from the experience of the large plants which are doing the sensational things in the power field to-day.

Seven Years of Operating Experience of a Single-Phase Interurban Railway

Chicago, Lake Shore & South Bend Railway Has Fine Record for Reliability of Service and Has Greatly Reduced Maintenance Costs and Equipment Failures—Operating Methods and General Results Obtained are Described

On the Chicago, Lake Shore & South Bend Railway, the headquarters of which are at Michigan City, Ind., single-phase equipment has been in service for more than seven years under unusually severe operating conditions. Cars weighing 55 tons frequently attain speeds as high as 68½ m.p.h., 60 and 65 m.p.h. being regularly reached on certain sections of the road. Multiple-unit trains of from two to seven cars, built up on a moment's notice, are operated daily, and enviable results have been obtained both as regards low operating costs and reliability of service.

At the time the Chicago, Lake Shore & South Bend Railway was built it was the most important single-phase installation in this country. It extends along the southern shore of Lake Michigan from Pullman, a suburb 14 miles south of the Chicago loop district, to South Bend, Ind., a distance of 76 miles. In the beginning the cars of the electric line connected with those of the Illinois Central Railroad, a steam road, at Pullman, Ill. About two and one-half years ago, however, a traffic arrangement was made whereby through trains or cars were operated between Gary, Ind., and the Randolph Street station of the Illinois Central Railroad in Chicago. Electric motor cars pull these Chicago coaches or trailers from Gary to Kensington, Ill., where they are coupled to a suburban-type steam locomotive for the trip to Chicago's downtown district.

That portion of the single-phase line between Pullman and Gary is built through the densely-populated industrial district requiring numerous station and railroad crossing stops, as well as relatively low speeds, because at many points the tracks are laid in the streets. The road from Gary to Pullman is double tracked and

17 miles long, while that from Gary to South Bend, the eastern terminus of the road, is single track and 59 miles long. Between Gary and South Bend there are relatively few stops, and on this section of the line the maximum speeds are attained. At no point on the line is a curvature greater than 10 deg. encountered, and the maximum gradient of approximately 2 per cent obtains only at one or two overhead crossings.

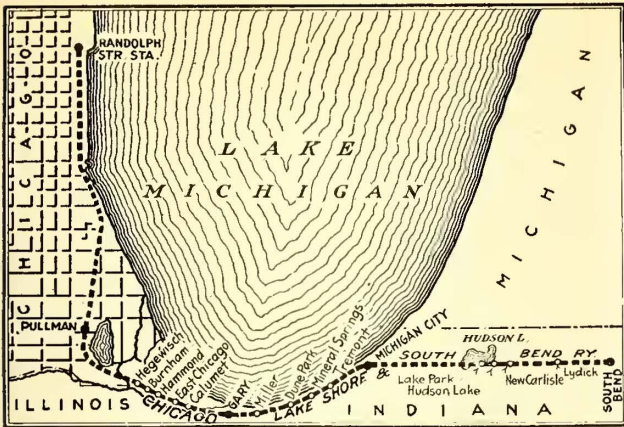
Track is laid with 70-lb. and 85-lb. A.S.C.E. rail and creosoted ties on crushed stone and gravel ballast. The overhead construction consists of No. 0000 grooved, copper trolley wire with a steel contact wire of the same section supported from a catenary messenger wire hung from 9-ft. mast-arms. Poles are 45 ft. long, of longleaf pine creosoted throughout, including the cross-arms, and set in concrete. Track, overhead construction, bridges and other structures are maintained in first-class condition.

METHODS OF HANDLING TRAFFIC

Traffic is confined largely to the passenger business, exclusive of package express handled by one of the standard express companies, milk shipments and passengers' baggage. Beginning Nov. 1, 1915, however, the company began to take on a car-load freight business, for which the line offers great possibilities. Between Gary and Pullman the passenger business is largely local, with morning and evening peaks. During the spring, summer and fall months numerous special parties are handled, and many of these arrive at Gary and Pullman unannounced, making it necessary for the transportation department to be prepared at both these points for any emergency. A passenger



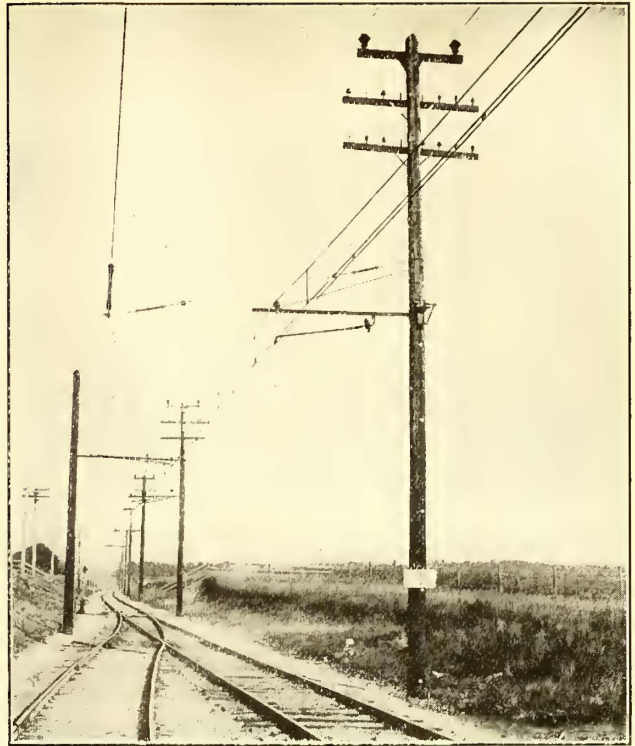
SINGLE-PHASE OPERATION—SINGLE TRACK EAST OF GARY



SINGLE-PHASE OPERATION—MAP SHOWING PART OF CITY OF CHICAGO ON ENLARGED SCALE

coach yard at each of these stations, with plenty of extra cars, enables the transportation department to cope with these instantaneous rushes. Trains to meet these emergencies vary in size up to seven cars each.

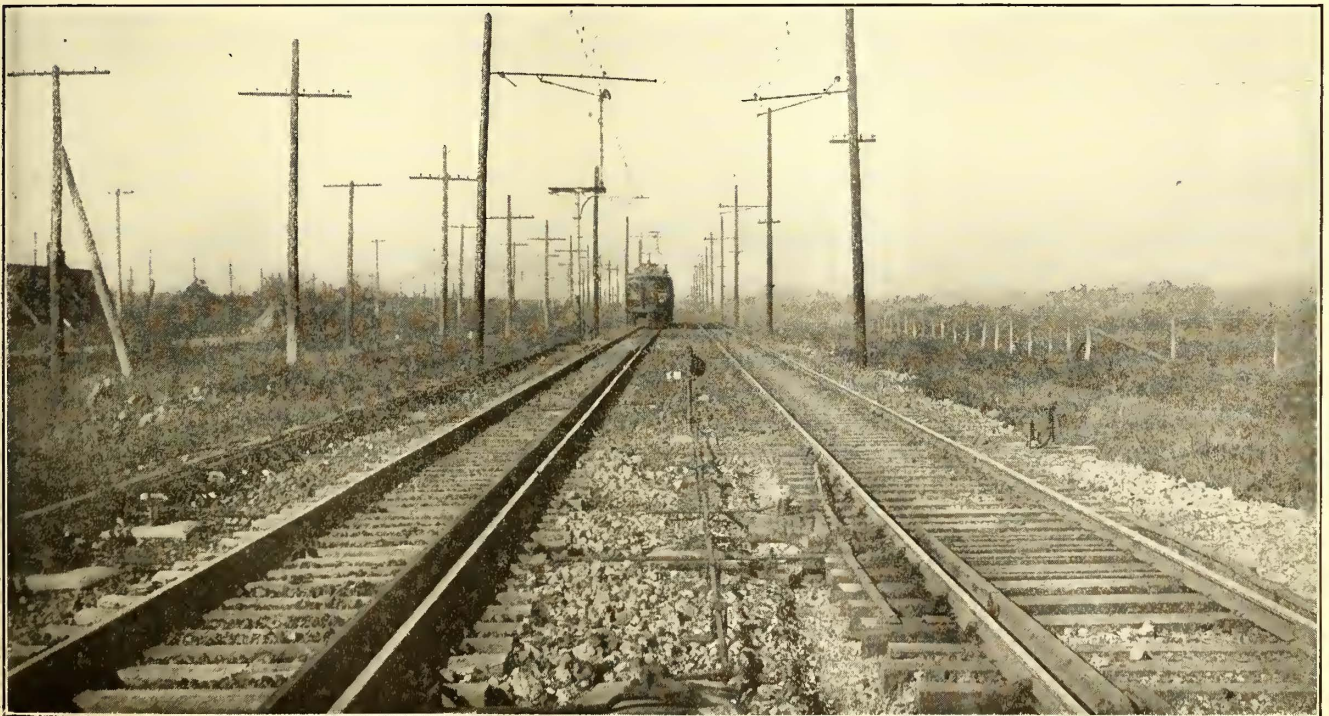
Limited trains between South Bend and Gary average about 5 miles between stops, while between Gary and Pullman the average is sixteen stops in 16 miles. This service is performed with a three-car train made up of one motor car and two trail cars. Local trains average about 1 mile between stops during the rush period. When local traffic is heaviest, frequently trailers are handled between South Bend and Gary, and on the remaining trip to Pullman this local train usually hauls two trailers. The ratio of trailers to motor cars operated on a maximum day averages 45 per cent to 50 per cent, and for a normal day from 30 per cent to 35 per cent. Trailers or coaches are added to trains to take care of increased traffic with the following average results: Seat increase, 150 per cent; tonnage increase, 128 per cent, representing a saving in weight per train of 22 per cent. On the normal day 23 per cent of the seats furnished are in trailers and 77 per cent are in motor cars, and on a maximum day the percentages are 44 and 56 respectively.



SINGLE-PHASE OPERATION—OVERHEAD CONSTRUCTION AT SIDING

Regular schedules require twenty-three trains, usually consisting of three or four cars each, between Gary and Pullman, and eleven trains each way consisting of one or two cars each between Gary and South Bend. Local trains make the 76-mile run between South Bend and Pullman in two hours and fifty-two minutes and express trains make the same run in two hours and thirty minutes. The express trains between South Bend and Gary make the 59-mile trip in one hour and forty-two minutes and between Gary and Kensington, a distance of 17 miles, in forty-three minutes.

As an example of the regular morning schedule out



SINGLE-PHASE OPERATION—DOUBLE TRACK BETWEEN GARY AND PULLMAN



SINGLE-PHASE OPERATION—REGULAR CHICAGO-GARY TRAIN

of Pullman, the 6.18 a. m. train is made up of two motor cars and two trailers. One motor car and one trailer are set out at Gary, one trailer at Michigan City and the motor car continues the trip to South Bend. On this trip an average of 685 passengers are handled daily, seventy-two stops are made, and 102 milk cans, ten pieces of baggage and sixty-seven pieces of express are picked up and delivered.

To maintain regular schedules twenty-two main-line crews, eight collectors and four flagmen are required, in addition to four crews for the city-line service between East Chicago and Indiana Harbor. The conductors on excursion trains of three or more cars are held responsible only for the safety of the train while the collectors take up all fares. Between Gary and Pullman each train also carries a flagman who operates all derails and flags trains across the railroad crossings.

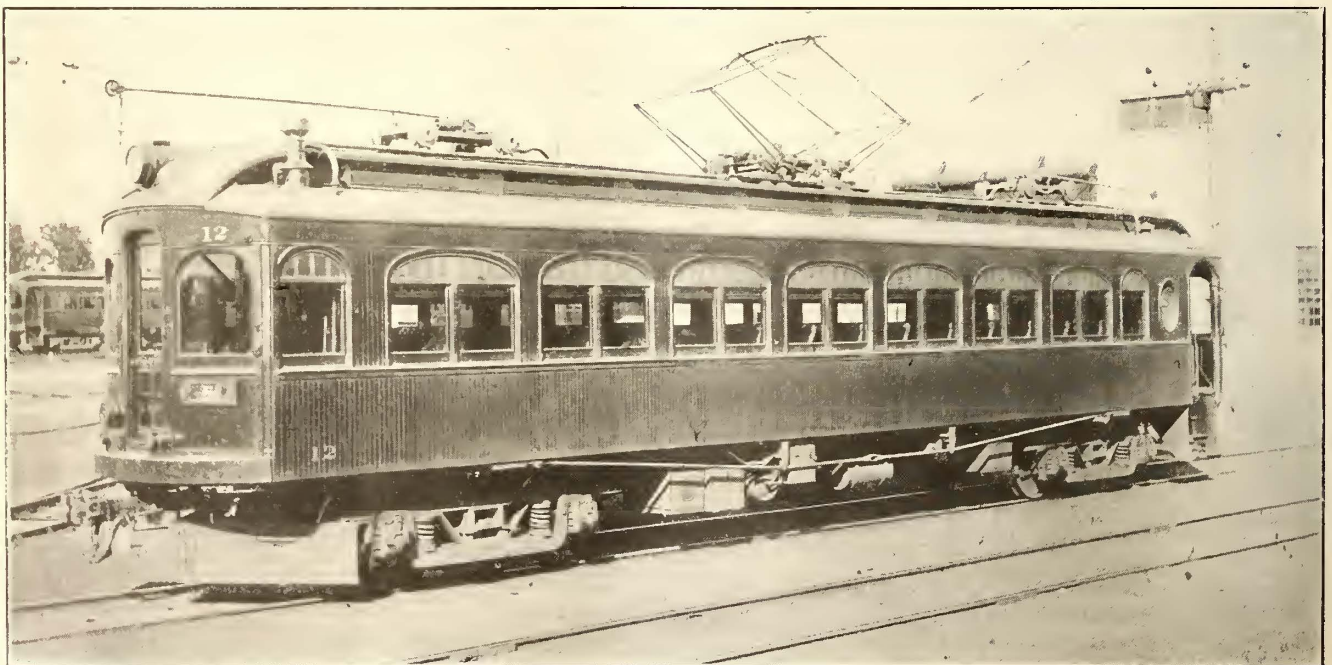
Between these two points there are eleven steam railroad crossings, involving the crossing of twenty-five tracks, and three of these crossings are interlocked. The line is also intercepted by one drawbridge, where operators are stationed at all times.

All prospective motormen, upon breaking in, are required to spend four weeks in the shops with the regular repair force. During this time they are paid 17½ cents an hour, and the master mechanic sees that they are made familiar with various defects in the car equipment in the different shop departments. This training, to a certain extent, accounts for the relatively few car failures attributable to the motormen's abuse of equipment. All motormen are examined once a year to refresh their memories concerning the equipment as well as the rules. Upon taking charge of trains all motormen are required to test the brakes and the pantographs as a safety precaution. If additional motor cars are added to multiple-unit trains the brakes and pantographs are again tested.

ROLLING STOCK

The passenger equipment includes eleven passenger motor cars and eight combination motor and baggage cars weighing 55 tons each. There are also ten 50-ft. trail cars weighing 27½ tons each and four 60-ft. trail cars of about the same weight. The passenger cars in single units and in trains are provided with motor capacity as follows: Single motor cars, 9.1 hp. per ton; motor car and one trailer, 6.1 hp. per ton, and motor car and two trailers, 4.6 hp. per ton. These cars are mounted on Baldwin class 90-35 M.C.B. trucks with 7-ft. 6-in. wheelbase. The trucks are fitted with 38-in. rolled-steel wheels mounted on axles 6½ in. in diameter at the center, 7½ in. at the gear seat and 7 in. at the wheel seat. The journals are 5½ in. x 10 in. inclosed in Symington journal boxes and fitted with M.C.B. brasses. All trucks have ball-bearing center bearings designed for a center-plate load of 35,000 lb. The body and electrical equipment on the motor car weighs 59,750 lb. and the trucks and motors 51,600 lb., making the total weight 111,350 lb.

The electrical equipment on the motor cars includes four Westinghouse No. 148 single-phase motors rated at 125 hp. and equipped with multiple-unit control. With this equipment the average energy consumption at the power plant is 5.75-kw.-hr. per car-mile. Considering cars with a seating capacity of sixty-two and a gross weight of 57 tons, the following results are obtained: Watt-hours per ton-mile, 101; per seat-mile,



SINGLE-PHASE OPERATION—STANDARD PASSENGER CAR

COMPARATIVE STATEMENT OF CAR EQUIPMENT FAILURES OR TROUBLES

	Broken Air Pipes	Switch Group	High-Tension Cable	Armature Trouble	Car Body Damaged	Motor Trouble	Hot Axle	Air Compressor	Pantograph Insulation	Pantograph Lock	Line Switch	Low Bearings	Field Troubles	Hot Journals	Pantograph Off	Headlight	Triple Valve	Reverser Wires	Broken Gear	Flat Wheels	Total Failures
1910																					
July	2	5	1	6	6	1	2	4	4	4	2	1	7	7	2	1	1	1	1	1	51
August	2	5	1	6	6	1	2	4	4	4	2	1	7	7	2	1	1	1	1	1	44
September	2	1	2	4	3	3	2	3	6	3	2	2	3	3	4	1	1	1	2	1	42
October	1	3	1	3	3	3	2	1	3	2	1	1	3	3	4	5	1	1	1	1	35
November	1	2	4	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	16
December	1	8	5	1	1	1	2	1	1	1	1	1	5	7	3	3	1	1	1	1	37
1911																					
January	2	4	3	2	4	1	1	1	1	1	1	1	2	4	2	2	1	1	1	1	27
February	1	3	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	14
March	2	3	1	2	1	1	1	1	4	1	3	1	2	4	1	1	1	1	1	1	26
April	1	1	1	1	1	1	1	1	3	1	1	1	1	4	1	1	1	1	1	1	15
May	4	5	3	2	2	2	2	2	13	1	1	2	11	2	11	2	2	5	1	1	51
June	4	3	2	1	5	1	2	6	1	1	2	1	10	1	10	1	2	1	2	1	40
July	2	2	1	3	1	2	1	6	1	1	2	1	13	1	13	1	1	1	1	1	34
August	1	6	1	2	2	2	3	3	2	2	2	2	2	2	2	1	1	1	1	1	12
September	2	1	1	2	2	2	3	3	2	2	2	3	2	2	2	2	2	2	2	2	20
October	1	3	1	2	6	4	3	2	2	2	2	2	6	3	3	3	1	1	1	1	27
November	1	4	1	1	4	1	4	3	3	3	3	1	1	1	1	1	1	1	1	1	16
December	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	282

SINGLE-PHASE OPERATION—EQUIPMENT FAILURES FOR 1910-1911

only affected two trains on the regular schedules. Another improvement which materially reduced the number of equipment defects was the introduction of a steel slipper wire suspended beneath the copper trolley wire. This decreased the number of pantograph failures which were principally due to broken trolley wire. A change in the style of pantograph insulator also aided in reducing difficulties in this part of the equipment. Brush-holder failures were decreased by the introduction of an improved brush-holder, and failures in the motor fields, reversers and switch groups, as well as the preventive coils were materially minimized by the lower starting torque obtained with the lower gear ratio.

From the preceding paragraph it might appear that equipment failures were numerous and serious, but that never has been the case. Few electric interurban properties can boast of a more reliable service even when the difference in operating conditions are taken into account. As evidence the service records for the years ending June, 1912, and June, 1915, are shown. These

MAINTENANCE COST OF CARS, 1915

Items	AVERAGE FOR EIGHT MONTHS			Average Mileage for Eight Months
	Total Amount	Total Cost	Cost per 1000 Miles	
Wheels, 39 in.	26	\$714.37	\$0.838	
Axles, 6 1/2 in.				
Brakeshoes	926	796.99	0.935	
Car-miles per shoe	61,298 miles			7,649
Brakeshoe heads	56	22.23	0.026	
Brakeshoe-head cones	179	2.68	0.0015	
Brakeshoe-head bolts	54	18.90	0.022	
Brake levers	7	21.00	0.024	
Swing links	8	20.00	0.023	
Springs	8 1/2			
Gear pans		30.00	0.035	
Motor oil	1484 1/2 gal.			
Compressor oil	199 gal.			
Gear grease	2,391 lb.			
Total lubrication cost		412.37	0.483	
Pantograph material		110.69	0.129	
Pantograph and trolley insulators	24	87.60	0.27	
Motor brushes in cars	4,255	261.30	0.306	
Car-miles per brush	140,368 miles			17,546
Brush-holders in motors	57	760.95	0.892	
Brush-holder parts		223.04	0.206	
Brush-holders for air motors	4	9.32	0.0109	
Brushes for air motors	157	9.42	0.011	
Compressor governor parts		15.80	0.0185	
Compressor check valves	7	10.68	0.0125	
Air hose	65	44.52	0.0523	
Switch-group material		56.89	0.0666	
Preventive coils				
Total cost of repairs				
Line-switch material		6.08	0.0071	
Reverser material		4.82	0.0056	
Headlight material		22.89	0.0267	
"Mazda" lamps	692	139.78	0.163	
Armature hahitt metal	624 lb.	321.36	0.378	
Antimonious lead	1,243 lb.	118.08	0.1385	
Armature bearings	4	38.00	0.0445	
Motor bearings	42	29.82	0.0349	
Bearing housings	3	93.45	0.0108	
Armatures rewound	8			
Armatures repaired	10			
Armature material		1,026.68	1.20	
Glass, total cost	88	100.32	0.118	
Car bodies damaged	19			
Car bodies repaired, total		121.25	0.142	
Car bodies repainted	14			
Total cost of painting		1,866.49	2.19	
Total mileage				852,406

SINGLE-PHASE OPERATION—DETAILED TABULATION OF MAINTENANCE MATERIALS AND COSTS

records are typical of all those for the past five years. Calculations made from these show that although the per cent of trains on time has changed only a few per cent, a marked reduction in the number and time of detentions has been made. Against 804 delayed in 1912, only 276 were recorded in 1915. This represents an improvement of from 8798 miles per detention to 21,958 miles per detention. This is also most compelling evidence that single-phase equipment has attained a high degree of reliability. In another tabulation the exact amounts of money spent and the quantities and materials used for the first eight months during the present year in the maintenance of equipment are shown. All of these data are totaled and reduced to a cost per 1000 car-miles.

Single-phase electrical equipment, like any d.c. equipment, had to pass through a period of service tests. Surprising as it may seem, however, at no time have defects in the equipment seriously affected the reliability of the service. As shown in the transportation records, the yearly average of trains on time has seldom, if ever, been below 95 per cent during the eight years of operation, and for the year just closed, June 30, 1915, an enviable record of 98.37 per cent of trains on time was made. Records of this kind could not obtain if equipment defects were numerous or serious. In another article to be published soon these defects will be taken up in detail and the methods by which they have been eliminated will be described. The article will also tell how other operating economies have been developed. Enough has already been given to show that, after making allowances for differences in the operating conditions, the character of service and the schedule speeds, the Chicago, Lake Shore & South Bend

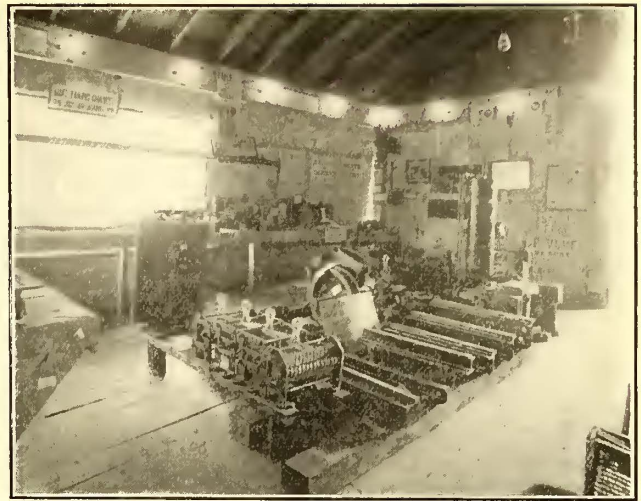
SIGNAL DEPARTMENT—MONTHLY REPORT

Month of... March... 1915..

Division	Failures Chargeable to
No. of Signals	80 Signal Department
No. of Movements	1,113.52 Blown Fuse 1
No. of Failures	3 Burned Out Lamp 4
No. of Trains Stopped	3 Defective Apparatus
Minutes Delayed	10 Track Department
Movements per Failure	37,117.3 Power Department
Movements per Train Stopped	37,117.3 Overhead Department
Movements per Min. Delayed	11,135.2 Operating Department
	Broken Wire
	Miscellaneous
	Creditable Failures 2
Remarks:	
	W. E. ROLSTON, Supt. O.H.L. & Signals.

SINGLE-PHASE OPERATION—TYPICAL MONTHLY SIGNAL OPERATION REPORT

Railway has made a fine record for reliability of service and low operating costs. The present condition of the physical property shows the results of permanent construction and careful maintenance. The management can point with pride to a record of 99.3 per cent of trains on time for an entire year, a maintenance cost of 2.55 cents per car-mile on equipment, and 0.854 cent on overhead and signal lines. During the past five years the percentage of trains on time has never been less than 95 per cent, and in the same period equipment failures were reduced from more than 300 to less than 200 per year, representing an improvement from 8798 miles per detention to 21,958 miles per detention. For these excellent results credit must be given to C. N. Wilcoxon, president and general manager, assisted by his able department heads, J. K. Gray, superintendent; J. E. Rolston, chief engineer, and C. E. Heslett, master mechanic.



BEAVER VALLEY TRACTION COMPANY'S BOOTH AT BEAVER COUNTY FAIR

Utilizing the County Fair in Publicity Work

How An Enterprising Interurban Railway Identified Itself with Its Constituency by Exhibiting at the County Fair

BY W. H. BOYCE, SUPERINTENDENT BEAVER VALLEY TRACTION COMPANY, NEW BRIGHTON, PA.

How many times during county fair days and holidays have we heard the "bromide" exclaim, "I surely would like to have the traction company's receipts to-day!" We have never heard one say, on a winter's night, between 9 and 11 o'clock, "I certainly would like to have what the company earned to-day."

The Beaver Valley Traction Company recently conducted a novel exhibit at the Beaver County Fair for the purpose of demonstrating to the people of the vicinity that all of the nickels garnered by us during those days of the fair were not "velvet," and of impressing upon the public the great variety of ways in which we have appealed to them during our educational campaign for the prevention of accidents. We believe that we made the public think during that week. L. F. Coffin, our master mechanic, was in charge of the booth and explained the operation of the various mechan-

ical and electrical devices. A complete straight air-brake equipment was in operation so that the intermittent pumping of the air compressor and the occasional shrieks of the air whistle attracted crowds as well as demonstrated some of the inner workings of a street car.

For our exhibit we had prepared a panel appearing near the center of the partition above, which showed the sixteen operations necessary in removing old paint from a car exterior and in applying the successive coats of primer, surfacing, sanding, applying color, and striping and varnishing. On the floor space we had arranged a platform-type controller, grid resistance boxes, motor frame mounted on a 4 1/4-in. axle, as shown herewith. We had the whole so wired with carbon lamps as to show clearly the path of the current on different points of the controller. We thus called attention to the large current waste in starting a car so as to give it a comfortable rate of acceleration. The controller, the cover of which was open, showed also the multiplicity of fingers, segments, screws and lock nuts, all of which we used to emphasize the need of continual inspection and renewal.

"Did you ever think"~
That we use these Emery Shoes to grind out flat wheels, which annoy you, whenever you do hear one remember that one of these Shoes is fast grinding it out.

"Did you ever think"~
That we operate 150 of these Comutators at a cost of \$20 each.

"Did you ever think"~
There were so many kinds of Screws in one Street Car.

We Maintain 2,250,600 Sq.ft. of your Street Paving.

"Did you ever think"~
That our 3360 # of these Brasses Cost \$1008 and last only 2 yrs.

"Did you ever think"~
That a Controller had so many parts.

"Did you ever think"~
The scientific painting of a Street Car requires the application of so many coats. Examine this board closely.

"Did you ever think"~
Our Wheels make 16,573,420 Revolutions per day.

"Did you ever think"~
Our Trolley Wheels average 22.6 Revolutions per Second.

"Did you ever think"~
1 1/2 Tons of these brasses in service, Cost \$670.



CENTRAL FEATURES OF BEAVER VALLEY TRACTION COMPANY'S FAIR BOOTH

We demonstrated the construction of an armature, explaining the methods used in building up laminations, pressing in the shaft, assembling the commutator and placing and connecting the armature coils. The boiler tube, some types of overhead line material, car trimmings, the different and latest types of lighting arresters, which we have installed in our efforts to reduce car failures and delays to the minimum and thus better the service, the daily and yearly coal consumption record painted in yellow on a large block of coal, also shown herewith, all were used to call attention to the variety of our problems.

As a necessary adjunct to the solution of these problems of maintenance and renewal we explained the operation of our modern storeroom and, that we might bring home a little more forcibly the extent of our stock, had arranged a board showing types of screws carried and labelled it—"Did you ever think there were so many kinds of screws in one street car?" We further emphasized our storeroom movements by the sign hung over a journal brass—"Did you ever think—1½ tons of these brasses in service, length of life only one year?"

An excellent water color of the "Capture of the Essex," one of the commerce raiders of the War of 1812, bearing the legend, "Yes, our painter did it," was a tip as to the ability and type of workmen we employ. In this connection a single photograph showing the assemblage at our last Christmas tree and a group of employees' field meet photographs gave the public an insight into our employees' welfare work.

That we might also present the financial problems involved in street railway operation we had arranged a series of rails mounted on two cross-ties and used them to illustrate the difference in cost of construction twenty-five years ago and to-day.

Another sign read as follows:

"Your fare has not increased but—
 "Operating expenses 1906 = _____"
 "Operating expenses 1914 = _____"

We went even further and presented a portion of our 1914 expense account, showing cost of maintenance of equipment, of production of power, trainmen and car-house employees' wages, bridge tolls, insurance premiums, maintenance of way costs, etc. We gave this cost to demonstrate that our tax burden, both state and county, was high—not low, as is so commonly the impression.

The last and one of the most important phases of our activities as they are related to the public, that of

"safety first," was brought clearly to the attention of all who visited our booth. These give a fair idea of the accident-prevention advertising matter used and show safety-first matter as it formed a background and border for the exhibits and a covering for the walls. We distributed at the booth the following:

1000 safety-first cards for teamsters bearing at the top a large horse blanket pin.

2500 boxes of safety matches, with a warning sticker on one side lettered in red letters on white background: "Safety First Means a Lot to You. The Beaver Valley Traction Company." On the reverse side, in blue letters on white background was: "We Are Doing Everything in Our Power to Prevent Accidents. Will You Do Your Part?"

1000 scratch pads bearing on front cover: "Note Book." "Note Down Safety First for Yourself, Your Relatives and Friends, and The Beaver Valley Traction Company." On the reverse side was a short discourse on "The Perils of the Street."

1000 halftone booklets given to mothers, the cover bearing a short appeal for safety and the seven pages of the booklet depicting as many ways in which accidents might happen, and a miscellaneous lot, totaling about 1000, of drinking cups, blotters and cards, which we had formerly used in our accident-prevention campaign.

The cost of preparing, installing and removing the appliances in the booth was \$46. The cost of advertising matter was \$56.

As to the amount of good derived, it is too bad that we can't tell you in dollars and cents, isn't it?

Mapping the System on a Window

The Cumberland County Power & Light Company, operating the electric railway service of Portland, Me., and vicinity, effectively advertises the layout of the system by a map painted in colors on the plate-glass window of the waiting room in Monument Square, Portland, as shown in the accompanying halftone. The system extends from Saco to Waterville, and the featuring of the map as a transparency attracts much attention from both inside and outside the waiting room.



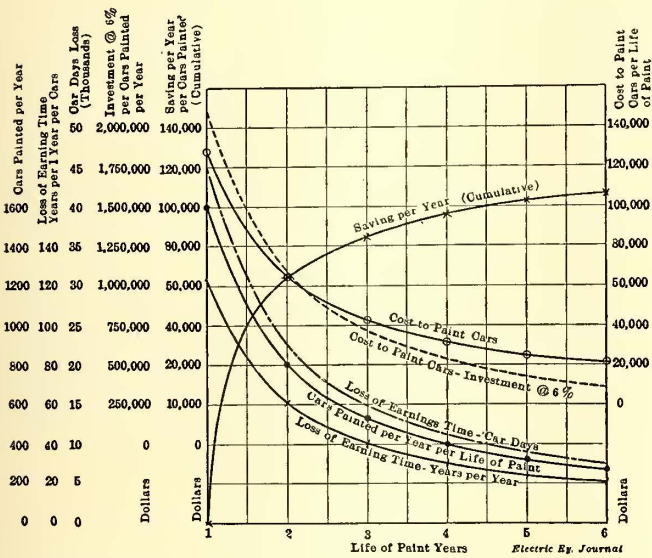
DISPLAY OF MAP ON WAITING-ROOM WINDOW AT PORTLAND, ME.

Graphics in Maintenance Work

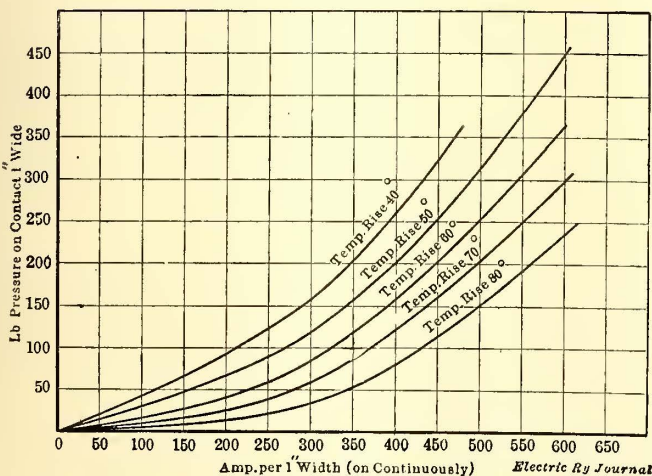
Examples of Graphical Records of Various Kinds Used in Modern Electric Railway Practice, Together with Some Generalizations Based Thereon

Observation of the practice of electric railway companies in different parts of the country indicates that the use of graphical records in electric railway shops is on the increase. Such records have long been used in the power and distribution, accounting and transportation departments, but are only beginning to be appreciated in the equipment department. Some roads use graphical records on a very large scale, while probably few do not find them helpful in some degree. For the purpose of furnishing an instructive exhibit of the kinds of records that are being found useful a number of typical examples were selected from recent volumes of the *ELECTRIC RAILWAY JOURNAL*. These were chosen as representing good practice and possessing commendable features, but no attempt has been made to draw general conclusions from them. They will suggest to some companies how greater use might be made of this method of presenting data, while others may see how their practice can be simplified.

To be effective the information to be put in graphical



MAINTENANCE GRAPHICS—FIG. 1—LIFE-OF-PAINT CURVES, DETROIT UNITED RAILWAY



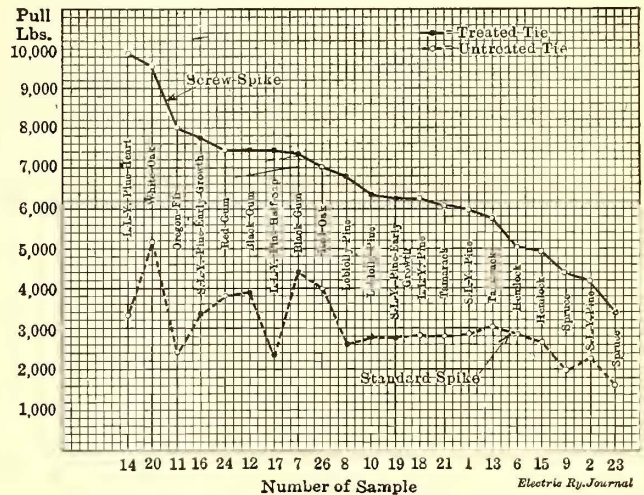
MAINTENANCE GRAPHICS—FIG. 2—SPRING CONTACT PRESSURE CURVES

form must be such as can be used in impressing some lesson in the direction of improvement, or such as it is desirable for employees to keep before them, in a comprehensive way. For example, a graphical record of trolley breaks by months and years cannot but lead to study of causes and remedies. Again, an organization chart of a shop maintenance force shows at a glance "who's who" in the company and how the responsibility is subdivided.

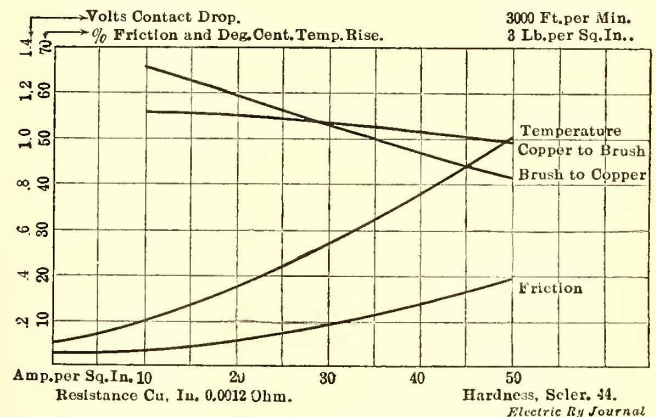
The present practice in graphical records appears to comprehend the following varieties for the purposes indicated:

(1) Curves plotted between variable quantities affecting equipment details, such as the relation between current-carrying capacity of spring contacts and the pressure at the point of contact, or the relation of the life of paint and total cost. Such curves are of great value in determining details of practice on the basis of real information. Manufacturers are in a position to furnish data in this form.

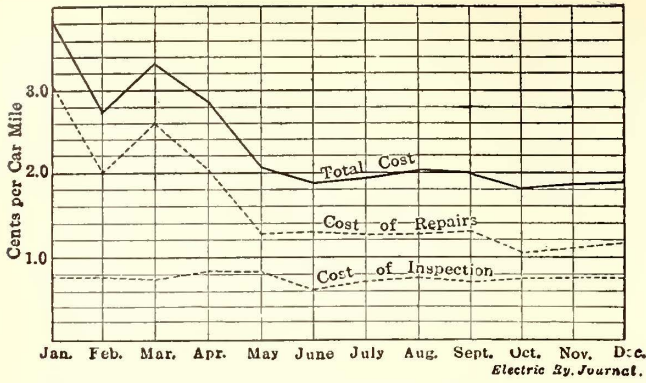
(2) Records of costs plotted, usually, against time for maintenance of detail parts and totals. Such are valuable for the determination of the durability of the individual parts of the equipment and especially as a basis for conference and discussion.



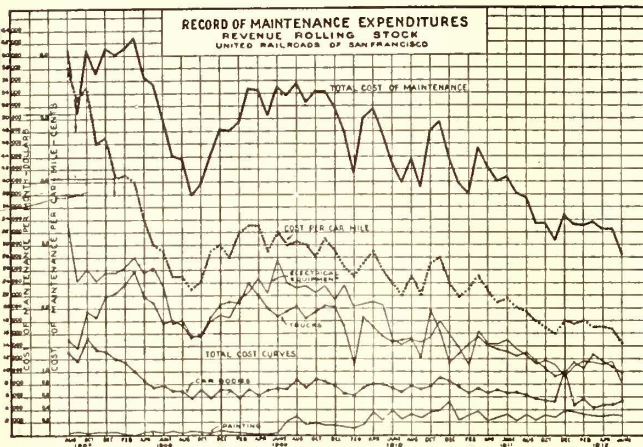
MAINTENANCE GRAPHICS—FIG. 3—HOLDING POWER OF SPIKES



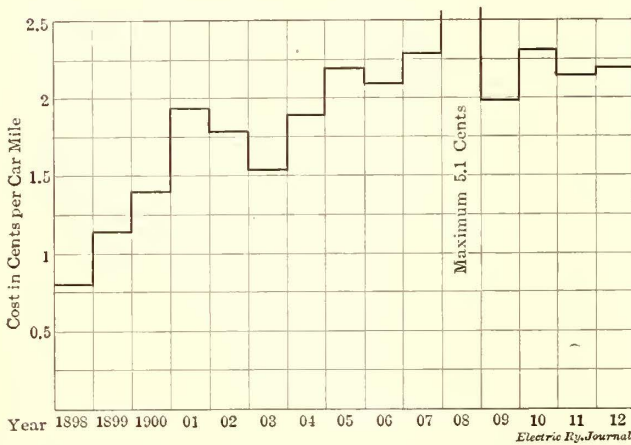
MAINTENANCE GRAPHICS—FIG. 4—CARBON BRUSH CURVES



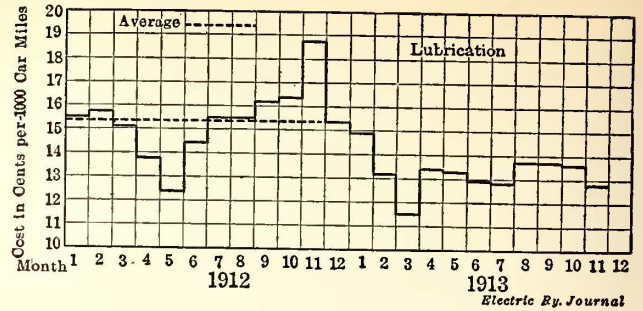
MAINTENANCE GRAPHICS—FIG. 5—CAR MAINTENANCE COST, NEW YORK, WESTCHESTER & BOSTON RAILWAY



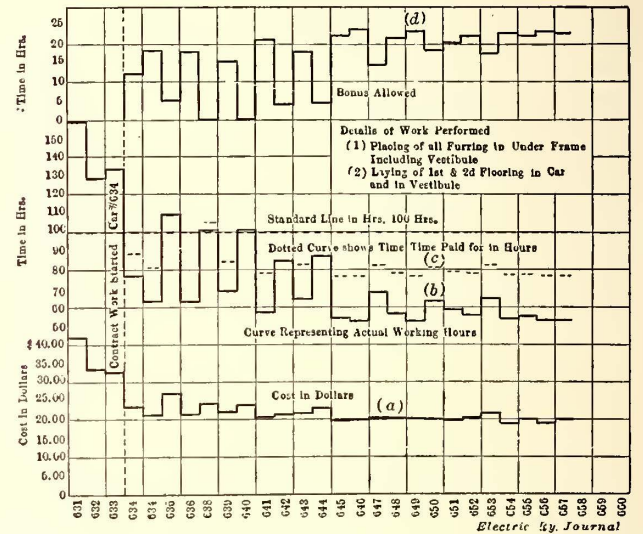
MAINTENANCE GRAPHICS—FIG. 6—CAR MAINTENANCE COST, UNITED RAILROADS OF SAN FRANCISCO



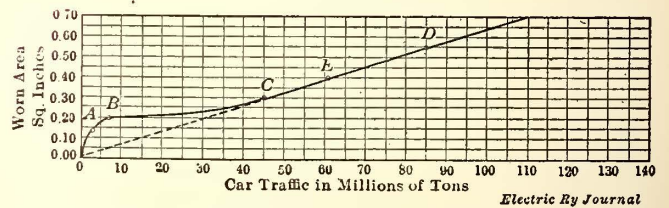
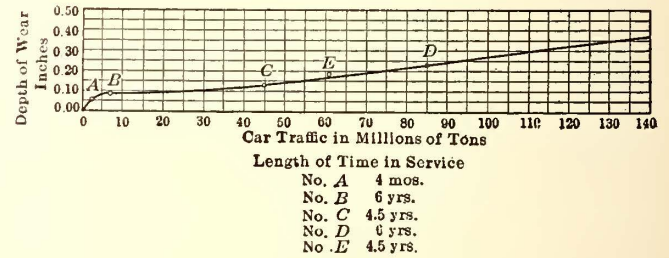
MAINTENANCE GRAPHICS—FIG. 7—CAR MAINTENANCE COST, NEW YORK RAILWAYS



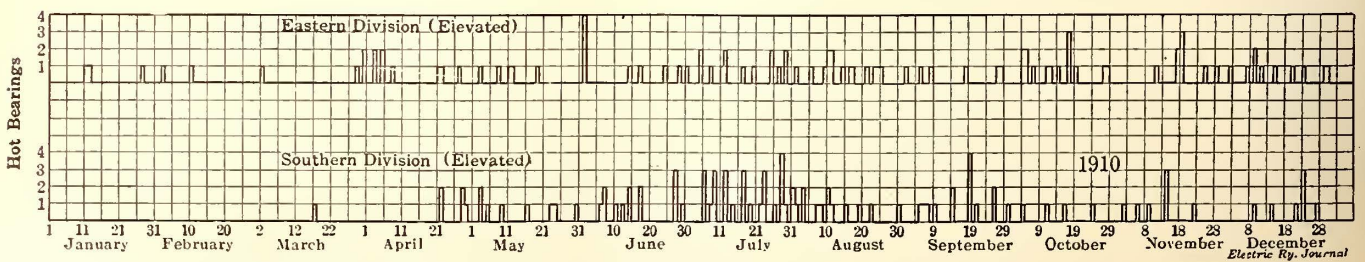
MAINTENANCE GRAPHICS—FIG. 9—LUBRICATION COST, NEW YORK RAILWAYS



MAINTENANCE GRAPHICS—FIG. 10—CAR FLOORING COST, MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY



MAINTENANCE GRAPHICS—FIGS. 11 AND 12—RAIL-WEAR CURVES, UNITED RAILROADS OF SAN FRANCISCO



MAINTENANCE GRAPHICS—FIG. 8—HOT BEARING RECORD, NEW YORK RAILWAYS

(3) Records of performance, usually on a time basis, such as numbers of cars pulled in by months, car-miles per defective car removed from line, hot-bearing records, etc. These are useful for the same purposes as (2).

(4) Construction progress records, partly for the purpose of insuring the delivery of parts at the times they are needed.

(5) Organization and routeing diagrams.

SAMPLES OF SPECIAL STUDIES

As examples of special studies, Figs. 1, 2, 3 and 4 have been selected.

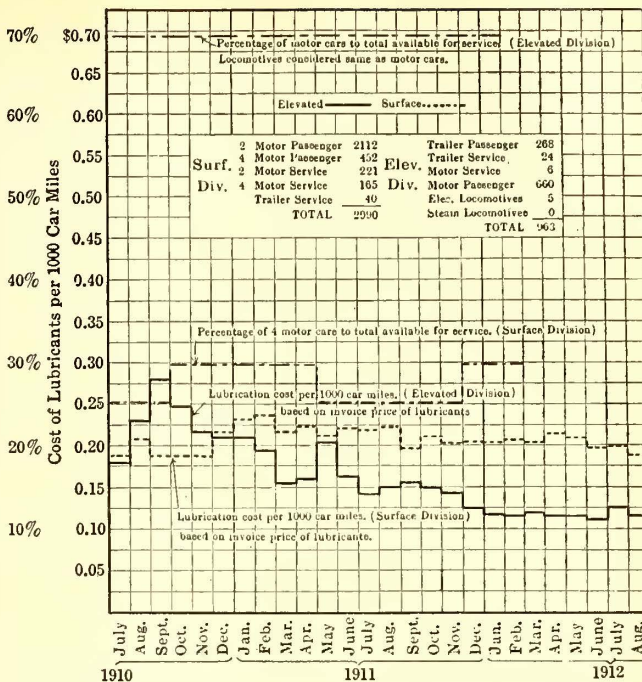
Fig. 1 is a study made by the Detroit United Railway in the process of reducing the cost of car painting by improving washing methods. It shows at a glance the results of increasing the life of car finish and could be used in selecting paint on an economical basis or, as it was, for determining the best methods of washing. Fig. 2 was used by C. W. Squier in his "Equipment Defects" series of articles, printed in this paper, in indicating how circuit-breaker contact pressures affect carrying capacity. Such data for every element of equipment should be in the hands of all equipment men.

Fig. 3 is from a report of the Board of Supervising Engineers, Chicago Traction. It is typical of the kind of information needed in track work in selecting ties and spikes. By the ingenious plan shown a great deal of information is condensed in a small space. This board makes extensive use of graphical presentation of data. Fig. 4 shows curves prepared by a brush manufacturer in the course of improving his product, but they supply exactly the information needed in the shop. Similar curves between brush pressure and voltage drop, pressure and life of brushes, etc., would also be convenient.

While it is true that the handbooks contain a great deal of this sort of information, yet new curves are always turning up and tests are being made for special purposes. Cross-section paper and cloth of letter size, and larger or smaller, are available for records, and a looseleaf binder furnishes a convenient device for filing purposes.

SAMPLES OF CONTINUOUS COST RECORDS

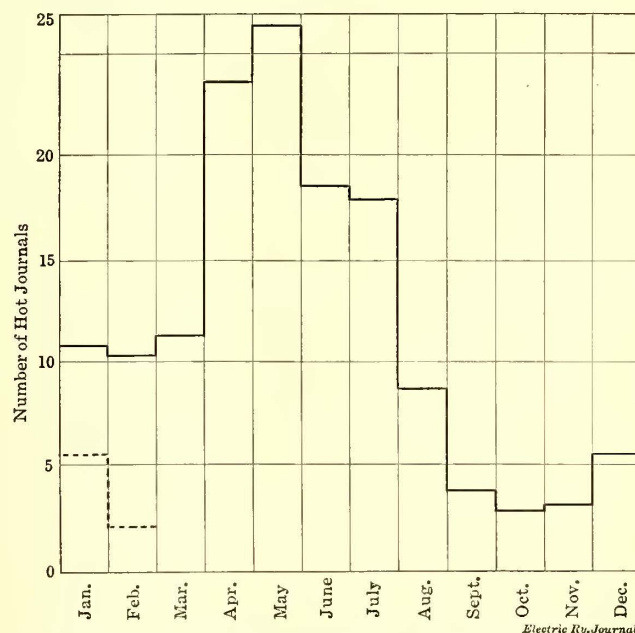
Continuous records of maintenance cost data are easily kept graphically and the advantages of so doing are obvious from an inspection of Figs. 5, 6 and 7. Fig. 5 is from the New York, Westchester & Boston Railway. It serves to show clearly how the cost of repairs was brought down to a reasonable value until it is nearly down to inspection cost. Fig. 6 gives a more elaborate analysis of the United Railroads of San Francisco records prepared by B. J. Arnold. It contains more records in a single sheet than are usually necessary but has the advantage of condensation. In reading diagrams like Figs. 5 and 6 it is necessary to remember that the points represent average values for the period corresponding to the horizontal units and not instantaneous values. The method of plotting shown in Fig. 7 is preferable because it is easier to read except when several lines which intersect are to be plotted on the same sheet. Fig. 7 is a sample diagram from the equipment department of the New York Railways, which employs graphical records on a large scale. This particular chart was prepared for the purpose of showing the change in maintenance costs over a long period, but similar charts, with the month as the time unit, are plotted for all elements of maintenance cost. These are sent monthly to heads of departments and are made the basis of discussion at staff confer-



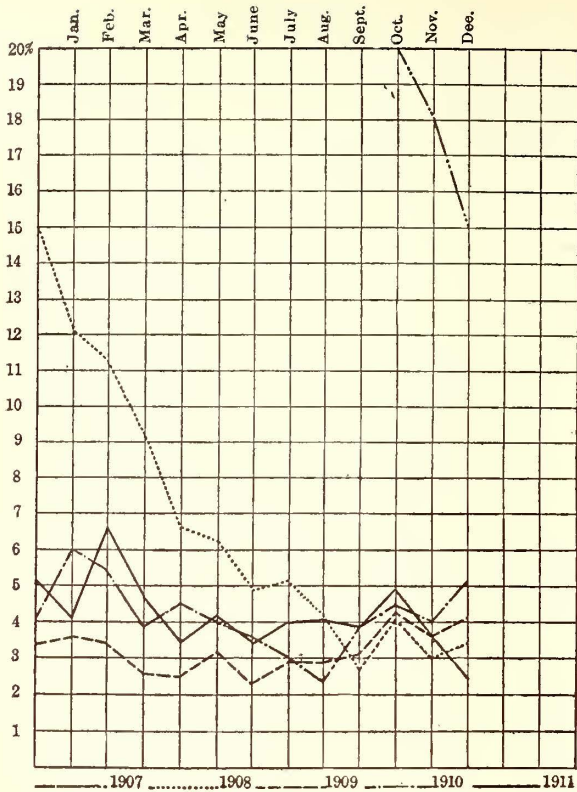
MAINTENANCE GRAPHICS—FIG. 13—LUBRICATION RECORD, BROOKLYN RAPID TRANSIT COMPANY

ences. Obviously discussion with the record of operating results at hand in such tangible form cannot but result in more intelligent shop practice. The advantage of keeping such records in some standard form can be seen from Figs. 8 and 9 from different roads, for if it is profitable to compare performance month by month on one system it is equally so to make inter-company comparisons.

Cost diagrams can often contain other information as to factors affecting cost as, for example, in Fig. 10, which was prepared by the efficiency engineering department of The Milwaukee Railway & Light Company. It shows the effect of introducing a premium system in the flooring of cars. Cars 631 to 633 were framed and floored by day work, cars 634 to 657 under the premium system. Line *d* is the bonus time allowed above a standard of 100 hours set from observation on the first three



MAINTENANCE GRAPHICS—FIG. 14—HOT JOURNAL RECORD, NEW YORK RAILWAYS

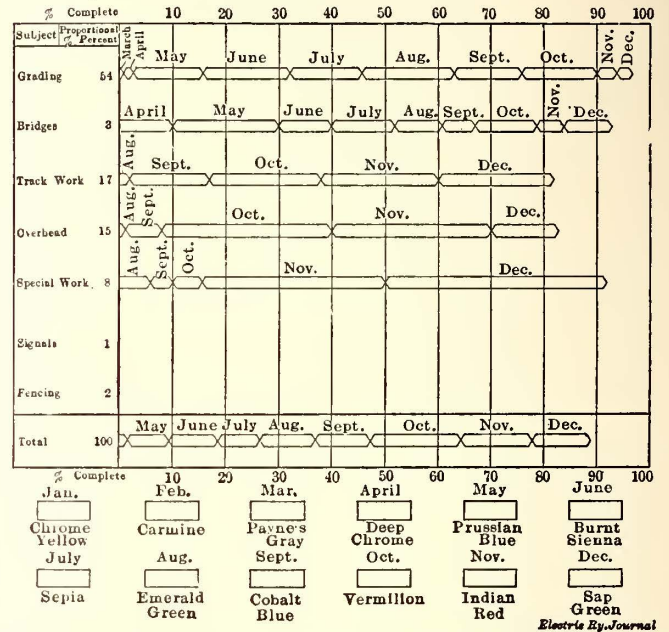


MAINTENANCE GRAPHICS—FIG. 15—RECORD OF CARS PULLED IN, CONNECTICUT COMPANY

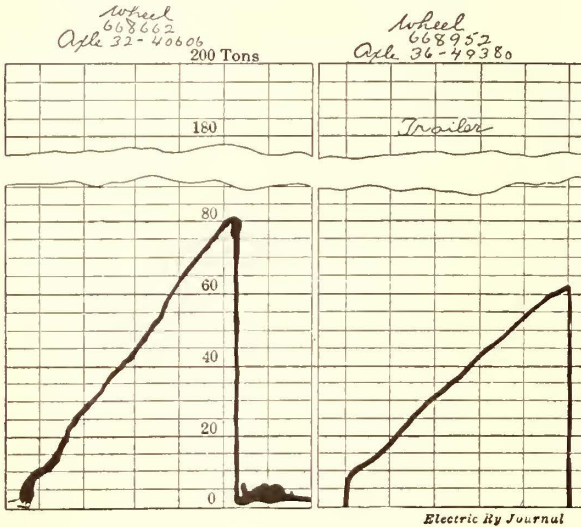
cars. Line *b* is the actual time consumed, in man-hours. Line *c* is the time paid for, and line *a* is the cost to the company for labor on underframe and floor construction.

SAMPLES OF CONTINUOUS PERFORMANCE RECORDS

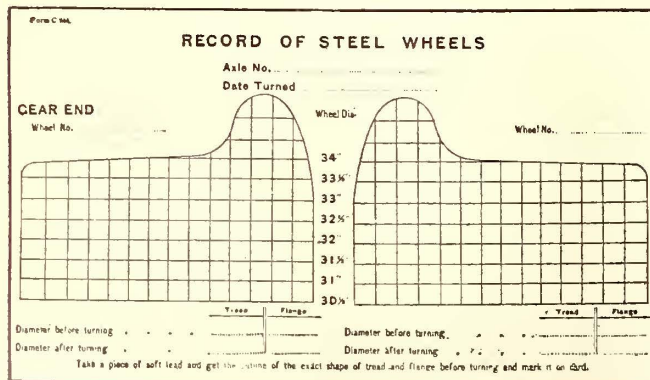
Another class of diagram, typified in Figs. 11 and 12, is of value in keeping track of performance in terms of



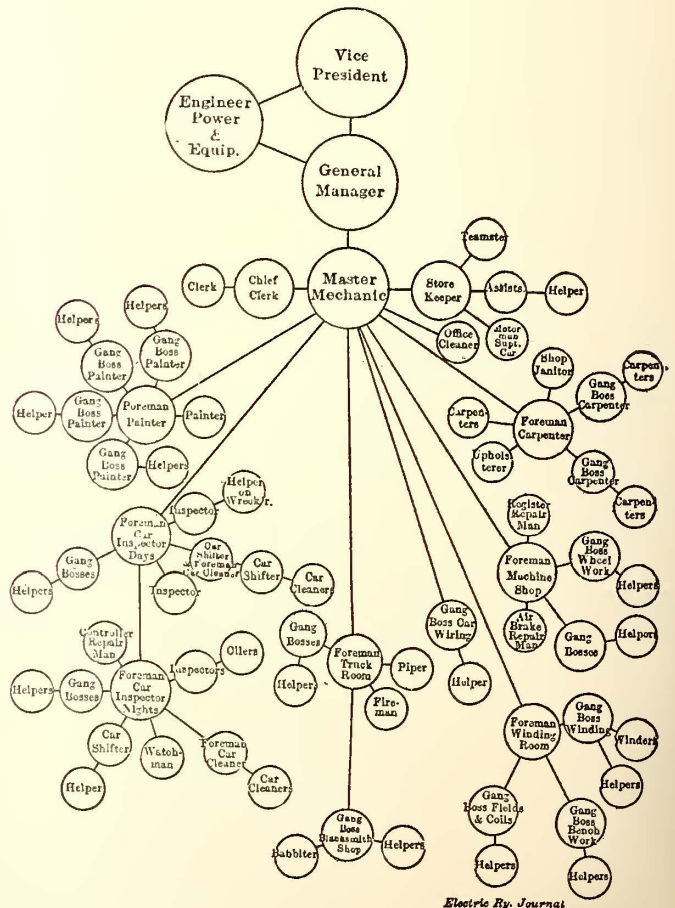
MAINTENANCE GRAPHICS—FIG. 17—WAY CONSTRUCTION DIAGRAM, CONNECTICUT COMPANY



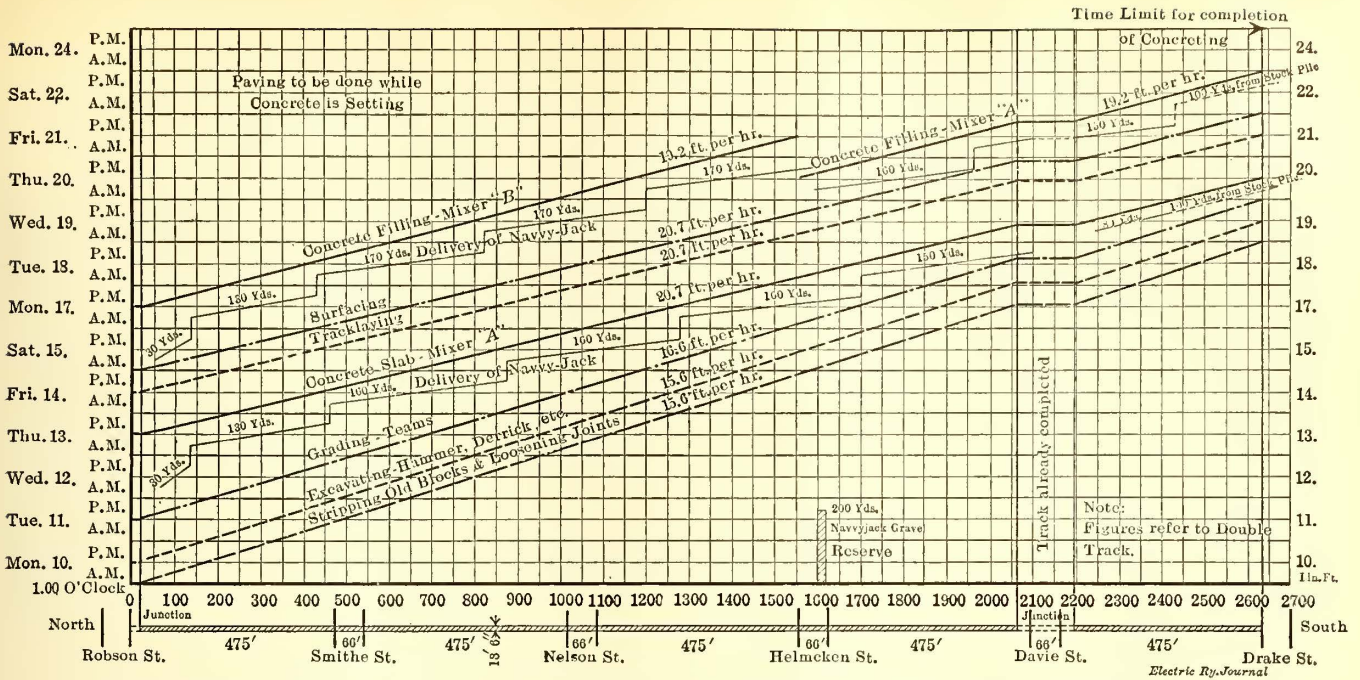
MAINTENANCE GRAPHICS—FIG. 16—GRAPHICAL WHEEL-PRESS RECORDS, BOSTON ELEVATED RAILWAY



MAINTENANCE GRAPHICS—FIG. 19—WHEEL-WEAR RECORD FORM, MASSACHUSETTS ELECTRIC COMPANIES



MAINTENANCE GRAPHICS—FIG. 20—ORGANIZATION DIAGRAM, WORCESTER CONSOLIDATED STREET RAILWAY



MAINTENANCE GRAPHICS—FIG. 18—WAY CONSTRUCTION DIAGRAM, BRITISH COLUMBIA ELECTRIC RAILWAY

traffic or time. These diagrams were made by B. F. Legare, engineer maintenance of way United Railroads of San Francisco. They depict rail-head wear, in terms of both traffic and time, by the simplest expedient of indicating time-points on the wear curves by letters. Fig. 13 shows a Brooklyn Rapid Transit daily hot-bearing record, in which a small rectangle represents one hot bearing.

Fig. 14 is a hot-bearing record from the New York Subway showing averages by months. The record for the succeeding year is placed on the same sheet for comparison of similar months. Generally this would answer the same purpose as the preceding and is much cheaper to produce. In Fig. 15 is given a "cars-pulled-in" record of the Connecticut Company, Hartford shops. This company uses similar diagrams for different car troubles, arranging data for comparison of carhouses with a view to stimulating competition. The lines for the several years are distinguished by their character.

SAMPLES OF OTHER FORMS OF GRAPHICAL PRESENTATION OF MAINTENANCE RECORDS

In addition to the examples already cited, there are many special uses of graphics in maintenance work. For instance, autographic records of wheel press pressure, such as shown in Fig. 16 which is from a car-shop hydraulograph operated by the Boston Elevated Railway. Construction progress diagrams are also very useful. The style shown in Fig. 17, as used by the Connecticut Company, is good for general summaries, but for daily records that shown in Fig. 18 is better. The latter is used by the British Columbia Electric Railway of Vancouver. Other forms were shown in an article by Norman Litchfield, printed in the issue of this paper for Feb. 13, page 339.

A wheel record form that combines simplicity and effectiveness is the card used by the Massachusetts Electric Companies and shown in Fig. 19. A history of each pair of wheels is entered on the back of the card. Fig. 20 is the organization chart of the Worcester, Mass., Consolidated Street Railway Company's equipment maintenance department. It is of the form generally used as the construction is simple and it is easy to revise. Such a diagram is worth many hundreds of

words in explaining the subdivision of work and responsibility in the department.

CONCLUSIONS

The foregoing illustrations have been selected from previous issues of this paper to show the usefulness of graphics outside of its original sphere. Drawing is so useful an art in conveying ideas and data regarding construction, and draftsmen, professional or amateur, are so plentiful on any electric railway property that it is but natural that both should be pressed into service in representing more than structural details. The examples indicate a wide variety of novel uses of graphics by a large number of companies.

Foreign Railway Equipment Described

With the object of placing in convenient and accessible form before persons in this country who are interested in railway materials, the United States Bureau of Standards, in connection with its investigation of failures of such material, has obtained, through the courtesy of the State Department, copies of specifications for railway material—rails, axles, wheels, and tires—used in several European countries. These specifications are given in full, together with a digest and discussion, in a forthcoming circular of information from the bureau. Available data concerning the types and weights of foreign railway equipment, together with those concerning derailments and accidents abroad, are included in the circular. Copies of the publication will be furnished on application to the Bureau of Standards, Washington, D. C.

The *Electric Railway and Tramway Journal* states that between 1500 and 1600 motormen and conductors and other employees of the tramways committee in Liverpool, England, have volunteered to give their labor in preparing munitions during their spare time, those most suitable for the work, either by age or training, having been accepted. The offer came spontaneously from the ranks, but the volunteers are paid overtime according to the usual tramway rates, and just now a large number of the men are giving useful service in the turning out of shells.

Illinois Association Meets

The Discussion at Chicago Last Week Was on Interchangeable Mileage, Interurban Rates of Fare, Oxy-Acetylene Welding for Bonds, and First-Aid Work

Experience with interchangeable mileage, electric interurban rates of fare, oxy-acetylene welded bonding and first-aid work on electric railways were the principal topics discussed at the meeting of the Illinois Electric Railway Association held at the Hotel La Salle, Chicago, Ill., on Oct. 29. About seventy-five railway and manufacturers' representatives attended this meeting and President F. E. Fisher presided. The report of the traffic committee called attention to the fact that many Illinois electric interurban lines were not participating in the use of the interchangeable coupon books. Some of the roads have cheaper local books which have reduced or eliminated the sale of the association book and thereby diminished the results which would obtain from its more general use. To improve this situation the committee urged all lines to become members of the agreement and to abolish all other forms of coupon books except those good on their own lines.

The traffic committee also recommended that the executive committee consider the question of interurban railway fares and whether the 5-cent zone system shall be continued, or whether fares shall be figured on a 2-cents-per-mile basis. Another question considered was whether permission should be granted to conductors to cut cash-fare slips for the proper fare except where the amount does not end in zero or five, when they are authorized to collect the next higher amount ending in zero or five. It was suggested that where more than 2 cents a mile was collected by the conductor, a provision should be printed on the cash fare slip that any ticket agent would refund the difference between the amount collected and the correct rate of fare.

Another suggestion by the traffic committee was that the president of the association appoint one man to act as agent and all members of the association give him power of attorney to file joint tariffs with the state and interstate commissions and to issue coupon books as requested by the various member companies. The committee also suggested that the member companies do what they could to encourage the proposed law to permit steam railroads of the State to charge 2½ cents per mile for passenger business. The report was signed by T. W. Gregory, East St. Louis & Suburban Railway; W. M. Brown, Central Illinois Public Service Company; A. M. Farrell, Chicago, Ottawa & Peoria Railway, and Richard Breckinridge, Aurora, Elgin & Chicago Railroad.

In the discussion which followed this report, J. R. Blackhall, Chicago & Joliet Electric Railway, said that he was particularly anxious to have an expression of opinion regarding the proper method of calculating the rates of fare. He said that his company was preparing a new rate schedule and that he would like to see some definite action on the part of the association as to whether the basis should be the 5-cent zone or 2 cents per mile. He said that in Indiana and Ohio interurban lines collected 2 cents per mile, while in Illinois the fares were based on 2 cents per mile, but collections made in multiples of 5 cents. Mr. Blackhall also pointed out that the Chicago & Milwaukee Electric Railroad had received the approval of the Wisconsin commission to increase its fares to approximately 2 cents per mile, whereas a similar increase on the Illinois section of that road had not been granted

by the Illinois commission. To set before the commission the views of the electric interurban roads in Illinois, it was important that all should agree to a common basis of calculating fares, and action by the association in this respect was desirable.

C. J. Jones, Aurora, Elgin & Chicago Railroad, and R. E. Dill, Joliet & Eastern Traction Company, also outlined their experience with coupon mileage and expressed the opinion that their companies would be willing to join in the more general use of the association's interchangeable mileage. In closing the discussion President Fisher called attention to the fact that the interchangeable mileage coupon books sold for \$8.50, whereas the coupon books generally used by roads to the exclusion of the association book were sold for \$5. He said that the higher-priced book was more desirable if all lines would come into the agreement and the cheaper or \$5 book if only a few roads were in. He said it was not the purpose to substitute the association mileage books for those used on any one road but only for passenger interchange. If the interchangeable book were sold for less than \$8.50, it would be so cheap that anyone would use it in place of paying regular fares. At the suggestion of one of the members, Secretary Griffin was instructed to communicate with all member companies requesting that they withdraw their own interchangeable mileage and substitute the association mileage.

G. T. Seeley, Elevated Railroads of Chicago, chairman of the sub-committee of the engineering committee investigating power economy on the car, reported that good progress had been made and that a report would be forthcoming soon. E. E. Soules, Illinois Traction System, chairman of the publicity committee, reported that the association map had been checked by all companies and when this information was transferred the map would be ready for publication.

At this point President Fisher again took up the question of the proper method of calculating rates of fares. He stated that all members were vitally interested in obtaining more revenue, and all should give serious consideration to increased fares where the fares could legally be raised. He said that his company thought of adding a 5-cent train fare to all cash fares collected on trains. This was to be done to encourage ticket sales and facilitate fare collection. He said that the Joliet & Eastern Traction Company had adopted such a plan and had practically eliminated all cash fares on the train. In connection with this plan, however, it was necessary to authorize conductors to collect the exact fare after certain hours at stations where agents were not on duty after stated hours at night. This was also true of road-crossing stops where no agents were maintained.

J. R. Blackhall favored fixing rates on a 2-cents-per-mile basis and eliminating the 5-cent zone system, because in equalizing the companies could not legitimately collect a fare greater than 2 cents per mile. It was also possible to make a charge of 2½ cents per mile for a train fare.

In closing Mr. Blackhall recommended that a committee be appointed to work out a scheme of calculating fares on interurban roads to be adopted by the association. Accordingly President Fisher appointed Mr. Blackhall, A. M. Farrell, Chicago, Ottawa & Peoria

Railway, and W. C. Potter, general passenger agent Illinois Traction System, on this committee.

FIRST-AID WORK

At this point Mr. Seeley called the attention of the association to the good work being done by the medical department of his company in the operation of a first-aid system, and suggested that it might be well for the association to appoint a committee to investigate and report to the association on medical subjects. He also suggested that each company present its medical adviser as a member and urge him to attend at least one meeting of the year which would be devoted to medical subjects. A standing committee could take up medical subjects and physical requirements of the various classes of employees, first-aid systems and instructions, sanitary inspection and medical work in connection with the claim department. Mr. Seeley stated that a higher standard for employees should obtain on electric railways, particularly in the cities where higher wages are being paid. To put this plan before all member companies, the secretary was instructed to outline the plan suggested by Mr. Seeley, in a communication and submit it to all companies for approval.

OXY-ACETYLENE WELDING FOR BONDS

J. R. Brown, engineer Ohio Brass Company, then addressed the association in an illustrated lecture on oxy-acetylene rail bonding. An abstract of this discussion will be published in a later issue of the *ELECTRIC RAILWAY JOURNAL*. It considered the welding equipment, welding methods and the effect of welding temperatures on rail steel.

In the discussion which followed it was brought out that one welder should average ten bonds per hour under traffic. As many as twenty-two bonds per hour had been installed, but this was under exceptional conditions. The standard acetylene and oxygen tanks will weld approximately forty bonds, hence the one welding gang would require three sets of tanks per day, if they average 100 bonds per day. It was also brought out that the electric welder had been replaced on a number of electric roads by the oxy-acetylene welding outfits, because the latter was cheaper to move when the bond replacements were scattered. If there are no leaks in the tanks, the quality of the gas does not deteriorate even after being in storage indefinitely. It was also brought out that welds could be made in any plane and that the metal would flow with the flame. Based on the cost of No. 0000 bonds which to-day is 37 cents, Mr. Brown said that the total cost of an oxy-acetylene welded bond was about 60 cents, including interest and depreciation.

OTHER BUSINESS

As a part of the regular program, E. J. Blair, electrical engineer Elevated Railroads of Chicago, outlined to the members the important topics discussed at the San Francisco convention of the American Electric Railway Association, and what action was taken on them. Dr. H. E. Fisher described, with the aid of lantern slides, the first-aid system in effect on the Elevated Railroads of Chicago. At the close of the meeting the members adjourned to the regular association luncheon.

At a meeting of the executive committee after the luncheon, members of the executive committees of the Illinois Gas Association and the Illinois State Electric Association were present and discussed the proposed amalgamation of these two associations with the Illinois Electric Railway Association. No definite decision was reached, but it was decided that at a meeting later in the year a definite plan will be outlined and submitted

to each association for approval. None of the Illinois associations mentioned is a member of the national bodies, and the numerous overlappings of membership made a consolidation of all three bodies desirable.

Library for Accounting Employees

In connection with the correspondence course of the American Electric Railway Accountants' Association, the educational committee sent out a pamphlet recommending that companies establish a library which would enable the students to pursue the collateral reading indicated in the lectures. The Connecticut Company, New Haven, Conn., recognizing the value of this suggestion, has purchased a few accounting books as the basis of establishing a more complete library as time goes on for the benefit of its large staff of employees in the accounting department. Following is a list of the books already included and their authors:

Net Worth and the Balance Sheet.....	Stockwell
Philosophy of Accounts.....	Sprague
Cost Accounting.....	Nicholson
Theory of Accounts.....	Esquerré
Accounting Practice and Procedure.....	Dickinson
Modern Accounting.....	Hatfield
Accounts—Their Construction and Interpretation....	Cole
Montgomery's Auditing.....	Montgomery
Getting the Most Out of Business.....	Lewis
Effective Business Letters.....	Gardner
American Office.....	Schulze
Commercial Law.....	Spencer
Railroad Accounting.....	Hooper
Modern Corporation.....	Conyngton
Graphic Methods for Presenting Facts.....	Brinton
Principles of Depreciation.....	Saliers
Electric Light Accounts.....	Edwards
Practical Accounting Methods.....	Key
Science of Accounts.....	Bentley

New York Safety Code Conference

Although the conference on the proposed national electrical safety code was not held last week in Washington as scheduled, a very important two-weeks conference under the auspices of the Bureau of Standards is just concluding its work in New York. This represents by far the most important step yet taken in the direction of adapting the code to the requirements of the electrical industry. The representation of the several branches of the industry was complete enough to insure an adequate presentation of the difficulties to be met with in applying a code of this kind.

Of the more than fifty attendants at the meetings several represented electric railway interests directly or indirectly. W. J. Harvie, Syracuse, N. Y., and C. L. Cadle, Rochester, N. Y., officially represented the American Association. There were also present H. A. Barre, Los Angeles, Cal., for the Los Angeles and Pacific Electric Railways; E. R. Hill, New York; E. B. Katté, New York; G. E. Quinnan, Seattle, Wash., representing the Puget Sound Traction, Light & Power Company; Paul Spencer, Philadelphia, Pa., and many others. The Bureau of Standards was represented by Dr. E. B. Rosa, who presided, and W. J. Canada, who has had much to do with the preparation of the rules.

The results of the conference will appear in the form of a revision of the proposed code which will be submitted within a few weeks to the members of the industry taking part in it and to a limited number of others, after which the Bureau of Standards will take up the matter with the public service commissions and municipalities. It is doubtful whether the Bureau of Standards will be able to hold a public conference on the code in Washington until after Jan. 1.

American Association News

Washington Railway & Electric Company Section Received Twenty-six Applications for Membership and Elected New Officers—A Paper on "The Power Plant Department's Part" Was Read by B. H. Blaisdell at the Manila Company Section Meeting on Sept. 7

WASHINGTON SECTION

A meeting of Washington Railway & Electric Company section, No. 4, was held on Nov. 2 with President George G. Whitney in the chair. Twenty-six applications for membership were received, bringing the total membership to 123. The new members included eight conductors and ten motormen.

The result of the election was as follows: President, Charles S. Kimball, engineer maintenance of way; vice-president, J. T. Moffett, superintendent of transportation; secretary-treasurer, R. A. Vetter, legal department; and director for a two-year term, L. B. Schloss, publicity agent. William L. Clarke, assistant secretary, holds over for another year as director, and C. P. King and W. F. Ham, president and vice-president of the company respectively, are ex-officio members of the board.

Robert G. Wall of the Sheldon School of Chicago, then gave a blackboard talk on the science of man building as applied to the science of business building. After the meeting, which was held in the instruction room of the company, tastefully decorated with cornstalks and husks, a buffet luncheon was served under the direction of Mr. Kimball.

MANILA SECTION

At the ninth monthly meeting of joint company section No. 5, Manila Electric Railroad & Light Company, held on Sept. 7, B. H. Blaisdell, chief engineer of power plant, read a paper on "The Power Plant Department's Part." He defined as the functions of the power plant the following: To produce electrical energy at such times and in such amounts as is demanded; to give uninterrupted service; to preserve satisfactory voltage regulation, and to reduce to a minimum the cost of production. He said that to fulfill its first function the power plant department must impress on the management the necessity of having sufficient generating equipment not only to carry the peak load but to relieve generating units for repair. Accurate records of output are necessary to this end. Continuity of service requires first-class engineering ability, careful and regular inspection, and prompt correction of small defects.

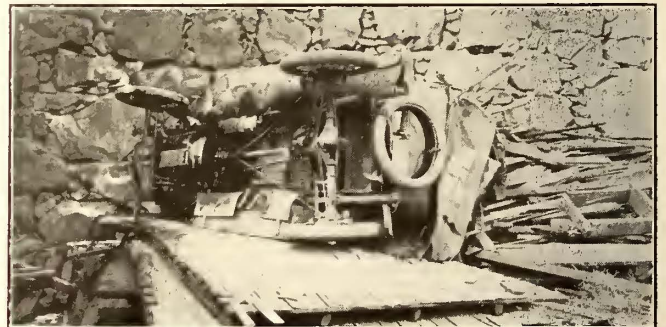
The reduction of energy cost to the minimum is the most important function of the power plant from the investor's standpoint, and is the real test of good engineering. As the cost of fuel is the greatest factor to contend with, every effort should be made to select a grade of coal best suited to the conditions and to the character of equipment, considering the cost of coal on a heat-value basis. Mr. Blaisdell stated that during the past three months the cost of fuel per kilowatt-hour had been reduced in the local plant more than 10 per cent without adding expense for equipment. This was done by showing the employees that savings were possible, by offering a bonus for fuel saving, and by fostering a good-natured rivalry. He gave as the conditions favorable to economy the following: cleanliness of boilers, tightness of boiler settings and baffle walls, good maintenance of grates, correct adjustment of air supply, thorough lagging to prevent heat radiation, dryness of coal, and proper firing. The responsibility for the economical use of fuel rests upon the men higher up than

the firemen. The former must determine the proper conditions relative to the supply and distribution of air to the furnaces, the thickness of fire to be carried, the number of boilers to be fired and banked, the proper times for the cutting out of generating units, etc.

Mr. Blaisdell concluded by explaining the sources of loss in a power plant, and outlining the characteristics of employees if the best results are to be secured. The paper was discussed by W. R. McGeachin, manager railway department; J. N. Weaver, superintendent power installations; E. I. Jeffery, assistant chief engineer power plant; J. C. Rockwell, manager electric department; L. L. Vincent, superintendent electrical testing, and C. N. Duffy, vice-president and general manager. Mr. McGeachin explained some of the advantages and disadvantages of the oil engine, the mercury engine and other inventions to reduce fuel consumption. Other speakers elaborated on points touched upon in the paper, all discussions bearing directly upon the subject in hand. In closing the discussion Mr. Duffy paid a tribute to the power plant department of the local company for its work during the night of the great flood in Manila, Sept. 2, 1914. By heroic efforts of the department steam was kept up and current supplied to the lines on that memorable night. After the meeting it was announced that the safety-first films which had been ordered from the United States had been received and would probably be shown at the October meeting.

Accident to Jitney in Spokane

The accompanying illustration shows a jitney after falling over a steep embankment on Sprague Avenue, Spokane, on Oct. 12. The occupants, both women, were reported to be seriously injured. One was the only



JITNEY ACCIDENT IN SPOKANE

woman jitney driver in Spokane, Mrs. W. L. Swain. The other was her sister-in-law. The accident was said to have resulted from a defect in the steering gear.

The risks attendant upon the use of the upper deck in double-deck cars was brought out in a recent inquiry held at Hastings, England, where a woman passenger on the local street railway had died following a fall from the stairway of a moving car. It was stated that the victim rang the signal bell on the upper deck to stop the car but descended the stairs while the car was still in motion and fell to the road. Neither the conductor nor the motorman heard the bell ring.

Equipment and Its Maintenance

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

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

One-Piece Splicer vs. Wrapped Joint in Feeder Cable Splicing Practice

BY S. L. FOSTER, CHIEF ELECTRICIAN UNITED RAILROADS OF SAN FRANCISCO

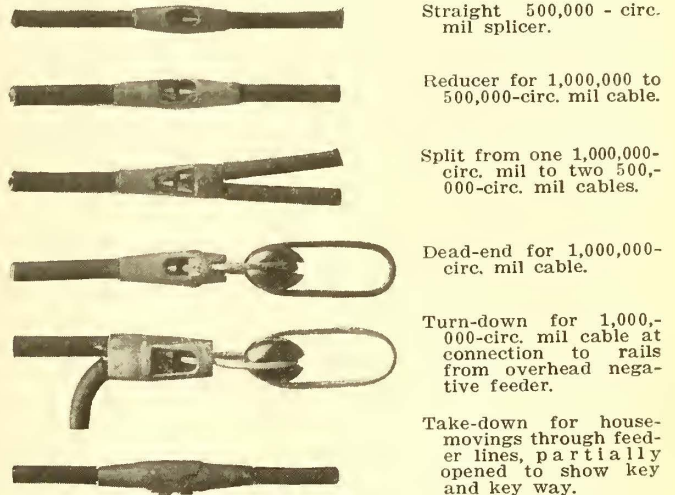
In 1895 the illustrated one-piece brass splicer for feeder cables was devised in San Francisco and has been found entirely satisfactory in all subsequent use. The idea came after observation of the mason's device for raising his huge blocks of stone by the insertion of a modest little wedge, called a "lewis," in a tapered hole. It has been stated to be a very old cable-splicing device, having been seen many years before 1895 in the coal mines of Pennsylvania.

This device seems to combine better than any other cable-splicing device the features of full tensile strength, full conductivity, small price, light weight, least requirements as to time, tools, labor and material, entire absence of shortening of conductor involved in completing the splice, freedom from patent claims, freedom from danger of internal corrosion from uncombined soldering chemicals, freedom from catching when pulled over cross-arms, and suitability for repeated use without repairs or waste except that of old tape removed.

The splicer is a rough, short, tapered, one-piece brass casting. The only finish is given by running a drill through it and tinning the interior. The only preparation required for the cable ends is removing the insulation for a distance equal to half the length of the short splicer, tinning the copper conductor, inserting it in the splicer and splitting the cable end with a screw-driver or chisel to fill half the central pocket in the splicer. The wedge of solder that fills the space in the split-open cable end of the pocket will insure the joint having a greater tensile strength than the conductor. As malicious or careless workmen have on a few occasions omitted to split open the cable ends and provide this

splice strength no results could be obtained, as the copper conductor broke repeatedly in the clamps of the machine. Tests for resistance showed that 12 in. of cable containing the sleeve had but 82 per cent as much resistance as 12 in. of uncut cable.

As the minimum length of any given insulated conductor that it pays to splice up equals the cost of the



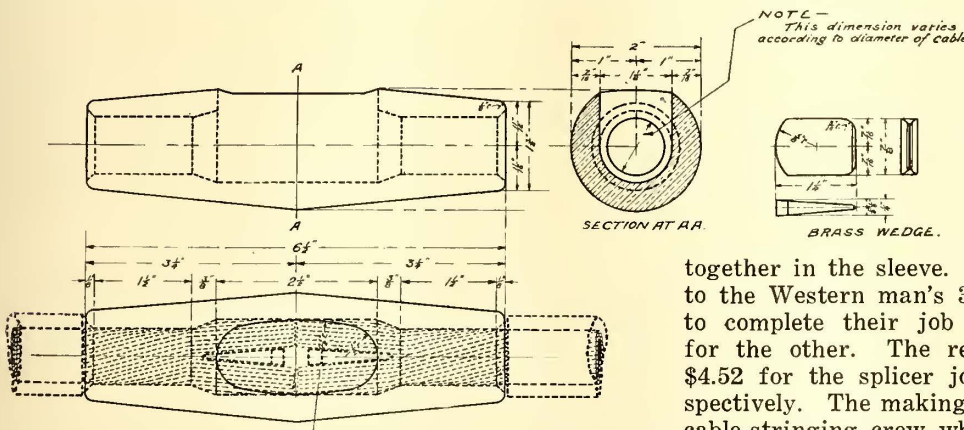
CABLE SPLICERS READY FOR SOLDERING AND INSULATION

splice divided by the difference between the cost of a foot of new wire and the net selling price of the scrap copper in a foot of old wire, and as this difference is practically constant, the lower the cost of the splice the shorter the piece of cable that can be economically spliced up and the more desirable becomes the type of splicer described.

Some Eastern linemen who were accustomed to make splices in feeders by the usual interlacing and wrapping method were asked to make a 1,000,000-circ. mil splice in their way while the Western man made a joint with the brass sleeve. The Eastern men unlaid their cable ends back 18 in., wasting 3 ft. of cable at once, while the Western man wasted no cable at all, butting the cable ends together in the sleeve. Then they used 6 lb. of solder to the Western man's 3 lb., and took seventy minutes to complete their job as against seventeen minutes for the other. The resulting splices cost \$1.89 and \$4.52 for the splicer joint and the wrapped joint respectively. The making of the latter delayed the whole cable-stringing crew while the former was done while the men were preparing to pull up the feeder, and the stringing was uninterrupted.

A similar competition on a 500,000-circ. mil cable cost 74½ cents for the sleeve and \$2.23 for the wrapped joint. The former took eleven minutes and the latter sixty-eight minutes to complete, while the former added 3.4 lb. to the cable as against 6.2 lb. for the latter.

When a feeder is to be taken down it is cut off in convenient lengths, usually 1000 ft. for a 500,000-circ.



DETAILS OF SPLICER FOR 500,000-CIRC. MIL FEEDER CABLE

wedge of solder as a key to the device, a tinned brass wedge is now driven in each cable end in the pocket before soldering.

When soldered by pouring hot solder in at the center until it runs freely from the ends, this sleeve, when taped and pointed, will readily slide over all cross-arms. When tested in a Riehlé testing machine for ten-

mil cable, pulled off the cross-arms and rapidly reeled up on a motor-driven reeling machine. It is then ready for use at once elsewhere. If a sleeve joint is to be cut out, the conductor is cut off at each end of the sleeve and the short pieces in the sleeve melted out. The sleeve is then ready for use again as good as new. The waste with the sleeve has been 5 in. or 6 in. of cable in the case of 500,000-circ. mil cable, as against about 4 ft. cut out of the cable when a wrapped splice is removed (including the lengths of cable required to make the splice originally).

In the great San Francisco fire of 1906 when copper cables lost their weatherproof covering and in some cases were burned off altogether these sleeve joints lost their solder but the wedges maintained the tensile strength of the joints and the cables remained in place. The linemen came along, put on ropes for safety, re-soldered the joints and they were as good as new.

A comparison in 1908 between this sleeve joint and a much advertised unsoldered one on the market showed that in the 500,000-circ. mil size the patented sleeve cost \$1.73 and the one-piece sleeve illustrated on page 955 cost 49 cents. The former cost 2.26 times as much in place and had 2.30 times as much resistance as the one illustrated.

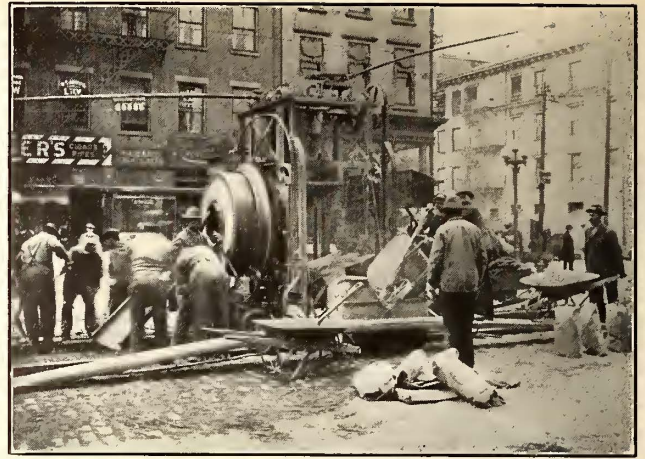
This one-piece splicer is conveniently made in all sizes for cables from No. 0000 to 2,000,000 circ. mils, also in many other forms as a neat reducer from 1,000,000 to 500,000, for example, or for changing from one to two conductors, as from one 1,000,000 to two 500,000-circ. mil conductors, for instance, or for a dead-end or dead-end and turn combined, as shown in the illustration.

Columbus Uses New Joint and Track Foundation

BY E. O. ACKERMAN, ENGINEER OF WAY COLUMBUS RAILWAY, POWER & LIGHT COMPANY

Quite an extensive track construction and extension program is being executed by the way department of the Columbus Railway, Power & Light Company, Columbus, Ohio. The work contemplated for this year includes approximately 9.7 miles of track. This is being laid with A. E. R. A. standard 7-in. grooved girder rail for all straight line construction, and A. E. R. A. standard 7-in. guard girder rail for all special track construction. In a few instances where the old rail is found in good condition, it will be relaid in track where light traffic obtains. On straight line work the rail is being laid on Carnegie ties and supported on a concrete foundation. Special track work is laid on white oak ties and is supported on a concrete slab foundation.

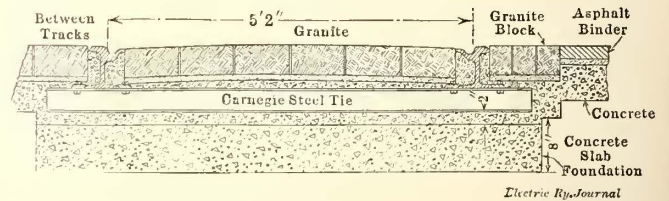
Incorporated in the new work on lines where heavy traffic obtains is a new type of construction. This pro-



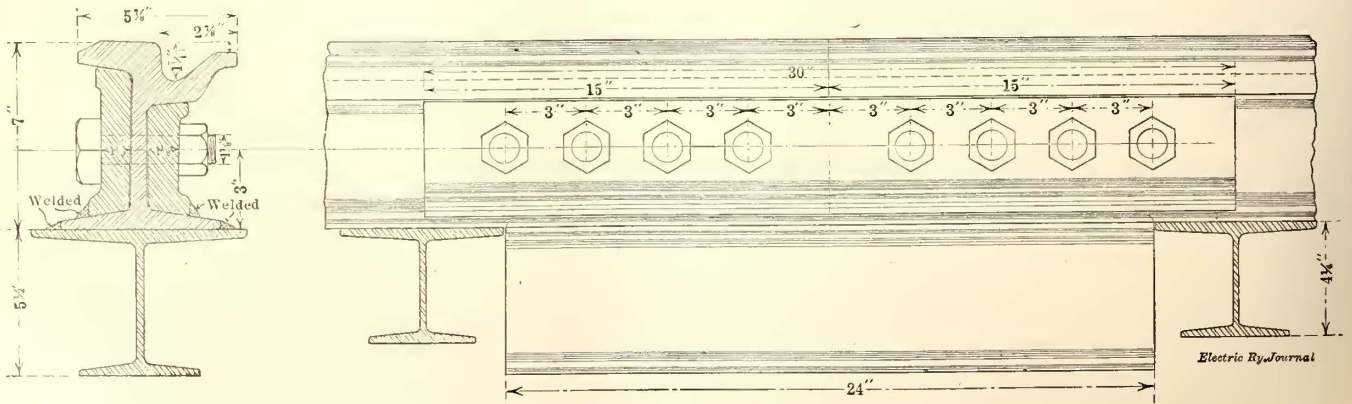
COLUMBUS TRACK—ELECTRICALLY OPERATED CONCRETE MIXER

vides for an 8-in. concrete slab sub-foundation, the top of which is 2 in. below the bottom of the steel ties, which are spaced at 2½-ft. centers. The track structure is assembled on top of this slab and blocked to permanent line and surface. In this position concrete is tamped under the steel ties and carried up to the required height to form the pavement foundation. The details of this type of foundation construction are shown in the track cross-section in one of the accompanying illustrations. This form of steel tie, solid concrete construction, provides rigidity and permanency, and at the same time there is a line of cleavage or a parting between the sub-foundation slab and the concrete incasing the track. In case renewals or repairs are necessary in this type of construction, it is contemplated that the sub-foundation slab may be left intact.

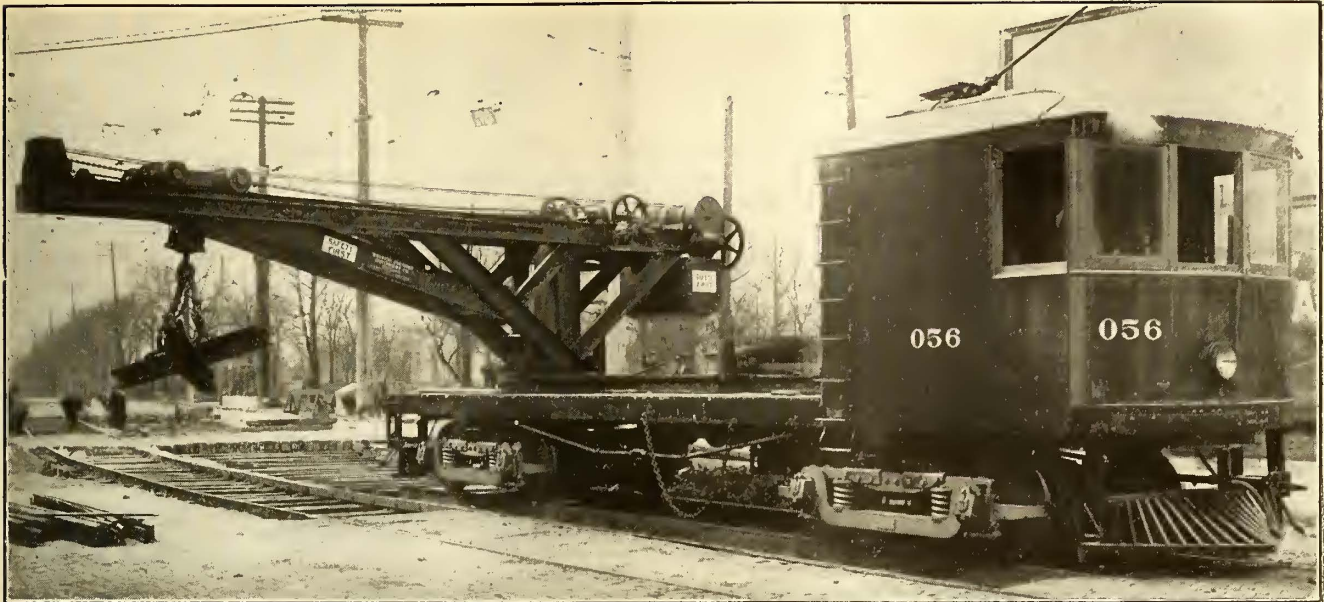
For all special track work there is provided an 8-in. concrete slab sub-foundation. When this has set permanently, the track is laid with white oak ties and tamped to line and surface with ¾-in. screened crushed stone. Over this, concrete is deposited to form the pavement foundation. This type of work provides a more flexible construction, both as to riding qualities and for making repairs and renewals than that used in straight track. Two kinds of unit pavement are being



COLUMBUS TRACK—STANDARD CROSS-SECTION



COLUMBUS TRACK—CROSS-SECTION AND SIDE ELEVATION OF JOINT



COLUMBUS TRACK—ELECTRICALLY OPERATED TRACK CRANE

used in the construction work this year, granite block for the heavy traffic lines and brick for the light traffic lines.

Probably the most unusual feature in connection with this new track construction is the Columbus rail joint, which has been adopted as standard for straight-line track. This joint is the outgrowth of a series of developments in joint construction through which the track and roadway department of this railway has passed. The fundamental feature of the joint was used in Columbus six years ago, and included the combination of the joint reinforcement and the anchor. Added stability is obtained in the joint used this year by resorting to the electric weld. An elevation and cross-section of this joint are shown in one of the accompanying illustrations. In the cross-section it will be noted that there are four lines of welds, one at the base of each joint plate and one at each side of the rail base, and all extend the full length of the joint.

Several years' experience with joints of this type has produced no failures, a record which has not been equaled by any other type of joint used by this company. This result was obtained despite the fact that the cost of the complete joint is relatively low when compared with other good joints. The essential features of the joint are the reinforcement support and anchor, the heavy splice bars with large bearing surfaces and the drive fit bolts. The holes, drilled at the mill, are afterward reamed in the field with power drills so that the bolts may have a drive fit. The bolts are also special, being made of chromium steel and manufactured very closely to a specified diameter. The cost of the joint complete is \$4.43, which includes material and labor and 50 cents for power consumed.

The track construction plant employed in connection with this year's work includes a self-contained concrete mixer, having a wheeling platform and concrete chute, all of which are under the control of a single operator. The mixer is motor driven and is mounted on a low steel truck which is self-propelled, energy being supplied through a trolley pole. The compactness of this mixer makes it a particularly valuable machine for track concrete work. The mixer was built by the L. T. Smith Company of Milwaukee, Wis. Another feature of the track-laying equipment is a Whiting electric crane which is used to install special track work. Views of the concrete mixer and the electric crane are shown in two of the accompanying illustrations.

Where Classifying Scrap Paid

BY A. W. REDDERSON, SUPERINTENDENT OF MOTIVE POWER
FORT WAYNE & NORTHERN INDIANA TRACTION
COMPANY, FORT WAYNE, IND.

From time to time articles appear concerning the advantage of classifying railway repair-shop scrap. Only recently the Fort Wayne & Northern Indiana Traction Company had occasion to test this. A number of obsolete Lorain No. 34 motors were retired from service and the mechanical department desired to dispose of them to the best advantage. Accordingly a circular letter describing this equipment and listing it, together with a number of new repair parts which were on hand in the store-room, was sent to all dealers in second-hand equipment, and in response a number of inquiries were received and several offers to purchase were made. In no case, however, did the company receive an offer of more than \$70 per motor, and the majority of the bids were about \$50 per motor. The mechanical department believed that these prices were entirely too low, and in order to verify this conclusion decided to dismantle one of the motors and classify the scrap. After this had been done the different materials were weighed separately and the following data were obtained:

Mixed Scrap	
Motor case	933 lb.
Gear case	120 lb.
Gear	220 lb.
Pinion	67 lb.
Armature core	380 lb.
Pole pieces	140 lb.
Total weight	1,860 lb.

Scrap Copper	
Armature coils	81 lb.
Field coils	260 lb.
Commutator	46 lb.
Total weight	387 lb.

To obtain the net weight of the scrap copper the insulation on the armature and field coils was burnt off.

Scrap Brass	
Field frames	56 lb.
Brush-holders	8 lb.
Axle bearings	48 ft.
Total weight	112 lb.

With this metal classified as indicated the 1860 lb. of mixed scrap was sold for \$7.50 per ton, a rather low

price for scrap of this kind which obtained in the Fort Wayne territory. At this time, however, the market price for scrap copper and brass was very high, the former selling for 17¼ cents per pound and brass for 16¾ cents per pound. From the foregoing market prices it will be noted that the mechanical department realized the following for one motor:

1,860 lb. scrap iron at \$7.50 per net ton.....	\$6.98
387 lb. scrap copper at 17¼ cents per pound.....	69.76
112 lb. scrap brass at 16¾ cents per pound.....	18.96
Total amount received	\$95.70

As a result of the sale of scrap of this one motor, the mechanical department immediately scrapped all the motors removed from service and realized almost twice as much money as was offered by any of the second-hand equipment dealers. From this amount, of course, the labor of scrapping must be deducted, but it was a relatively small item when compared with the total money received from the sale of these old equipments as scrap.

New Manual and Pneumatic Door and Step Control

The widening use of the fully-inclosed car has given increased importance to the mechanisms for controlling the operation of the doors and steps. Since this operation is in the hands of the motorman and conductor respectively, the liability of the railway in cases of accident is greater than when the passenger himself assumes the risk of boarding or leaving a moving car. Aside from this legal consideration modern door and step control must embody such features as these:

Quick operation, so that the stopping time of a car will be the minimum;

Safe operation, so that a passenger cannot possibly be caught by a closing door;

Reliable operation, so that the car will not lose shop-time because of maintenance defects in the mechanism;

Laborless operation, so that the motorman and conductor can manipulate doors and steps without so tiring themselves that their other work suffers.

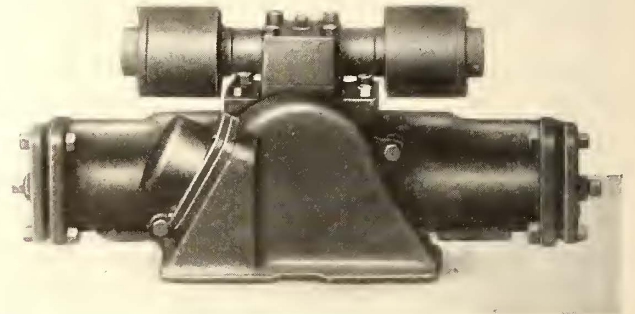
So far as the last point is concerned, pneumatic control offers the best solution for heavy service; but for conditions of less congestion, a manual control will answer if it is properly designed.

The features outlined plainly call for highly specialized skill and equipment. This fact will be made clear by the following details relating to the manufacture of new types of door and step control by the National

Pneumatic Company, Chicago, for the Interborough Rapid Transit Company, the Boston Elevated Railway Company, the Detroit United Railway, the Cleveland Electric Railway, the New York State Railways—Rochester Lines, the Northwestern Elevated Railways, Chicago, Market Street Elevated Railway, Philadelphia, and others.

MATERIAL

All control parts on which there are heavy strains or excessive wear are made of crucible cast steel instead of ordinary steel. On receipt at the works they are examined for defects, fins or other rough portions being ground off before going into stock. It is customary



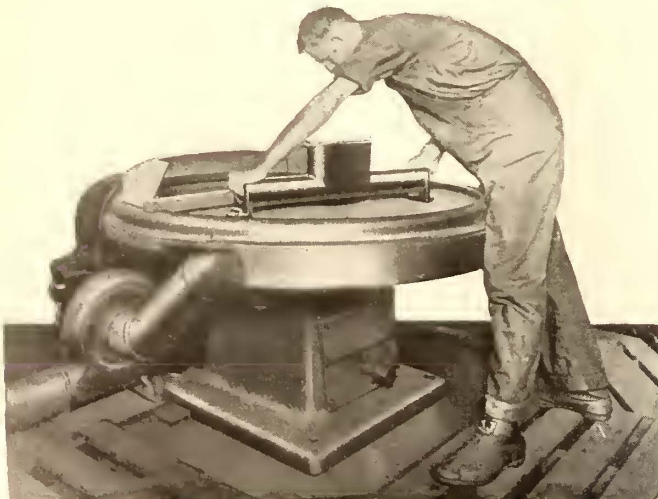
CLEVELAND ENGINE PLACED UNDER CONDUCTOR'S STAND

always to order enough extra castings to permit immediate replacement of any lost or spoiled parts. This surplus is not only large enough to avoid delays in manufacture, but also to ship replacements to the customer at once. Users of standard mechanisms are assured immediate shipment in any event. Another example of attention to detail is that most patterns stay permanently at the foundries to eliminate damage in shipment between founder and manufacturer.

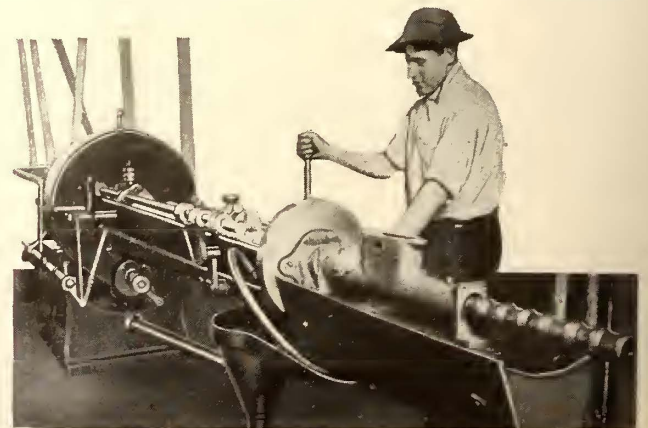
METHODS OF MANUFACTURE

Every detail in National pneumatic mechanisms has been planned to make maintenance by the user inappreciable. Thus the malleable-iron control transmission pipe could be cheaply attached to the levers on each end by means of a pin or set screw. Instead, the costlier but better practice of autogenous welding is applied because sooner or later the pin would shear or the set screw would slip in service. Next, the distance between these end levers is gaged by means of a jig, whereupon the transmission equipment is ready for painting. As with all other castings, the equipment is immersed in a tank of "125 Rubber" paint, then allowed to drip and finally baked for three and one-half hours in a gas furnace kept heated at 340 deg. Fahr.

The bearing wear which the transmission equipment



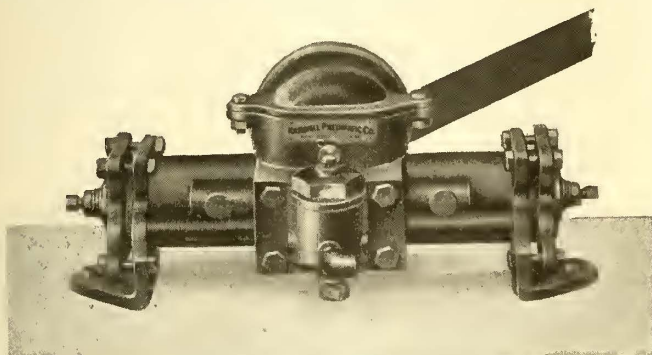
GRINDING OFF THE BEARING PARTS OF THE ENGINE FRAME



BROACHING THE CYLINDER BARREL TO GET PERFECT ALIGNMENT

receives is taken up by ball bearings. These bearings cost more than bushings, but they permit easier operation and allow no wear on the ball retainer or on the shaft over which the ball race works.

The faces of the main engine casting are ground off by pressing them against a sheeting of carborundum which is mounted on a horizontal grinder. This method is found more satisfactory than milling. The ends, however, are milled in a jig which can be swiveled around to allow each end to be milled exactly alike. The hole in the end of each foot of the engine casting is also in precisely the same relative position.



TYPE OF PNEUMATIC ENGINE USED IN CLEVELAND

The next step is to broach the interior of the engine with a specially-designed tool to get a finish of gun-barrel accuracy. Upon this the engine casting is drilled with the aid of rigid jigs, after which it is bathed in gasoline to remove all chips and foreign substances.

The last step before assembly is the individual inspection of each casting. Following the assembly, a second inspection is made by another inspector before the equipment is taken from the assembly bench for the final test hereinafter described.

The gears are drop-forgings and therefore are free from blowholes and other defects possible in steel castings. First a square hole is broached and then the gear is turned and cut. The teeth are cut in gangs of eight under conditions which assure absolute alignment of the teeth and a position concentric with the broached hole. The gear shaft is made of crucible steel and is accurately turned and broached to fit tightly the squared hole in the gear. The rack in which the gear works is made of solid rolled steel with cut teeth to insure absolute straightness.

The leather cups against which the compressed air pushes are attached to the ends of the rack. Inside each cup is a phosphor-bronze expansion piece to insure that the cup will always lie so closely against the cylinder wall that leakage of air will be impossible. The leather is the only air-proof material found out of several score tested.

Splash lubrication, so efficient in automobile work, has been adopted for this engine mechanism. All the working parts are subjected to continuous lubrication forced by the exhaust of the engine itself. The course of the oil is such that it returns for reuse after lubricating the valve and other working parts.

Special attention has been given to the design of a valve that would insure against air leakage so that existing airbrake compressors could be used to supply air for pneumatic door and step control. Even where storage air is employed, as at Detroit, this company's engine will be applied without interfering with the air-charging routine.

The valve face is of semi-steel, but the valve itself is made of phosphor bronze cut with a die to insure registration. This combination of semi-steel and phosphor bronze has been found to give the longest possible life.

The valve stem is so milled that it cannot be wrongly installed. Where the stem passes through the semi-steel, it is made of brass to avoid corrosion. As in the rest of the engine, no stuffing boxes are required. The lever for operating the stem is secured by a lock washer and nut instead of pins or set screws which would shear or work loose respectively. The gaskets throughout are of Tennax, a tough, fibrous material which can be used repeatedly instead of requiring replacement, like rubber or paper, at each removal.

The valves are ground in a specially-designed machine which has an oscillatory motion akin to that used in hand grinding. This machine assures a degree of accuracy and uniformity impossible in hand work. Upon completion, each valve is tested under water for assurance against leakage.

In all parts where several holes are to be drilled, even in different planes and angles, multiple-drill jigs are used so that all holes are made accurately at one setting.

The mechanical connections to the door engines depend, of course, upon the distance between the door engines and the operator. These connections are made through malleable iron rods with drop-forged jaws and 1/4-in. pipe. The jaws are pulled up tight without the use of lock-nuts, which frequently work loose. After this, the jaws are dipped and baked like other parts.

The control handles are sometimes made with counterweights to hold them positively at "open" or "closed" position. The connection between the valve and the handle is spaced by jig drilling. This spacing between the pins and the center of the gear is varied to take care of predetermined torsion in the transmission pipe and lost motion.

The handle base is made of steel. The pins which go into the base and hold the handles and their counterweights are fitted with a steel sleeve instead of being turned to a step. This sleeve prevents the crystallization from vibration that would otherwise destroy the pin.

The hole for the gear shaft of the engine base casting is made with a concentric reamer so that the two different-sized holes on opposite sides of the engine are in alignment.

All castings are painted before machining them. Consequently no trouble can arise from fouled threads.

ASSEMBLY AND TEST

After the mechanisms have been assembled, they are subjected to a leakage test by means of soap water. They are then attached to test doors which may be weighted to approximate any particular service condition.

The most important feature of the door operation is its positive checking or cushioning. This checking is non-adjustable, being calculated in advance for each specific condition. As the door closes it moves rapidly until within 2 in. or 3 in. of the jamb, whereupon it is automatically checked to complete its motion at a greatly reduced speed. It is often found desirable to supplement this checking device by the use of a collapsible edging or buffer which extends the full height of the door. When this buffer comes into contact with any obstruction during the closing of the door, the compression of the buffer actuates an auxiliary valve which reverses the air in the engine so that the door moves backward until the obstruction is cleared. Thus the tardy passenger cannot possibly be injured.

Another special feature is a ratchet mechanism which allows a station platform man to close the door from outside the car. To prevent him from closing the door violently, a pneumatic stop is provided to check the door momentarily when it is within 3 in. or 4 in. of the jamb. This delay is just enough to avoid the slamming which

might injure a passenger, and it prevents unnecessary shocks to the mechanism. It should be added that the last 3 in. or 4 in. of door movement is not manual, but is effected by the admission of air to the engine in the direction of closing. Thereby the door is locked mechanically just as if it had been closed pneumatically throughout the entire operation.

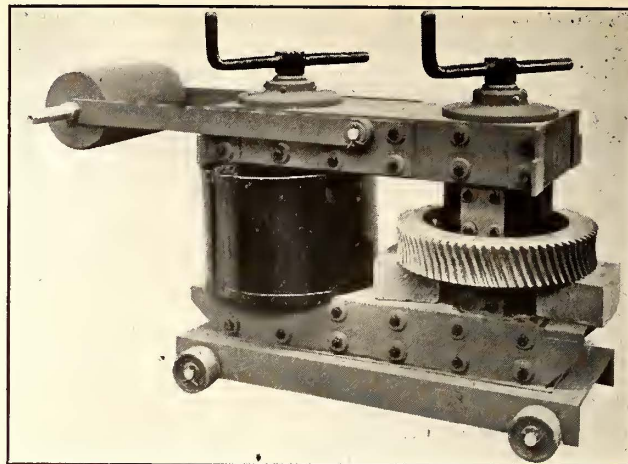
Electric Heater for Shrink Fits

An exceptionally interesting device for heating electrically the steel tires, gears and other features of car equipment that are applied by shrinkage has recently been commercialized by the Maschinenfabrik Oerlikon, Switzerland, and it is said that this not only insures absolutely even heating in a short space of time but also effects the operation at a very low cost for the current consumed. The process is based upon the well-known transformer induction principle that forms the basis of the melting and refining processes used in metallurgy. In effect, the tire or other ring of metal that is to be heated is made to form the short-circuited secondary winding of a transformer, and in this current is induced to an intensity proportional to the number of ampere turns of the primary coil, the induced current generating heat in the ring sufficient for the requisite expansion.

The practical design of the apparatus and its applications are shown in the accompanying illustrations. The device, which consists of a two-core transformer mounted on a suitable channel-iron frame for convenient transport on rollers, has one of its cores wound with tapped coils. The taps are provided to vary the current produced in the transformer secondary and thus to suit the size of the ring that is to be heated, the amount of heat being proportional to the current generated in the ring.

The windings are protected by a mechanically strong insulating cylinder. The secondary core has no windings but may also be protected with an insulating cylinder if desired. The top yoke of the transformer is, as shown in one of the illustrations, so arranged that it can be turned horizontally around one of the two screw spindles which are used for tightening up the members that form the magnetic circuit, thus making good contacts between the yokes and the cores. Both of the spindles must, of course, be loosened and one removed when the tire is being placed in position, the top yoke being swung to one side, so that the ring that is to be heated can be put over one of the vertical transformer cores.

To facilitate this operation and also to prevent damage to the joint between the transformer cores and the yoke, the weight of the yoke is counterbalanced by means of a weight arranged between two flat iron bars.

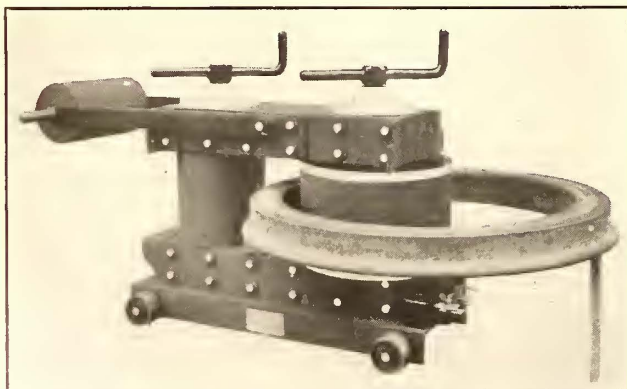


HEATING BRONZE GEAR WITH ELECTRIC HEATER

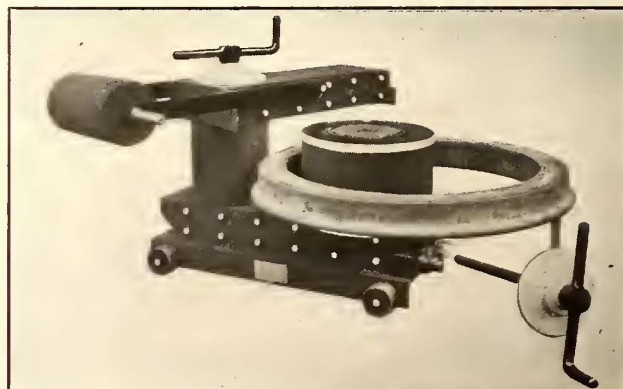
This balance weight can be swung over in a vertical plane around its bearings at the center of the top yoke, so that the apparatus can be used to heat a ring that has an inner diameter smaller than the outside diameter of the primary coil. In this case the ring that is to be heated is put around the free transformer leg, which has no windings, and not around the leg that is fitted with the primary coil, the thermal efficiency being thereby slightly reduced but not to any great extent.

Normally, the device is built for single-phase current at 200 volts or 220 volts and 50 cycles, but it can also be built for any other current condition. Thus far the apparatus has been standardized in two sizes, one of which possesses a coil with a small number of windings which are adjustable to several current steps suitable to the ordinary materials and sizes of rings. The other size is fitted with a primary coil having a larger number of windings and a correspondingly larger number of tappings so as to permit a more elaborate adjustment of the heat that is generated, such as is necessary, for instance, in connection with copper, bronze, or soft-metal rings with relatively low melting points. The increased number of taps permits also a finer adjustment for currents of different frequency.

As a rule the most favorable shrinkage proportion for iron and steel is 1:1000 or 1:1500 in a given length of metal. In practice it has been shown that for a tire having a diameter of, say, 28 in., an expansion in diameter of $\frac{1}{8}$ in. is quite sufficient. This corresponds to a maximum temperature of approximately 300 deg. Fahr. at which the metal does not alter either structurally or in the color or in the condition of the surface. In the case illustrated by the accompanying halftone, where car-wheel tires weighing 265 lb. were heated prior to shrinking on the wheel centers, the inner diameter was increased from $26\frac{1}{4}$ in. to $26\frac{3}{8}$ in. with a temperature



ELECTRIC HEATER WITH TIRE IN POSITION



TOP YOKE TURNED ASIDE TO PERMIT PLACING OF TIRE

of 300 deg. Fahr., and the following observations were recorded:

Time	Power Consumption	Initial Temperature	Final Temperature
9 minutes	17.2 kw.	59 deg. Fahr.	295 deg. Fahr.
35 minutes	6.2 kw.	59 deg. Fahr.	232 deg. Fahr.
180 minutes	2.2 kw.	59 deg. Fahr.	260 deg. Fahr.

The total weight of the complete electric heating device varies between 885 lb. and 975 lb. The apparatus is solidly built, perfectly safe in working and is easily transportable. It can be used for all kinds of ring and tire sections of various diameters. It works very economically and turns out a cheaper and cleaner job than the customary gasoline tire heater, and, of course, the heating of the rings is perfectly even throughout the metal. The time within which the rings are to be heated up to the requisite temperature can be conveniently and quickly adjusted by means of the taps provided on the primary transformer coil.

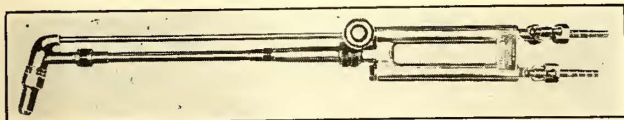
It is of interest to note that the apparatus can also be arranged for loosening rings and tires that are shrunk on to wheel centers or other members, this being accomplished by the provision of special equipment. However, in order to determine the necessary windings and tappings for such operations it is necessary for the manufacturer to know the exact particulars of the cross-section and diameters of the pieces to be heated.

Oxy-Acetylene Welder and Cutter

The oxy-acetylene welding and cutting apparatus that is manufactured by the Modern Engineering Company, St. Louis, Mo., is given exceptional guarantees by its makers. It is the product of exhaustive tests extending through a period of ten years, and the result has been that all parts of the apparatus are correctly proportioned and no weak links exist. Every equipment that leaves the factory is thoroughly tested, and it is warranted absolutely to give satisfactory service.

One of the first considerations in the design is safety, this being considered essential because in many cases in the past operators have been burned by back ignition of the gas in the hose. This has been overcome by the introduction of a special check-valve system in both of the gas conduits, which absolutely prevents either of the gases from flowing into the pipe that contains the other gas. All of the tips that are furnished with the torch are equipped with a special protective seal between the tip and the head, this insuring a perfect union and preventing leakage or breakage if the torch is dropped or handled roughly.

The mixing chamber is especially designed for high efficiency in mixing, and it produces an absolutely



OXY-ACETYLENE TORCH WITH CUTTING ATTACHMENT IN PLACE

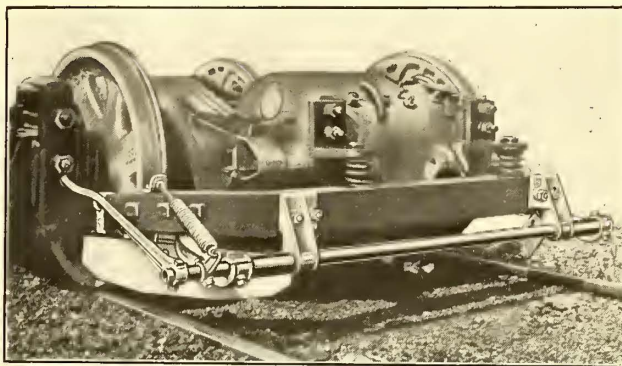
neutral flame having a temperature of more than 6300 deg. Fahr. The mixing of the gases is so carried out that it is impossible for combustion to take place in the mixing chamber even when the largest tips are used. A notable feature is the simplicity with which the cutter is attached to the torch, the necessity for removing the hose connection being eliminated. Two operations are involved, the first one being to remove the nut on the oxygen valve and the union nut on the gas conduit. When the cutter has been inserted and the nuts tightened again, the welding torch has been changed to a highly efficient cutting apparatus. The simplicity of this change-over as well as the non-back-

firing feature makes the tool especially satisfactory for use by inexperienced workmen.

Flexible Running Track Scraper

A new flexibly operating track scraper, to be known as the Simplex type, has been placed on the market by the Electric Service Supplies Company, Philadelphia, Pa. This scraper consists essentially of two scraping blades attached to a horizontal shaft, the latter being equipped with necessary hangers, control springs and brackets.

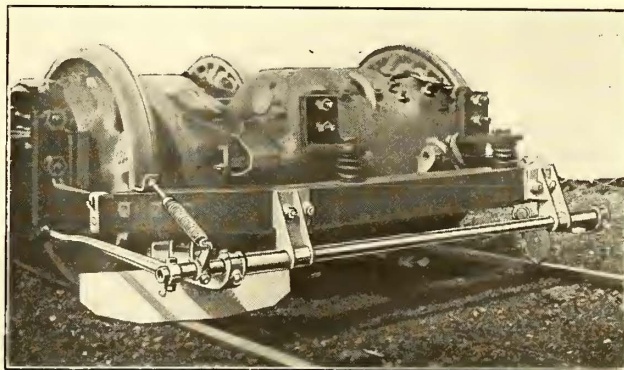
The primary feature of the new scraper is found in the flexibility of the blades, which allows them to swing back and over any obstructions that might be met, with



FLEXIBLE TRACK SCRAPER IN RAISED POSITION

the car running either forward or backward. They need not be raised for switches, crossings or other obstructions in paving, and may be used with any type of rail. When in working position they require no attention.

In the accompanying illustrations it will be noted that this equipment is attached directly to the truck proper instead of to the car body, as in the older scheme of attachment. This improved method results in a very strong, simple and rigid mounting, and on account of the scraper being so attached the blades automatically



VIEW SHOWING SCRAPER BLADES LOWERED INTO OPERATING POSITION ON RAILS

swing with the trucks, thus insuring efficient scraping when the trucks swing in rounding curves.

Raising and lowering of the blades is controlled by means of a hand lever and a strong helical spring. Hangers for attachment to trucks are adjustable along the main supporting shaft, hence one size of scraper may be fitted to any type of car, whether single or double truck; one type may be used interchangeably on any number of cars. Blades are adjustable to accommodate any standard track gage.

This scraper has been in use for two years on the lines of the Montreal (Que.) Tramways, operating with splendid results through two very severe winters.

LONDON LETTER

Women Conductors for London—Report of Municipal Tramway Conference—New Power Plant for Glasgow

(From Our Regular Correspondent)

London is now to be permitted to use women as conductors. A formal announcement has been issued by the war press bureau to the following effect: "With a view to removing obstacles to the voluntary enlistment of men of military age and suitable physique employed as conductors of stage carriages, the licensing authority for the metropolitan police area is prepared to issue licenses to suitable women to act as conductors of stage carriages. The term 'stage carriage' includes both omnibuses and tramway cars. Delay will be obviated by candidates forwarding their applications in the first instance through the manager of the company with which they seek employment." The use of women conductors in Glasgow, Edinburgh, Leeds, Birmingham, Newcastle and other cities is already an established success, and the experiment might readily have been attempted in London months ago but for the attitude of the London police, and also, it might be added, the attitude of the management of the London County Council Tramways, which was inclined to believe that women were not capable of handling the larger cars in London and the larger volume of traffic at the busy hours. The recruiting possibilities, as far as the Council tramways service is concerned, have to a large extent been discounted, as it will be recalled that, as the result of the recent strike, the services of men of military age were dispensed with, save in some very exceptional cases.

The fourteenth annual conference of the Municipal Tramways Association was held during the past month in London, under the presidency of Alderman H. Linsley of Salford, who has filled the presidential office for two years in succession. The conference was not held last year, owing to the war, and this year, instead of holding the meeting at Salford as would have been the case in ordinary circumstances, it was decided to meet in London and to restrict the business to discussion of various points arising from the war in connection with the conduct of tramways. In his presidential address, Alderman Linsley stated that more than 16,000, or 30 per cent, of the municipal tramway employees had responded to the country's call to join the colors, and he also made the interesting statement that £23,500 had been subscribed by tramcar passengers to numerous charitable funds connected with the war by contributions placed in the various collecting boxes on tramcars on practically all the systems. James Dalrymple, Glasgow, introduced the first subject for discussion, "Tramway Labor Problems as Affected by the War." He stated that owing to the varying conditions in the different tramway undertakings no general experience could be given. Glasgow had not suffered much so far as the general staff of tradesmen and laborers was concerned in the various carhouses, etc. Government work was being done by the Glasgow tramways department, and new tramway work had been stopped, as it was impossible to get more tradesmen. A very warm tribute was paid to the 818 women who are now acting as conductors in Glasgow. It was stated that 12,000 women had applied for situations, and those selected were from twenty-five to thirty-five years of age. About 300 were married women and fifty-five were widows. The women had the same conditions of service as the men, but were not asked to work seven days a week. They were employed on all routes. The only complaint against the women was their inability at first to place a proper value on the question of punctuality, but this was being rapidly overcome. The subject was discussed by Mr. Mallins of Liverpool, who doubted whether women conductors could be used on the Liverpool hilly routes. He said that there was plenty of male labor above military age in that city. He thought a much more important question was the utilization of the resources of the tramways for munition work. Mr. Fell, London, stated that the Metropolitan Commissioner of Police had met them in their efforts to maintain the tramway services by allowing overloading of the cars. He thought it would be inadvisable to employ women on the crowded cars, but that they should be allowed on out-

lying routes and in special cases. (The action of the London police, as noted herein, had not at that time been taken.) Mr. Fearnley, Sheffield, spoke in favor of the women, and said they were employed on the hilly routes in that city. In the afternoon, Alfred Baker, Birmingham, discussed "Financial Problems as Affecting Tramways During the War." He called attention to the cost of stores and material, which had gone up at least 27 per cent as compared with 1912-1913, while the traffic and permanent-way staff wages showed an increase of 10 per cent. In Birmingham, the net result had been a decrease in the surplus, and the sum of £30,000 had gone to the relief of the rates, which is less than one-half of the amount two years ago. As a remedy it was decided that a new schedule of increased fares should be adopted, and this so far had been quite successful, and they expected to be from £70,000 to £80,000 better off on the year as a result. The following morning, Mr. Fisher, general manager of the Dundee tramways, was elected president of the association and Mr. Mozley, Burnley, vice-president.

A new generating plant is in course of erection at Dalmarnock for the Glasgow Corporation. The first work consists of a water intake from the River Clyde, a screening house, two water culverts—one for the inlet condensing water and the other for the outlet water—a switch house, a turbine room, two boiler houses, workshop and store, and a complete coal-handling plant capable of dealing with 100 tons of coal an hour. The work now proceeding was contracted for prior to the war. The cost includes £50,000 for excavations, etc., and £25,000 for coal-handling plant. It is not proposed to place the contract for the buildings or issue specifications for the first instalment of the machinery until after the war. The first instalment of the machinery will consist of three 15,000 kw. turbines, which will be coupled direct to a.c. generators; also three 1000 kw. turbo sets for driving auxiliary machinery. It is proposed to add plant units of 15,000 kw. as the demand increases, while turbines of 30,000 kw. can be installed if found to be necessary. The ultimate capacity of the Dalmarnock works will be about 150,000 kw. It is intended to transmit electricity at 20,000 volts, three-phase alternating twenty-five periods per second, to distributing centers at Port Dundas, Springburn, Partick, Cathedral Street, Osborne Street, Waterloo Street, Pollokshaws Road, Govan, Linthouse and Dalmarnock.

The Devonport & District Tramway has passed into the possession of the Corporation of Plymouth. The ceremony was quite simple. The tramways manager for the corporation, and the valuer under the arbitration arrangement, met the manager of the Devonport tramways, and two representatives of the company at midnight, and completed the transfer. Between that hour and the time at which the first workman's car left the Devonport sheds, the change was announced on the dash-plates at either end of the thirty-two cars by the lettering "Plymouth Corporation Tramways" and the additional inscription "C. R. Everson, manager," as required by the legal enactments.

The London & South Western Railway announced that on Nov. 1 the first section of the electrified line which serves the district between Waterloo, Putney and Wimbledon would be opened. There is to be a train in each direction every twenty minutes throughout the day, and the journey is to be completed in twenty-four minutes, as compared with thirty minutes by the steam trains. Other important sections of the electrified line, including Richmond, Kingston, Shepperton, Hounslow, Surbiton, Hampton Court, etc., are expected to be ready shortly.

Despite the opposition of the Chief Commissioner of Police, the House of Lords select committee has passed the London County Council tramways and improvements bill. The hostility of the police was manifested against those portions of the bill which provide for new tramways in Hackney and the reconstruction and electrification of the old horse tramways in Bermondsey. At first, the police hostility was against details of the tramways, but later the police took up an attitude of general hostility, going so far as to say that unless their objections were met the tramways should be vetoed by Parliament. The police demands would involve the Council in an expenditure of more than £150,000 for road widening and other improvements. A. C. S.

News of Electric Railways

TUESDAY'S ELECTION RESULTS

Municipal Ownership Defeated in Detroit and Cleveland— Toledo Franchise Rejected—Other Cleveland Issues Successful—Results in Pennsylvania and New York

By a vote of 35,494 to 32,672 the electors of Detroit rejected at the special election on Nov. 2 the proposition to purchase the lines of the Detroit United Railway within the one-fare zone and have the price fixed by the Wayne County Circuit Court. The proposed contract required a three-fifths affirmative vote, but failed to register a majority. The vote was the heaviest of any special election ever held in Detroit and almost approached the vote of the last Presidential election.

The election followed probably the most bitter newspaper battle ever staged in the city, both opponents and proponents using every resource to secure victory. Mayor Marx, the city administration, the Street Railway Commission and the majority of the political leaders of the community favored the purchase plan. Against them were arraigned the Municipal Ownership League, the Federation of Labor and the local street car employees' union, and, of course, the voters who oppose municipal ownership.

Characterization of the proposal as a "blank check plan" and a "pig in the poke" was probably responsible for the action of the electorate. The idea of buying without knowing the price, perhaps more than anything else connected with the proposition, did not appeal to the majority. It was upon this angle that the chief efforts of the opponents of the plan centered.

Following the election the Detroit United Railway issued this statement:

"The people have expressed themselves and we bow to their will. We feel relieved just as we would have felt had the people voted the other way. It is our earnest desire to do as nearly as possible just what the informed public would like us to do. There are those who think we have been waiting for and that we very much desire a term franchise. This is not the case, as we certainly want nothing of the kind. The Detroit United Railway, like any individual or corporation, is subject to the sovereignty of the State. We ask nothing more than that the State shall exercise a benign guardianship over us; and by the State we mean that government which the people erect over themselves and us. Let us have fair play—we would have nothing more.

"In addition to motor cars and trailers ordered some months ago, such as are now being installed on some of the lines, we are to-day placing orders for more cars to be delivered and put into service as soon as possible. We will do everything in our power to provide any facility we may be permitted to provide for the further improvement and extension of the company's plant."

The Municipal Ownership League fought the proposed contract on the ground that the price would be too high for successful operation of the lines by the municipality. The Federation of Labor backed up the street car employees in their opposition because of the contention that the purchase would destroy their union. However, the great bulk of the quiet opposition came from the wards where either the fear of higher fares or increased taxes or the unknown price operated to kill off the rather rosy promises which the supporters of the plan presented.

Just what the effect of the vote will be upon the municipal ownership question cannot be stated at this time. One of the newspapers which has been a steady fighter for municipal ownership but opposed this plan declared an adverse vote would set back municipal ownership for years if not kill it outright. On the other hand there is a feeling that because the street car issue has been such a meaty one for the newspapers and politicians for years it will pop up again in some new form before very long.

The Dotson franchise, under which the Toledo Railways & Light Company was to have the right to operate in the streets of Toledo, Ohio, for twenty-five years, was defeated at the election on Nov. 2 by a plurality estimated the fol-

lowing day at 6273. The campaign indicated that the business men of the city were strongly in favor of the franchise. They were anxious to have the question settled and improvements made in the transportation facilities.

In commenting on the results the Toledo *Times* said: "Toledo has gone on record on the Dotson ordinance. Inspired opposition to the stand taken by the business interests of the city preyed upon the prejudices of the voter. But this one fact stands out prominent: Before Toledo can go ahead and reach its natural growth the street railway situation must be settled. The Dotson ordinance offered a plan. It is now up to the sources of opposition to this settlement to proffer a plan. Will the interests which have fought the proposition come forward with a solution of the question? It is due to the business interests of the city."

The municipal ownership ordinance in Cleveland was defeated by a large vote. None of the candidates for Mayor espoused its cause, and there was no campaign made for it, except by the Socialists, by whom it was initiated. The ordinance provided for the issue of bonds for the purchase of the property of the Cleveland Railway, the bonds to be a lien against the railway property only.

The Cleveland & Youngstown Railroad, which already had a franchise for an electric line through Kingsbury Run and back on the hill to the southeast of the city, was voted a further franchise for the establishment of a large, high-level freight yard in the Cuyahoga Valley, near the retail business district of the city. This right carries with it the authority to operate steam trains over its right-of-way along Kingsbury Run and erect both freight and passenger depots for steam and electric railways. The company has constructed a portion of its electric track on the hill and expects to complete it to East Ninth Street within another year. This will admit interurban roads from the south and east. The company will serve all roads, both electric and steam, which desire the facilities it offers. The freight yards will be operated with steam until such time as electricity can be practically applied.

The franchise granted the Cleveland, Akron & Canton Terminal Railroad for a four-track, electrically operated subway under East Fifty-fifth Street, was also approved by a heavy vote. This subway will give the railroads from the south and southeast direct admittance to the lake front and paves the way for great docks for the lake boats. Ohio C. Barber, the match king of Barberton, Ohio, is the president of the company and the originator of the idea. It is understood that the contracts for constructing the subway were all made, subject to approval of the franchise at the polls.

Harry L. Davis defeated Peter Witt, Street Railway Commissioner, for Mayor of Cleveland. The construction of the two improvements mentioned and the new union station for the steam roads, also approved by the voters, will come under his administration. Mr. Witt, in all probability, will be succeeded in the office of Street Railway Commissioner by a man from Mr. Davis' own party. William S. Fitzgerald, member of the City Council, has been mentioned for the place. The Council is strongly Democratic, while Mr. Davis is a Republican.

The franchise adopted by the Council of Lakewood, suburb of Cleveland, was approved by a large majority. It provides for a rate of 3 cents within the city of Lakewood and straight 5 cents between Lakewood and points within the city. It also provides for the extension of the Madison Avenue car line to Rocky River. Clayton R. Tyler, an advocate of the franchise, was re-elected Mayor.

The new constitution, voted upon at the election in New York State, was defeated by more than 460,000 votes. The constitutional amendments, among them woman suffrage, were also lost. The outstanding feature of the proposed constitution was its further centralization of power in the executives. It would have made the present Public Service Commissions constitutional bodies, the members to be appointed by the Governor subject to confirmation by the Senate. Likewise the tax commission, the industrial commission and the civil service commission would have become constitutional bodies. Under the defeated constitution the State budget would in the

future have been submitted to the Legislature by the Governor instead of being initiated by the Legislature and subject only to a limited veto power by the chief executive. The proposed constitution would have vested with a commission of nine men appointed by the Governor the power of the Legislature to initiate conservation and other legislation. One of the points on which the measure was attacked was that it did not confer on the cities of the State the power to operate or own public utilities. The question of whether there shall be another constitutional convention will be submitted to the people in 1916.

Four amendments to the Pennsylvania constitution, three of importance throughout the State and one affecting Philadelphia only, were voted on in Pennsylvania at the election on Nov. 2, in addition to the numerous local issues. One of the amendments was to give the vote to women. The others were to make workmen's compensation compulsory as of Jan. 1, 1916, to authorize the Legislature to make laws for a new system of registering land titles, and to permit Philadelphia to increase its borrowing capacity 3 per cent in excess of the present limit, 7 per cent of the assessed valuation, the increase to be applied only to public improvements of a self-supporting nature.

The Mayoralty campaign in Philadelphia, however, held the center of the stage in Pennsylvania politics, as the carrying out of certain important improvements begun under Mayor Blankenburg was regarded as dependent for success on the election of George D. Porter. The plans for improvements under Mayor Blankenburg included those for new rapid transit facilities. These had their inception in the appointment of A. Merritt Taylor as City Transit Director by Mayor Blankenburg on May 27, 1912. Mr. Taylor was asked to report on ways and means to secure rapid transit commensurate with present and future needs. On March 8, 1915, Councils approved the holding of a special election to obtain the consent of the electors to an increase in the city's indebtedness of \$6,000,000 for starting actual subway construction. The proposition carried at the special election on April 29. Two ordinances subsequently were passed by Councils. One appropriated \$3,000,000 for the construction work on the Broad Street subway and one appropriated an equal amount for the Frankford elevated. Both ordinances were approved on July 2, 1915, and some of the contracts have been let. The future of the plans for rapid transit was regarded as hinging largely on the passing of the constitutional amendment, thus releasing the necessary funds. The vote on the amendment was favorable. Many of the adherents of Thomas B. Smith, elected Mayor, are known to be opposed to the rapid transit program of the present administration, at least so far as the proposed down-town delivery loop is concerned. The amendment in regard to workmen's compensation also was passed.

PAVING DISPUTE IN EAST CLEVELAND

Through City Solicitor E. A. Binyun the city of East Cleveland filed suits in the Cuyahoga County Common Pleas Court on Oct. 19 to compel the Cleveland Railway to repave between its tracks in Euclid Avenue, that city. Arrangements have been made to pave the entire length of that thoroughfare in East Cleveland. Aside from the strip between the railroad tracks, the cost is to be divided among the city, county and the citizens. The city claims that the franchise granted to the company in 1896 provides that the company shall pave the strip between its tracks and that it has refused to do so unless its franchise, which expires in 1921, is renewed on a 5-cent basis. City officials claim that the Nickel Plate Railroad will be operating suburban cars or trains before 1921 and that the city will not agree to an increase of fare above that paid by passengers in Cleveland.

The Chamber of Industry, an organization of West Side business men, has announced that plans are on foot for building a rapid transit line along Bulkeley Boulevard and through Edgewater Park, primarily for the development of the section of territory west of Rocky River. It will be similar in its plans and purposes to the Cleveland & Youngstown Railroad's line, which is expected to result in the rapid development of the Shaker Heights district in Cleveland.

ELECTRIC RAILWAY SHARE IN STREET MAINTENANCE TO BE INVESTIGATED

The Massachusetts Public Service Commission was to hold a hearing at Boston on Nov. 4 relative to the share taken by electric railways in street maintenance, snow removal and local franchise taxes. At the last session of the Legislature a resolution was passed directing the board to investigate the subjects above mentioned and to report in January, 1916, with a bill revising existing statutes so far as deemed essential. Question blanks have been sent to all the companies in the State asking for data on existing and recent track mileage, amounts expended in highway maintenance, for snow removal, franchise and commutation taxes. The investigation is the outcome of several bills presented at the last session, one of which, brought by petition of the Massachusetts Street Railway Association, sought to reduce the burdens now laid upon operating companies in connection with the maintenance of public ways over and above the natural obligation to restore excavated sections in track construction or repairs to their previous condition.

ELECTRIFICATION AT CHICAGO

Forecasts of Report on Smoke Abatement and Railway Terminal Electrification

It is announced that the report of the Chicago Commission on Smoke Abatement & Railway Terminal Electrification will be made public within the next few weeks. This is the report on which a commission has been engaged since April, 1911, the commission consisting of four men to represent the city, four the railroads and four the Association of Commerce. The railroads terminating in Chicago volunteered to pay the entire expense of the investigation, which is said to have amounted to more than \$500,000.

In an article which appeared in the *Chicago Daily Tribune* for Nov. 3, Henry M. Hyde gives what purports to be some advance information in regard to the contents of the report. He says, in part:

"Early in its career the committee divided its work into three classes. It decided to reach a determination as to:

"1. The necessity of changing the motive power of steam railroads to electric or other power.

"2. The mechanical or technical feasibility of such a change.

"3. The financial practicability of such a change.

"As the final result of the investigation made under its direction, the committee finds, as to the first point:

"That the complete elimination of steam locomotives from the railroad terminals of Chicago, as a means of smoke abatement, is not, under present-day conditions, necessary."

"As to the technical feasibility of complete electrification of Chicago's railroad terminals, the committee reports:

"1. The launching of such an undertaking, to be participated in by all the railroads at practically the same time, would involve a large amount of experimentation.

"2. The problem of contact design when considered in relation to normal railroad operation, presents many difficulties. A limited amount of trackage in the Chicago terminals is so located that it has been found impracticable to equip it with any form of contact system. Operation over such trackage, subsequent to electrification, will need to be conducted by some form of self-propelled unit or there must be some rearrangement of tracks. The difficulties imposed at numerous points by insufficient clearance of overhead structures will, under the plans of the committee, be met by the installation of warning devices or the enforcement of regulations governing the presence of trainmen on tops of cars.

"3. The technical difficulties to be met and overcome in bringing about the complete electrification of Chicago's terminals will, through the general development of the art, diminish year by year. Therefore, the longer the undertaking can be delayed the more certain will become the procedure by which the electrical establishment can be secured."

"On the final point the report says:

"The complete electrification of the railroad terminals of Chicago as a betterment to be brought about by the railroads through the investment of free capital is, under present-day conditions, impracticable."

"As to the cost of electrification, the report shows that the direct cost, including the extension of electric service to points as far outside the city limits as Waukegan, Desplaines, Elmhurst, Morton Grove, Mannheim, Blue Island, Hawthorne and Hammond would be \$188,000,000. To this the sum of \$102,000,000 is added to cover the cost of changes and betterments in the existing railroad establishments, which might otherwise be postponed for a long time. It is understood that the sum of \$102,000,000 was arrived at as the result of estimates made by the railroads interested."

SERVICE RESTORED IN WILKES-BARRE

As a result of the proposition made by T. A. Wright, general manager of the Wilkes-Barre (Pa.) Railway, to submit to the Luzerne County Courts the question as to the right of the arbitrators to repudiate their own wage award, the employees have made a counter proposition in which the suggestion is advanced that the company name another arbitrator to take the place of S. D. Warriner, Philadelphia, the new man to act with T. D. Shea, the employees' representative, and Dr. John Price Jackson, the umpire of the original arbitration board, and that the three agree upon a flat wage rate.

James A. Steese, a representative of the Pennsylvania State Department of Labor, met the executive committee representing the striking carmen and submitted two propositions for their consideration, the acceptance of either of which might bring about an early resumption of work by the strikers. These propositions follow:

First, it was urged upon the men that inasmuch as the company had agreed to submit the point of the legal right of the arbitrators to repudiate their award to the courts of Luzerne County the question should be referred to the local judges, particularly as Dr. Jackson, the umpire of the board of arbitrators, has made a similar recommendation.

Second, It was urged that the men return to work on the sliding scale basis and that the company and its employees, without any outside interference, get together to fix a flat rate wage rate for all trainmen. This would mean negotiations for a wage scale without national officers of the union taking part.

Rioting occurred in Wilkes-Barre, Pa., on the morning of Nov. 3 when cars of the Wilkes-Barre Railway were run for the first time since the beginning of the strike, three weeks ago. The first car was met by a mob near Ashley, on the outskirts of the city, and bricks were thrown through the windows. About 250 men engaged to take the places of the strikers are quartered in the Wood Street carhouse.

REPORT PRESENTED ON PROPOSED TORONTO-GUELPH RADIAL RAILWAYS

Having heard the report of Sir Adam Beck, chairman of the Ontario Hydro-Electric Power Commission, upon the proposal to construct a hydro-electric radial railway between Toronto and Guelph, the representatives of fifteen municipalities interested passed a resolution indorsing the scheme, and declaring that the electors in each place should be allowed to pronounce upon it by voting upon a by-law in January next.

The Hydro-Electric Power Commission submitted plans for a system of radial railways to connect Toronto, Port Credit, Milton, Guelph, Berlin, New Hamburg, Stratford, St. Mary's, London, Strathroy, Arkona and Sarnia. Sir Adam Beck, chairman of the commission, told the members of the conference that in the opinion of the Provincial Commission the proposed railway between Toronto and London would be a paying one and could be built and equipped for \$10,000,000 or \$11,000,000. He was not prepared at the moment to divulge the details of the arrangements made with the Toronto Harbor Commission for an entrance to the city of Toronto, but stated that the road would come into Toronto by the water front and would run to the market center. He also intimated that a lake shore line to Hamilton and thence to Niagara Falls was under consideration. He also told a Milton delegate that the commission had had an opportunity to purchase the railway now under construction from Toronto to Guelph via Georgetown, but had done nothing with regard to the offer. He said that the commission had prepared plans for a line by the most

feasible and most profitable route and that it would do nothing detrimental to its own interests and the interests of the province. He promised to notify the municipalities of its intention with regard to the road now being built before the time came to vote on the by-laws.

A resolution was adopted approving the route suggested, but authorizing the commission to make any diversion from the general plan which might be considered of benefit to the project and the province as a whole. Another resolution advocated the commencement of a campaign in favor of the construction of the road immediately, and asked the commission to supply each municipality with the data necessary to inform the electors of the details of the project. Representatives of municipalities on the route for the second link of the proposed line conferred with the commission on Oct. 28 and approved plans for the section between Guelph and London. Delegates from places between London and Sarnia, which will be the third link, were to confer with the commission on Nov. 2 and others from points between Toronto and Collingwood on Nov. 3.

Sir Adam pointed out that while the supply of power under present contracts was about exhausted the commission had before the government for approval plans that would allow an ultimate development of 600,000 hp. and an immediate development of 200,000 or twice the amount now used.

ANNUAL REPORT OF BOSTON TRANSIT COMMISSION

The twenty-first annual report of the Boston (Mass.) Transit Commission covers 102 pages, including descriptions of work under way during the year, statistical data regarding the rentals paid by the Boston Elevated Railway for the use of subways and tunnels in Boston proper, construction expenses and legislative matters. The commission, of which Prof. George F. Swain is chairman, states that it hopes to open the Summer Street section of the Dorchester tunnel to traffic by Jan. 1, 1916. The contract for that portion of the tunnel under Fort Point Channel has been let, as has the section in South Boston between Broadway Station and Andrew Square. Important enlargements of the Park Street subway station under Tremont Street took place within the year. Toll receipts from the East Boston tunnel for the year ended June 30, 1915, were \$138,314. During the year the Boston Elevated Railway paid as rentals the following: Tremont Street subway, \$211,782; Washington Street tunnel, \$355,488; Cambridge subway connection in Boston, \$70,858; Boylston Street subway, \$150,381. Since its organization the commission has expended \$29,002,756 on Boston rapid transit subway, tunnel and related work.

In his annual report, Chief Engineer Edmund S. Davis describes the main features of the Dorchester tunnel now building, construction methods, and contract details, and discusses the improvements effected at Park Street subway station, the alterations in the Public Garden section of Boylston Street and the construction methods in the East Boston tunnel extension into the West End. The Dorchester tunnel will be about 12,000 ft. long, of which about 8300 ft. is completed or under contract. An important station in this tunnel will be located at Dewey Square, adjoining the South Terminal Station. This will be a two-story structure, with lobby for ticket offices and general distribution of traffic above, and two side platforms, each 350 ft. long, with tracks below. The lobby will connect with the street by four stairways, and in addition two single-file, cleat-type escalators will connect the lobby with the sidewalk. Two stairways will connect the lobby with each of the train platforms, and two escalators will connect the two train platforms with the sidewalks above.

At the Park Street station, one of the most important points on the Boston Elevated System, the commission executed noteworthy improvements by reducing track curvature and increasing platform areas. The westerly platform was increased in area from 8212 sq. ft. to 14,047 sq. ft., and the easterly platform from 7046 sq. ft. to 9625 sq. ft. The former was lengthened about 118 ft., and its width now averages about 27 ft. It provides berths for eight cars on each southbound track. Eight berths were also provided on each side of the easterly platform, so that thirty-two cars can occupy the station at one time.

Pardon for Columbus Dynamiter Denied.—Governor Frank B. Willis of Ohio has refused to give Alfred Strader, the man who was convicted of dynamiting cars during the Columbus strike in 1910, his liberty, although the board of pardons had recommended such action. Strader was given two sentences of five years each. He has served his first sentence and one year on the second.

Chicago Elevated Employees Accept Offer.—In a referendum the employees of the elevated railroads of Chicago accepted the wage offer of the company by vote of 1836 to 319. The new agreement included no important changes in the working conditions, but did provide substantial increases in the rates of pay as outlined in the *ELECTRIC RAILWAY JOURNAL* of Oct. 30, page 923. It is estimated that the total increase in wages will amount to about \$200,000 a year.

Union Jurisdiction Settled.—The board of arbitration appointed to decide questions between the Amalgamated Association of Street & Electric Railway Employees of America and the Empire United Railways, Syracuse, N. Y., has decided against the Amalgamated's claim to exclusive jurisdiction over employees of the Auburn and Port Byron line of the Empire United Lines. The Amalgamated's claim was disputed by the Brotherhood of Locomotive Engineers and the Order of Railway Trainmen. Arbitration was agreed upon after a strike last summer. All cars on the Auburn-Port Byron division of the Empire United Railways will be operated from Newark hereafter instead of from Auburn.

Boston Elevated Carhouse Burned.—The Eagle Street carhouse of the Boston Elevated Railway in East Boston, Mass., was destroyed by fire in the early evening of Nov. 1, causing an estimated damage of about \$250,000. Twenty-two semi-convertible cars were burned. The carhouse was built about eighteen years ago and was a wooden structure, 100 ft. wide and 100 ft. deep. It contained eight tracks. The service in East Boston was maintained without interruption and an adjacent power plant of the company was uninjured. Two snow plows were also destroyed by the flames. The company will probably rebuild with a smaller carhouse of concrete, using open-air storage on the premises as far as possible.

Preparing for the Des Moines Election.—The special election on the granting of a new franchise to the Des Moines (Iowa) City Railway will be held on Nov. 22 as ordered by the City Council. Election notices are now being published. Emil G. Schmidt, president of the company, says no campaign will be made. Mayor Hanna, chief opponent of the franchise grant for years, voted for it upon final adoption by the City Council and there is now no opposition whatever among leaders in public opinion. Mr. Schmidt is busily preparing for improvements to cost \$1,500,000 which will be made as soon as the grant is adopted. He is now in the East to make final preparations for ordering new cars.

PROGRAMS OF ASSOCIATION MEETINGS

Central Electric Railway Accountants' Association

The Central Electric Railway Accountants' Association will meet at Detroit, Mich., on Dec. 7 and 8.

Central Electric Traffic Association

The Central Electric Traffic Association will meet in the office of the chairman of the association in Indianapolis, Ind., on Nov. 17.

Central Electric Railway Association

The Central Electric Railway Association will meet at the Claypool Hotel, Indianapolis, Ind., on Thursday and Friday, Nov. 18 and 19.

American Society of Mechanical Engineers

The annual meeting of the A. S. M. E. will be held in New York on Dec. 7-10. The opening session will be on the evening of Dec. 7. Professional sessions will be held on Dec. 8 and Dec. 9 and one industrial safety meeting on Dec. 10. The annual dinner will be held on the evening of Dec. 9.

Financial and Corporate

ANNUAL REPORTS

Albany Southern Railroad

The comparative statement of income, profit and loss of the Albany (N. Y.) Southern Railroad for the years ended June 30, 1914 and 1915, shows that for the latest fiscal year the gross revenue of all departments (railway, electric and gas) was \$502,775, a decrease of 0.84 per cent as compared to the preceding year, and the operating expenses including taxes were \$366,083, a decrease of 4.16 per cent, leaving net revenue of \$136,692, an increase of 9.2 per cent. Deductions of interest on bonds, rentals and reserves amounted to \$91,719, a decrease of 6.5 per cent, leaving a net corporate income of \$44,972, an increase of 66 per cent.

The following table shows some comparative railway statistics for the last two years:

	1915.	1914.
Revenue passengers carried.....	1,452,739	1,563,064
Revenue passenger car mileage.....	706,771	737,877
Gross operating revenue per passenger car mile	\$0.461	\$0.460
Operating expenses per passenger car mile	\$0.314	\$0.341
Tons of freight carried.....	61,211	67,661
Freight train mileage.....	74,759	75,074

In the railway department the diminishing traffic experienced the previous year continued in even more marked degree, owing to the general business depression. Several of the important mills along the line were shut down, others were worked on short time, and the freight and passenger traffic normally derived from these sources contributed largely to the decrease of \$13,849, or 4.1 per cent, in the gross revenue of this department. The company met the situation as much as possible by a rearrangement of its train schedule with due consideration for public welfare. Owing to the unusually large expenditures for maintenance in the preceding two years the cost of maintenance of way and structures showed a decrease of \$7,001, or 21.6 per cent, for this year. The expenditures for maintenance of equipment decreased \$4,039, or 17.2 per cent. Jitney buses are running in competition with the company between Albany and Nassau, but the traffic has been light and the effect little felt. During the last year the company expended \$17,482 on construction and new property.

For the last two years a vigorous effort has been made to obtain more equitable taxes for the company with very good results. While the tax rate each year has increased, the assessed valuations of the company's property in the various towns have been reduced, and the amount of taxes paid in 1913 was \$43,535 and in 1914, \$42,010. These are the first two years that have shown any decrease in the charges for taxation.

Fonda, Johnstown & Gloversville Railroad

The comparative statement of income, profit and loss of the Fonda, Johnstown & Gloversville Railroad for the years ended June 30, 1914 and 1915, follows:

	1915	1914
Operating revenues	\$874,761	\$986,877
Operating expenses	467,236	494,771
Net revenue from railway operations.....	\$407,525	\$492,106
Railway tax accruals	39,500	45,367
Railway operating income.....	\$368,025	\$446,739
Miscellaneous operations (Sacandaga, N. Y., summer resort)—deficit	6,017	7,279
Operating income	\$362,008	\$439,460
Non-operating income	31,804	33,580
Gross income	\$393,812	\$473,040
Deductions from gross income.....	380,549	380,333
Net income (available for dividends).....	\$13,263	\$92,707
Dividends on preferred stock.....	30,000	30,000
Balance to profit and loss.....	*\$16,737	\$62,707

*Deficit.

Business conditions were so unfavorable throughout the year that the result of operations was more unsatisfactory than in any other year in the history of the company. The output of all manufacturing plants in the section served by the company was greatly reduced, and many were shut down or run on short time. A glove cutter's strike, de-

clared in August, continued for five months, during which period the glove industry of Johnstown and Gloversville was practically at a standstill and all other business seriously affected. In the spring months jitney competition with the electric lines in Johnstown and Gloversville cut heavily into earnings, before legislative action for proper regulation and a publicity campaign eliminated this competition in the latter part of June.

Through the combination of such unfavorable conditions in one year, the company suffered a loss in net income of \$79,228 as compared with the previous year, and in gross revenues of \$112,115, which brought the total gross earnings to a point lower than in any year since 1909. Freight revenue declined only \$24,623, however, while passenger earnings decreased \$74,342 and express revenue \$2,663. The total operating expenditures of \$467,236, which included a charge of \$4,984 for depreciation of equipment as required by the Interstate Commerce Commission, showed a reduction of only \$27,535. The operating payroll, included in the above figures, amounted to \$323,083 or about 37 per cent of gross revenues—a decrease of \$28,429.

The sum of \$76,558 was expended during the year for the improvement and development of existing property. The 2.03 miles of new track in Amsterdam cost \$38,868 and 0.72 mile in Johnstown involved an amount of \$9,956. Among the other items was the only expenditure for road equipment during the year, amounting to \$2,283 for a new track grinder for the electric division and a caboose for the steam division. No securities have been sold since 1911, and all additions to property since then, amounting to \$205,961, have been financed from surplus earnings and temporary loans. This amount is subject to addition to the capital accounts.

This company operates 83.91 miles of electric road and 40.60 miles of steam road, a total of 124.51 miles. The following table shows the separate electric and steam revenues and expenses for the year ended June 30, 1915, with the increases or decreases as compared with the preceding year:

	ELECTRIC.		STEAM.	
	1915	Change	1915	Change
Revenue from transportation	\$541,779†	— \$62,655	\$311,134*	— \$39,572
Revenue from other railway operations.	18,618	— 10,206	3,230	+ 318
Total operating revenues	\$560,397	— \$72,861	\$314,364	— \$39,254
Way and structures ..	\$50,309	— \$8,332	\$24,839	— \$2,512
Equipment	31,751	+ 1,777	20,803	+ 4,373
Power	46,578	— 9,325
Conducting transportation	134,466	— 4,494	86,179	+ 4,935
Traffic	3,163	— 213	4,992	+ 38
General and miscellaneous	48,017	— 959	16,138	— 2,953
Total operating expenses	\$314,284	— \$21,546	\$152,951	— \$5,989
Net revenues	\$246,113	— \$51,315	\$161,413	— \$33,265
Operating ratio.....	56.08	+ 3.05	48.65	+ 3.70
Passengers carried..	5,994,376	— 701,402	211,913	— 46,089

*Freight revenue, \$239,574 (\$24,623 decrease); passenger revenue, \$54,137 (\$11,975 decrease).
†Passenger revenue, \$536,479 (\$62,366 increase).

Dick, Kerr & Company, Ltd.

Judging from the profit, the year ended June 30, 1915, was a moderately good one for Dick, Kerr & Company, Ltd., London, England. The net revenue was £46,960, an improvement of £2,000 over the previous year and £22,500 over the average of the five years before 1913-1915. From the net revenue the debenture interest and the preference dividend were paid, and a sum of £25,000 was set aside as a reserve against contingencies. To make this appropriation the balance in profit and loss was reduced by more than £7,000 to £18,346.

On June 30 the amount due to the company on contracts was £460,365, more than double the sum due twelve months before. Stocks and work-in-progress, apart from contracts, stood at a figure £34,000 lower than a year ago, but cash and investments were higher. The outlay incurred on contracts was financed by a heavier indebtedness to creditors of £93,000, and by a loan from bankers of £100,000, this loan being secured on a second debenture.

Part of the company's business was doubtless disorganized by the outbreak of war, and though German competition in the manufacture of electrical machinery and apparatus has been eliminated, great difficulties stand in the way of that branch being extended. It is believed that these difficulties will probably continue for some time, but at the close of the war, or in its final stages, it should be possible to make substantial progress.

EXTENSION GRANTED IN KANSAS CITY

**City Council Upon Request of Judge Hook Grants Ninety-Day Extension to Complete Details of Reorganization—
Judge Hook Takes Full Charge of Railway Matters**

The City Council of Kansas City, Mo., on Nov. 1 granted an extension of ninety days to the Kansas City Railways for complying with the conditions of the new franchise granted in July, 1914. This action was taken in response to a request from Judge Hook, who stated that the essentials of the reorganization had been effected and only details remained, which required more time.

Judge Hook on Nov. 1 issued a ruling instructing the receivers and managers of the company to take all necessary steps to secure from the Missouri Public Utilities Commission the orders and approvals that the legal situation demands. This has particular reference to the separation of the railway and light companies. The order included a statement that Judge Hook had taken full charge of the street railway matters, and that no other proceeding would be allowed to interfere with the consummation of the plans now under way and the assumption of control by the new company. It was understood to be the purpose of the court to gather all litigation under one jurisdiction at this time and to prevent any outside interference with reorganization.

Frank Hagerman, attorney for the receivers of the Metropolitan Street Railway, is quoted as follows with reference to the court's order:

"No court, notary public or anybody else, except Judge Hook in the receivership cases, has any right, directly or indirectly, to question in any way the validity of the franchise, or attempt to harass anybody connected therewith, or to use any pretended contest for political or capital purposes."

The particular local application of the order is to the Wilson suit now pending, in which the validity of the franchise is attacked on the ground of conspiracy in its enactment. The taking of testimony in the suit had been temporarily suspended because of a court order quashing a notice to take depositions before a notary. The Kansas City Court of Appeals decided on Nov. 1 that testimony must be taken before a commissioner, who can rule out matters apparently relevant to the election and the franchise, but not bearing directly on the suit.

TAXABLE VALUATIONS IN IOWA

The 1915 taxable valuation of interurban electric railways in Iowa, as fixed by the executive council of the State last July and now published in that body's forty-fourth annual report, amounts to \$1,810,491 for 477.80 miles of road. The taxable valuation of the steam railroads in the State is \$78,880,376 for 10,016.71 miles of road. Other valuations are as follows: Transmission lines, \$117,352; equipment companies, \$257,800; sleeping cars, \$427,067, and express property, \$312,243.

The detailed lengths for the interurban electric railways as on Jan. 1, 1915, and the taxable values thereof are shown in the following table:

	Miles of Road	Taxable Value Per Mile	Total Taxable Value
Cedar Rapids & Marion City Railway....	20.97	\$8,500	\$178,245
Centerville Light & Traction Company...	7.84	3,000	23,520
Charles City Western Railway.....	16.33	2,000	32,660
Davenport & Muscatine Railway.....	25.27	3,000	75,810
Fort Dodge, Des Moines & Southern Railroad	117.97	3,000	353,910
Inter-Urban Railway	64.18	3,500	224,630
Iowa & Illinois Railway.....	33.05	3,700	122,285
Iowa Railway & Light Company.....	54.48	3,700	201,576
Mason City & Clear Lake Railroad.....	14.62	4,500	65,790
Oskaloosa & Buxton Electric Railway....	2.30	3,700	8,510
Southern Iowa Railway & Light Company	10.00	2,500	25,000
Waterloo, Cedar Falls & Northern Railway	110.79	4,500	498,555
Total	477.80	\$1,810,491

BIG MERGER ARRANGED

American Railways Amalgamates with National Properties Company—Stock of Wilmington & Philadelphia Traction Company to Go to Former for New Stock

The American Railways, Philadelphia, is to be merged with the National Properties Company, New York, according to Newburger, Henderson & Loeb, Philadelphia, the bankers who have directed negotiations to this end. The conditions of the merger have been approved by the managements of both corporations and a majority of the American Railways stockholders. The plan is to become effective on Jan. 1, 1916.

According to the agreement, the entire capital stock of the Wilmington & Philadelphia Traction Company, Wilmington, Del., amounting to \$4,060,000, formerly owned by the National Properties Company, is to become the property of the American Railways. In addition, \$500,000 cash will be paid into the treasury of the American Railways for purchase at par of a like amount of its preferred stock to be issued and bought by the National Properties Company. By these changes it is said that the equities behind the funded debt of the American Railways will be increased.

The American Railways is to issue additional 7 per cent preferred stock to the amount of \$1,500,000 and \$2,560,000 of new common stock for the \$4,060,000 of Wilmington & Philadelphia Traction Company stock turned over by the National Properties Company. The outstanding common stock of the American Railways will be bought at par, or \$50 per share, by the National Properties Company, payment being made in guaranteed collateral trust bonds to be secured by such stock and also by the \$2,560,000 of new common stock to be turned over to the National Properties Company.

These collateral trust bonds are not to exceed \$7,000,000 and will run for thirty years. Interest on them will be at rates increasing from 4 per cent per annum, the present dividend rate on the American Railways common stock. After two years the rate will become 4½ per cent for two years, and thereafter 5 per cent. To secure further the equity of holders of American Railways common stock, it is stipulated that if at any time the National Properties Company shall pay dividends on its common stock in excess of 5 per cent per annum, an additional amount will be paid as interest on the collateral trust bonds up to a maximum of 6 per cent.

The board of directors of the American Railways will soon issue a notice to stockholders requesting them to deposit their shares with a trust company, which will issue negotiable receipts exchangeable for definite bonds. The plan to be effective requires the deposit of not less than 75 per cent of the stock.

Atlantic Shore Railway, Kennebunk, Me.—The Atlantic Shore Railway has defaulted the initial payment on \$641,750 of refunding mortgage thirty-year gold bonds. These bonds, dated 1910, bear interest at 4 per cent, payable for the first five years only if earned. No interest was earned during this period, but the coupon falling due on Oct. 1 was the first of the obligatory ones. It is reported that the company during its year to April 1 secured \$361,577 in gross revenues, but had left only \$77,329 for taxes and interest. After these payments there was a \$25,087 loss to be added to previous losses of \$67,155, making a deficit of \$92,242 for the five-year period.

Brooklyn (N. Y.) Rapid Transit Company.—The South Brooklyn Railway, one of the subsidiaries of the Brooklyn Rapid Transit Company, has been authorized by the Public Service Commission for the First District of New York to purchase all the outstanding capital stock of the Prospect Park & Coney Island Railroad, namely, 2500 shares, with a par value of \$100 each. Of the total amount 1768½ shares are to be acquired immediately, and the remainder from time to time. The commission requires as a condition of the purchase that the offer of the company to pay \$200 per share for the stock shall be kept open to Dec. 31, 1915. Within twenty days from date it must notify all stockholders of the Prospect Park company, excepting those whose stock

has already been acquired, of its acquisition of a majority of the stock, of the price paid, and of its willingness to acquire the remainder on the same terms on or before Dec. 31, 1915. As noted in the *ELECTRIC RAILWAY JOURNAL* of Oct. 23, the minority holders opposed the purchase of the 1768½-share block from the Long Island Railroad, which has been leasing the line to the Brooklyn Rapid Transit Company, unless the latter company would make a uniform offer to all stockholders. The rental for the line was said to be its only income.

Cleburne (Tex.) Street Railway.—An offer of \$17,000 for the rails and wire of the Cleburne Street Railway has been refused by John W. Floore, Sr., the owner of the line. Mr. Floore said that \$16,000 would pay him for the line, which is not being operated at present, but he will sell the property only to some one who will agree to operate it. The sale of this line at foreclosure to Mr. Floore, the mortgagee, was noted in the *ELECTRIC RAILWAY JOURNAL* of May 15.

Empire United Railways, Inc., Syracuse, N. Y.—The Public Service Commission for the Second District of New York has approved the merger of the Monroe County Electric Belt Line with the Empire United Railways, Inc. Some time ago the commission approved the purchase of all of the outstanding capital stock of the belt line by the latter company, as noted in the *ELECTRIC RAILWAY JOURNAL* of Sept. 11. The stock has now been all purchased, and the present order approves the merger, the Empire United Railways, Inc., taking over all the assets and assuming all the liabilities of the belt line company.

Groton & Stonington Street Railroad, Mystic, Conn.—The stockholders of the Groton & Stonington Street Railroad voted at the recent annual meeting to reduce the number of directors from nine to seven. The following were then elected to the board: Morton F. Plant, Robert W. Perkins, F. De C. Sullivan, A. E. Locke, H. M. Verrill, C. L. S. Robinson and C. L. Avery.

International Traction Company, Buffalo, N. Y.—The directors of the International Traction Company have declared a dividend of 1½ per cent on the company's 4 per cent cumulative preferred stock, payable on Nov. 15 to stockholders of record on Nov. 5. This payment compares with 2 per cent paid last February and 2 per cent in July, 1914. On Oct. 16 the company filed at Trenton, N. J., an amendment to its charter providing for the retirement of \$5,000,000 of 4 per cent cumulative preferred stock, with accumulated dividends thereon, by the issuance of new 7 per cent cumulative first preferred stock, share for share. This plan was described in the *ELECTRIC RAILWAY JOURNAL* of Aug. 21.

Iowa Railway & Light Company, Cedar Rapids, Iowa.—Miller & George, Providence, R. I., are offering at \$100 and dividends a block of the 7 per cent cumulative preferred stock of the Iowa Railway & Light Company.

Lehigh Valley Transit Company, Allentown, Pa.—The directors of the Lehigh Valley Transit Company have declared a semi-annual dividend of 2½ per cent on the company's 5 per cent cumulative preferred stock, payable on Nov. 10 to stockholders of record on Oct. 31. Dividends at the rate of 2 per cent per annum were paid semi-annually from November, 1911, to May, 1915, the accumulation after the present payment amounting to 14½ per cent.

Mississippi Valley Electric Company, Iowa City, Iowa.—It is announced that the Mississippi Valley Electric Company has taken over and is operating the Fort Madison Street Railway. This act followed the approval of a new franchise for the local company by the voters of Fort Madison, this being the condition of purchase, as noted in the *ELECTRIC RAILWAY JOURNAL* of June 26. The new owner expects to put on four new cars and otherwise improve the line.

Monongahela Valley Traction Company, Fairmont, W. Va.—The shareholders of the Fairmont Gas Company are to vote on Nov. 24 on selling the entire property to the Monongahela Valley Traction Company. It is proposed by the directors that the proceeds of the sale shall be distributed as follows: (a) To the holders of the preferred stock one share (\$100 par value) of preferred and one-fourth share (\$25 par value) of common stock of the Monongahela Valley Traction Company and \$17 in cash for

each two shares (\$100 par value) of preferred stock of the Fairmont Gas Company. (b) To the holders of the common stock one share (\$100) of the common stock of the traction company and \$18.75 in cash for each 2½ shares (\$125 par value) of common stock of the Fairmont Gas Company. On the completion of the deal the Monongahela Valley Traction Company will have outstanding \$5,000,000 of bonds, \$2,787,150 of preferred stock and \$6,782,037 of common stock. The authorized common stock, it is said, will be increased from \$5,000,000 to \$9,500,000 and the authorized preferred from \$2,500,000 to \$3,000,000. The Monongahela Valley Traction Company agrees to begin dividends on its common stock in January at the rate of 4 per cent a year. The payment of this dividend, as well as that of 5 per cent on its preferred stock, will be made in quarterly disbursements from that date. The capitalization of the Fairmont Gas Company is \$2,000,000 of common stock and \$728,150 of preferred. The last-named stock was recently reduced from \$750,000 with earnings.

Muscatine & Iowa City Railway, Muscatine, Iowa.—The Muscatine & Iowa City Railway, organized to provide electric service on a 104-mile leased section of the Rock Island Railroad, as noted in the ELECTRIC RAILWAY JOURNAL of Oct. 30, has been granted a charter by W. S. Allen, Secretary of State of Iowa. The authorized capital stock is \$400,000, of which \$100,000 is common and \$300,000 preferred. Headquarters of the company will be at Muscatine. The lease with the Rock Island Railway has been drawn up and will be approved by the new company as soon as the charter is issued. It is for a period of fifty years. The directors of the company are G. M. Titus, E. L. McColm, H. F. Giessler, W. F. Bishop, F. O. Block and A. D. Bowen of Muscatine; William Musser, S. W. Mercer, Ralph Otto, C. W. Schmitt and W. P. Hohenschuh of Iowa City; H. G. Moore of Wellman, and E. D. Rayburn of Montezuma.

North Branch Transit Company, Bloomsburg, Pa.—A. W. Duy, receiver North Branch Transit Company, has applied to the court for permission to issue \$62,000 of receiver's certificates to provide for needed improvements to the company's track and equipment. The appointment of the receiver for this company was noted in the ELECTRIC RAILWAY JOURNAL of Oct. 16.

Philadelphia Company, Pittsburgh, Pa.—The stockholders of the Philadelphia Company are to vote on Dec. 28 on the following propositions: (1) An increase in the authorized capital stock from the present \$69,433,400 to \$71,933,400, such authorized increase to be in the common shares; (2) the sale of \$2,500,000 of new common stock to Ladenburg, Thalmann & Company, and Hayden, Stone & Company. The purpose of the increase is to provide funds for paying off all the outstanding floating indebtedness of the company. This sale, together with cash on hand, will clean up the entire floating indebtedness incurred last winter for improvements and betterments when business was slack. The wisdom of the improvements made during the period of inactivity in the Pittsburgh district is said to be now reflected in the company's earnings. It is estimated that earnings this fall will be at least 20 per cent in excess of any previous months in the history of the company. It is reported that none of the new stock, when taken by the bankers mentioned above, will be offered in the market.

Winnipeg, Selkirk & Lake Winnipeg Railway, Winnipeg, Man.—The Dominion Securities Corporation, Ltd., Toronto, Ont., is offering \$1,000,000 of 5 per cent ten-year general mortgage and refunding gold bonds of the Winnipeg, Selkirk & Lake Winnipeg Railway. The bonds are dated July 1, 1915, and are due on July 1, 1925, but are callable, as a whole or in part, at 103 and interest. These bonds are part of a closed mortgage issue of \$1,400,000, of which \$400,000 is reserved to retire an underlying 5 per cent issue of like amount, due in 1933 but now being rapidly exchanged. The principal and interest are unconditionally guaranteed by the indorsement of the Winnipeg Electric Railway.

Youngstown & Ohio River Railroad, Leetonia, Ohio.—Application has been made by the Youngstown & Ohio River Railroad to the Ohio Public Utilities Commission for permission to issue \$200,000 of one-year bonds. These would be used in taking up an equal amount of outstanding securities.

DIVIDENDS DECLARED

Boston (Mass.) Elevated Railway, quarterly, 1½ per cent.
 Connecticut Railway & Lighting Company, New Haven, Conn., quarterly, 1 per cent, preferred and common.
 International Traction Company, Buffalo, N. Y., 1½ per cent, preferred.
 Lehigh Valley Transit Company, Allentown, Pa., 2½ per cent, preferred.
 Monongahela Valley Traction Company, Fairmont, W. Va., quarterly, 1¼ per cent, preferred.
 Ohio Traction Company, Cincinnati, Ohio, quarterly, 1¼ per cent, preferred.
 Union Street Railway, New Bedford, Mass., quarterly, 2 per cent.
 Washington Railway & Electric Company, Washington, D. C., quarterly, 1¼ per cent, preferred; quarterly, 1¼ per cent, common.
 Washington-Virginia Railway, Washington, D. C., 2½ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

BATON ROUGE (LA.) ELECTRIC COMPANY.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Aug., '15	\$15,284	*\$8,714	\$6,570	\$3,169	\$4,401
1 " " '14	14,158	*9,423	4,735	2,070	2,665
12 " " '15	183,355	*109,967	73,388	25,421	47,967
12 " " '14	177,200	*115,622	61,578	25,222	36,356

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

1m., Aug., '15	\$14,394	*\$9,070	\$5,324	\$1,107	\$4,217
1 " " '14	16,237	*8,249	7,987	1,091	6,896
12 " " '15	116,776	*99,084	17,692	13,602	4,090
12 " " '14	119,491	*100,066	19,425	12,809	6,616

BROOKLYN (N. Y.) RAPID TRANSIT SYSTEM

3m., Sept., '15	\$7,301,319	*\$4,294,099	\$3,007,220	\$1,162,362	†\$1,974,393
3 " " '14	7,239,787	*4,272,735	2,967,052	1,162,535	†1,920,224

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO

1m., Aug., '15	\$114,658	*\$74,194	\$40,464	\$27,591	†\$12,969
1 " " '14	123,058	*70,205	52,853	27,396	†25,457
8 " " '15	810,839	*548,453	262,386	220,002	†43,175
8 " " '14	837,571	*543,026	294,543	218,634	75,909

DALLAS (TEX.) ELECTRIC COMPANY.

1m., Aug., '15	\$147,944	*\$92,059	\$55,885	\$28,380	\$27,505
1 " " '14	174,775	*103,473	71,302	30,569	40,733
12 " " '15	1,906,443	*1,114,880	791,563	362,055	429,508
12 " " '14	2,277,091	*1,353,852	923,239	307,779	615,460

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

1m., Aug., '15	\$135,757	*\$89,610	\$46,147	\$26,257	\$19,890
1 " " '14	228,733	*109,226	119,507	28,763	90,744
12 " " '15	2,039,965	*1,216,816	823,149	339,484	483,665
12 " " '14	2,460,399	*1,357,393	1,103,006	362,235	740,771

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

1m., Aug., '15	\$25,511	*\$12,903	\$12,608	\$4,583	\$8,025
1 " " '14	24,573	*14,183	10,390	4,649	5,741
12 " " '15	264,104	*163,413	100,691	55,563	45,128
12 " " '14	284,379	*180,993	103,386	55,602	47,784

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

1m., Aug., '15	\$147,066	*\$89,338	\$57,728	\$24,911	\$32,817
1 " " '14	174,663	*95,120	79,543	23,229	56,314
12 " " '15	1,755,263	*1,039,550	715,713	294,975	420,738
12 " " '14	2,158,252	*1,205,238	953,014	277,219	675,795

PENSACOLA (FLA.) ELECTRIC COMPANY.

1m., Aug., '15	\$22,075	*\$12,510	\$9,565	\$7,090	\$2,475
1 " " '14	22,669	*14,772	7,897	7,188	709
12 " " '15	245,486	*148,256	97,230	86,849	10,381
12 " " '14	283,238	*177,469	105,769	86,837	19,532

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

1m., Aug., '15	\$606,229	*\$387,166	\$219,063	\$182,893	\$36,170
1 " " '14	689,028	*404,450	284,578	177,899	106,679
12 " " '15	7,763,789	*4,787,515	2,976,274	2,160,424	815,850
12 " " '14	8,657,136	*5,060,019	3,597,117	2,085,359	1,491,758

SAVANNAH (GA.) ELECTRIC COMPANY

1m., Aug., '15	\$65,767	*\$44,786	\$20,981	\$21,608	†\$627
1 " " '14	71,339	*46,517	24,822	21,265	3,557
12 " " '15	801,161	*520,837	280,324	258,031	22,293
12 " " '14	851,035	*566,663	284,372	254,090	30,282

TAMPA (FLA.) ELECTRIC COMPANY.

1m., Aug., '15	\$78,924	*\$40,365	\$38,559	\$3,606	\$34,953
1 " " '14	82,811	*42,522	40,289	3,703	36,586
12 " " '15	978,209	*502,026	476,183	43,683	432,500
12 " " '14	957,023	*522,397	434,626	46,676	387,950

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

Traffic and Transportation

JITNEY JOTTINGS

Tennessee Bonding Law Upheld—Jitneys a Menace in Atlantic City—Company in Springfield, Ill., Applies for Relief

The Supreme Court of Tennessee has upheld the law that provided for bonding jitney buses. Thirty days are allowed by the decision of the court for the operators of jitneys to obtain permits or franchises to use the streets and to take out bonds. In Memphis, however, the proscription was put into effect immediately by the city authorities, at least pending issuance of temporary permits in the matter. The court considered two cases, one that of the Memphis Street Railway against the Rapid Transit Company and others, and the second that in which the city of Memphis was appellant. The first asked an injunction. The street railway contended that it holds franchise rights from the sovereign power and that to use the streets in a manner not common to the general public the person so using them must first obtain a franchise or permit. The street railway, having a special interest and special property rights under its franchise, was being specially damaged in a manner not common to the public, by the unlawful operation of the jitneys, doing business similar to that of the street railway. The court held that under the act of 1915 it was unlawful to operate jitneys in any city of Tennessee until such city had passed an ordinance authorizing their presence and fixing their routes, and until the jitney owners had procured licenses and executed bonds to cover damages, etc. In Memphis no such ordinance had been passed and no jitney bus operator had given any bond. On the other hand, the street railway company, having complied with the law, was entitled to protection from illegal competition, it was ruled. The other case was that of a jitney operator who had been arrested by the police for operating without bond, the lower court in its finding having held the State law unconstitutional. This finding was reversed.

The Atlantic City & Shore Railway, Atlantic City, N. J., has appealed to city officials, hotel owners and business men for relief from ruinous jitney competition. As a result of a preliminary conference between I. H. Silverman, president of the company, executives of civic organizations and bankers, the Chamber of Commerce, Hotel Men's Association and the Rotary Club appointed committees to meet with officials of the company to discuss the situation and decide what the business community can do to help the company in its emergency. In the absence of any other requirement than a municipal license fee of \$25, the competing conveyances grew to more than 400 during the summer rush. William F. Hanstein, president of the Hotel Men's Association, has proposed that the jitneys be excluded altogether from Atlantic Avenue, the principal business thoroughfare of the city, where the Shore Line, before the jitney's advent, derived most of its profitable income. Representatives of the company are said to have declined to consider informal proposals from the joint committees of merchants, hotelmen and bankers that the company establish a 3-cent fare zone for the business district.

A. D. Mackie, vice-president and general manager of the Springfield (Ill.) Consolidated Railway, has filed a petition before the Illinois Public Utilities Commission asking that the jitney men in Springfield be restrained from operating their cars until they have obtained a certificate of necessity and convenience from the commission. The petition contends that the "service" cars operated in Springfield are carrying passengers for hire the same as the street railway and that they are common carriers. In the Jacksonville jitney case, decided by the commission some time ago, the commission held that jitneys are common carriers and subject to the same regulations as other common carriers, and that to obtain the right to operate in a city they must follow specified routes, file adequate bonds and not operate where satisfactory service is being given by street railway. When the City Commissioners of Springfield recently passed an ordinance regulating the jitney buses these features were eliminated by efforts of the jitney men. This ordinance

went into effect on Nov. 2. Plans which were being made by Mr. Mackie to start jitney buses in Springfield on Nov. 1 have been abandoned. Mr. Mackie was unable to rent large buses and did not want to buy them.

The People's Motor Club was characterized by Assistant City Solicitor Lowengrund of Philadelphia as a "sham and a fraud," at a hearing on a bill for a preliminary injunction to restrain Director of Public Dripps from interfering with the operation of the automobiles hired by the club to carry its members. The club was organized, according to Paul Randolph, its president, at a meeting of eighteen business men. Its stated purpose is to provide means of transportation to members of the club. To become a member it is only necessary to apply at the club's headquarters or to one of the ten or twelve branch offices in drug stores and cigar stores along Broad Street. There the applicant's name is taken and upon the payment of 25 cents, a membership card and five tickets are handed to him which represent five 3-mile rides in one of the thirty-seven automobiles the club has hired. No money is accepted by the driver. The chauffeurs, every evening, receive 4½ cents in exchange for every ticket received from members during the day. The club retains the other half cent. The active members of the club began suit against Director Dripps following the arrest of several chauffeurs employed to drive the club's automobiles. They aver that the purpose of the club is not to evade the jitney ordinance, but to accommodate members.

The North Corning, Corning and Painted Post jitney bus lines have been required by the Public Service Commission of the Second District of New York to cease operating until they have complied with the law and secured permits from the Corning Common Council and certificates of necessity from the commission itself. The Painted Post line has been operating all summer in competition with the Corning & Painted Post Street Railway.

At the request of Burt C. Hurtgam, who has been operating a motor-bus line between Lockport and Olcott, Public Service Commissioner Hodson has adjourned until Nov. 20, the hearing on his petition to continue to operate the line in competition with the Lockport and Olcott branch of the International Railway. The commission recently forced Hurtgam to discontinue his service. Hurtgam now claims he will operate the line only between Olcott and the Lockport city line and asks if this will be in violation of the commission's order.

A hearing in the matter of the application of about sixty local jitney drivers at Rochester, N. Y., for permission to ask for a certificate of conveniences and necessity from the Public Service Commission will be held on Nov. 9. At a meeting of the Common Council of Rochester on Oct. 26, the finance committee reported a hearing would be necessary and the date was fixed.

The jitney ordinance of Houston, Tex., has been upheld on every count by Judge Charles E. Ashe of the Eleventh District Court in the case of a number of jitney operators who sought to enjoin the city from enforcing the ordinance. The decision was rendered after Judge Ashe had had the case under advisement for three weeks. The ordinance was attacked on the ground that the city had no right to establish classifications in automobiles; that to do so was discrimination; that the license fee of \$72 a year was excessive; that the provisions of the ordinance establishing routes and schedules for jitneys were unreasonable; that the jitneys, having paid the old license fee of \$1 a year, could not be required to pay the new and higher fee until after the expiration of the old license, and that the license fee of \$72 was more than sufficient to reimburse the police department for the additional expense growing out of the police regulation of the jitneys.

The Washington Auto Bus Company, organized in the interest of the Puget Sound Traction, Light & Power Company, Seattle, Wash., has applied to the city comptroller of Bellingham for four jitney bus licenses. According to C. W. Howard, attorney for Stone & Webster in Whatcom County, the company will begin operations shortly after Nov. 1. The buses will operate in conjunction with the Bellingham lines of Stone & Webster. Each car will be bonded under the State law, in the sum of \$2,500, and in addition, each car will carry insurance.

CHICAGO QUESTIONS AUTHORITY OF STATE COMMISSION

Suit has been filed in the Circuit Court of Cook County by Corporation Counsel Richard S. Folsom of Chicago for a temporary injunction to restrain the Public Utilities Commission of Illinois from putting into effect its recent service order, as mentioned in the *ELECTRIC RAILWAY JOURNAL* of Oct. 20, page 931. Up to Nov. 3, the court had taken no action on the prayer of the city, and pending definite action, the Chicago Surface Lines has not complied with the order of the commission requiring it to file certain schedules, plans and specifications on or before Nov. 1. The suit was filed at the direction of the City Council, which is seeking to protect its right to regulate public utilities. Chief among the allegations in the city's bill is one that the State constitution gives the regulation and control of the construction and operation of street railroads to the cities and villages in which they are located. This has been the continuous policy of the general assembly in the enactment of new legislation both before and after the passage of the public utilities act in 1913. The bill further alleges that the public utilities law was not constitutionally passed, as the Senate did not finally act upon the law passed by the lower house, and the final vote was taken after the time set for adjournment. The bill also states that the commission's order is an interference with the contract rights of the city with the surface railroads and the property rights of the city looking to future municipal ownership. The suit was directed at both the Public Utilities Commission and the several companies forming the Chicago Surface Lines.

WASHINGTON RELIEF ASSOCIATION REPORT

Association Has 1339 Members, \$7,312 Cash, \$120,000 Invested, and \$4,075 Loaned to Members

The Washington Railway Relief Association, organized in 1900 and composed exclusively of employees of the Washington Railway & Electric Company, Washington, D. C., and subsidiaries, including the Potomac Electric Power Company, now has 1339 members. The report of Sept. 30, 1915, shows \$141,772 paid out for health, accident and death benefits since organization.

The object of the association is to provide for members disabled by reason of sickness or injuries received, and at their death for their families. Sick benefits are allowed at the rate of \$1 a day, not exceeding, however, the sum of \$200 in any one year. In addition to an accumulated share of the surplus \$250 is paid in case of death of a member. In the event of the death of the wife of a member the husband is paid \$50, and upon the death of the mother of a single man a like amount is paid the member. Free medical and surgical attendance is provided for all members. Independently, the Washington Railway & Electric Company and allied companies maintain a pension system for employees, whether or not they are members of the association.

A board of managers composed of thirty-three, selected from each division and department of the companies, administer the affairs of the association. These men serve without pay and are elected annually by the members. The present officers are Clarence P. King, president; C. E. Brown, treasurer; P. T. Haller, secretary, and Clarence A. Weaver, medical officer. The affairs of the association have been so conservatively and ably managed that with dues of \$1 monthly, it has been possible to credit each member's surplus amount \$11.26 at the end of the fiscal year, making an actual cost of all benefits derived only 74 cents for the current year, or about 6 cents a month.

The Washington Railway & Electric Company guarantees the accounts of the association, bears a considerable part of the yearly operating expense, pays the rent of and maintains the club rooms and furnishings, in addition to all expense for the several entertainments given in the name of the relief association. The club rooms are centrally located, and contain bowling alleys, pool tables, musical instruments, games and reading rooms. A branch of the Public Library with a circulation of more than 1000 books is also maintained, and nearly 400 members take advantage of the convenience.

The association has a savings department paying 5 per

cent per annum, compounded semi-annually. At present \$35,000 is on deposit. During the year 1910 a loan department was established. Members pay 6 per cent interest on loans and pledge as security for loans their share of the association surplus fund. The annual excursion for 1915 netted \$1,700. This was credited to the individual accounts of members, giving each a credit of \$1.37.

After deducting sick and death benefits and miscellaneous expenses of the association, the balance of the dues paid in by members, together with interest on investments and other miscellaneous income constitute a surplus fund, and is periodically credited to the individual accounts of members. In the case of charter members the present value is nearly \$100; ten-year men \$87; five-year men \$51 and two-year men \$21. All amounts credited to members are payable upon leaving the service of the company or to the beneficiary upon the death of the member.

The assets of the association total \$131,615. They consist of cash on hand and in bank amounting to \$7,312, \$120,000 in stocks and bonds at present market values, \$227 in accounts receivable, and \$4075 loans to members.

FRESH-AIR CARS FOR CHICAGO ELEVATED

At the request of Dr. John Dill Robertson, commissioner of health, the elevated railroads of Chicago put in operation on six of its trains what have been popularly termed "fresh-air" cars. Complaints to the health department ranging from too much to too little ventilation had begun to arrive, and in response to these, Dr. Robertson asked the elevated railroads to co-operate with him to the extent of putting on several cars with the windows and doors removed. Trains carrying these "fresh-air" cars were announced in the press as leaving the north and south side terminals at a certain time so that those desiring plenty of ventilation could test the new service. The first cars of this type were put in service on Nov. 1. All windows and doors were fastened in the open position and the "fresh-air" car was coupled in the middle of the train so that in case passengers did not like the innovation they could proceed to the fully-inclosed coaches.

At each end of the "fresh-air" cars white cards furnished by the Chicago health department were posted. Among other statements these cards contain the following concerning fresh air and health: "Dirty air is death," "Good air means good work," "Too much fresh air is just enough," "Fresh air is the best life assurance agency," "Get the fresh-air habit; dress warm enough to enjoy it," "Colds are 'catching,'" "Coddle yourself and you flirt with pneumonia," "Breathe freely and fully; the more you expand your chest the less you will contract cold." These were printed over the signatures of Mayor Thompson and Dr. Robertson. According to the city health department, the service is proving popular and its educational value is deemed immeasurable. "Fresh-air" car service will continue to be furnished until it ceases to be popular.

Car Capacity Order in Effect Again.—The order of the Board of Health of New York limiting the number of passengers on the cars of certain lines of the Brooklyn (N. Y.) Rapid Transit Company has been made effective again after having been suspended during the summer.

Court Decision on Car Tax and Fender Ordinances.—Judge H. M. Waggoner in the Circuit Court of Fulton County, Ill., has declared valid an ordinance of Canton which required a tax of \$10 a year on each car operated over the streets of the city. The same jurist declared invalid an ordinance of the city of Canton requiring the use of basket fenders. The Illinois Central Electric Railway operates in Canton.

Successful Train Operation in Buffalo.—Success in the operation of two-car trains during the rush hours in the morning and evening has prompted the International Railway, Buffalo, N. Y., to extend the operation of these trains to almost all lines during the rush hours. The first car of each train is a remodeled rear-entrance car with an exit at the front end, while the second car is a pay-as-you-enter near-side front-entrance trail car with fare box on the front platform.

Relief from Vehicular Obstruction Asked in Chicago.—Leonard A. Busby, president of the Chicago Surface Lines,

requested the local transportation committee of the Chicago City Council to recommend an ordinance prohibiting the parking of vehicles in the loop thoroughfares and barring heavy teaming in the loop district during the morning and evening rush-hour periods. Vehicular obstruction has been the subject of much comment by various regulative bodies. Its elimination has been suggested by the Illinois Public Utilities Commission and attention has been directed to it in the advertisements published by the Chicago Surface Lines.

Automobile Parking a Problem.—Louisville's police authorities have taken up in earnest the matter of control of automobile parkings on the down-town streets and are approaching the proposition from the viewpoint of the public. In order to formulate a plan of action the Board of Public Safety has called for an expression on the subject from citizens. Samuel Riddle, superintendent of transportation of the Louisville (Ky.) Railway, in discussing the problem for publication in local papers, declined to submit a plan, but pointed out to the police that the practice of allowing automobiles to stand along Fourth Street made the operation of cars on that thoroughfare exceedingly difficult and dangerous especially during rush hours.

Subjects Discussed in Milwaukee Talks to Patrons.—Up to Oct. 26 The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., had published six advertisements in its series "Plain Talks to Our Street Car Patrons," the first of which, dealing with the need for a readjustment of fare, was reproduced in part in the *ELECTRIC RAILWAY JOURNAL* of Oct. 23 page 889. The second talk dealt with the size and usefulness of the street railways as a factor in city growth, the third with how Milwaukee's city government broke its 1900 agreement with the company and prevented the earning of a fair return under the conditions agreed upon, the fourth with the decline of the average cash return per passenger from 5 cents to 2.98 cents, and the fifth with the sums spent by the company for paving that owners of abutting property on a few favored street ought to have paid for.

Rehearing Refused in Lockport Interchange Case.—The Public Service Commission for the Second District of New York has refused the application of the New York Central Railroad for a rehearing of the Lockport freight interchange case. The case was decided on Sept. 21, when the commission directed the New York Central and the International Railway to install in Lockport switch or other track connections and such other track facilities as might be necessary to afford adequate and convenient interchange of freight between the two lines, and requiring the roads to enter into an agreement as to the plans and report to the commission before Oct. 25. Both companies notified the commission that they would appeal the case. As the first step in this proceeding the New York Central applied for a rehearing of the case before the commission on Oct. 25. The commission found the application raised no new question and denied the request in order that final determination in the courts may be reached as speedily as possible. The opinion of the commission in the case was referred to at length in the *ELECTRIC RAILWAY JOURNAL* of Oct. 9, page 783.

Twenty-three Instances of Careless Driving in a Month.—J. A. McCrea, general manager of the Long Island Railroad, made public a statement on Oct. 30 which shows that in the last month twenty-three persons, while operating automobiles and other vehicles, violated the railroad's mandate to stop before starting over grade crossings. That only three people were injured in these twenty-three instances of careless and reckless driving, Mr. McCrea indicates, was due partly to the vigilance of motormen, engineers and crossing watchmen, but he attributes immunity from serious or fatal accidents in the majority of cases largely to good luck. Twelve automobiles, five motor trucks, five wagons and one motorcycle make up the list of conveyances that were driven across the tracks of the Long Island Railroad during the last thirty days, without regard either for the safety of human lives or the preservation of property. Twelve of these vehicles, mostly automobiles, plunged wildly through lowered crossing gates, breaking eight of them. Four traffic signposts, on crossings, were also damaged and a number of lanterns or lamps were demolished.

Telling the Public About the Disposition of the Nickel.—With a teaser in the way of a yellow card on which is raised in the minds of passengers the question as to what becomes of the nickels they drop in the fare boxes, the Louisville (Ky.) Railway has begun a new educational movement, through which the officials of the company hope to obtain the interest and the co-operation of the public. The first card will be followed by a series, each of which will set forth some piece of information about the company in its relations to the public. The full text of the series of cards has not been worked out as yet, but all of them will be designed to acquaint the passengers that the nickels they pay for rides do more for them than merely to pay their fares. Statements will be made as to the amounts paid out by the company on the payrolls, as to the amounts expended in Louisville for materials, as to the amounts of taxes which are paid into the city treasury by the company, etc. This new series of cards will take the place of the safety-first cards which have held the place of honor at the front of the coaches, though from time to time a safety-first card or suggestion will be inserted in place of the informative cards.

"Near Accidents."—F. H. Miller, superintendent of motive power of the Louisville (Ky.) Railway, advises the men under him that a "near accident" gives just as much reason for study of safety principles as a calamity itself. Mr. Miller says: "Every time an operating man realizes that either he or his machinery has had a close call, conditions are ripe for just the kind of study we have in mind. Such 'near accidents' include occurrences like a narrow escape from injury on account of dropping a heavy pipe wrench into the firing aisle; slight overheating of motors due to excessive speed of a motor; ignition of waste in an open holder by a carelessly thrown match; blowing of a lighting fuse because of careless wrapping of a lamp cord around a metal support; accumulation of condensed steam from a leaky pipe joint in a cable duct line and sluggishness of governor action due to insufficient cleaning and lubrication. On the electrical side of a generating station many occurrences fall within the class of 'near accidents,' especially those due to insufficient care in approaching live circuits and terminals, temporary arcs and flash overs caused by improper handling of switches, regulators, etc., and burn-outs of minor character caused by inadequate fusing, poor mechanical contacts, insufficient insulation and the making of wrong connections. By observing the cause of 'near accidents' we are in position to prevent their recurrence. 'Prevention First' means 'Safety First' and 'Never an Accident'."

Results with Railway-Ferry Transfers in New York.—The annual report of the New York (N. Y.) Railways for the year ended June 30, 1915, contains the following reference to the transfer arrangement between the city and the company providing for transfers to the Staten Island municipal ferry line: "Under date of Sept. 9, 1914, an agreement was entered into with the city of New York effective on Sept. 15, 1914, providing for the exchange of transfers between the Staten Island division of the municipal ferries and certain lines operated by this company, viz., the Broadway and Columbus Avenue line, the Sixth Avenue line and the Eighth Avenue line. Out of the 5-cent far in effect under the terms of this agreement the city of New York receives 2 cents for each passenger transferred from our lines, while this company collects 3 cents for each passenger it carries transferred from the ferry lines. During the period Sept. 15, 1914, to June 30, 1915, there were 1,317,135 transfers lifted on our lines, while the municipal ferry lifted 1,185,449 transfers, the average number of passengers per month transferring from the Staten Island ferry to our lines being 138,646, while the number transferred from this company's lines to the municipal ferry averaged 124,784 per month. The total of such passengers carried during this period of nine and one-half months was 2,502,584, an average of 263,430 a month. The amount of gross revenue collected by the city of New York under this transfer arrangement during the period indicated was \$50,051.68 and by this company \$75,077.52. The receipts during the past few months indicate a growth in this traffic."

Personal Mention

Dr. Charles P. Steinmetz, consulting engineer of the General Electric Company, Schenectady, N. Y., has been elected president of the Common Council of the city as the representative of the Socialists.

Mr. Thomas Cheyne has been elected as an additional vice-president of the Reading Transit & Light Company and Metropolitan Electric Company in Reading, Pa. Mr. Cheyne prior to 1915 was with Haskins & Sells, accountants, New York.

Mr. C. L. Stone, formerly general manager of the Manila Electric Railroad & Light Corporation, Manila, P. I., has been appointed general manager of the Otsego & Herkimer Railroad, Colliers Light, Heat & Power Company and the Hartwick Power Company, Cooperstown, N. Y., to succeed Mr. S. Walter Mower, resigned.

Mr. Frank Harris, who has for the last four and one-half years acted as publicity agent for the British Columbia Electric Railway, Ltd., with offices at Vancouver, B. C., recently presented his resignation and on Nov. 1 he severed his connections with the company. Mr. Harris went to Vancouver from New York in 1904 and served on the Vancouver daily press for several years before taking up the post from which he has just resigned. He will take a much needed rest, after which he will again enter business.

Mr. Chester F. Gailor, assistant chief engineer of the United Railways & Electric Company, Baltimore, Md., since Dec. 15, 1913, has resigned from the company to become chief engineer of the Atlantic Welding Corporation, New York. Mr. Gailor was formerly roadmaster of the Hartford Division of the Connecticut Company. Mr. Gailor is a graduate of Lansingburg Engineering Academy, Lansingburg, N. Y., and began his railway career as a rodman with the Hudson Valley Railway. He has done much inventive work in electric rail welding. A portrait and a biography of Mr. Gailor were published in the *ELECTRIC RAILWAY JOURNAL* of Dec. 6, 1913.

Mr. F. A. Nichols, vice-president and general manager of the Ottumwa Cold Storage & Ice Company, Ottumwa, Iowa, has disposed of his interest in the company and has resigned, effective on Jan. 1, 1916. On June 1, 1914, Mr. Nichols resigned his position as electrical engineer of the International Railway, Buffalo, N. Y., to become general manager of the East Liverpool Railway & Light Company, East Liverpool, Ohio. He resigned from the company at East Liverpool late in 1914, and early in 1915 became an officer of the Ottumwa Cold Storage & Ice Company. Mr. Nichols is a technical graduate and has had more than ten years' experience in engineering, construction and street railway work. He has not yet made any definite plans for the future.

Mr. Norman McD. Crawford has resigned as president and general manager of the Reading Transit & Light Company. Mr. Crawford succeeded Mr. W. S. Barstow in 1913 in this position. He was formerly president of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. Mr. Crawford was for several years vice-president of the Ohio Electric Railway, Cincinnati, Ohio, and previously, for a long time, was general manager of the Hartford (Conn.) Street Railway. As a contractor he built the Glastonbury line of the Hartford Street Railway in 1891 and was afterward retained by the company as engineer. In 1894 he was made general manager of the company, which position he held until the Hartford Street Railway was taken over by the Connecticut Company. In December, 1908, Mr. Crawford was elected president of the Mahoning & Shenango Railway & Light Company. While Mr. Crawford has not announced his personal plans for the future, he anticipates continuing his residence in Reading until after the first part of the coming year.

Mr. Erastus L. West has been elected president of the Reading Transit & Light Company, Reading, Pa., and Metropolitan Electric Company to succeed Mr. Norman McD. Crawford, resigned. Mr. West was graduated from Cornell in 1899 and was awarded a fellowship for 1900. He spent the following eight years with J. G. White & Company in New York and London. From 1908 to 1912 he was general manager of the Central Colorado Power Company, Denver,

leaving there in March, 1912, to become general manager of the Connecticut Power Company, Worcester, Mass. In September, 1914, he was appointed to make an expert examination of the various properties in which W. P. Bonbright & Company, bankers, New York, are interested. There will be no further change in the management of the company at Reading, which will continue under the ownership of W. P. Bonbright & Company and the supervision of W. S. Barstow & Company, New York. Mr. West's headquarters will be in Reading. The Reading Transit & Light Company is controlled by the Eastern Power & Light Corporation. The system at Reading includes a general light and power business in that city and vicinity and more than 170 miles of electric railway, operating more than 240 motor cars.

Mr. S. Walter Mower has resigned as general manager of the Otsego & Herkimer Railroad, Colliers Light, Heat & Power Company and the Hartwick Power Company,



S. WALTER MOWER

Cooperstown, N. Y., following a change in ownership of the properties. Before becoming connected with the Otsego & Herkimer Railway in October, 1912, Mr. Mower was general manager of the London & Lake Erie Railway & Transportation Company, London, Ont. He was born at Grand Haven, Mich., on Aug. 13, 1876. In 1890 he moved to Detroit and in 1900 entered the service of the Detroit (Mich.) United Railway as assistant to Sir Albert Stanley, then general manager of the company. Five years later he

was appointed assistant superintendent of the Port Huron division of the Michigan United Railway. In June, 1906, he was appointed general manager of the Southwestern Traction Company, succeeded by the London & Lake Erie Railway & Transportation Company. Mr. Mower was secretary-treasurer of the American Electric Railway Engineering Association from its organization in 1903 until 1908. The *Otsego Farmer*, in expressing its regrets at the retirement of Mr. Mower, said: "There will be a general feeling of regret not only in Cooperstown but throughout Otsego County and among the employees of the local road at the announcement of the resignation of Mr. Mower. Mr. Mower has been in charge of the road for three years, and in that time has won the hearty commendation of the patrons of the line for his untiring efforts to improve the property and give the public the best service possible. The harmonious relations with the local communities served by the railroad and lighting companies are well known and appreciated and must continue to be a source of gratification to Mr. Mower in other fields. This spirit also extends to the employees, a fact which speaks highly of the confidence and mutual esteem between management and men."

OBITUARY

Reagan Houston, for many years attorney for the San Antonio (Tex.) Traction Company and at one time president of the company, died at his home in San Antonio on Oct. 24 at the age of fifty-six, after an illness of about two weeks.

Ralph S. Rowley, general claim agent of the Chicago (Ill.) Surface Lines, died suddenly on Nov. 2, 1915. Mr. Rowley was born at Marshall, Mich., in 1866. He entered the service of the Chicago City Railway's claim department in 1895 as a claim investigator. In 1900 he was made chief clerk to the general claim agent, and in 1905 he was made claim agent. In 1912, upon the resignation of Mr. J. W. Crawford, Mr. Rowley was appointed general claim agent. In January, 1914, when the Chicago City Railway was merged with the Chicago Railways, forming the Chicago Surface Lines, Mr. Rowley was appointed assistant to Mr. Sidney Ossoski, general claim agent. Upon the resignation of Mr. Ossoski in August, 1914, Mr. Rowley was appointed general claim agent. He is survived by a widow and six children.

Construction News

TRACK AND ROADWAY

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

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

RECENT INCORPORATIONS

Muscatine & Iowa City Railway, Muscatine, Iowa.—Incorporated in Iowa to provide electric service on a 104-mile leased section of the Rock Island Railroad, as noted in the *ELECTRIC RAILWAY JOURNAL* of Oct. 30. Capital stock, \$400,000, of which \$100,000 is common and \$300,000 preferred. The headquarters of the company will be at Muscatine. The incorporators consist of business men of Muscatine, Iowa City, Wellman and Montezuma. A. D. Bowen, Muscatine, has been elected president. [Oct. 9, '15.]

***Huntington-Chesapeake Bridge Company, Huntington, W. Va.**—Incorporated in West Virginia to construct a line in Huntington and Chesapeake, Ohio. The company proposes to build a highway bridge with double-track street car line. Incorporators: R. P. Aleshire, Paul Hardy and J. C. Miller.

FRANCHISES

Los Angeles, Cal.—The Pacific Electric Railway has asked the Council for a franchise to construct a line on Front Street, O'Farrell Street, Newport Street and Bay Street. Bids for this franchise will be received by the City Clerk until Nov. 9, 1915. The Pacific Electric Railway has received an ordinance from the Council consenting to and accepting the abandonment of its line on Ninth Street between Tennessee Street and Santa Fé Avenue.

Randolph, Mass.—The Bay State Street Railway has asked the Council for a franchise to lay a double track on South Main Street from its present terminus at the Randolph-Avon line to Central Square.

Pontiac, Mich.—At a recent election residents of Pontiac approved the thirty-year franchise asked for by the Detroit, Pontiac & Owosso Railway. [Oct. 9, '15.]

Salem, N. J.—The Salem-Pennsgrove Traction Company has received a franchise from the Council in Salem. The Board of Chosen Freeholders has also granted the company a fifty-year franchise to operate a line over the county roads and bridges. It is expected that the township committees of Lower and Upper Penn's Neck will shortly take similar action.

Buffalo, N. Y.—Providing the Council grants the application of the International Railway Company at once for a franchise through Bailey Avenue from Clinton Street to Kensington Avenue, about 3 miles, E. G. Connette, president of the company has promised to have the work completed in three years instead of four years, as was proposed. Some opposition developed toward the company's four-year plan and the present three-year proposal is favorable to residents in this section of the city. The company agrees to lay double tracks between Clinton Street and Broadway the first year; between Broadway and East Ferry Street the second year and between Delavan Avenue and Kensington Avenue the third year. It is expected the franchise will be granted at once.

Corvallis, Ore.—The Southern Pacific Company has received a franchise from the Council to construct a double track on Sixth Street. Electrification may now be begun whenever the company is ready.

Linnton, Ore.—O. M. Clark and associates have filed an acceptance of the franchise granted by the Linnton Council. It is proposed to construct a line between Portland and Linnton. [Sept. 4, '15.]

Ogden, Utah.—The Utah Light & Traction Company has filed an acceptance of the franchise granted by the Council on Aug. 26 to construct, maintain and operate an electric heating, lighting and power system in Ogden.

Huntington, W. Va.—The Huntington-Chesapeake Bridge Company will ask the Council for a franchise to construct a line from Fourth Avenue and Sixth Street, Huntington, over the Ohio River to a point in Chesapeake, Ohio.

Pacific Electric Railway, Los Angeles, Cal.—This company will construct an elevated track from Sixth and Main Streets to San Pedro Street. The cost is estimated at about \$300,000. A contract has been awarded to Robert Sherer & Company, Los Angeles, for grading the roadbed for this company's line between Hawthorne and Iona Avenues on the Redondo via Watts line. It is estimated that the cost will be about \$20,000.

Connecticut Company, New Haven, Conn.—Plans are being made by this company to reconstruct its tracks extending through Waterville. It is proposed to construct a double track from Homer Street, where the tracks enter Boyden Street, through Thomaston Avenue.

Georgia Railway & Power Company, Atlanta, Ga.—This company will begin at once the construction of an extension of its line on Lakewood Avenue to the main fair ground entrance.

Lewiston-Clarkston Transit Company, Lewiston, Idaho.—It is reported that this company will construct an extension to the eastern section of Lewiston if local interests warrant such an extension.

Illinois Traction System, Peoria, Ill.—This company has been asked by the village of Oakwood, Ill., to move its track from the south side to the north side of Main Street through that village.

Winnipeg (Man.) Electric Railway.—This company is constructing a double-track line on concrete base on Webb Street, Winnipeg.

Bay State Street Railway, Boston, Mass.—Material has been received and work will be begun at once by this company double-tracking its line on Main Street, Haverhill.

Springfield (Mass.) Street Railway.—This company has begun construction on the extension of its East Street line in Chicopee Falls to the factory of the Westinghouse Electric & Manufacturing Company at East Springfield. The extension has been delayed on account of opposition in Chicopee to the use of T-rails, but last week the local board of aldermen authorized the use of this type of construction, in order to enable the Westinghouse Company to utilize the tracks for war order shipments.

Worcester (Mass.) Consolidated Street Railway.—It is reported that this company may soon extend its Lake View line to Lake Avenue, thence to Sunderland Road to the city line.

***Joplin, Mo.**—A committee consisting of A. S. Wilson, J. F. Lanier and Albert Schmidt has been appointed by the Commercial Club of Joplin to consider the construction of an electric railway out of Joplin.

Trenton, Lakewood & Seacoast Railway, Trenton, N. J.—Construction has been begun on this company's line between Lakewood and Point Pleasant. The roadbed has been graded, poles erected and the supporting standards placed in position. George O. Vanderbilt, Trenton, is interested. [July 17, '15.]

International Railway, Buffalo, N. Y.—The new double-track line between Buffalo and Niagara Falls which is to be built by this company calls for an elevated line through the business and residential sections of North Tonawanda. Some opposition to the elevated tracks has developed in North Tonawanda as the company's franchise calls for tracks at grade through the city except where the line crosses Sweeney and Tremont Streets. The Board of Public Works will convene in special session to consider the project.

Cincinnati (Ohio) Traction Company.—An agreement was closed on Oct. 30 through which the Cincinnati Traction Company will be able to construct tracks to Bond Hill over Paddock Road, Cincinnati. This agreement was signed by the company, City Solicitor Schoenle and the residents of Reading Road who are affected by the line. These residents will be reimbursed by the company for their expenditures in the long fight against the city and the company to prevent the construction of the track, a period of about ten years. Officers of the company state that the line will be in operation in about eighteen months and until that time it will co-

operate with the bus line now serving the territory by issuing and receiving transfers.

Steubenville & East Liverpool Railway & Light Company, Steubenville, Ohio.—The Council of Steubenville has awarded a contract to this company for street lighting for a period of ten years. The contract provides for a considerable amount of new construction work in the near future.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—This company plans to reconstruct its Wilson Avenue and Federal Street lines in the spring. It is expected that the cost will be about \$175,000.

Lawton Railway & Lighting Company, Lawton, Okla.—Work has been begun by this company repairing its track on Second Street. A concrete base will be constructed beneath the tracks and new ties will be put in on the line between C and Gore Avenues.

Choctaw Railway & Lighting Company, McAlester, Okla.—Plans are being made by this company to extend its line from the terminus at Hartshorn to Gowen and Wilburton.

Toronto, Ont.—Having heard the report of Sir Adam Beck, chairman of the Ontario Hydro-Electric Power Commission, upon the proposal to construct a hydro-electric radial railway between Toronto and Guelph, representatives of fifteen municipalities interested passed a resolution indorsing the scheme and declaring that the electors in each place should be allowed to pronounce upon it by voting upon a by-law in January. The Hydro-Electric Power Commission submitted plans for a system of radial railways to connect Toronto, Port Credit, Milton, Guelph, Berlin, New Hamburg, Stratford, St. Mary's, London, Strathroy, Arkona and Sarnia.

Lehigh Valley Transit Company, Allentown, Pa.—The Lehigh Valley Transit Company, lessee of the trolley line which is operated between Nazareth and Farmersville Junction, is making an attempt to have this branch abandoned. Insufficient receipts is said to be the reason.

North Branch Transit Company, Bloomsburg, Pa.—A. W. Duy, receiver of this company, has asked the court for permission to issue receiver's certificates to the amount of \$62,000, to be expended for needed improvements to the company's road and equipment. The petition set forth that it is necessary to replace the present aqueduct at Rupert with a steel bridge, to replace the present bridge over Boone's race with a steel structure and to replace the present wooden overhead near Willow Springs with a steel structure. It is also necessary to replace 7 miles of ties, to equip the road with continuous joints and to make repairs to the Catawissa bridges.

Milford, Pa.—The project to build a railway from Milford to Port Jervis, about 8 miles, is being revived. It is reported that residents of Milford have guaranteed an amount of \$25,000 to aid in the project to construct the line. Gifford Pinchot, Milford, is interested. [June 5, '15.]

Pottsville & St. Clair Electric Railway, Pottsville, Pa.—A contract has been awarded to Smith & Campion, Mahanoy City, Pa., to construct a tunnel under the tracks of the Reading Railway. This tunnel will enable the new line being constructed between Pottsville and Shenandoah to take an easy grade up Broad Mountain. This roadbed has been almost completed to the tunnel.

Philadelphia & West Chester Traction Company, Upper Darby, Pa.—Plans are being made by this company to extend its Collingdale division from its present terminus at Parker Avenue, Collingdale, to the Chester pike, Sharon Hill. The company also plans to double track its Media Short Line division.

Williamsport (Pa.) Passenger Railway.—Plans are being made by this company to begin work at once on the double tracking of its Third Street line from the end of the present double track at Park Street to the west line of Maynard Street.

Dallas (Tex.) Southwestern Traction Company.—Surveys have been completed of this company's line from Glen Rose to Stephenville, 80 miles. E. P. Turner, Gaston Building, Dallas, president. [Oct. 9, '15.]

Southern Traction Company, Dallas, Tex.—At a conference of representative business men of Waco, and E. J.

Strickland, president of the Southern Traction Company, plans were made for the establishment of a bus feeder line from Bellemead, a settlement just outside of Waco, to the terminus of the East Waco Street line. This was considered more practicable at present than an extension of the line, as was first suggested.

San Antonio & Austin Interurban Railway, San Antonio, Tex.—The plans of this company to build a line between San Antonio and Austin have been revived and negotiations for financing the project are now in progress. Most of the right-of-way for the line has been secured. The proposed line will extend through New Braunfels, Hunter, San Marcos, Kyle, Buda and Manchaca. V. P. Brown, San Antonio, is interested. [June 5, '15.]

Van Horn Valley Railway, Van Horn, Tex.—It is reported that this company has completed 15 miles of grade for track laying on its proposed 70-mile railway from Lobo to a point in New Mexico. R. H. Owen, 511 Andrus Building, Minneapolis, Minn., president.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—This company's extension to Spanish Fork has been completed, and the line will be extended to Payson. It is expected that the line will be finished by Jan. 1.

Utah Light & Traction Company, Salt Lake City, Utah.—This company will replace its wooden poles on Eleventh East Street between Ninth South Street and Yale Avenue with steel poles.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—Plans are being made by this company to extend its electric transmission line to Merton and Lake Five.

SHOPS AND BUILDINGS

Boston (Mass.) Elevated Railway.—The East Boston car-house of this company, containing twenty-two semi-convertible cars, two snow plows and other valuable equipment, was destroyed by fire on Nov. 1, with a loss of about \$240,000. Further reference to the fire is made on page 966 of this issue.

New York Municipal Railway Corporation, Brooklyn, N. Y.—This company has applied to the Public Service Commission for the First District of New York for permission to enter into a contract with the George W. McNulty Company, for the construction of the Coney Island terminal of its elevated railroads. The company, in its application, states that the McNulty Company, in its opinion, is well equipped to do the work, and that the prices which it agrees to perform the work for are reasonable. The McNulty Company is the same concern which constructed the Sea Beach line for the New York Municipal Railway Corporation.

The International Railway, Buffalo, N. Y.—This company has prepared plans and specifications for an enlarged freight and passenger terminal in Lockport, but permission to proceed has been denied by the city. The proposed improvement was to have cost about \$9,000. Public Service Commissioner Hodson has directed the city officials and the railway company to arrive at an agreement and present their agreement to the commission for its approval. The city of Lockport recently filed a complaint with the commission against the alleged inadequate terminal facilities in the city.

London & Port Stanley Railway, London, Ont.—Work has been begun by this company on the construction of a car-house south of Phillips Street, London. The contract was awarded to Hyman & Son, London, for \$27,000.

Montreal & Southern Counties Railway, Montreal, Que., Can.—A passenger station is being constructed by this company at Abbotsford.

POWER HOUSES AND SUBSTATIONS

Carbon Transit Company, Mauch Chunk, Pa.—A report from this company states that it will enlarge and concentrate its power plants at once, adding a 250-hp. boiler and a 300-kw., 600-volt d.c. generating unit.

Sherbrooke Railway & Power Company, Sherbrooke, Que.—Plans are being considered by this company to construct a substation at Waterville, Que.

Manufactures and Supplies

ROLLING STOCK

Durham (N. C.) Traction Company will order six new cars.

Toronto (Ont.) Civic Railway contemplates securing thirteen motor cars this winter.

Union Traction Company of Indiana, Anderson, Ind., is rebuilding three cars for winter use at the Anderson shops.

Mississippi Valley Electric Company, Iowa City, Ia., which has taken over the Fort Madison (Ia.) Street Railway, expects to equip its system with four new cars.

Morrison & McCall, St. Louis, Mo., have purchased four cars from the Southern Car Company for their properties, the Laredo Railway & Electric Company, Laredo, Tex., and Walnut Ridge & Hoxie Light, Power & Transit Company, Walnut Ridge, Ariz.

Detroit (Mich.) United Railway has just ordered twenty-five motor and twenty-five trail cars from the G. C. Kuhlman Car Company, in addition to the order for twenty-five motor and fifty trail cars placed with the same company about four months ago.

Interborough Rapid Transit Company, New York, N. Y., has issued requests to car builders for bids on 311 new steel subway cars of practically the same type as those recently ordered by the company for use on its new extensions in the Bronx and Queens. This equipment includes 234 motor cars and 77 trailers. Deliveries on the cars are expected to commence during February, 1916, and end in April.

Boston (Mass.) Elevated Railway has ordered from The J. G. Brill Company twenty-five new trailers of a type now being used on suburban lines of the company. Doors will be equipped with the National Pneumatic Company's air operating device. It is understood that some of the trailers will be used in the Mattapan Square-Dudley Street line and that others may be used on the Jamaica Plain-Dudley Street line, running by way of Center Street. This railway company on Nov. 1 lost twenty-two semi-convertible cars and two snow plows in a fire which destroyed its Eagle Street carhouse.

Wilmington & Philadelphia Traction Company, Philadelphia, Pa., has ordered thirty-one cars from The J. G. Brill Company, instead of twenty-five as previously reported. The new cars will be of the Brill semi-convertible type. They will measure 29 ft. in car body length and 41 ft. over all, with seating capacity for forty-four persons. The cars will have cross-seats and will be equipped with folding doors. Four-motor electrical equipment will be provided by the General Electric Company. Ring curtain fixtures and Rex all-metal rollers will be supplied by the Curtain Supply Company. It is reported that this railway company will completely overhaul the old cars on the recently acquired lines to New Castle and Delaware City.

TRADE NOTES

B. E. Tilden & Company, Chicago, Ill., have been organized to manufacture railway supplies of all kinds. E. A. Biggs, J. E. Early and G. H. Hubbard are interested.

General Electric Company and Edison Lamp Works have removed their Los Angeles offices to the twelfth floor of the Corporation Building, 724 South Spring Street.

Nova Scotia Car Works, Ltd., Halifax, N. S., have gone into voluntary liquidation, being unable to effect a compromise at 50 cents on the dollar with its creditors or to secure financial assistance from the city.

Industrial Works, Bay City, Mich., have established a Philadelphia office in the Widener Building, where complete data and information can be obtained regarding this company's line of locomotive, wrecking and freight handling cranes, pile drivers, grab buckets, etc.

Lindsay Brothers, Minneapolis, Minn., have established a southwestern sales office in St. Louis, Mo., in charge of Frank O. Grayson, who will be located at 405 La Salle Building. This territory was formerly handled by the Grayson Railway Supply Company, St. Louis. The new office will cover the States of Missouri, Kansas, Oklahoma, Texas, Louisiana, Arkansas, Tennessee and southern Illinois.

Hess-Bright Manufacturing Company, Philadelphia, Pa., announces that the Standard Roller Bearing Company, Philadelphia, Pa., the New Departure Manufacturing Company, Bristol, Conn., Gurney Ball Bearing Company, Jamestown, N. Y., and the U. S. Ball Bearing Company, Chicago, have arranged for permanent licenses under the Conrad patent and are now fully authorized to manufacture under this patent.

ADVERTISING LITERATURE

Diamond State Fibre Company, Bridgeport, Pa., has issued a catalog describing and illustrating its fibre gears.

MacGovern & Company, New York, N. Y., has issued a catalog, dated Oct. 15, of their electrical and steam machinery, cars, car equipment, etc.

General Electric Company, Schenectady, N. Y., has issued a complete catalog describing and showing numerous illustrations of its line material and rail bonds for the construction of overhead trolley systems and track return for electric haulage in mining and industrial plants.

Mesta Machine Company, Pittsburgh, Pa., has issued a catalog analyzing the savings effected by its barometric condensers by means of vacuum produced, low first cost, low cost of power required by auxiliaries, freedom from shut down and repairs, and other advantages.

NEW PUBLICATIONS

Proceedings of Seventh Annual Convention Pacific Claim Agents' Association.—San Francisco, Cal., June 24, 25 and 26, 1915. 92 pages. Paper. Secretary, H. G. Winsor, general claim agent Tacoma Railway & Power Company.

This publication contains a list of officers and committee members of the Pacific Claim Agents' Association, as well as the complete and indexed proceedings of the convention held in San Francisco last June. This convention was reported in the *ELECTRIC RAILWAY JOURNAL* of July 3 and 10.

Comparative Railway Statistics—United States and Foreign Countries, 1912. Bureau of Railway Economics, Washington, D. C. 78 pages.

The purpose of this bulletin is to present comparative data regarding the steam railroad situation in the United States and in the principal foreign countries. The year 1912 is made the basis of comparison because it is the latest year affording essentially complete official data. Part I gives consecutively the tabular matter for the thirty-eight countries covered, while Part II brings together in tables the significant averages and ratios pertaining to railroad operation in the different countries. On account of the lack of a sufficiently approximate common basis, no figures for accidents are included.

Principles of Depreciation. By Earl A. Saliers. The Ronald Press Company, New York. 200 pages. Three-quarters leather, \$2.50.

The author has endeavored in this volume to discuss fully the subject of depreciation as a factor in valuation and income tax accounting. The theoretical and legal aspects of the subject are considered, for a knowledge of these are held to be necessary in the application of the mathematical formulas used in depreciation calculations. The various methods of determining depreciation are also described, with the algebraic formulas fully explained, specimen problems solved and graphic representations formulated. In an appendix the author presents a depreciation bibliography and an explanation of the use of logarithms.

While the reader may not at all times agree with the writer's theory of depreciation in valuation work, the book is a valuable source of general practical data. Its scope may best be shown by the following list of contents: Part I, Theory: Character of Industrial Plant; Analysis of a Hydroelectric Plant; The Plant Ledger; Depreciation Reserves vs. Depreciation Funds; Depreciation and Efficiency. Part II, Practical Applications; Regulation by Courts and Commissions; The Income Tax; Valuations; Land in Valuations. Part III, Determining the Depreciation Charge; Methods of Depreciation; The Straight-Line Method; The Reducing Balance Method; The Sinking Fund Method; The Annuity Method; The Equal-Annual-Payment Method and The Unit Cost Method.