

# Electric Railway Journal

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## ANALYZE RAIL RENEWAL PROBLEMS

Some engineers have looked askance at the formula suggested in our issue of July 31 to test the economy of renewals in the "Girder and High T-Rail Renewal" article. Others have expressed the opinion that financial considerations based on pure economy seldom govern rail renewals but that municipal demands or public policies compel renewals regardless of the economy of the problem. By the same token, it is the public desire that all railway companies should reduce fares, but this is no reason why the companies should do so. To make a renewal before economy dictates and without a place to relay the old rail so as to obtain its complete wear life is equivalent to a fare reduction. Way engineers cannot afford to be responsible for an increase in the expense of operation which amounts to a reduction in fares. We do not mean to say that rail renewals in the past have been generally made on an extravagant basis, but we seriously doubt whether all track engineers in the past have so carefully analyzed their maintenance problems that they know, to a reasonably close degree, the economy of each case as it presents itself. True, some of the factors entering the problem must be assumed, but an assumption carefully made on the basis of experience is much better than a mere guess. If the municipal authorities demand a renewal before it is really needed, the actual loss to the company in dollars and cents is the kind of an argument the public can understand. The mere expression of opinion of an engineer, particularly when he is a company man, is of little avail. In other words, we believe that rail renewals, like other operating problems, are capable of scientific analysis.

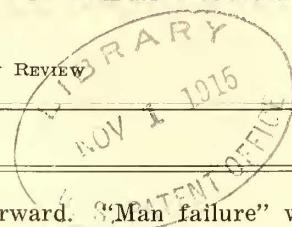
## MAN VERSUS THE MACHINE

A recently-published report on the disastrous troop-train wreck that occurred in England some four months ago discloses evidence of the most amazing character as to the contingency of that decidedly mysterious mental process frequently classed as "man failure." The accident, which was the worst in the history of English railroading, appears to have been brought about by a signalman's failure to comprehend the presence of a passenger train standing in the block beyond his signal tower hardly 100 ft. away. Although the signalman had actually alighted from this train but a few minutes before, and could hardly have helped seeing it from the tower window, he cleared the block for a following train, quite as if he wanted the wreck to occur. In this case there were none of the contributory causes such as incompetence, fatigue, intoxication, or distraction from the duty at hand, that could

possibly be brought forward. "Man failure" was the only explanation, and as an astounding climax to a lengthy record of experiences pointing to the inevitability of mental lapses in long-continued work of a repetitive nature, it emphasized the importance of automatic means where such conditions are involved. The manual block system of signaling, which was in use at the point where the wreck occurred, has unquestionably many material advantages, but in the face of such a failure of the human controlling agency, which here might well have been dominated by Edgar Allen Poe's "imp of the perverse," the value of the automatic signal becomes obvious. The action of a machine in case of failure can, at least, be predicated in advance and made subject to mechanical checks.

## A VICIOUS "EXPERIENCE ORDINANCE"

The "experience ordinance" recently passed by the city of Cincinnati was undoubtedly intended as a form of support to traction employees who might be considering future strikes. Everyone will admit that inexperienced platform men ought to have ample instruction before being placed in complete control of a car. No street railway could afford regularly to take the risk of accident damages incident to the operation of cars by untaught recruits. For that reason the ordinance is about as valuable to the city as an armless dog-catcher. Yet the character of the legal restrictions governing the procedure in this case actually renders it impossible for the company to act in emergencies, regardless of its ability to obtain experienced car operators, because the ordinance requires that new men must be instructed only by old employees who shall have been in service for "one year immediately preceding the date of giving such instruction." Obviously, if all the old employees suddenly leave the service, the instruction of new men to take their places can hardly be undertaken without recourse to miracle-working. The facts are that if the ordinance was enforced in such a case, the community would suffer more under it than the railway company. The company would then have a choice of two things. One would be to assume that the law automatically relieved the railway from its obligation to run cars. This would give the walking public plenty of time to ponder over the wisdom exhibited by their chosen authorities. The other plan would be to disregard the law. If it should do this the company would undoubtedly be sustained by public opinion, because we cannot believe that the many sensible people in Cincinnati really think that the present trainmen in that city possess a monopoly of all knowledge in regard to proper car operation.



### ENGLISH MUNICIPAL FARES RAISED

American electric railway operators will find it difficult to sympathize with the mingled astonishment and disapproval that was aroused at the recent Municipal Tramways Association Conference in London, when Alfred Baker, general manager of the Birmingham municipal lines, described the adoption of an increased scale of fares. Rather will they heartily indorse the action taken in Birmingham. According to Mr. Baker, the municipal tramways of England at the beginning of operation dealt "generously" with the public in the matter of cheap fares, long distances and liberal wages. In time, however, it was discovered that the general costs were steadily mounting, and the situation became worse after the outbreak of the war. In Birmingham, for example, the wages of the traffic and permanent way staff have increased 10 per cent since 1913, taxes have more than doubled in the last three years, and the cost of stores and materials (exclusive of permanent way materials) has shown an average increase of 27 per cent on account of the war. With expenses thus coming perilously close to receipts, the municipal tramway committee raised the fares and increased the receipts £1,666 a week without a public murmur.

Mr. Baker refused to say, however, that raising fares is a general remedy for all municipal tramways to use in meeting the higher costs of operation, and from the outspoken criticism by some managers the plan in truth does not seem likely to be widely adopted. Yet in fearlessly pointing out the weakness of English municipal tramways to-day as a result of their excessive and unbusiness-like liberality of operation, Mr. Baker has brought into prominence a question that sooner or later must be decided in connection with every municipal undertaking, whether in England or elsewhere. It cannot be argued that the present higher costs are only the transitory result of hostilities, for many municipal committees were forced to look anxiously at the financial condition of their undertakings even before the war broke out, and many of the increased burdens of the last year or so will, we believe, show a tendency toward permanency.

The question that is thus presented for municipal advocates to solve is one which involves the fundamental concept of municipal operation as viewed by two distinct schools. One faction believes that a municipal tramway should be run as a business enterprise to return a profit, while the other maintains that such objects as cheap fares, more frequent service and extensive city developments through tramway operation constitute the goal to be reached, whether the tramway shows a loss or profit. The first view is the one usually advanced when the road is municipalized. The advocates of municipal ownership want simply that the city should have the "profit" which the company formerly earned. But as politics creep into its operation and as demands are made for the extension of the lines in this direction or the other and for higher wages, these concessions and economical operation are found incompatible. Then follows the demand that the deficit should be made good by the general taxpayer.

In their ardor for making concessions to the riding public many English municipal lines have lost sight of the fundamental economic relation between the price and the cost of transportation, but now with the increased cost of operation their concessions to the patrons have turned to plague the inventors in a way that commands attention. We hope that the volume of higher costs will bring enlightenment as to the value of cost-accounting principles in fare-making.

### NEW ROCHELLE MOTOR-BUS LINE

The franchise which was granted for a motor-bus line in New Rochelle last week by the Public Service Commission of New York, Second District, places the bus line on an entirely different basis than that of the ordinary jitney. Indeed, with the provisions that children under five and policemen and firemen on duty shall be carried free, that buses shall run on at least a twenty-minute schedule from 6.30 a. m. to 1.30 a. m., that 3 per cent of the gross earnings shall be paid quarterly to the city, that a bond shall be given to insure prompt payment of this and other obligations and that the franchise shall be forfeited in the event of the insolvency of the holder or failure to operate the system in accordance with the terms of the franchise, it reminds one of a railway franchise. In granting the franchise the commission also has emphasized its present policy of protecting already established utilities under its jurisdiction from unnecessary competition and has rejected two of the six routes for which application had been made by the motor-bus company. The reason given was that these routes were too closely competitive with the existing trolley system. The maximum headway is to be twenty minutes and the fare is to be 5 cents. The length of each route is from 1 mile to 1½ miles.

If the motor bus company should accept this franchise and should begin operation the installation will form an interesting example of the relative merits of bus and electric street car operation under somewhat similar conditions. Although the average passenger ride in this case will probably be less than a mile we are rather skeptical of the success of the project. The promoter will have to average three passengers per mile or four and a half passengers for each half trip of 1½ miles to pay operating expenses, reckoning these at 15 cents per bus-mile, and will have to carry considerably more than this number to provide for depreciation, taxes, a profit and interest on the investment. The possibility of doing this in local service in a town like that of New Rochelle, with its population of some 32,000 people, is not great. We are by no means disposed to decry the use of motor buses or to deny that there is a field for them in passenger transportation. We think there is a good field and one which is much wider than that to which they have been at present applied. But we do believe that where the franchise calls for a regular schedule and other similar traffic regulations, as in this case, the number of places where motor buses can be made to operate successfully on a 5-cent fare is very limited.

**PAVEMENT SAND CUSHION BECOMING OBSOLETE**

Comparatively recent experimental pavements in which brick or granite block was laid on a mortar cushion, instead of the usual sand cushion, demonstrate the utility of the former which, it is believed, will eventually relegate the sand cushion among the other obsolete practices of pavement engineers. Several years ago granite-block pavement was laid on a mortar cushion by the Houston (Tex.) Electric Company with most satisfactory results. As early as 1904 the Philadelphia Rapid Transit Company paved between its rails with granite block on a dry mixture of sand and cement and the pavement is still in service.

More recent experiments made on highways and in paved streets have also proved the advantages of the mortar cushion. This type of cushion is just as applicable to the track allowance as it is for highway or street-paving purposes and will undoubtedly eliminate many of the common defects which can only be attributed to the unstable sand cushion. To obtain the maximum life of any pavement, it must be impervious to water. When a rigid surface is laid on a resilient cushion it is practically impossible to make the surface waterproof. Water percolating through the joints or along the rail in any type of unit pavement carries silt which ultimately starts a pumping action in the pavement surface. During wet seasons or on pavements that are sprinkled frequently this silt, along with the sand, is forced to the surface and a pocket or rut is formed in a comparatively short time. Deterioration of this kind, however, is not as serious as that resulting from freezing and thawing of the sand cushion. Many instances could be cited where the brick surface has been heaved so badly by freezing and thawing that complete relaying was necessary.

Better pavement surfaces at a lower cost per square yard may be obtained with the dry sand and cement mixture than with the old-style sand cushion. A mortar cushion, together with a grouted filler, insures a pavement absolutely impervious to water, and eliminates the shifting and yielding incident to a sand cushion which is largely responsible for uneven pavement surfaces. Sand cushions were supposed to have furnished a resilient base for the rigid pavement surface. If such a base resulted the sand cushion could not perform its function properly because any movement would unquestionably decrease the life of the pavement surface. The mortar cushion lends itself just as readily to construction as the sand cushion and produces a pavement surface which will not fail because of wide changes in temperature. Openings in the pavement to make repairs will cost slightly more, perhaps, but this is to be expected if pavement life is to be prolonged. Any structure designed to facilitate repairs is quite certain to fail before one designed with wear life as the governing factor. A longer wear life will make fewer repairs necessary, and in the end the increased cost of making openings in the pavement will be more than offset by reduced pavement maintenance.

**LARGE AND SMALL POWER PLANTS**

Although one cannot deny that there is a great fascination in such large generating units as have been described in recent issues of the *ELECTRIC RAILWAY JOURNAL*, it is profitable occasionally to note some of the interesting developments that are going on in small plants. An example of such a plant is that of the Springfield (Ohio) Railway, described in this week's issue. In this plant the condensing, coal and ash-handling and oiling equipments are as ingenious and as worthy of study as the respective elements in many plants of ten or more times its size. This is also an excellent example of a rehabilitation in which a considerable part of the old plant was incorporated effectively in the new, and that without serious interference with operation.

That the small railway power plant is an important element in transportation is indicated by the fact that two-thirds of the energy used by electric railways, or roughly 6,000,000,000 out of a total of 9,000,000,000 kw.-hr., is still generated in the railway companies' plants, or was at the time of the last census report. There is undoubtedly a well-defined tendency on the part of electric railways located in the territory of large central stations to buy energy, but, in spite of this fact, it is significant to note that between 1907 and 1912 there was an increase in generating capacity of electric railway power plants of 45.4 per cent. The figures for 1912 show that in that year a total of 495 companies had a combined generating capacity of 3,665,000 hp., or an average of about 7400 hp. each. Allowing for a few extremely large plants this means that there is a very considerable number of plants averaging about the size of that in Springfield.

In these plants it would appear that there is need of more economical operation to offset increasing unit costs. While in the states containing very large cities the cost of energy per kilowatt-hour has decreased or remained stationary, in other states it increased about 14 per cent in five years. In the United States as a whole it decreased more than 15 per cent in the same period, due to the large plants. It thus behooves the managers of the small plants to study their problems most carefully and look to savings in labor and material, both in operation and in maintenance. Even if a plant is not near enough to a large central station to force competition in cost of electrical energy production, it is desirable to generate this energy as cheaply as possible to offset in part the increase in costs of other components of transportation. The power plant must have reasonable appropriations for the purchase of equipment which will conduce to this end, as the use of labor-saving devices is an important element of economy.

While the *ELECTRIC RAILWAY JOURNAL* will continue to chronicle the interesting achievements in the power plants of 100,000-kw. capacity or more, the editors realize that to the average railway man such plants are of general rather than immediate interest. The small and moderately-sized plant will therefore, as heretofore, continue to have a large share of attention in the columns of this paper.

# A Railway Power Plant Rebuilt Without Interfering with Operation

A Plant of Moderate Size Has Been Newly Housed and Equipped with Efficient Auxiliaries, Including a Novel Form of Condenser and an Original Oiling System—Reciprocating Engines Are Retained for the Present

The Springfield (Ohio) Railway, a subsidiary of the American Railways, Philadelphia, Pa., has just completed the remodeling of its power plant located at the corner of Power and Warder Streets in Springfield. The new plant has been built around and within the old one without interference with operation. The company has now a most satisfactory plant, and one up to date in every particular with the possible exception of the use of reciprocating engines instead of the more popular steam turbines. The impelling reason for the use of reciprocating engines in the new plant was that the American Railways had on hand, in addition to the two McIntosh & Seymour units originally installed here, two excellent engines which had been displaced with steam turbines in other stations. While the reciprocating engines were installed in this plant for the present the possibility of changing later to turbines was considered and provision was made for doing so.

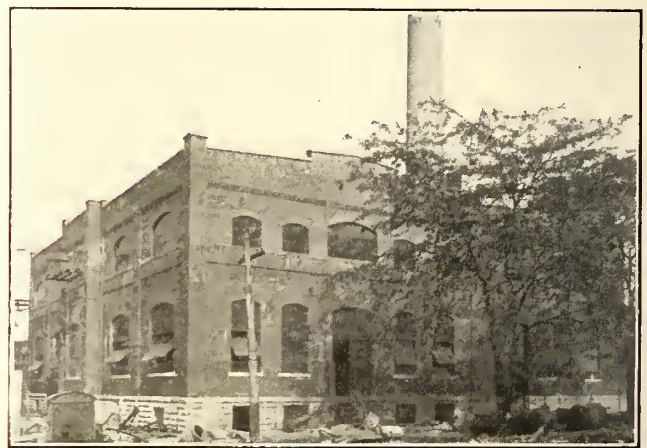
In rebuilding the plant without interfering with operation many puzzling problems in piping support, etc.,

ing crane. A basement for the accommodation of auxiliaries extends beneath the entire building. No wood was used in the construction of the building, the doors, door frames and window frames being of steel and the floors and roofs of concrete.

## THE BOILER ROOM

In the boiler room the firing aisle is located against the partition. Over this aisle is a suspended steel bunker of 300 tons capacity carrying below it a weighing larry from which the coal is spouted to the stokers. The larry is motor-driven and floor-controlled, and it has a capacity of 1 ton. Cast-iron gates are provided in the bunker bottom with a 5-ft. spacing, thus minimizing the amount of dead coal therein. The larry is equipped with a ticket recorder so that accurate records can be kept of the coal consumption as a whole, for the several boilers and for the several firemen.

The boiler equipment comprises a total capacity of 2100 b.hp. of Stirling-type, water-tube boilers. There



SPRINGFIELD RAILWAY POWER PLANT—THE OLD POWER HOUSE AND THE NEW ONE

had to be solved. How some of them were solved is indicated in several of the illustrations which accompany this article. Of particular interest were the schemes used for taking care of the flue gases while installing the fan and economizer, for supporting the steam header while the wall behind it was removed, and for protecting the operating machinery amid the dirt and confusion.

## THE BUILDING

The pair of illustrations above show the appearance of the two stations, and subsequent pictures indicate the way in which one was gradually superimposed on the other. The new building was designed for this superposition so as not to interrupt regular service. The general layout of the plant is indicated in one of the line cuts. The new building is one story in height, with walls of brick and foundation of concrete below ground and ashlar cut masonry above ground. It is divided by a firewall into engine and boiler rooms of equal size, and in the former is installed a 20-ton Whit-

are six units, four of 400-hp. capacity each, and one each of 300-hp. and 200-hp. capacity. Two of the large boilers are new. All boilers are equipped with Murphy stokers with both electric and steam drive. Beneath the stokers is a track for ash cars, forming part of a very complete equipment for handling ashes.

Draft for the furnaces is provided by means of a brick chimney 8 ft. in diameter at the top and 150 ft. high, and a steam-driven induced-draft fan. As shown in the general plan, there are three outlets from the main smoke flue, one through an economizer chamber and the fan, one direct through the fan, the other through a by-pass. The economizer is of the Green type and is rated at 2000 hp. Stack, fan-house and economizer are all located out of doors, permitting a simple and economical arrangement of the equipment which was placed inside.

The boiler-room auxiliaries include an open-type Cochrane feed-water heater of 2000-hp. rating, Warren vertical marine-type feed pumps of 350 gal. per minute capacity each, and a water softener to purify make-up

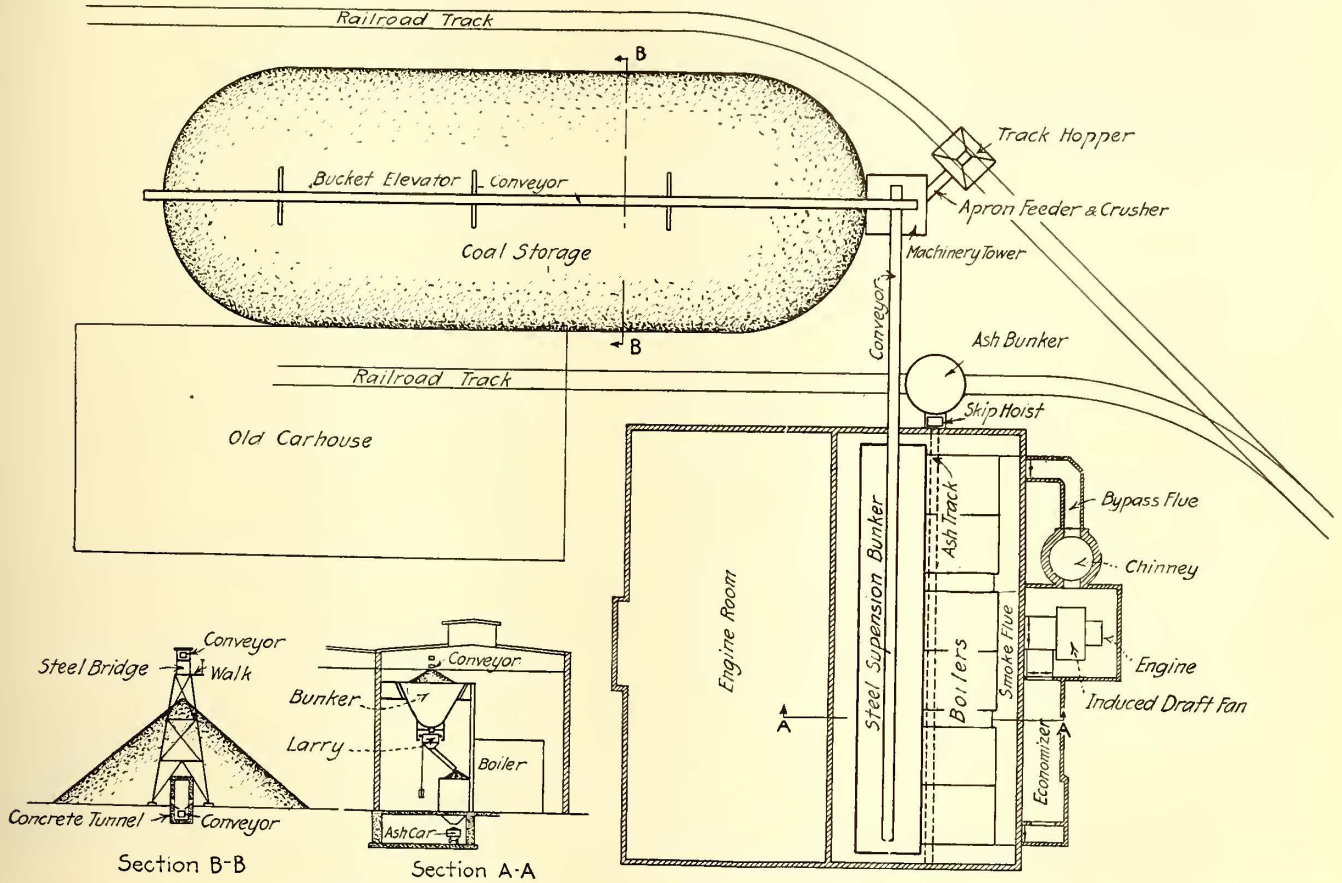
water. The last-named is necessary because the raw water from the wells is very hard, containing 24 grains of incrusting solids per gallon and this caused much trouble in the old plant.

THE ENGINE ROOM

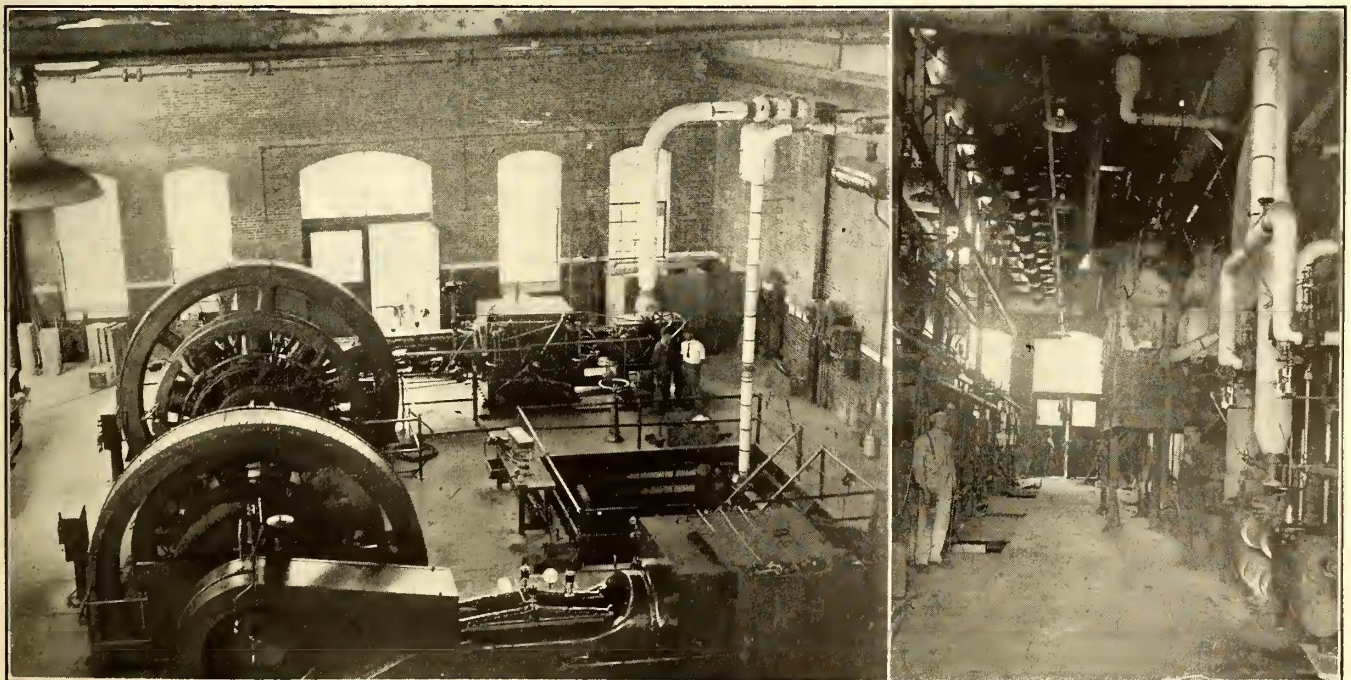
In the engine room four units of a total capacity of 1975 kw. are installed as follows: One 450-kw. McIntosh & Seymour tandem-compound condensing engine with GE generators; one similar 500-kw. unit; a similar 500-

kw. engine coupled to a Crocker-Wheeler generator, and a 525-kw. Allis-Chalmers Corliss engine coupled to a GE generator.

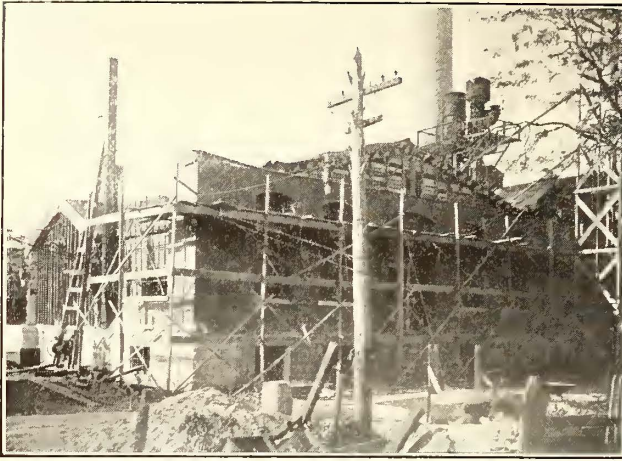
The engines exhaust into one exhaust main which at one end connects with two Kuylenstjerna barometric surface condensers, which are described later in this article. Before it reaches the condensers the steam passes through a Sweets oil separator where the oil is removed to the extent of 99 per cent. This main exhaust line is also provided with automatic free exhaust



SPRINGFIELD RAILWAY POWER PLANT—GENERAL LAYOUT OF PROPERTY



SPRINGFIELD RAILWAY POWER PLANT—ENGINE ROOM INTERIOR—FIRING AISLE OF BOILER ROOM



SPRINGFIELD RAILWAY POWER PLANT—NEW BUILDING INCLOSING OLD ONE

valves in each end so that, if necessary, some of the units can be run non-condensing when the others are in on the condenser.

In the engine-room basement are two condenser circulating pumps drawing water from ten 35-ft. driven wells located on the property near the power house. There is also a connection to a near-by creek. Two steam-driven, reciprocating vacuum pumps for the condenser are located on the engine-room floor.

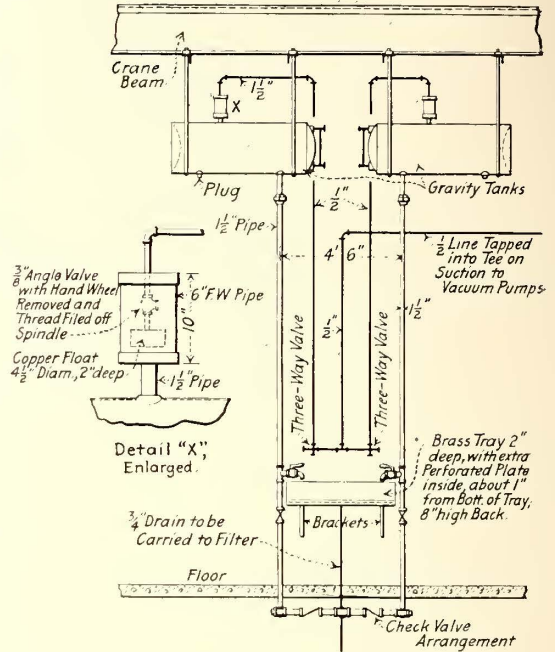
The generator output is controlled through a switch-board of standard GE make, containing four generator, one lighting, one totalizing and six feeder panels, with ample room for expansion. The outgoing feeders inside the station are supported on a steel cable rack mounted on the building wall, and outside they are carried upon angle-iron poles 40 ft. high above ground.

OILING SYSTEM

The oiling system differs from the usual type in the use of the vacuum from the condenser, or the condenser vacuum pump, to lift the oil from the filter to the elevated storage tanks. The details of the scheme can be seen in the accompanying diagrams. Three parts of the system are referred to therein, as follows: The elevated

storage tanks, two in number, of a capacity of 50 gal. each, together with the accompanying valves, the oil filter and auxiliary storage tank (not shown but indicated by lettering near the pipes leading to them), and a check-valve arrangement in the pipe connecting the elevated and low-level tanks and in the oil feed pipe.

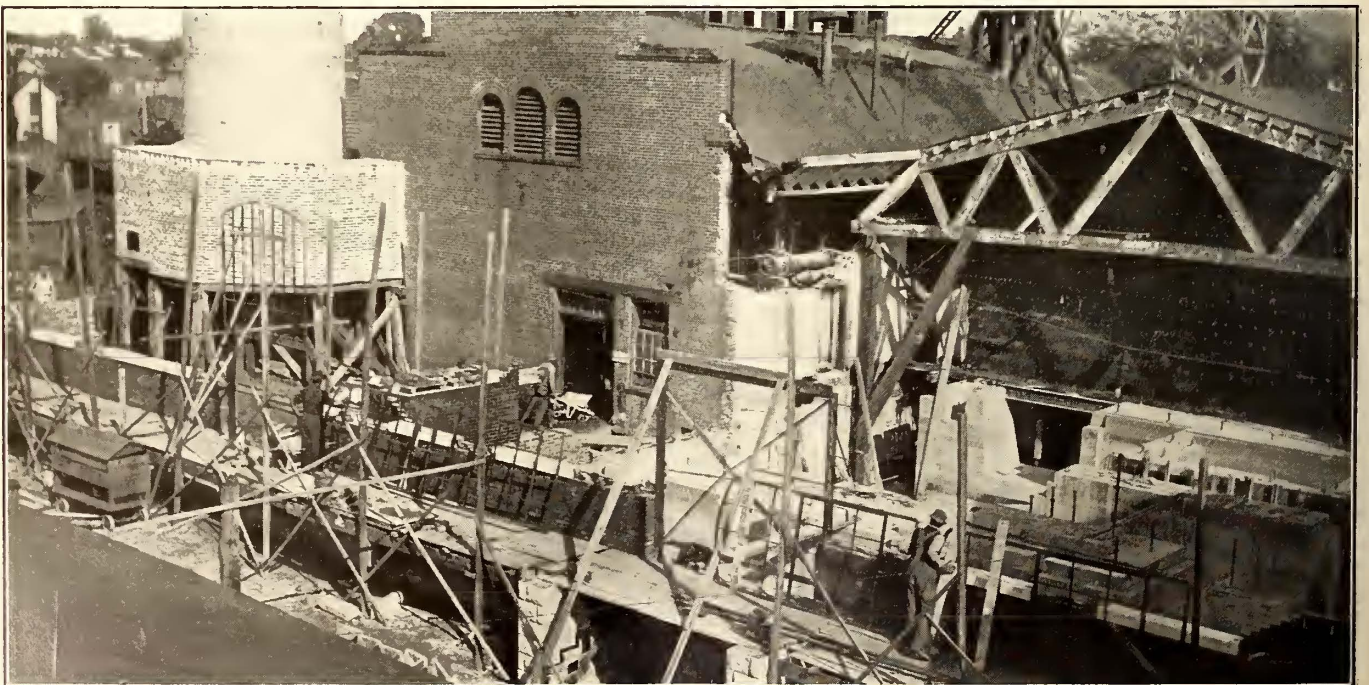
The suction pipes enter the elevated tanks at the top through a home-made check valve consisting of an angle



SPRINGFIELD RAILWAY POWER PLANT—STORAGE TANKS AND PIPING OF OILING SYSTEM

valve operated by a copper float which rises when the tank is filled with oil. In the suction pipe line to each tank is a three-way valve operated by hand during the filling operation. In one position (filling) this valve puts suction on the tank, in the other atmospheric pressure is applied, allowing for gravity feed to the bearing pipe line.

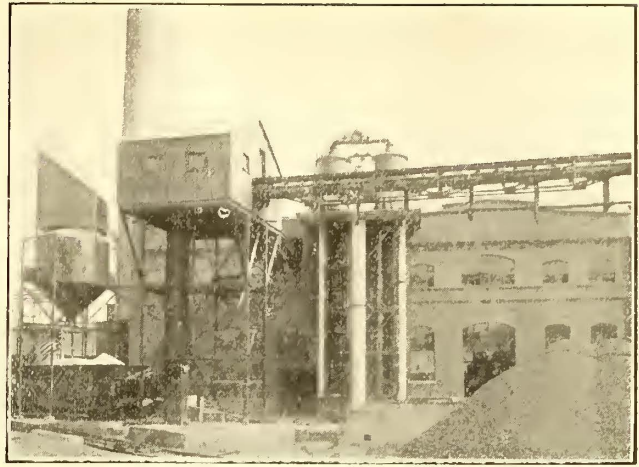
As stated, there is a check-valve system in the feed



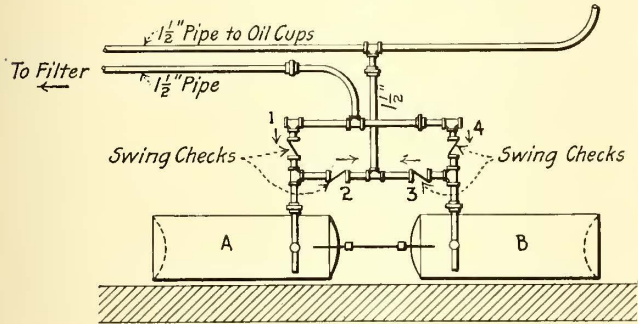
SPRINGFIELD RAILWAY POWER PLANT—TEMPORARY CONSTRUCTION DURING REBUILDING

line. This is shown diagrammatically herewith. It consists of four swing check valves, 1, 2, 3 and 4, which allow oil to flow in the directions shown by the arrows. When tank A is under suction, B is under atmospheric pressure. Then oil flows through valve 1 into tank A, and out of tank B through valve 3 to the oil cups, and vice versa.

With this arrangement it generally takes about five minutes to put a barrel of oil from the basement to the elevated tanks. If the condensers do not happen to be in operation when the tanks are to be filled the air pump can be started up for a few minutes. The suction pipe is tapped into the vacuum line near the air pump for



SPRINGFIELD RAILWAY POWER PLANT—CONVEYOR HOUSE, CONDENSERS AND ASH BIN



SPRINGFIELD RAILWAY POWER PLANT—CHECK VALVES IN OIL-FEED SYSTEM

this purpose. The operation of the system is very satisfactory to the attendants and there is no sticking of the valves as they all work in oil. The system was designed by Adolph Kuylenstjerna, mechanical engineer of the company.

APPARATUS FOR HANDLING COAL AND ASHES

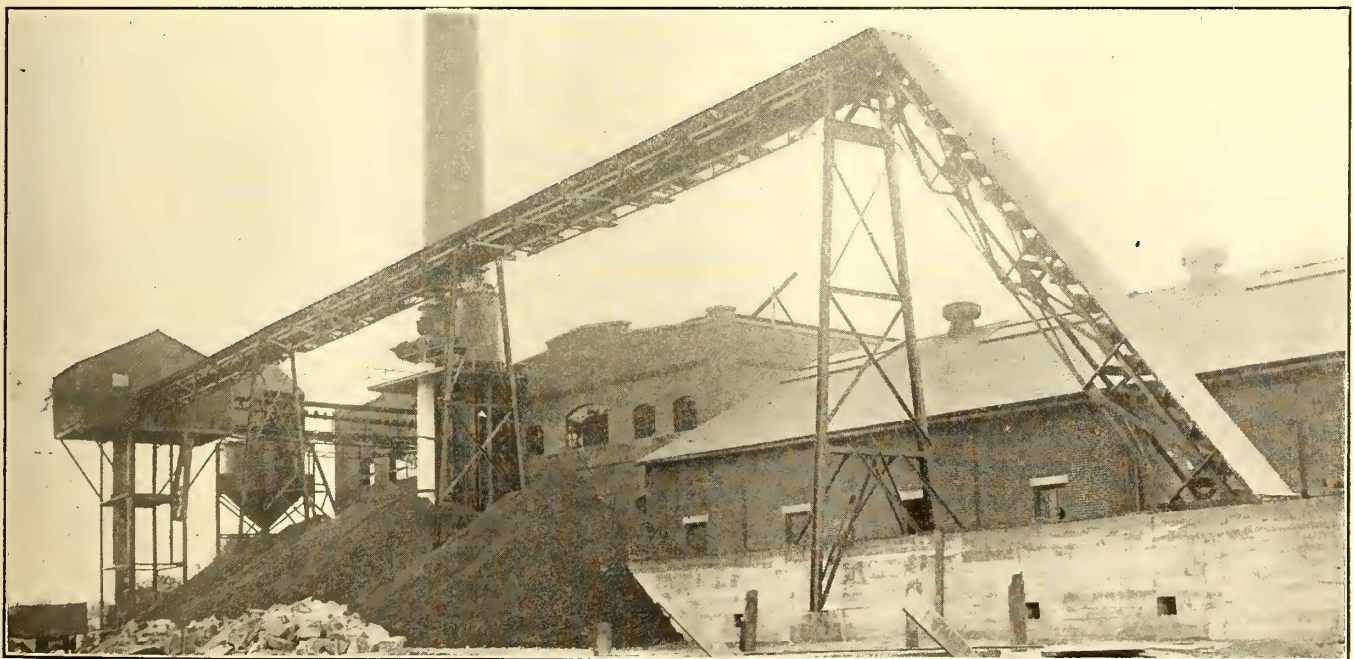
Coal is brought into the yard in the railroad cars, from which it is dumped into a steel track hopper. Through this it falls upon an apron feeder which delivers it to a two-roll crusher. The crushed coal is distributed upon the storage pile by a V-bucket conveyor onto the vertical run of which the crusher discharges. For direct filling of the boiler-room bunker a cross-conveyor is provided, connecting with the upper run of the

storage-pile conveyor. The horizontal run of the latter is carried on a trestle, the return run being through a concrete tunnel. Coal to be reclaimed from storage is admitted to the conveyor through gates.

At the junction of the yard conveyor and the boiler-room conveyor is a tower which contains all of the driving machinery, suitably surrounded with guards.

The storage space has a capacity of 3000 tons of crushed coal. The experience of the American Railways with storage of crushed coal indicated that there was not an undue fire risk incurred thereby, while this practice permitted the use of simple machinery, cheap to install and easy to operate.

The ashes are handled entirely separate from the coal so that the two equipments can be operated according to their own requirements. Ashes are collected in pits under the stokers, whence they are drawn into a push car. This car has roller bearings, and its capacity is such that when fully loaded it can be easily pushed by one man. The car dumps into a skip hoist located at one end of the building, the skip bucket having a capacity 10 per cent greater than the car and a width 1 ft. greater to prevent spilling during filling.



SPRINGFIELD RAILWAY POWER PLANT—COAL CONVEYING AND STORING EQUIPMENT

The operator starts the hoist, which is electrically driven, by means of a controller, after which its operations of dumping, returning to the starting position and stopping are automatic. The ashes are stored in the elevated bunker shown in the plan view and in one of the halftones.

THE CONDENSERS

The condensers are mounted upon a steel tower outside the building with a hot well below. The hot well is in two compartments, one for the circulating water and one for the condensate. The compartment which holds the condensate is equipped with an oil-filter bed intended to remove any trace of oil still remaining in the water coming from the condensers.

The condenser itself, also the invention of Mr. Kuylenstjerna, is of the surface type but combining with this an auxiliary jet-condenser feature. By referring to the cross-section shown herewith it will be noted that the circulating water enters at the top and passes downward through the central group of tubes and up-

features of this condenser the following: As the upper tube plate is free to rise and fall with the expansion and contraction of the tubes it was possible to expand the tubes into the sheet. As the tubes are open at one end, tube leaks do not affect the vacuum and at the same time the vacuum assists in lifting the water from the pump into the condenser. The hot steam meets the hottest water, thus minimizing tube strains. The vertical position of the tubes enables each to carry off its own condensate. The absence of baffles in the tubes allows free circulation. The jet-condenser feature provides for peak loads, permitting the capacity to be figured for average load. There is no need for a wet-vacuum pump as the barometric feature takes care of the condensate. The arrangement provides for easy cleaning and draining. The surface-condenser feature provides for freedom from scale and yet many of the jet-condenser features are retained. The tube surface in the condenser is about 2000 sq. ft., which at the nominal rating indicates a capacity of 2000 hp. The condenser of the size shown has handled as high as 3000 hp.

As stated, the hot well has two compartments, one for the circulating water and one for the condensate. They are side by side and both deep enough to thoroughly seal the condenser tail pipes immersed in them. Between the two chambers is an outside pipe connection with a swing check valve permitting make-up water to flow into the condensate chamber when the level falls sufficiently.

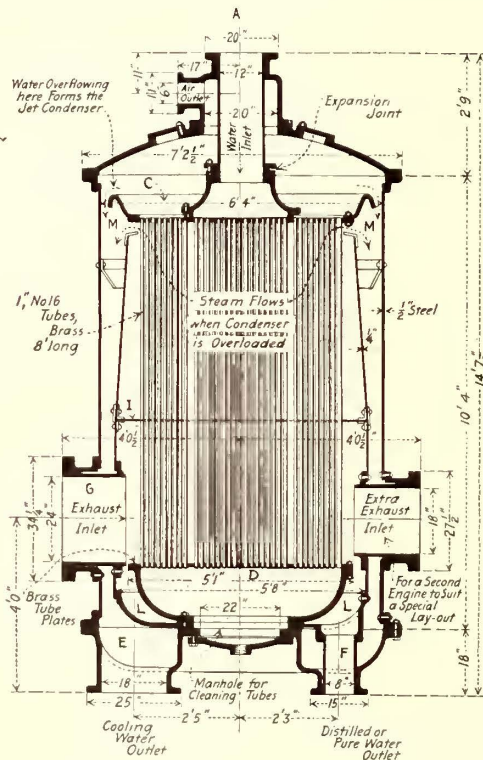
ADMINISTRATION AND MANAGEMENT

The power plant remodeling described above is part of a rehabilitation scheme of which another section, comprising new shops and carhouse, was described in the issue of the ELECTRIC RAILWAY JOURNAL for March 20, 1915, page 556. The power plant work has been carried out under the direction of the American Railways Company, of which H. J. Crowley is general manager, and A. Kuylenstjerna is mechanical engineer. Adolph Schmittauer was superintendent of construction in direct charge of the work. The Springfield property is under the management of George C. Towle, general manager of the People's Railway, Dayton, Ohio.

Anniversary of Incandescent Lamp Invention

Edison Day, Oct. 21, commemorated the thirty-sixth anniversary of the invention of the electric incandescent lamp by Thomas A. Edison. On Oct. 21, 1879, Mr. Edison first successfully made a carbon filament glow when a current of electricity was run through the filament in a glass bulb from which the air had been exhausted. This was even before he had successfully determined and chosen carbonized bamboo, the only substance used for about ten years in making filaments for commercial lamps, which was followed by the "squirted" filament employing carbonized cellulose in one form or another, next the metallized carbon filament, then the pressed tungsten filament, and finally the special form of drawn tungsten wire which is used in the modern Mazda lamps.

The Interborough Rapid Transit Company, New York, N. Y., has already converted six of the 478 composite cars, used in the subway, into all-steel cars. The composite car bodies were removed from the trucks and new all-steel bodies placed upon those trucks. The company has notified the New York Public Service Commission for the First District that already 184 steel car bodies have been received and that the work of converting the composite cars is progressing at the rate of thirty-one cars per week.



SPRINGFIELD RAILWAY POWER PLANT—CROSS-SECTION OF BAROMETRIC CONDENSER

ward through the outside ring of tubes into the trough C. Flowing over the lip of the trough it forms a thin tube, finally leaving by the outlet E, through the tail pipe, to the hot well below.

The exhaust steam enters at G and impinges upon the tubes, being forced between the tubes by a baffle ring, I. Any steam remaining uncondensed flows through the opening M into the outer space in the shell, there coming into contact with the falling sheet of circulating water and being quickly condensed. The steam condensed on the tubes falls into the chamber L and thence flows out through outlet nozzle F into the tail pipe and into a separate hot well.

The air is pumped out of the condenser at the nozzle located close to the cooling water inlet. This arrangement was adopted to secure the reduction in volume of the outgoing air which accompanies the lowering of its temperature. Otherwise an extra air cooler would have been necessary.

Mr. Kuylenstjerna mentions as some of the design



# Rhode Island Wage Arbitration

Company's Brief Shows that During the Past Few Years Wages for Railway Employees Have Advanced Much More Rapidly than Those in Other Industries and Cost of Living—An Urgent Plea Is Made for a Substantial Reduction from the Present Scale

The Rhode Island Company presented its argument in the pending wage arbitration at Providence on Oct. 25, through James M. Swift of its counsel. James H. Vahey of Boston, Mass., submitted an argument on behalf of the union, and the case then went to the board for adjudication within thirty days. The company's point of view was presented in a printed brief of 168 pages, abstracted below.

The Rhode Island Company, incorporated in 1902, is the result of several operating consolidations comprising to-day 398 miles of track and furnishing transportation to about 90 per cent of the population of the State. It is at present operated by the federal government through a board of trustees holding the company's securities. If no purchaser for the company is found by 1919, the company, if in existence, is to be sold at auction. The trustees are charged with the double responsibility of providing efficient transportation service and of preserving the integrity of the system itself, which centers in the city of Providence.

The local division of the Amalgamated Association began its activities in 1912, and in July, 1913, a working agreement was effected covering thirty sections bearing upon wages, hours and conditions of labor. At the recent hearings Secretary Daniels of the union testified that since the organization of the union the men have more favorable conditions of working and higher pay than ever before, justifying the inference that in negotiating the 1913 agreement the union was fully conversant with the needs of its members and that the agreement fully satisfied those needs. So satisfactory was the agreement that when the company and the union met in conferences this year at its expiration to consider whether its terms should be changed it was agreed that, except as to wages and guaranteed hours to spare men, no alteration should be made. No agreement as to wages and hours could be reached, and arbitration was agreed upon. Because the company would not consent to let the union name all three arbitrators, a strike resulted in July, 1915, resulting in disorder, serious inconvenience to the public and heavy additional loss to the company, already staggering under an acute falling off in its earnings. Public opinion, however, forced the union to a realization of the unfairness of its attitude, with the result that conferences were resumed, and the present board of arbitration was selected.

## POINTS AT ISSUE

The subject-matter to be determined by arbitration is: 1. The rate of wages to be paid by the company to members of the union. 2. The number of hours, if any, to be guaranteed extra men for a minimum day's work.

The board of arbitration has no right to fix any scale of wages made conditional upon any co-operative plan or any scheme based upon the future earnings of the company. The award is to date back to June 1, 1915, and the agreement is to continue in force until June 1, 1917.

The arbitration board consists of Mayor Joseph H. Gainer of Providence, chairman; Henry F. Baldwin, representing the union, and Michael J. Houlihan, representing the company.

The company estimates that the demands of the union, based on the normal working year and excluding over-

time or bonus time wages, correspond to a total increase of \$567,479 per annum, classified as follows:

Seven-hour guaranteed day for extra men, \$108,085.  
Motormen and conductors (including all blue-uniformed employees), based on minimum of 30 cents and maximum of 35 cents per hour, under four-year graduated scale, \$292,298 per annum. The present weighted average hourly rate is 27.85 cents; that demanded is 34.85 cents, an average weighted increase of 6.99 cents per hour, or 25.12 per cent.  
Increase of 10 cents per hour for repair shop employees, \$43,624.  
Increase for carhouse employees, \$23,342.  
Increase for employees of power department, \$9,589.  
Increase for employees in line department, \$8,379.  
Increase for employees of freight department, \$20,792.  
Increase for regular employees of track department, \$33,163.  
Increase for irregular employees of track department, \$25,218.  
Increase for employees of stores department, \$2,999.

## COMPANY'S CONTENTIONS

The company contends that in view of the fact that the union has failed to prove either an increase in work or an increase in the cost of living sufficient to justify an increase in the present wage, and in view of the financial condition of the company, these demands are absolutely unjust and impossible. The company has requested the board to reduce the present scale of wages to that in force prior to the working agreement of July, 1913, viz., for blue-uniformed men, 22 cents to 27.5 cents per hour, with corresponding decreases in the wages of employees in miscellaneous departments. In considering this request, it is urged that the original offer of the company in conference to increase the pay of blue-uniformed employees contingent upon an increase in revenue, its offer of a six-hour guaranteed day to such spare men as were required to report and its failure in the early conferences to request a reduction in the wages of employees of the miscellaneous departments were in lieu of arbitration, it being distinctly stated that if arbitration became necessary the company would insist upon the requests now submitted to the board.

The company maintains: First, that all its employees now receive a wage sufficient to support an ordinary family in health and reasonable comfort; second, that the increase in wages of a great majority of the employees since the last fixation and before has been greater than the increased cost of living and that there has been no such increase in the responsibility and difficulty of the work as would justify an increase in wages; third, that the work performed by its employees is peculiar to a unique employment and does not severely tax the endurance of the men, in most departments calls for something less than ordinary skill, knowledge and intelligence, and involves comparatively little danger to life, limb and health; fourth, that the wages received by other workmen are not material in this case, and do not afford a safe basis of comparison in determining the wage in this occupation; fifth, that the wages demanded by the union are unreasonable, both from the standpoint of the company's financial condition and of local needs; sixth, that the issue is purely local, and that in its decision the board may not safely consider wages or working conditions of other street car companies or of other employments in other localities; seventh, that such evidence as has been introduced is material solely on the issues of wages and guaranteed hours, and that the board is limited to considering such evidence as indicates a change in conditions since July, 1913; eighth, that the union has shown no sound reason for instituting

a guaranteed number of hours for spare men, the company's experience showing with a similar guaranty that under local conditions it is impractical; ninth, that the financial condition of the company renders it not only unable to pay any increase in wages, but obliges it, if it is to continue to exist, to reduce its wages.

The argument sets forth in considerable detail the position that comparative evidence from other companies, as attempted by the union, is inconclusive in view of the entire insufficiency of data upon which to base parallels. Fred Fay, executive board member of the Amalgamated Association, stated in the Boston Elevated arbitration that the union has always contended that the wages paid in other cities was no criterion in determining what wage should be paid in any immediate locality requiring arbitration. International President Mahon stated at Rochester, N. Y., in an interview last month that what can be paid in one place cannot be standardized by what some other traction company pays somewhere else and that wages must be determined upon local conditions. By abandoning its former contentions and principles, states the brief, the association confesses its inability to establish its case in accordance with the principles on which other increases have been secured.

This cardinal principle of arbitration is recognized and followed by Justice Higgins, president of the Commonwealth Arbitration Court of Australia (*Australian Builders' and Laborers' Federation v. Archer and 569 Others*). In the controversy between the Pittsburgh Railways and the Amalgamated Association, Chairman Buffington found that there is no general standard of wages for street car men, but that each of our large cities has made such fixation on the basis of local conditions. Wages paid in one city afford little light on what should be done in detail in another. This finding was made without objection by either side to the introduction of comparative evidence.

#### DISCUSSION OF WAGE SITUATION

So far as motormen and conductors are concerned, the union evidence showing the wages of outside trades is immaterial. There is no similarity of work established, and the unit of comparison is the hour, day or week and not the yearly wage, which takes into account the most important element of constancy of employment. For these reasons the testimony of taxicab drivers is of little value. As to these it appeared also that their responsibility and skill are considered greater than the motorman's, because a license to operate is required. In the shop and miscellaneous departments, street railway service is peculiar to itself, by no means qualifying men to do general work of the same name outside.

Since 1907 union wages in the building trades have increased but 11.1 per cent, only 0.5 per cent faster than the cost of living for the period; and the wages of employees in the metal trades have increased 13 per cent, but 2.4 per cent faster than the cost of living. During the same time, the maximum rate per hour for motormen and conductors has increased 12 per cent, the minimum rate 12.5 per cent, the weighted average rate 13.9 per cent, the average rate per car-hour 20 per cent and the average wage per year 17.6 per cent, each unit of comparison being materially higher than the cost of living increase. The increase in the average wage per year, which is the proper measure of the living wage, shows an increase 7 per cent greater than the increase in the cost of living, an increase 4.6 per cent greater than the metal trades, and an increase 6.5 per cent greater than the building trades.

Since 1912 the average weekly wage of power-house men has been increased 7.7 per cent; of linemen, 23.8

per cent; of freight department employees, 7.5 per cent; of carhouse and repair-shop men, 13.3 per cent, and of trackmen, 25.1 per cent.

#### COST OF LIVING

The increase in the cost of living has been only 12.1 per cent since 1907. This increase now shows a break in its general trend since 1907 and indicates a gradual though as yet unascertainable decrease since 1914. As the average wage per year tends to increase because of the graduated scale and because the cost of living now tends to decrease, the margin between the two for 1915 will undoubtedly be substantially larger.

The company's argument contains an exhaustive refutation of the contentions of the union relative to the rate of increase in the cost of living since 1900. Only 319 of the present 2469 employees were in the company's or its constituent company's service at that date, less than 13 per cent of the present employment. The remaining 87 per cent have no right to ask that their wage be now increased because of a change in the cost of living from a time before they were employed by the company. At that period many of them were but children, supported by their parents, and others employed in occupations which they later chose to desert for this. In the union figures, the period selected for a cost of living basis was admittedly the lowest-price era during all the time for which price records are now available. Using the union's own figures, the increase in food cost at Providence since 1899 is found, on careful analysis, to be only about 75 per cent of that claimed.

The company's brief states that the increase in prices arrived at by the union is fallacious. Food increases were derived from either old figures discredited as being of no present value by the government department which compiled them, so carefully selected that they are not representative, or spurious. Fuel costs were taken from wholesale figures; clothing figures employed were vague estimates, with limited items, while rent was largely a matter of guesswork. The union weighting of items does not agree with the weighting of the authorities referred to, and the new method of weighted index numbers standardized in government economic calculations was insufficiently utilized. Full particulars are given in the brief of the company's methods of calculating the cost of living increase.

#### WORKING CONDITIONS

The company contends that the work of its employees is virtually no harder than at the last fixation of wages and cites extended figures bearing upon traffic conditions, car service, etc., to prove this point. Compared with other companies cited by the union, the work of motormen and conductors, so far as affected by speed, density of population, annual car-miles operated per crew, revenue per mile of track, annual receipts per conductor, proportion of air-brake equipment, length of graduated scale, season peaks, transfers, etc., is in general easier on the Rhode Island system. It was shown that could the company place in effect its so-called "efficiency timetable," both regular and spare men would earn substantially more than at present, increasing the actual average of all men from \$729 to between \$791 and \$839 per year. The fact that some spare men have refused opportunities to go on the regular list indicates that there are some advantages in remaining a spare man, whether in pay, hours, or working conditions, and without a guaranteed number of extra hours. The amount for bonus time actually paid is \$9,090 per year more than the total for reporting time and accident reports. The percentage of inoperative Rooke fare registers per year is only 0.68 per

cent per conductor, or approximately one per conductor in each 1.5 years. During the fiscal year 1915 2,774,000 signal hours were operated. In this period there were 3312 signal-hours' failure, or 0.84 inoperative signal-hours for every 1000 signal-hours operated. This is less than one inoperative signal per motorman per year and shows the falsity of the motormen's contention that their work has increased because of the number of inoperative signals. Since 1913 the work performed by the blue-uniformed department has decreased between 3 and 4 per cent, as determined from passenger revenue per car-hour and from passengers per car-hour. The company claims that the occupation of motorman and of conductor is not a skilled occupation in the sense that the union defines the term.

#### FINANCIAL CONDITION OF COMPANY

Wholly irrespective of dividend requirements, the company contends that no increase in wages is possible, but that a reduction should be ordered. Its borrowing capacity is exhausted; the city of Providence has so far failed to relieve the road of any of its franchise obligations; there is no market for its stock; the lessor companies have the right to require the company to keep up maintenance under penalty of forfeiture of the lease; business depression, ruinous competition of jitneys and diminished growth of population, not anticipated—all these render it impossible for the road to increase wages under present conditions. No commission with authority to grant fare increases exists in Rhode Island. Before any change can be accomplished, it would be necessary for the city of Providence and other municipalities to forego their contractual rights under franchise agreements and for the Legislature to grant an amendment to the company's charter. As to the possibility of such an outcome, the members of the board are as well able to judge as counsel. Closing, the company holds that it has been shown that the men are receiving substantially more than a living wage and that the question is whether the men are entitled to more than their present adequate wage before the company is to be allowed to earn its necessary going expenses; "that is, whether the men are to be allowed to commit financial murder of the Rhode Island Company." The irresistible conclusion is that wages should be reduced.

#### Kansas Association Meets

The Kansas Gas, Water, Electric Light & Street Railway Association, at its annual convention in Topeka, on Oct 21, 22 and 23, changed its name, which had been somewhat of a misnomer, to the "Kansas Public Service Association." A committee on constitution was appointed, of which A. M. Patten, assistant general superintendent of the Illinois Traction Company, is chairman. The revised constitution will be submitted to a vote of the members within the next two months. The questions to be voted on will include a graduation of the fees in the manner similar to that of the N. E. L. A., the employment of a paid secretary, the establishment of permanent headquarters at Topeka and the making of Topeka the permanent convention city. One feature of the new constitution, which has already been practically determined, will be the elimination of the water and gas departments, which have heretofore taken little part in the association work and have been represented by a very small number of members. The program of the convention was very largely confined to subjects pertaining to commercial aspects of central-station operation.

The officers elected on Oct. 24 were: President, A. H. Purdy, Topeka; first vice-president, W. R. Wagoner,

Salina; second vice-president, R. G. La Fite, Eureka; third vice-president, W. J. Welfelt, Winfield; secretary, E. A. Wright, Manhattan; treasurer, J. D. Nicholson, Newton.

#### Fourth Congress of National Safety Council

The fourth annual safety congress of the National Safety Council was held at the Bellevue-Stratford Hotel, Philadelphia, Pa., on Oct. 19, 20 and 21. A general session of the association was held on Oct. 19. This was followed on Oct. 20 and 21 by sectional round-table meetings covering various branches of industrial activity. Of greatest interest to the readers of the *ELECTRIC RAILWAY JOURNAL* were the public utilities round-table sectional meeting and the railroad sectional meeting, both held on Oct. 20. At the public utilities meeting E. C. Spring, assistant to the president Lehigh Valley Transit Company, Allentown, Pa., gave an extemporaneous talk on "Hazards of Street Work," and F. J. Warnock, claim agent Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, discussed "Education of Street Car Platform Men." At the railroad sectional meeting C. W. Wilson, claims attorney Delaware, Lackawanna & Western Railroad, discussed "Public Safety and the Railroads," and J. C. Ross, chief claim agent Pennsylvania Railroad, considered the subject of "Automobile Grade Crossing Accidents."

More than 2000 delegates attended the sessions. Forty-seven railroads were represented. In connection with the congress there was a display of safety-first posters, showing virtually every type of industrial danger point and how to avoid it. This included a photographic collection portraying hundreds of appliances for guarding against injury to the worker from machinery.

One of the most important things accomplished at the congress was another step forward in the plan to establish permanent sections in the organization. These would include representatives of allied industries with special problems and hazards. The railroads had accomplished this prior to the congress just ended, and it is expected that other industries will perfect plans before the next annual meeting. The railroad organization originally started was known as the American Railway Safety Association. It is now affiliated with the National Safety Council, making up the steam railroad section. R. W. Campbell, the retiring president, said in his opening address at the congress that an invitation had been issued to the Safety First Federation, then in convention at Detroit, to join the council. The invitation was not accepted, the federation limiting its field to that of public safety. Hope for a union later was held out by Mr. Campbell. In the meantime a public safety section has been organized by the council.

The new officers of the council are Arthur T. Morey, assistant to the president Commonwealth Steel Company of Illinois, president; L. R. Palmer, Harrisburg, first vice-president; C. W. Price, Madison, Wis., second vice-president; E. R. Wright, Chicago, third vice-president; W. H. Cameron, Chicago, secretary-treasurer; Marcus A. Dow, New York, general safety agent New York Central Lines, director of exhibits.

The new members elected to the board of directors follow: H. A. Bullock, George T. Fond, C. H. Howard, L. A. Larsen, H. W. Moses, E. K. Prichett, S. F. Shattuck, J. C. Smith, L. B. Somerby, L. A. DeBlois, Dean Clifford B. Connelley of the Carnegie Institute of Technology; Dean L. E. Reber of the University of Wisconsin; J. M. Guild and Sidney A. Johnston. The new members of the executive committee are Dean Connelley, Mr. Prichett, Mr. Shattuck, Mr. Moses, Stephen W. Tener and Mr. Dow.

# Efficiency in the Stores Department

The Writer Discusses the Best Location of Main and Auxiliary Stores, the Advantages of a Mnemonic System for Layout, the Use of Non-Rigid Bins and Stores Accounting in General

BY WILFRED G. ASTLE, STOREKEEPER TORONTO ELECTRIC LIGHT COMPANY, FORMERLY WITH THE DOMINION POWER & TRANSMISSION COMPANY, HAMILTON, ONT., AND THE CANADIAN PACIFIC RAILWAY

The handling and care of material and supplies in stores have become a matter of very great importance for it is now being realized that material is nothing else but a direct representation of cash and should be treated and handled as carefully as if it were actual cash.

If one has no orderly method of looking after material in stock there will always be danger of serious and costly losses, duplication of material ordered and the tying up of unnecessary capital. An efficient method, therefore, means the elimination of needless waste of material and time and the adoption of methods for quick handling and accounting of stock. This type of system has been the means of making great savings wherever it has been intelligently used.

The objects and purpose of a stores system are always to have on hand the proper amount of materials to meet the regular requirements, while keeping the stock as low as is consistent with the time and cost of replacement, to care properly for the materials so that they can be given out promptly with a minimum cost for distribution, to know what materials are required to keep work going in the most efficient manner, and to determine what kinds and quantities of materials are on hand at the time that work is put in process.

## PHYSICAL ARRANGEMENT

The physical arrangement should be such that all material can be easily received and distributed when required. It should also have the proper facilities for preserving the condition of the material and be kept safe from disturbance by outside parties.

A space should be laid out near the entrance of the storeroom for receiving materials, and also for sorting and checking before they are placed in the bins or racks. A space in which outgoing material may be temporarily placed should also be laid out. These two spaces should be separated so that it will be impossible to make mistakes as far as incoming and outgoing material is concerned. The provision of these two spaces will facilitate the work and allow the material called for by stores requisition to be made ready in advance of the time that it is actually required.

In laying out the space required for any particular kind of material, the needs of each department should be studied, and standards of maximum and minimum quantities established. The space should be arranged according to the kind of classification used, so that all of one kind will be together and those of similar kinds next to one another.

The most satisfactory arrangement of storage racks or bins is that where the standard size steel equipment is used, which is provided with means for subdividing and resubdividing on the unit principle (see illustrations). Thus a small bin can be had simply by slipping into a large bin one or more smaller units, whereas if more space is required for a particular material it is necessary merely to remove the unit subdivision. If the materials are arranged according to some type of mnemonic classification, it will not be necessary to number the bins in any way. If the material is of a class that does not permit this arrangement to be satisfac-

torily used, it will be necessary to number the bins and sections and to maintain a bin index.

The location of the material in the storeroom should be arranged with regard to the nature and the frequency with which it will be handled. If it is handled many times it should be stored near the department where it is to be used. If it is handled only occasionally it can be stored in the basement or a shed outside of the regular storeroom building. Consideration should be given to such features as protection from the weather, theft, fires, dampness, unusual dryness, etc. The location and arrangement should be further governed by the fragility, value, weight and the bulk of the material. Consideration of these features will determine what facilities should be provided for handling, sorting and



STORES DEPARTMENT—STEEL SHELVING OF ADJUSTABLE TYPE

arranging the materials and just what provisions for light and heat will be required.

Small materials of great value should be stored in an especially safe place, such as a vault, where protection against fire and theft will be absolute. Materials of a delicate nature should be protected from dampness, and materials that suffer from unusual dryness should be stored in a properly humidified room. Stock such as oils, paints or others of an inflammable nature, should be stored so as to be protected from danger of igniting themselves, and also so as to avoid adding any undue risk to the remainder of the plant. Fragile material should be stored so that it will not come in contact

with heavier or coarser materials. Unusual weight either of the individual parts or of the great quantity of material stored will necessitate the location of the storeroom upon the ground floor in order that ample support may be provided without any undue expense for strengthening the floors and walls of the building. If the materials are light and easily handled and are kept in relatively small quantities, they can be stored in almost any convenient location.

#### MNEMONIC SYMBOLIZING OF THE MATERIALS

The operation of any storeroom as well as the entire system will be simplified if some form of mnemonic classification is used. The object of a symbol system in the classification of the material is to furnish a shorthand method of designation. The symbols should contain suggestions and aids to remembering the names of the articles, so as to make it as easy as possible for a person knowing nothing about the system quickly to locate the material in the classification, after spending a few minutes in receiving explanation or studying the primal elements of such symbolization. This symbol system should be so constructed that it will be complete, simple, flexible, uniform and conform to all other symbol systems used in other parts of the plant. Therefore, it is best when considering the installation of such a system to map out in advance all the general classi-

article that the material is used for, to cover stores used exclusively for that work, as for example:

- SA—Stores used for armatures
- SB—Stores used for car bodies
- SC—Stores used for controllers
- SM—Stores used for motors
- ST—Stores used for trucks.

Such material which is carried in stores and used for a number of purposes, apart from that which is used for certain specific work only, should be classified under "V"—"SV" meaning "Stores used for various purposes."

The third letter should signify the nature of the material and should be used regardless of whether the second letter is "V" or one of the others, indicating the general classes of work. For example, "STC" would mean "Castings for trucks in stores," and "SVC" would mean "Castings for various purposes in stores." The fourth letter of the classification is the general subdivision of the three-letter symbol. For example, under "SVC" would be given:

- SVCA—Aluminum castings
- SVCB—Brass castings
- SVCS—Steel castings

etc., and under "SVB," meaning "Bars for various purposes in stores," would be given:

- SVBB—Brass bars
- SVBC—Copper bars
- SVBM—Machinery steel
- SVBP—Pipe, tubing, etc.
- SVBR—Cold-rolled and cold-drawn steel
- SVBY—Babbitt metal.

The fifth letter of the symbol should be the particular kind of article in the subdivision shown by the fourth letter. For example, "SVB," meaning "Bars for various purposes in stores," in which would be "SVBB," meaning "Brass bars for various purposes in stores," would be given:

- SVBBF—Flat or rectangular brass bars
- SVBBH—Hexagonal brass bars
- SVBBN—Octagonal brass bars
- SVBBR—Round brass bars
- SVBBS—Square brass bars
- SVBBT—Triangular brass bars, etc.

If a further subdivision should be necessary to describe an article fully a sixth letter can be used. This sixth letter should indicate the different makers of the five-letter symbol, and should be if possible the initial of the manufacturer's name or trade name of the article. After the last letter should be given the size of the article. In giving size, absolute uniformity should be followed as to dimensions indicated by the relative position of the figures.

When three figures are used in giving dimensions, they should be given in the order of thickness, breadth and length. When one dimension only is given, it should indicate thickness or diameter. If two figures are given, the thickness should be given first and the breadth last. In the case of cylindrical articles, the first figure should be the diameter and the last figure the length, and with tubing the first figure will be the outside diameter, the second the gage or inside diameter, and the third the length. It does not matter very much whether this or the opposite method of designating dimensions is used, as there are good points in favor of both, but it is most essential that some one method be adopted for general use.

It is better, except possibly in very rare cases, to make the general classification by the shape of the material; for example, as shown in the subdivision of "SV"—all bars are given in one group no matter what the material, whether hollow bars, such as pipe and tubing, or



STORES DEPARTMENT—STANDARD SHELVING WITH EXTENSION SHELVES

fications that will be required in order to insure a uniform system.

The letters used to denote any particular article or division in the classification should primarily be the initial letter of the name of such article or division, so that in reading the symbol the thought first goes to the letter shown as the initial of the required word. In cases where the initial letter has already been used for another article or division the secondary letter should be used. This secondary letter should be the letter which, aside from the initial letter, has the most prominent sound and consequently would be secondmost prominent in the thought of the person reading the symbol.

The first letter used for all general stores symbols is "S," meaning "Stores," and this letter as the initial letter of a symbol should be omitted from all other classifications so that all symbols beginning with "S" will indicate that it is general stores, or material purchased from outside. The second letter should be the initial letter of the name for the particular work or

iron bars. The reason for this is that it is most convenient to store all these articles in one section of the storeroom in racks built for bars. This makes it easier to locate the material by the symbol when all such material is stored in one place, the storage properly sectioned off according to subdivisions of the general class, than it would be under the method of keeping all brass and brass products under one general class, copper, steel, wrought iron, etc., and products of same under another general class.

METHOD OF OPERATION AND USE

Materials that are received from outside of the plant should pass through the receiving department, where they should be thoroughly checked. The receiving clerk should then sort the various kinds of material, attach the lot tag showing symbol, quantity and date received, and enter each item on a receiving report, showing symbol, quantity, date, and from whom received. As the materials are received they should be distributed to the proper bins and the quantity and date received entered upon the bin tags.

If the storeroom is operated on the double-bin system, the main bin, assigned for a particular kind of material, should be divided into two parts. In each part should be placed the standard quantity, and the tag attached to the materials by the receiving clerk should be placed on the hook for that section of the bin. Stores requisitions should then be filled from one section of the bin, until that quantity is exhausted, at which time the bin tag for that section should be taken off and sent to the storekeeper as a notice that the quantity on hand has reached the minimum and that an order for the standard ordering quantity should be placed.

Any stores requisitions received after that should be filled from the other division of the bin. The maximum and minimum quantities should be so fixed that there will always be a part of a lot in one section of the bin. It is seldom necessary to carry more than two lots at any one time, that is to say, one complete lot in each section of the bin.

When the materials are such that the amount on hand is subject to great fluctuation in quantity, or is not carried at all during certain periods of the year, it is more economical of space to arrange them in bins that may be available at the time. In such a case it is necessary that the bins should be numbered and a bin index showing location of each kind of material should be maintained.

Under the single-bin system these maximum and minimum quantities are carried on the balance-of-stores

sheets, while with the double-bin system, the minimum is one lot, the ordering quantity one lot and the maximum that seldom will be exceeded is two lots.

REQUISITION AND RECEIVING FORMS

To make intelligent purchases the purchasing agent should be guided and directed by specifications in every instance. The storekeeper should be responsible for the specifications drawn up from which the purchasing agent is to act, because he should be familiar with exactly what is required.

As material of any kind is required it should be indicated to the purchasing agent through the medium of the general requisition for purchasing, as reproduced. No matter by whom these requisitions are made they should first be passed to the storekeeper, who should check them to determine whether he has or has not any or all of the materials required on hand or on order, after which he should pass the original to the purchasing agent and retain the duplicate for his records. This mode of procedure gives the storekeeper absolute control of the amount of materials on hand.

In every case these requisitions should state the purpose for which the materials or supplies are required as well as by whom wanted, and material of two different classes should not be listed on the same requisition.

In the organization of the stores department it is necessary to provide for a record of the receipt of all material and supplies. The system must be so constructed that it will not only insure a record of all material coming into the storeroom, but prevent the acceptance of material which should not be received. This receiving report, as reproduced, should be made out in duplicate, the original to be forwarded to the purchasing agent and the duplicate retained by the storekeeper. Upon receipt of this form the purchasing agent will bring together all papers dealing with the transaction, namely: Original copy of receiving report, copy of purchase order, original copy of requisition, invoice from the dealer.

This will enable the purchasing agent to verify the invoice and approve it for payment. It also enables him to settle all questions of differences as to quantity, price, etc., before entry is made in the stores ledger, and in this way makes the inventory records absolutely reliable.

REQUISITION FOR SUPPLIES				H-11379
To the Purchasing Agent—				191
Please supply the following, required for _____				
_____ and charge Acct. _____				W.O. _____
P. Agent's Order No.	Quantity	Description	For use of Purchasing Dept.	
For _____ Dept.				

STORES DEPARTMENT—REQUISITION FOR PURCHASING

Goods received by Stores Department			191 <sup>A</sup>
From _____			Order No. _____
_____ Bags _____ Bundles _____ Keets	_____ Barrels _____ Lots		Via _____
_____ Boxes _____ Crates	_____ Weight _____ Car No. _____ Way Bill _____		Charges _____
QUANTITY	DESCRIPTION	HOW USED	
<b>IMPORTANT</b> Full details of all Shipments received must be given above, and this form sent to Audit Dept. within 24 hours after receipt of goods.			Received by _____ Correct _____ <small>Storekeeper</small>

STORES DEPARTMENT—RECEIVING REPORT

UNIT	PRICE	DESCRIPTION	LOCATION			NORMAL STOCK		BALANCE	VERIFIED BY
			FLOOR	SECTION	SHELF	MINIMUM			

STORES DEPARTMENT—STOCK REPORT

Date..... 191.....		Work Order Number.....	
To the Storekeeper: Please furnish following material and charge to		Account Number.....	
		Name.....	
		Address.....	
QUANTITY	MATERIAL	PRICE	EXTENSION
			Extensions
			Checked by
			Entered in
			L
			WORK ORDER DEPT. COPY
Foreman on Job.....		Signed by.....	
		Total	

STORES DEPARTMENT—STORES REQUISITION

STORES DEPARTMENT.		Dept. No. ....	
The following material received on order No. ....			
has been transferred to order No. .... Date. ....			
Foreman. ....			
Quantity	Description	Cost	Value
Date Entered. ....		Storekeeper. ....	

STORES DEPARTMENT—MATERIAL TRANSFERRED

ble for the items which they cover. No material should go into stock until the invoice is received, so that in case of overage or shortage, or lack of any specified quality, adjustments may be made to cover any consignment before it loses its identity by being absorbed into stock.

METHOD OF FINAL DISPOSITION OF THE PRECEDING FORMS

The storekeeper should hold his copy of the general requisition for purchasing until he receives his copy of the purchase order covering the material, when he should file the two copies, namely, the copy of the general requisition for purchasing according to the kind of material, and the copy of the purchase order according to the name of the dealer. This will enable him to have a cross index to these orders.

As soon as the original invoice for such material has been checked, and entry made on the stores ledger, the storekeeper should file under "Orders Filled" all papers pertaining to the transaction in his department under the proper purchase order number and should keep a record of the names of the dealers to whom the orders have been given.

STOCK RECORDS, REQUISITION, RETURNED MATERIAL, ETC.

The stock record form reproduced is provided to show the complete status from a storekeeping point of view of every kind of material bought from the outside for use in the manufacture of any product and the upkeep of the plant. A separate sheet should be provided for each different kind of material, and should show the full description of the article and where located, as well as the established maximum and minimum quantities. It should also provide a record to enable the storekeeper to know not only the material he has on hand, but what he has on order, so that he can intelligently forecast his future requirements at any time and issue the necessary requisition on the purchasing agent to keep up his stock.

No material should ever be given out without a stores requisition, like that reproduced, showing the symbol

of the material, the quantity and any other particulars necessary. After these requisitions have been filled by the stores clerks they should be passed on to the stock record clerk, who should number each requisition consecutively and enter each item on his records, after which he should forward the original to the accounting or cost department and retain the duplicate to be filed under the account chargeable.

When a foreman receives an order to do certain work, he estimates the quantity of material required and draws it from the stores. He does not always estimate the exact quantity; he may be short or have material left when the job is completed. Unless this material can be used immediately on another job, it should be returned to stock with a report to the storekeeper, like that reproduced, showing the job or work order number for which the material was drawn. When the storekeeper receives unused material and this report, he will enter the quantity on the stock record sheets under the head of receipts, and then forward the report to the accounting or cost department.

When a foreman has left over material which can be used on another job, a report is necessary to insure credit to the job for which it was drawn and a charge to the job on which it was used. This form, which is reproduced, should show the numbers of the jobs for

Form No. 142. 3m-9-14 B. J. S. 32870		Date..... 191.....		Work Order Number.....	
To the Storekeeper: Please receive the following material and credit to				Account Number.....	
				Name.....	
				Address.....	
QUANTITY	MATERIAL	PRICE	EXTENSION		
					Extensions
					Checked by
					Entered in
					FORWARD
					THIS
					TO OFFICE
		TOTAL			
Foreman on Job.....		Signed by.....			

STORES DEPARTMENT—MATERIAL RETURNED TO STOCK

which the material was drawn and to which it was transferred. After entering the correct quantities on his stock records, the storekeeper should forward this report to the accounting or cost department. If it is not considered necessary for the storekeeper to make these corrections in his records, the report may be sent direct by the foreman.

If the stores department is properly maintained, the following results will be obtained which will more than pay for the operation of the storeroom and give facts and information which cannot be obtained in any other way:

The elimination of waste due to improper care, and to carrying over from year to year stock which has become obsolete, instead of disposing of it or using it at a time when it is of value.

Materials will be ready when wanted and will be available in such quantities as are needed.

Ability to fix responsibility for errors.

The prevention of tying up material and labor in process on account of the shortage of some article which has not been provided.

Ordering and purchasing material become a matter of routine nature.

The amount of space required for storage will be less under a proper stores system because the amount carried will be smaller and the arrangement more economical, and the consequent overhead charge for floor space will be reduced accordingly.

The better care of materials of all kinds.

Ability to replenish stock automatically without unnecessary delay when it is getting low.

The prevention of tying up material in excessive quantities and a consequent saving in the money invested in the material and in the interest charge on this money.

The maintenance of a balance sheet which shows not only the amount on hand in the storeroom, but the amount ordered, the amount available for future orders and the amount which has been drawn out for use during any period.

Simplicity of control with less labor to operate and a consequent smaller cost for handling the same amount of material.

If the system is properly maintained with competent help, the taking of the annual inventory becomes an easy and also an accurate matter. It consists simply of transferring from the balance sheets to the inventory sheets, the quantities in the storeroom, the quantities in process and the cost or value. This method is perfectly practicable, but in order to obtain accuracy the help in the storeroom must be competent and all work should be checked and inspected in a routine manner. A schedule should also be drawn up whereby the number of items in stock is verified every day.

### Bonus Earned in Manila

Based on the saving in coal, the plan of a bonus system of wages, which was established on June 1 for the power plant employees of the Manila Electric Railroad & Light Corporation, Manila, P. I., has proved satisfactory to both the company and the participating power plant employees. The total amount of bonus earned by eighty-two employees during June was \$209, which is at the rate of approximately \$2,500 per year and equivalent to a 10 per cent increase in the wages of the employees. The value of the coal saved to the company was \$417, representing 3.3 per cent of saving effected over the prescribed standard.

In the operation of this bonus plan the standard basis of coal consumption per kilowatt-hour at the switchboard is 3.5 lb. A total of 50 per cent of the value of the coal saved on the basis of 3.5 lb. consumed, based on 11,715 B.t.u. per pound of coal or 41,000 B.t.u. per kilowatt-hour at the switchboard, is distributed to certain participating power plant employees. In figuring the coal consumption the actual weight of the coal consumed is taken, and 1 per cent is added to cover possible

errors or omissions in weighing and possible losses of coal consumed in the pile by reason of spontaneous combustion.

In distributing the bonus, a system of points is used. The chief engineer of the power plant, who does not participate, determines the schedule of points to be allowed the different occupations of the different employees, based on the relative value of their services. He also establishes a schedule of penalties to be applied to the schedule of points. The point arrangement as now constituted is as follows for each day's work: Superintendence: assistant chief engineer, 40; foreman, 20; chief coal checker, 5; assistant coal checkers, 3; clerk, 5; engineers, 20; oilers, 3. Switchboard tenders: tenders, 5; helpers, 3; firemen, 6; coal passers, 3; water tenders, 10; watchmen, 2; other labor, 2. Mechanics and helpers: foremen, 15; mechanics, 5; helpers, 3; laborers, 2; construction and reconstruction, 2. Total, 154 points.

### Attractive Street Railway Shelter in Worcester, Mass.

An unusually attractive shelter for street railway passengers has been erected by local real estate interests at Chamberlin Parkway, in the Lenox district of Worcester, Mass. This section of the city is one of the latest and best residential areas undergoing development, and the shelter, while distinctly of the open-air type, lends considerable architectural value to the neighborhood. It is a concrete structure having a timber



STREET RAILWAY SHELTER IN WORCESTER, MASS.

roof with copper flashing and it contains two seats 9 ft. 6 in. long, 18 in. wide and 16 in. high. The roof is supported by six concrete pillars, and the ceiling consists of concrete panels molded between wooden beams. Flower beds and shrubbery, together with a curved stone coping and neat wall, complete the structure, which, however, is supplemented by two open concrete seats on either side of the parkway as shown in the accompanying illustration.

### Primary Mercurial Resistance Standards

The bureau of standards of the Department of Commerce has recently issued scientific paper No. 256 dealing with the construction of four standard ohms. The work consisted in the construction of mercury columns in glass tubes, the columns being constructed to have a constant cross-section, a mass of 14.4521 grams and a length of 106.3 cm. at the temperature of melting ice. Such a column has a resistance of 1 ohm as defined by the International Congress on Electrical Units and Standards held in London in 1908, and since internationally adopted. So accurate was the work of construction of the four standards that the average deviation of their individual values from their mean value is less than 0.00001 ohm.



## B. J. Arnold Restates His Views on Municipal Ownership

### He Says Its Disadvantages Are Too Obvious to Require Reiteration

In some of the reports in the daily papers of the address by B. J. Arnold at the San Francisco convention the statement was made that Mr. Arnold approved the policy of municipal ownership of electric railways. Such an idea could have been obtained only by taking a very distorted view of what Mr. Arnold said. To clear up the situation, however, Mr. Arnold, while in Los Angeles, was interviewed by a representative of the *Los Angeles Times*. In this interview, which appeared in the issue of that paper for Oct. 15, Mr. Arnold is quoted as having stated as follows:

"The reports which made me say in an address before the American Electric Railway Association at San Francisco that municipal ownership of utilities is inevitable are incorrect. What I did say was: 'Let us spend no more time worrying about whether immediate municipal ownership or ultimate municipal ownership is the thing the people want. Chicago once tried to get municipal ownership, but failed because the city could not raise the money, and a study of the indebtedness and bond limits of other cities present like conditions.

"Time will therefore settle whether the immediate municipal ownership or the ultimate municipal ownership plank, or neither, is to go into municipal platforms. The point I want to make is that we cease wasting our energies in opposing a public movement that will surely come, in spite of opposition, if it is economically sound, and direct our energies toward the terms of the purchase clause and the conditions of a resettlement franchise.

"It is time for us to prove to the courts and commissions that railway investment can be made practically as sound as what are termed savings bank investments. Several plans have been worked out, notably those which are included in my reports on Chicago, Kansas City and San Francisco. They differ somewhat in franchise conditions, but the central idea is to put tangible property behind intangible values, so that if ultimate municipal ownership should prove to be the policy of the country, it will come without destroying investment values, or curtailing service to the public during the time of its coming."

Speaking further on the same subject, Mr. Arnold said: "The only advantage of municipal ownership and operation over private ownership, from a financial standpoint, is the ability of a municipality, in most cases, to borrow money at a lower rate of interest than private corporations or individuals are willing to accept for their money when it is to be invested in public utilities.

"Therefore, if the municipality will operate an electric railway as efficiently and as economically as a private corporation, the municipally-owned and operated railway will be the cheaper to the community.

"But the question is: Will the municipality so manage the property? Inasmuch as the margin is only the difference in the cost of money, it may easily be absorbed by inefficient management, through the loading of the municipally-operated road with excessive operating expenses in the way of labor and other considerable items that may enter into the management.

"The San Francisco experiment is being watched closely and up to date it has been conducted and operated efficiently and honestly, although there has already been a tendency toward the construction of unprofitable extensions and toward a reduction of the fare. The question is whether the municipality will continue to manage the property as well as it has in the past.

"The advantages that I have pointed out above are purely theoretical advantages. I cannot emphasize this too strongly. In many cases they have proved to be no advantages at all in actual practice. The disadvantages of municipal ownership are too obvious and too well known to require reiteration."

## Power Station Organization on Bay State Street Railway

An interesting feature of the Bay State Street Railway wage arbitration was the testimony of C. F. Bancroft, superintendent of motive power and machinery, relative to the administration of the company's great system of power plants. The power for 941 miles of this company's track, for the carhouses and shops and for the commercial electric lighting systems of Newport, R. I., and Portsmouth, R. I., is furnished by fifteen generating stations and six substations. In these plants are sixty-three main generators of 44,855-kw. capacity and thirty-three rotary converters of 16,450-kw. capacity, ninety-three boilers of 33,215 hp., and sixty engines and turbines of 66,325 hp. combined rating. These generating stations annually consume about 151,000 tons of coal, and 405,000,000 gal. of feed water and their output is 121,397,000 kw.-hr. About 240 men are employed, the fifteen generating stations being operated by crews of from six to forty-five men under the supervision of a chief engineer. The six substations are operated by crews of three or four men, including a foreman.

The operation and maintenance of all power stations and substations are in direct charge of a superintendent of power stations, with the exception of central stations at Newport and Portsmouth, which report to the superintendent of motive power and machinery through another channel. The superintendent of power stations supervises the installation of all new power plant machinery and makes yearly recommendations for additional requirements. All repair work, including labor and material, except ordinary routine maintenance, is authorized and supervised by this officer. He makes a monthly report to the superintendent of motive power and machinery covering the operations of each plant, and makes special reports of all accidents and abnormal occurrences.

The assistant superintendent of power stations for the southern division has charge of five substations, directing the work of each through its foreman. He is in charge of the installation of all new substation machinery and repairs and takes charge of all plants on the southern lines in the absence of the superintendent of power stations, with the exception of the two stations in Rhode Island which have been previously mentioned.

On the northern lines, where practically all the plants are of the d.c. type, the assistant superintendent of power stations is chiefly occupied in directing and supervising new plant construction, testing machinery, supervising draftsmen and making special reports in relation to equipment.

Thirteen chief engineers are employed on the system, each in charge of a plant and reporting directly to the superintendent. With this officer's approval they employ and discharge all help at their respective stations; make all requisitions for materials and are responsible for the proper care, use and accounting for material. All routine repairs are directly supervised by the chief engineers, and at the Quincy and Chelsea power stations, where coal is discharged, the chief engineers also supervise the discharging and storage of coal.

## The Graded Wage Scale

BY W. J. SHERWOOD, SUPERINTENDENT OF TRANSPORTATION MOBILE LIGHT & RAILROAD COMPANY

The question as to the length of service on the wage scale of trainmen has been in frequent evidence of late. Some representatives of labor organizations have made the claim that at the end of his first year of service a motorman is as fully qualified in the work of running a car as he ever will be and that commencing with the end of that period he should receive maximum pay per hour worked. Such contention being contrary to my experience led to a further study of the question, and, in the course of it, a statement was compiled of accidents that occurred on this system during the years of 1913 and 1914, account of which settlements had been made to June 30, 1915. The costs of these settlements were then grouped according to the grades of service of the trainmen concerned.

An abstract of the complete report is given below, and an examination of it will, I think, conclusively show that so far as this company is concerned the men in the

PERCENTAGE STATEMENT OF SETTLEMENTS MADE ACCOUNT OF ACCIDENTS THAT OCCURRED IN 1913 AND 1914, MOBILE LIGHT & RAILROAD COMPANY

Grade of Service of Trainmen	Percentage of Total Trainmen				Average Cost of Settlements per Car-Hour per Man	
	1913		1914		1913	1914
	Per Cent	Per Cent	Per Cent	Per Cent	Cents	Cents
First year . . .	43.6	37.3	57.25	75.73	0.0447	0.0446
Second year . .	16.0	17.6	29.18	15.11	0.0621	0.0189
Third year . . .	11.1	12.8	3.74	0.48	0.0114	0.00083
Fourth year . .	8.0	9.5	4.26	1.89	0.0139	0.00433
Fifth year . . .	4.1	4.7	1.67	0.15	0.0139	0.000719
Over five years.	17.2	18.1	3.90	6.64	0.0077	0.0081

second year of service were considerably below the full qualifications for their work and were not entitled to the same rate of pay as apportioned to men longer in the service.

There is a wide variance in the time required between the minority class of men who become proficient early and the majority class of men who slowly obtain from constant instruction and experience the ability to perform their work with reasonable care and safety, and the variations found make it difficult to determine the time when trainmen attain maximum efficiency.

If a complete record could be maintained and the grades of wage scale established upon the basis of individual performance a more equable adjustment of the question would result, but a plan of the kind would require prohibitive supervisory cost and is therefore economically impossible. The general practice of graded wage scale according to the years of service is the most practical one at hand, and that it contains the essentials of equity has been recognized many times by various boards of arbitration.

## Protection of Steel Against Rust

At the recent convention of the Master Painters' Association P. J. Burns, foreman painter at the Hoboken shops of the Pennsylvania Railroad, stated that the initial rusting of steel invariably begins on the sharp edges and minute projects existing on the surface. This proves that it is practically impossible to obtain a uniform protection when a brush is used in applying paint to the surface. However, the lasting qualities of "smalted" signs indicate that by substituting a very fine sawdust for the sand used in that process, applying this in the same manner, and then painting over the sawdust, a very much better metal protective coating can be secured than by the direct application of paint. This scheme might be carried further by applying with a

coating of fresh paint a substance that will completely cover the metal and fill up all the small holes and cracks, forming a ground for the subsequent paint coatings. A large variety of materials may be used, such as asbestos, cement or any inert pigment. The finishing coating can be made very heavy and applied freely so as completely to cover the surface that is being painted.

## New York Railways Closes Power House

According to the annual report of President Shonts the Ninety-sixth Street power plant of the New York Railways will be closed for the present, except in rush hours during the winter months, owing to the fact that it can no longer compete in economy of energy production with the great power plants of the Interborough Rapid Transit Company from which the New York Railways now purchases its power.

The power plant was built by the Metropolitan Street Railway, the predecessor of the New York Railways, in 1898 and 1899. It was a famous plant in its day, the home of the General Electric generator of 3500-kw. capacity which in some quarters became known as the "Metropolitan" alternator. The power house is a handsome brick structure 201 ft. x 279 ft., containing eleven vertical, cross-compound Allis engines of 4500-i.hp. nominal and 7000-i.hp. maximum rating. These were the largest engines which had been constructed in the United States up to their time. The chimney also was a record breaker in its day, being the largest in the world and the tallest in the country. It contains 3,600,000 bricks and weighs 8540 tons. There are eighty-seven B. & W. boilers in three tiers in the plant, and above the boiler section are coal bunkers with a combined capacity of 9000 tons.

Three-phase alternating current at 6400 volts was furnished by the station, but, as M. G. Starrett, chief engineer of the company, said at the time, this kind of current was not decided upon without due consideration of the merits of the direct-current system. The station was designed for operation with a force of 180 men. The water required per kilowatt-hour at the switchboard was somewhat over 22 lb., including all auxiliaries and coal hoisting and stoking. The cost of the power station, including real estate, was nearly \$4,500,000, or about \$90 per indicated horsepower of capacity.

## New York Railways and the Workmen's Compensation Law

On the subject of the New York workmen's compensation law the New York (N. Y.) Railways said in its pamphlet report for the year ended June 30, 1915: "The law has not been in operation long enough to form a basis upon which to calculate with exactness its annual burden upon the revenues, but it is apparent that our course in assuming as self-insurers the responsibility imposed by the law was wiser than to insure in the State insurance fund or with insurance companies. It is believed that our relations with our employees have been more satisfactory than they would have been had the matter of their disabilities been turned over to outside agencies. A competent and efficient medical staff was organized and in readiness when the law went into effect on July 1, 1914, to furnish every possible attention promptly to injured employees. Every effort has been made to prevent minor injuries becoming serious through neglect or improper treatment. The very best hospital and other facilities have been provided in all cases. While this has been expensive it is believed that it has been appreciated by our employees and that in the long run it will be found to have been justified."

# American Association News

Public Service Section Hears Instructive Address by Noted Valuation Expert, Elects Officers and Reports Successful Year's Work—Denver Section Also Elects Officers—Milwaukee Section Had Excellent Program for This Week's Meeting

## DENVER TRAMWAY COMPANY SECTION ELECTS OFFICERS

As announced last week, the regular meeting of the Denver Tramway Company section was held on Oct. 21. President C. B. Wells called upon R. W. Toll, chairman of the nominating committee, for nominations of officers for the ensuing year. The following were nominated and elected: President, W. G. Matthews, superintendent of overhead lines; vice-president, W. H. Seip, superintendent central division; secretary-treasurer, H. G. Mundhenk, transportation department; director for two years to take the place of W. G. Matthews, who was elected to the presidency, W. E. Casey, chief electrician. F. W. Hild became a director ex officio as he had recently become general manager of the company. A. M. Evans, engineering department, is the remaining director, whose term expires on Oct. 30, 1916.

Mr. Hild was called upon for a few informal remarks, and he delivered a very energetic and interesting address which was enthusiastically received by the audience of 700. Mr. Hild in turn introduced Dr. George B. Vosburgh of the University of Denver, who gave a beautifully illustrated lecture on "The Tramway and the Modern City."

## PUBLIC SERVICE COMPANY SECTION

A meeting of company section No. 2 was held on Oct. 28 in Newark. Dean Mortimer E. Cooley of the University of Michigan addressed the section on the subject, "Fundamentals of Appraisal and Valuation." After the address H. D. Briggs, assistant general claim agent Public Service Railway, gave some interesting reminiscences of the San Francisco convention, at which he was one of four representatives of the company.

Secretary A. T. Warner gave a brief annual report containing the following data: The membership in good standing at this time is 290 as compared with 249 a year ago. The average attendance at meetings during the 1914-1915 season was 184 as compared with 128 for the preceding season. The present membership is divided among the departments thus: transportation, 90; maintenance of way and engineering, 49; mechanical, 37; auditing, 20; claims, 20; distribution, 16, and general, 58.

The election of officers resulted as follows: President, W. B. Graham, division superintendent; vice-president, R. H. Harrison, mechanical department; treasurer, T. J. Manning, accounting department; secretary (re-elected), A. T. Warner, cadet engineer, and trustee to serve for three years, H. H. George, assistant engineer maintenance of way. After the election the retiring and incoming officers made brief addresses, and resolutions of thanks to the former and expressing a spirit of co-operation with the latter were passed.

Dean Cooley began by explaining the difference between an appraisal and a valuation, the former being simply a priced inventory of a property. The latter may include the former but may include other items as well. The first appraisals were made to determine sale prices, particularly of water works. Another purpose of early appraisals was in connection with taxation, an

example being furnished by Michigan where, in 1900, the railroad property was appraised in order that taxation might be put upon an ad valorem basis. More recently appraisals have been made to justify or serve as a basis for the issuance of securities and as a basis of determining rates.

In appraising a property two elements are involved; first, the determination of the cost of reproduction new, that is at present prices of materials and labor, and, second, the determination of the physical condition of the property.

Dean Cooley then explained in detail the elements which go to make up the value of the property emphasizing the importance of the intangible elements. He said that the intangible elements may include items very difficult to determine, such, for example, as the value of a building razed to make way for an improvement. He also urged the keeping up of the property in the most economical condition, which averages about 85 per cent of the condition new.

He gave the following example showing estimated subdivision of the total cost of a mile of track:

Total cost	\$100,000
Preliminary expense	750
Physical property, cost	75,000
General contingencies	4,500
General engineering	4,000
Insurance and taxes	1,750
Organization, administration and legal	2,000
Cost of promotion	750
Interest during construction	7,000
Stores and supplies	1,000
Working capital	3,000
Office furniture	250

Dean Cooley stated as the elements of depreciation the following: Wear, decay, obsolescence and inadequacy. Of these the former two are easy to determine, but the latter two are not, as they involve a psychological factor.

## MILWAUKEE COMPANY SECTION

The regular meeting of The Milwaukee Electric Railway & Light Company section was held on Oct. 28. Papers were presented on the following subjects: "Standardization and Specifications for Employees," "Standard Rules for Operation of Electric Railways" and "Review of Technical Press." Further details of the meeting will be given in a later issue of the ELECTRIC RAILWAY JOURNAL.

## Safety Measures at Way Stations

Possible accidents to passengers at way stations on the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., have been minimized by putting the passenger or unloading platforms, which are rail height, on one side of the track, and the express and milk platforms, which are car-floor height, on the opposite side. At points between Gary, Ind., and Pullman, Ill., however, this arrangement was unnecessary, because all platforms are car-floor height. In case a passenger hurriedly attempts to board or alight from a moving car at a station, this platform arrangement makes it impossible for him to be struck by the elevated platform.

COMMUNICATIONS

Wheel Diameter and Motor Heating

THE OHIO ELECTRIC RAILWAY COMPANY  
COLUMBUS, OHIO, Oct. 18, 1915.

To the Editors:

I wish to congratulate Mr. Broomall on his article on "Effect of Car-Wheel Diameters on Motor Heating," published in the Sept. 11 issue of the ELECTRIC RAILWAY JOURNAL, page 452.

This is the kind of article that I have been looking for for some time. The men in charge of equipment

need to know what the heating effect and consequent damage to motors will be if the wheel diameters are allowed to differ by a certain amount, under certain prescribed conditions. These data can now be secured by reference to the accompanying curves which are given in Fig. 3 of Mr. Broomall's article. The fact that all values are worked out in percentages makes them applicable to all classes of motors and to all sizes of wheels, so that by the use of Fig. 3 anyone can work out the allowable limit of difference for any service.

For some time the writer has made it the rule not to allow more than 1-in. difference in diameter of wheels on interurban cars. To test the correctness of this ruling he applied the curves to the following case:

DIFFERENCES IN MOTOR HEATING DUE TO DIFFERENCES IN WHEEL DIAMETER

Quadruple equipment of Westinghouse No. 303-A motors, of which the one-hour rating speed at 500 volts is 580 r.p.m.; gear ratio, 25:52; car operated at an average speed of about 28 m.p.h.; average voltage on trolley, 500. On three of the motors the average wheel diameter is 36 in., and on the fourth it is 37 in. As the normal, or one-hour rating speed of the motor is 580 r.p.m. at 500 volts, this will correspond to a car speed of 31 m.p.h. at the one-hour rating for the 37-in. wheel. A difference of 1 in. in wheel diameter is about 2.7 per cent, and 28 m.p.h. is about 90 per cent of the one-hour rating speed. Applying these data to the curves we find that the motor geared to the 37-in. wheels will have about 10 per cent greater heating effect than the average of the other motors. This 10 per cent, unless the motors are already overloaded, will generally do but little harm, therefore the 1-in. difference seems to be a fairly safe one for cases similar to the one cited.

Mr. Broomall's article points out very clearly that the question of difference in wheel diameters is of much greater importance when the car speeds are low than when they are high. One meaning of this is that for cars used for local service the sizes of wheels should be kept nearer together than is necessary on fast or limited service.

In order to see what would be the effect of a difference of 2 in. in wheel diameter at the same speed in

the above problem, the curves were again applied and showed an increase of 20 per cent in heating effect for the motor with the large wheels or double the percentage found with 1-in. wheel difference. With an average speed of 42 m.p.h., or about 135 per cent of 1-hr. rating speed, this heating difference falls again to about 10 per cent, so that a difference in diameter of 2 in. at an average speed of 42 m.p.h. in this equipment would be about as safe as a difference of 1 in. at 28 m.p.h.

F. J. FOOTE, Master Mechanic.

Cars at Less than Cost

NEW YORK, Oct. 21, 1915.

To the Editors:

One feature of the recent discussion in the columns of the ELECTRIC RAILWAY JOURNAL concerning the question of "cars at less than cost" should receive additional emphasis. It is the adherence to certain types of cars on the part of individual companies, as mentioned in Mr. Storer's letter, published in your issue of Sept. 25. As has been stated in the JOURNAL before, it is not uncommon for some managers who are asked to give the reason why some progressive step is not taken or some widely adopted standard is not used on their property to take refuge behind the worn-out phrase "local conditions." In most cases it would probably be found that the reason that special types of cars are on individual properties is the personal opinion of some one individual.

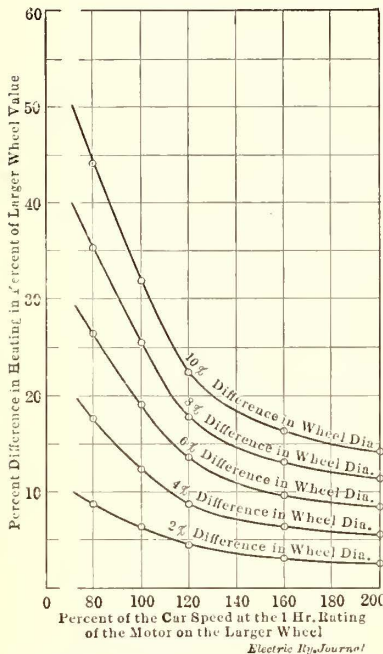
There is much truth in the statement made by Mr. Storer, that a large part of the cause for the higher price of rolling stock is to be laid at the doors of the individual managers and operators of railway properties. Is it not possible to substantiate this deduction from the developed experience of the steam railroads? They have practically a standard type of car for general passenger service that is in use all over the country. This particular type of car is not desirable for city electric railways, but some one or two of the several types now being exploited on the streets of different cities could be adopted almost universally for urban use, provided the operators and managers of the companies could be weaned away from their own prejudices and an exaggerated idea of the controlling importance of their "local conditions."

It is not desired nor desirable to destroy initiative, but fads and personal notions can be carried too far, and what may be called "local standardization" can become very expensive to the industry, as has been clearly pointed out in the letter referred to.

Does not this discussion point to a work of great potential value to the electric railway business which the American Electric Railway Association could undertake? The Engineering and Transportation & Traffic Associations might well formulate and develop in conjunction with the manufacturers of cars and car parts a few standard types for general use.

For example: If the center-entrance car is found advantageous on properties having such varied and dissimilar conditions as Brooklyn, Pittsburgh, Cleveland and Denver, and has worked out so successfully in these cities that this type of car has practically been adopted as standard, it would seem that this fact should be a guide to the purchase of new equipment for other good-sized towns and cities. Here, however, the conservatism of the individual manager steps in, and because he has always used an end-entrance type of car with certain particular structural features, the newer type is passed by, and the reason, if you could pin the operating heads down to giving the real one, would often be found to be the alleged local conditions in that particular city.

TRANSPORTATION MAN.



## Box-Frame Motors and the Removal of Armatures

EMPIRE UNITED RAILWAYS

SYRACUSE, N. Y., Oct. 2, 1915.

To the Editors:

In connection with the discussion of box-frame motor parts and armature removal, I would say that I have found very interesting both Mr. Potter's article in the issue of the *ELECTRIC RAILWAY JOURNAL* for Aug. 28 and the discussion of Mr. Booth's article in the issue for Sept. 4. I have been using Mr. Potter's method since 1908 on motors weighing 3750 lb. and 4500 lb. complete, with absolute success. I see no reason for the installation of any elaborate devices for removing armatures from motors of this type, as, after observation of various methods in different shops, I came to the conclusion that the simpler method requiring only the service of a hoist is, as is usual with simple methods, the best and most economical.

I believe that the placing of the armature in the motor frame from above has one advantage over the horizontal method in that the workmen are able to see if the armature is bumping the pole pieces as it is lowered. A drop light may be placed in the commutator end of the motor and the man replacing the armature does not have to assume one of the poses of a Jess Willard exercise for the cure of indigestion, as he is able to observe the armature being lowered to its proper bearing while standing in a natural position. The only objection to the method described in Mr. Potter's article is that particles of foreign matter or dirt may drop into the commutator end bearing while the armature is being lowered. This objection is easily overcome by the use of a cardboard shield placed over the commutator end bearing until the armature shaft is low enough to just about enter the bearing.

In the writer's opinion one of the main advantages of the box-frame type motor is that it is necessary to remove the truck to change a motor on the heavier types. This places motor, truck and motor wiring within view, and parts which need replacement or repairs thus call loudly for attention by being brought to light.

While all subjects pertaining to the business are of considerable interest, it seems that a discussion of the removal of armatures from box-frame type motors is

really unnecessary, as the method to be employed is so obvious and simple and a discussion of the advantages of the box-frame motor over the split-frame type would seem a waste of breath and paper to anyone who has had experience with both types. I believe that a buyer of ordinary intelligence would no more purchase a split-frame motor to-day, unless for some special work, than he would purchase a GE-800 or a Westinghouse 12-A motor in place of those of the later-developed, efficient, ventilated, light-weight type.

H. C. PRATHER, Assistant General Manager.

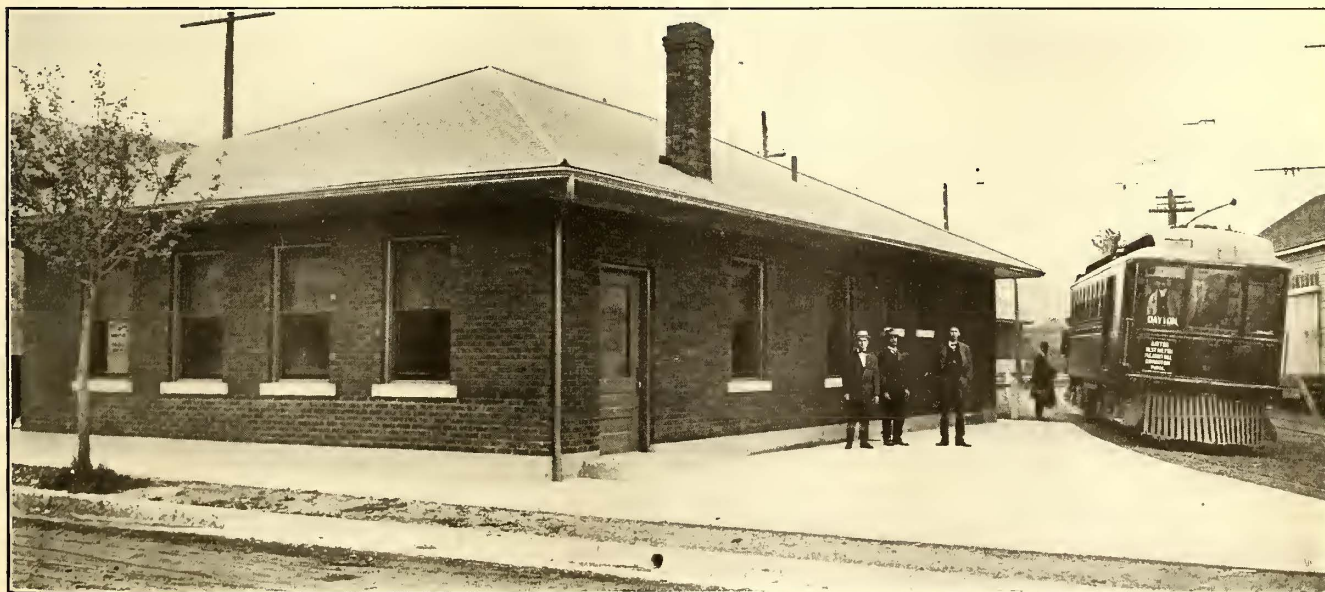
## Progress on the Newark Terminal

The \$5,000,000 terminal project of the Public Service Railway in Newark is rapidly assuming form. The steel framework of the building is in place and the erection of the walls is keeping pace with the floor work. It is expected that the entire building will be inclosed by Dec. 1 and that it will be entirely completed by May 1, 1916. Illustrated accounts of this important project were given in the issues of the *ELECTRIC RAILWAY JOURNAL* for Nov. 28, 1914, page 1190, April 24, 1915, page 793, and July 24, 1915, page 151.

## New Passenger Station for Dayton, Covington & Piqua Railway

A new passenger station has recently been completed at Covington, Ohio, by the Dayton, Covington & Piqua Traction Company. The building is in accordance with the most modern ideas in interurban passenger station design, being constructed of brick throughout with a low-ridged roof and wide overhanging eaves. A concrete platform extends around all sides of the building. The interior is divided into rooms containing the offices, the baggage department, the lavatories and separate waiting rooms for ladies and gentlemen.

Thomas J. Brennan, general manager Dayton, Covington & Piqua Traction Company, has received a number of compliments on the new station as well as on a number of other improvements made by the company at Covington. At a recent meeting, in fact, the City Council of Covington, with the approval of the Mayor, adopted a resolution thanking the traction company for the addition of such an attractive structure as the new station to the numerous artistic buildings already in the city.



NEW PASSENGER STATION FOR DAYTON, COVINGTON & PIQUA TRACTION COMPANY

# 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.)

## Detail Cost of Track Work with Steel Twin Ties

BY A. J. WOLFE, FORMERLY CHIEF ENGINEER SCIOTO VALLEY TRACTION COMPANY, NOW WITH COLUMBUS RAILWAY, POWER & LIGHT COMPANY

In the summer of 1911 the Scioto Valley Traction Company installed at Circleville, Ohio, under the writer's direction, about 9000 ft. of straight track of the type shown. The 7-in. T-rail was laid in a concrete beam foundation on International twin steel ties in a paved street through which the interurban cars were operated. Of course, the box truss construction and clip fastening of this tie are too well known to require description here.

The most interesting experience with the twin steel tie was acquired at the very beginning of its use. The track was laid during very hot weather, and the following winter was unusually severe. Yet even in zero weather the track was found to stay in perfect condition. In the following years the track continued its good behavior. Up to the time that the writer left the employ of the Scioto Valley Traction Company, September, 1913, not a cent had been spent to maintain this installation; nor has any money been spent upon it since.

For the benefit of other way engineers a detailed cost of this construction is given in the accompanying table. In considering the costs therein it should be noted that the joints were of especially substantial construction. The bonding, too, was unusually expensive, being prac-

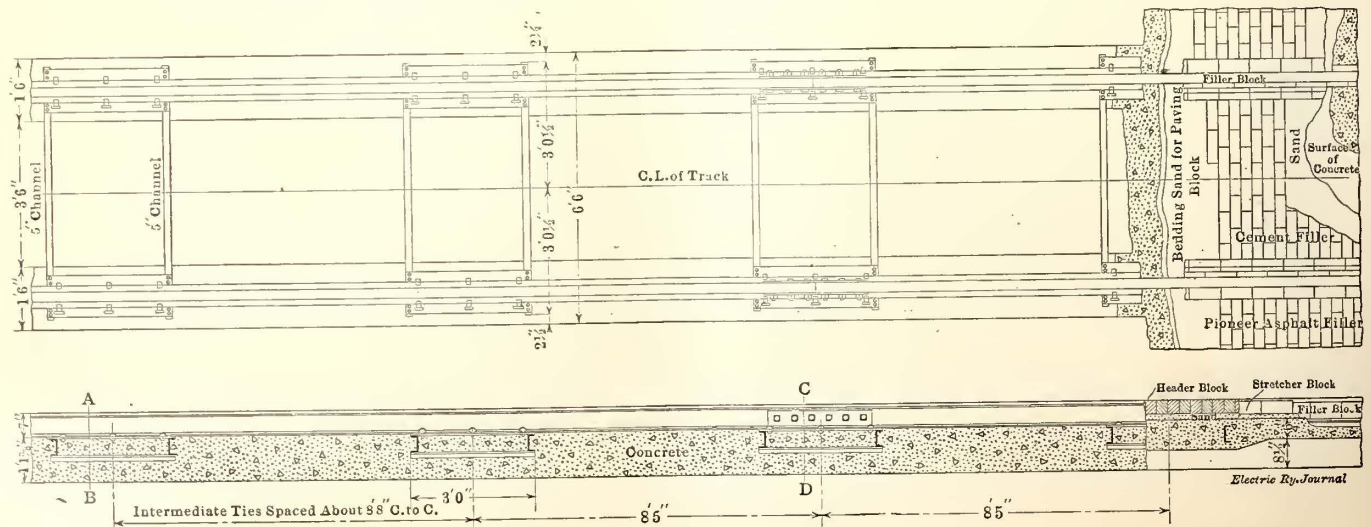
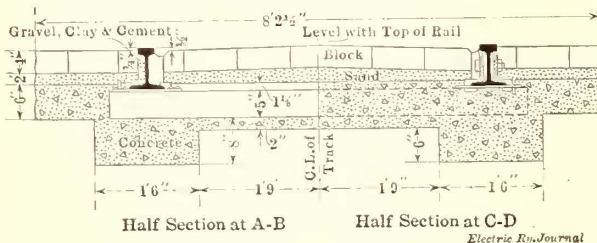
tically double as heavy as that ordinarily used, due to municipal requirements based on electrolysis considerations.

As stated before the track had an unusual temperature test; in fact, it was exposed to freezing weather before the paving was laid. Even after this it was impossible to find the joints from the surface of the rail. The anchoring to the substructure due to the distribution of the stresses by the tie clips, and the protection of the joint bolts from shear contributed to this result. These bolts were put in with a driving fit.

I have been informed that there is difficulty now in finding these joints and that in five years of service not a single joint had given trouble. The only work required on the track has been on the paving, as the brick worked up on the outside of the rail due to the use of asphalt filler instead of cement grout. The special work in this construction was put in with Carnegie steel ties and solid concrete foundation and has required no work on it in the five years.

THE SCIOTO VALLEY TRACTION COMPANY—TRACK IN CIRCLEVILLE, OHIO, BUILT WITH INTERNATIONAL TWIN STEEL TIES IN GROUTED CONCRETE, SPRING, 1911

Items (9000 ft. straight track)	Total Cost	Cost per Lineal Foot
Engineering .....	\$509.23	\$0.0565
Special work and tie rods .....	.....	.....
Rail .....	9,679.46	1.0755
Joints and fastenings .....	993.62	0.1104
Bonding .....	1,325.30	0.1472
Ties .....	3,963.48	0.4404
Laying new track .....	1,532.95	0.1700
Miscellaneous material .....	238.22	0.0265
Miscellaneous labor .....	482.64	0.0536
Gravel .....	611.20	0.0679
Excavation .....	2,585.39	0.2872
Concreting .....	1,834.60	0.2038
Cement .....	3,048.19	0.3397
Paving—outside rails .....	1,091.01	0.1212
Paving—inside rails .....	1,930.38	0.2145
Brick—standard .....	4,866.52	0.5407
Brick—filler .....	802.35	0.0892
Brick—stretcher .....	610.65	0.0678
Contractor's extra work .....	83.20	0.0092
	<b>\$36,188.39</b>	<b>\$4.0209</b>
Temporary track .....	2,276.12	0.2528
Handling trolley .....	351.96	0.0391
	<b>\$33,816.47</b>	<b>\$4.3028</b>



CONSTRUCTION DETAILS OF STEEL TWIN-TIE TRACK, CIRCLEVILLE, OHIO

Before entering his present position, the writer also installed for the Lancaster Traction & Power Company, Lancaster, Ohio, nearly 1 mile of twin-tie construction. This was similar to the Circleville work except that the joints were electrically welded both for the bonding effect and for mechanical strength, although the machine-fit bolts were retained. This work cost \$3.22 per lineal foot, including sand-filled brick paving.

### Preventing Burning of the Top of Brushes

BY R. H. PARSONS, ELECTRICAL FOREMAN

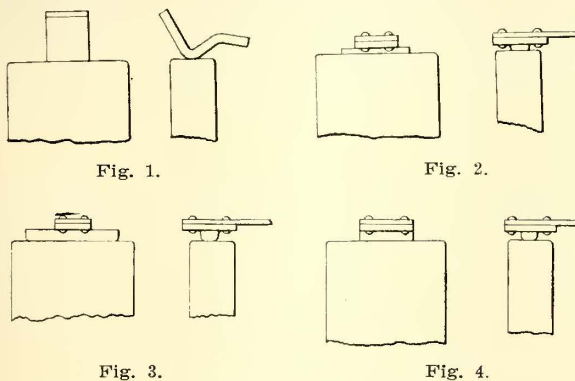
Many otherwise perfectly good carbon brushes are thrown away because they are badly worn and chipped on top, although the commutator bearing surfaces are perfect and give promise of long service. Not only is the destruction of the carbon a serious trouble, but broken pieces of carbon falling upon the commutator become wedged under the brushes and, by injury to the commutator, do damage more costly to repair than the loss of the brushes.

In the older types of motors this difficulty was not so serious for many reasons, among which are the following:

1. The life of the brushes was not long enough to make the defects apparent.
2. The tension of the brush-holder springs was not as carefully attended to as now and was often excessive. While the result was a wearing of the spring and contact into the top of the brush, the brush itself wore out at the bottom before the top wear became troublesome.
3. There was not as much tendency for the spring in the old type motors to destroy the tops of the carbons as there is in many of the modern ones.

The accompanying diagrams show different types of spring contacts resting upon the carbons, drawn especially to show the relative width of contact space and brush space.

Fig. 1 shows the hammer found in a relatively old type of motor, hundreds of examples of which are in service to-day. The wearing of the top of the brush is



SEVERAL TYPES OF BRUSH-HOLDER HAMMERS, OLD AND NEW

not a distinctive trouble in this type provided that a proper spring tension and carbons of good quality are used.

Fig. 2 represents the contact in an early type of a more modern brush-holder. The tip is less than one-half the width of the carbon, and there has been no trouble experienced with this type of hammer in the destruction of the tops of the carbons.

Fig. 3 represents the type of contact used in all modern brush-holders, the one which causes trouble. The tip covers nearly the whole of the top of the car-

bon, and when it starts to wear into the brush the whole top is soon gone. It is then necessary either to throw away the carbon or to grind it down to a flat surface, wasting 1/4 in. of length.

The remedy for the difficulty is illustrated in Fig. 4. It is to cut off the ends of the tip even with the spring, making the tips cover about one-third of the brush surface rather than nearly all of it. While it may be difficult to believe that this procedure will produce the results as stated, the reader is advised to try it if he is having trouble with worn and chipped brush ends. A brush-holder with the shorter tip will give three times the life of brush as the one with the long tip.

On first thought it might be said that, as the wear in the top of the brush is brought about by burning caused by the very small arcs formed between the tip and the

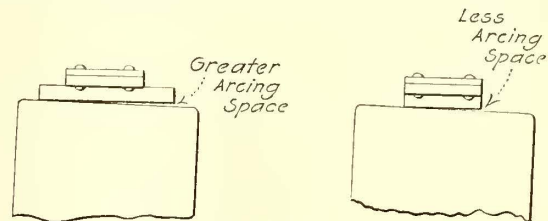


Fig. 5.

SKETCHES TO ILLUSTRATE ONE THEORY OF BRUSH-TOP BURNING

brush, the greater the surface covered by the tip the greater will be the carrying capacity of the contact. Therefore it would appear that with a wide contact there should be less liability of the formation of arcs by vibration and the jumping of the hammers as the trucks pass over rough tracks.

Although this argument sounds plausible it is not borne out by the facts. My conclusions, as stated above, are based on observations of a large number of motors. A certain company put in service 300 or 400 motors with brush-holder tips similar to those shown in Fig. 2. No trouble has ever been experienced with these brushes. Later another lot of 200 motors, and following that a lot of 400 motors, were put into service with brush-holders having wide contact tips. Inside of three months the brushes were found worn at the tops so badly that it was necessary to remove them and to grind off the worn parts. Part of these tips were of copper and part of bronze, and there were two or three different styles of surface contour among them, but no differences could be noted on account of the difference in shape or material.

The superintendent of equipment of the company concluded that, as the brushes were not being destroyed on the motors having the short contact tips it would be well to try a few of the new motors under the same conditions. The motor manufacturers gave their consent to this plan, although the ideas did not impress them strongly enough to influence them to change their designs. The result of the change was entirely satisfactory.

In endeavoring to arrive at an explanation of this result I have come to the conclusion illustrated in Fig. 5. It is that, as the commutator rotates and has lateral motion at the same time, force is exerted on the brush to tilt it. Although the brush is not completely lifted from the commutator it is slightly lifted. Under these conditions the long hammer is raised more than the short one and allows a greater arcing space at one end or the other. It is also raised from the brush end a greater length of time and therefore there is more opportunity and time for arcing. In the figure this condition has been greatly exaggerated in order to illus-

trate the theory clearly. Again, with the long hammer there is more leverage upon the hammer, tending to twist it. This produces greater wear on the brush-holder pin, allowing the hole in the hammer to become larger and this contributes to the wearing away of the top of the brush.

Whether the above is the correct explanation or not the fact remains that the short tip gives decidedly better service than the long one. Even if the burning and wear with the two types of tip were practically the same, the short tip would make only a small hole and would not destroy the entire top of the brush.

## Remodeling Westinghouse No. 49 Motor Armatures

BY E. W. MCPHEETERS, ARMATURE WINDER UNITED RAILWAYS, ST. LOUIS, MO.

As there are many companies having Westinghouse No. 49 motors on hand, it may be of interest to describe a plan for remodeling the armatures. With slight changes and at small cost these can be made to give good service, as they are doing in four-motor equipments.

After the armature is stripped and tested for a sprung shaft, the laminations should be straightened, two core irons being run through the core so that the laminations will line up perfectly. The core slot should then be milled  $\frac{3}{32}$  in. deeper. The slots should then be braced with hardwood sticks driven the length of the core. These should be about  $\frac{1}{2}$  in. deep and forced in as tightly as possible to hold the laminations in place while grooves are being turned for the bands.

One groove should then be turned at each end and one in the center,  $\frac{3}{4}$  in. wide by  $\frac{3}{32}$  in. deep. The sticks should then be removed and the core should be filed up ready to be wound with three-turn coils, two coils being placed together. These coils should be wound from No. 9 magnet wire and they should be banded down with No. 17 steel-band wire, the surface of the band being somewhat lower than the surface of the core.

## Comparative Tests of Chilled-Iron and Steel Wheels

In his presidential address delivered on Oct. 12 before the convention of the Association of Manufacturers of Chilled-Iron Wheels, George W. Lyndon suggested the following comparative tests for chilled-iron and steel wheels.

1. Relative wearing values when rotating on a steel rail under various loads, the tread wear and flange wear being observed separately.

2. Abrasion of the rail under various conditions of loading.

3. Determination of the intensity of heating stresses in all parts of the chilled-iron wheel—namely, single plate, intersection of plate, front plate, back plate, bracket, etc.

4. Analysis of the thermal test. Intensity of the stresses in various parts of the wheel and the effects of thickening the thermal ring, increasing and decreasing the temperature of the iron, etc. The thermal test should be an intelligent one instead of the present crude affair that is supposedly alike for all weights of wheels.

5. Determination of the stresses in the hub and the plates of the chilled-iron wheel due to pressing on axles. Variation in the stresses due to various classes of machining.

## Improved Lighting for Westchester Cars

The lighting arrangement for the cars on the New York, Westchester & Boston Railway is being changed over at the present time to a system that includes a small number of large units located along the center line of the car instead of the numerous small lamps that were placed along the sides in the original arrangement. This gives an equal illumination with an expenditure of only 560 watts as opposed to the original power consumption of 966 watts and, in addition, has effected a number of improvements, including a very much better interior appearance.

Some time ago the railway company undertook some experiments for the purpose of selecting a lighting system that would be best adapted to the requirements of fifteen new cars that are being delivered for service on the line. The results obtained were so gratifying that it was decided to change the lighting arrangements on the old cars with which the road is equipped with the idea of providing better illumination, decreasing cost of lamp renewals, improving interior appearance and increasing value of advertising signs, in addition to decreasing lamp wattage by nearly 50 per cent.

Originally the lighting system installed in the cars



WESTCHESTER LIGHTING—NEW LIGHTING ARRANGEMENT WITH LARGE LAMPS AND REFLECTORS ALONG CENTER LINE OF CAR

consisted of forty-two 23-watt Mazda lamps located under the lower decks, twenty-one being placed on each side of the car. The lamps were mounted in flush sockets without reflectors. Ten emergency lights were located on the ceiling along the center line of the car, and these were operated through an automatic relay from a sixteen-cell 32-volt battery. In the new arrangement, however, the main lights are located along the center line of the car. Ten 56-watt Mazda lamps are used, these being fitted with Safety Car Heating & Lighting Company's fixtures and heavy-density opal glass reflectors. These reflectors, it may be said, are held in place by clips over which a collar screws down, and this provides an arrangement that gives perfect security against the shade working loose and falling to the car floor.

The emergency lights, under the new system, are located under the lower decks, five on each side of the car. The illustration shows lamp bulbs in each of the forty-two outlets along the lower deck although only ten emergency lamps are used, but the unused outlets are being covered with white enameled plates in the cars



that are now being equipped. On the fifteen new cars that are soon to be placed in service the emergency lights are to alternate with the main lights along the center line of the car, so that only one line of conduit with three circuits is required, whereas with the former system three lines of conduit and six circuits were used.

The change-over of the lighting system on the present cars was accomplished with practically negligible wiring alterations, the most important of which was a reversal of the leads to the jumpers at the ends of the car. The main lights are wired in two circuits, for which the old emergency-light cables along the center line of the car were used. These are of No. 14 wire and are large enough to carry the necessary power for the 56-watt lights. The old main circuits under the decks are used for the emergency lights in their new position.

The new lighting arrangement, together with the use of reflectors for the lamps, has accomplished a reduction in lamp wattage on the main lighting circuit from 966 to 560. This decreased wattage, however, has not reduced the effective illumination but has actually resulted in improved lighting conditions because the maximum of light is reflected from the ceiling to the plane of



WESTCHESTER LIGHTING—ORIGINAL ARRANGEMENT WITH SMALL LAMPS UNDER DECKS AT EACH SIDE AND EMERGENCY LIGHTS IN THE CENTER

the car seat where it is most useful. By using only 25 per cent of the original number of lamps, a large saving in lamp renewal cost is obtained.

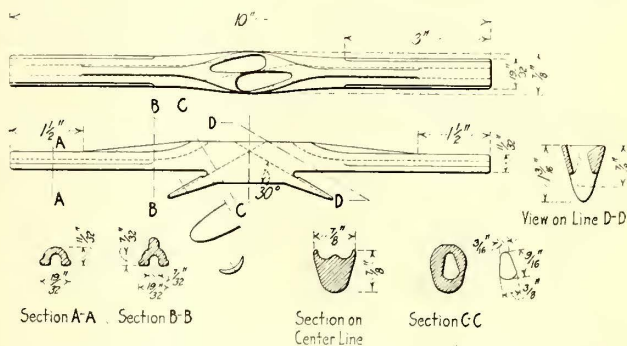
Other noteworthy improvements incidental to the change are better appearance of the car interior and increased advertising value of the signs. If the latter were located along the curve of the ceiling at its junction with the car side, with the main lights located along the center of the car, a partial shadow would be cast across the face of the sign. To overcome this condition the signs were lowered to a position just above the windows, thus eliminating the shadow and bringing the signs down to a position where they are most conveniently seen. At the same time the additional white surface provided in the ceiling aids in reflecting and diffusing the lights thrown downward from the top of the car.

The interior appearance of the cars that are changed over is exceptionally pleasing. The lamp fixtures are of white enameled metal and these, together with the white opal glass reflectors, blend very well with the white ceiling of the car. Also the signal cord has been run along the top of the sign panel or frieze instead of

being supported by unsightly hangers along the center line of the car. This gives a clear opening under the ceiling and an exceptionally large white area. All of the changes were made by the railway company's forces.

### A Balanced Trolley-Wire Splicer

Stability, light weight and reduced cost have been obtained by substituting an improved trolley-wire splicer for those formerly used by the overhead lines maintenance department of the Twin City Rapid Transit Company, Minneapolis, Minn. Increased stability was obtained, or the tendency of the splicer to overturn when in the line was overcome in the new splicer by minimizing the vertical depth which, as shown in the accompanying illustration, is only  $\frac{7}{8}$  in. The length of the splicer was reduced to 10 in. by placing the openings



TWIN CITY TROLLEY-WIRE SPLICER

through which the wires pass side by side transversely with the long dimension of the splicer. This also permits the trolley wire to be twisted after it is passed through the splicer, thereby the strain is taken by the wires directly rather than through the clamping action of the splicer. A smooth under-running surface is obtained by lips that are bent in to fill the space formed by the bends in the wires where they enter the splicer. The reduction in vertical height as well as length decreased the weight of the splicer, and at the same time reduced the cost.

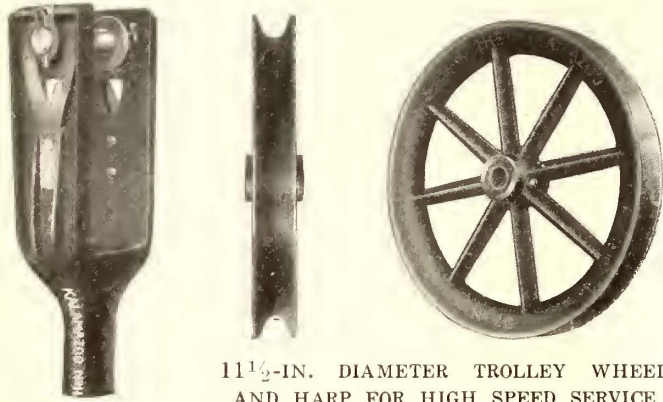
### Durable Fiber

A new material, called Whalebone Fiber, has recently been placed on the market by the Diamond State Fiber Company, Bridgeport, Pa., this being an improvement on the ordinary type of vulcanized fiber which has been used in the past for track insulation. The process by which the new material is made gelatinizes cotton cellulose to such a degree that it becomes almost impervious to water, so that when it is immersed in water at a fixed temperature and for a given time it will not absorb nearly as much moisture as ordinary fiber under the same conditions. This in addition to the fact that the new material will stand pounding and rough usage, together with bad climatic conditions, makes it especially suitable for track work. A considerable amount of the new fiber has already been used for insulation at the joints separating track sections for automatic signal systems, and also for rail pads on bridges, for which use the material is manufactured in blocks  $\frac{1}{2}$  in. thick.

The system of electric railways which is being constructed to connect Rome with surrounding localities is expected to be completed by the end of this year. The electric equipment is being supplied by the Italian Thomson-Houston Company.

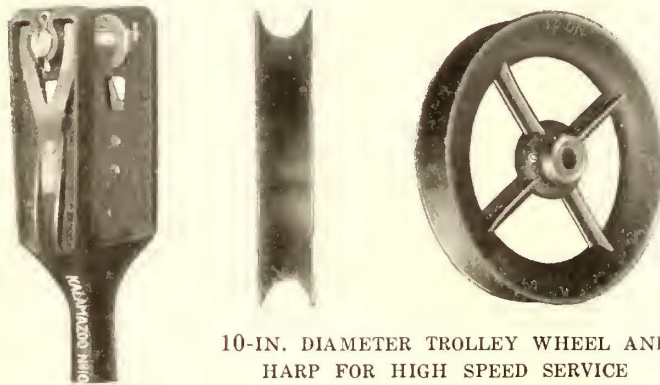
### Harps and Wheels of High Current-Carrying Capacity

The accompanying illustrations show two types of trolley wheels and harps now being put out by the Star Brass Works, Kalamazoo, Mich., which are designed especially for high speed lines and which have shown less



11 1/2-IN. DIAMETER TROLLEY WHEEL AND HARP FOR HIGH SPEED SERVICE

arcng and more mileage than the smaller wheels in the same service. On account of their large diameter there is more bearing surface on the wire and consequently greater contact and current carrying capacity. Wheel



10-IN. DIAMETER TROLLEY WHEEL AND HARP FOR HIGH SPEED SERVICE

No. 20, in the upper illustration, is 11 1/2 in. in diameter, 1 1/2 in. wide, has 3/4 in. depth of groove, and 2 in. length of hub. Wheel No. 21, shown in the lower illustration, is 10 in. in diameter, 1 7/8 in. wide and has 7/8 in. depth

of groove and 2 in. length of hub. Both wheels are furnished with graphite bushing for 5/8-in., 3/4-in. or 1-in. pin, as desired. The harps are of the regular "Kalamazoo" patented construction but are made large enough to take these wheels.

### Street Railway Service Being Inaugurated in Miami, Fla., with Storage-Battery Cars

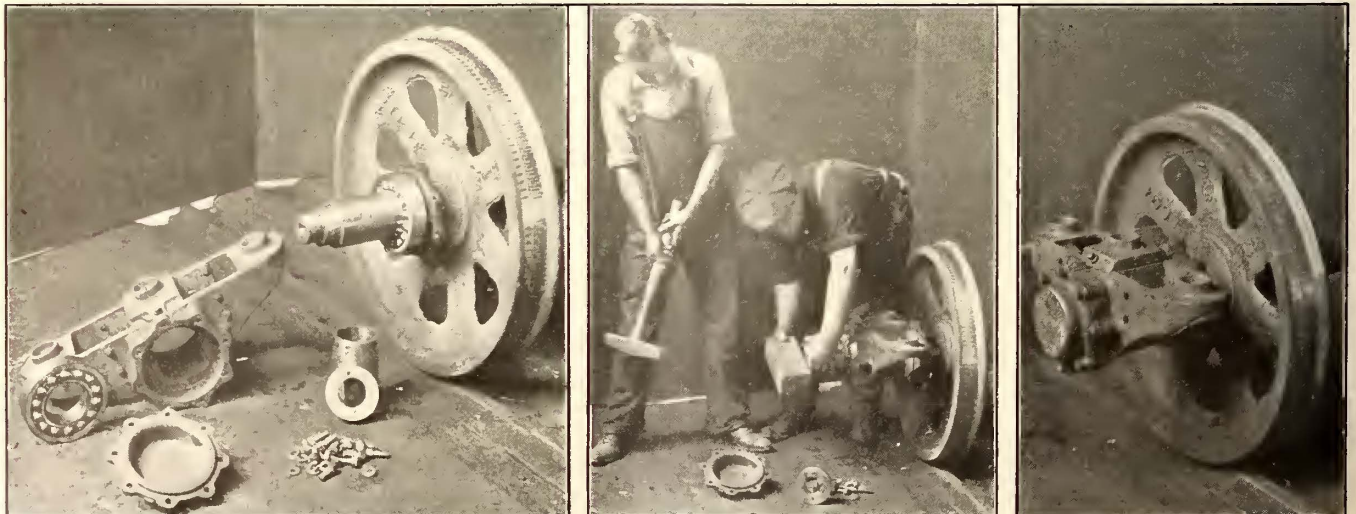
Miami, Fla., is soon to have its first street railway service, as the recently incorporated Miami Traction Company is now receiving from The J. G. Brill Company several small storage-battery cars. This city, one of the southernmost in the country, is below the frost line and is a center for the grape fruit industry. Partly on account of an increased appreciation of its fine climate and partly because it is located on the line of the Florida East Coast Railroad and at the mouth of



MIAMI CAR—GENERAL VIEW OF STORAGE-BATTERY CAR

one of the government canals leading from the Everglades, its population has increased rapidly in recent years. It is of interest, therefore, to note some of the features of the cars with which service is to be inaugurated in this thriving little city.

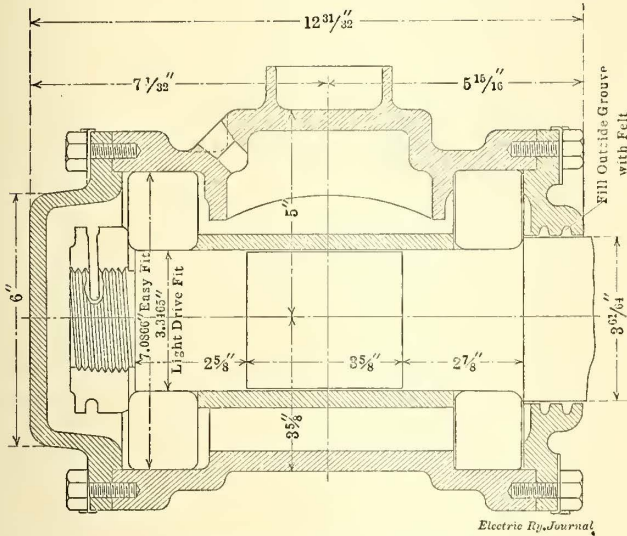
The bodies of the Miami cars are not unusual, being 18 ft. long over corner posts, 26 ft. 1 1/2 in. long over bumpers and 7 ft. 6 in. wide at the belt rail. They are fitted with longitudinal seats for twenty-four passengers. The wheelbase is 7 ft. 6 in., the wheels are of 30-in. diameter and there are two GE-1022 motors. The storage-battery equipment comprises fifty-eight MV-29 Hycap Exide cells. The weight of each car, completely equipped, is 10,696 lb. The general appearance of the



MIAMI CAR—PARTS OF BEARING AND HOUSING, OPERATION OF DRIVING BEARING HOME, HOUSING ASSEMBLED IN POSITION ON JOURNAL

car is shown in one of the accompanying illustrations on page 920.

The cars are equipped with S.K.F. ball bearings, for which a special housing and spring mounting was designed by the car company's engineers in consultation with those of the bearing company. The details of this housing are shown in the accompanying illustrations. The spring support of the body on the bearings is also

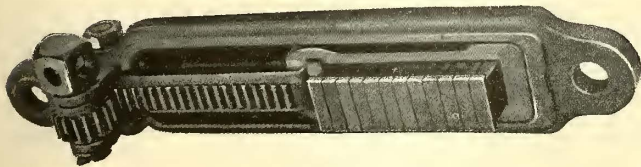


MIAMI CAR—CROSS-SECTION OF BEARING HOUSING

of interest as there are three long helical springs in each bearing with no semi-elliptical springs. The truck, therefore, is of the simplest possible construction, and the very considerable vertical play of the bearings in the pedestals provides the necessary cushioning effect to prevent jar on the battery. Obviously this construction also provides comfortable riding for the passengers.

### Inexpensive Slack Take-Up for Brake Rigging

A convenient and inexpensive device for adjusting air-brake piston travel without necessity for going under the car has recently been brought out by the Johns-Manville Company, New York City. It is installed as a part of the brake-cylinder tie-rod at a point near the equalizing lever where it is most easy to reach, and it thus becomes an integral part of the foundation

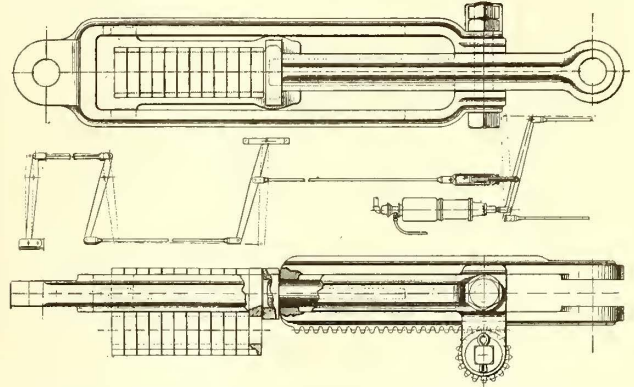


VIEW OF UNDERSIDE WITH ALL SHIMS DROPPED INTO LOWEST POSITIONS AND TAKE-UP IN RETRACTED POSITION

brake rigging. Its installation eliminates the necessity for removing cotterpins, drawing out the brake pins and resetting the levers in the dead-lever guides to take up slack in the brakes. The underlying principle is the dropping of metal shims, each 1/2 in. thick, behind the end of a plunger within a yoke, after moving the shims past the plunger end by rotating a pinion on a rack that is connected to the shim box. A turn of the pinion releases a shim which drops into the space that is thus left at the end of the plunger and this provides the equivalent of a 1/2-in. shortening of the tie rod, taking

up any wear that may have occurred at the brakeshoes. The shims are held in a yoke that travels within the exterior yoke to which the pinion is attached, and each shim has a hole in the lower half that the plunger may slide through when the shim is lifted and the take-up is extended.

The only labor necessary for the installation is the cutting off of the tie-rod and a rewelding, this being equivalent to the removal of a section of the rod corresponding to the space occupied by the take-up in its ex-

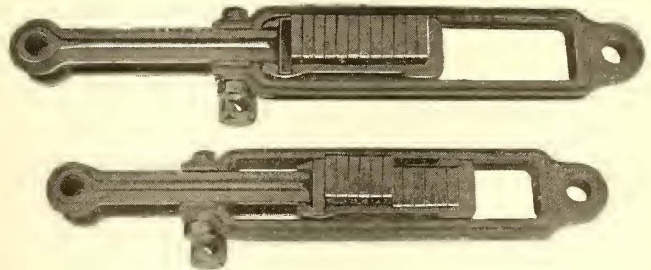


PLAN AND ELEVATION OF TAKE-UP IN RETRACTED POSITION AND SKETCH SHOWING METHOD OF APPLICATION

tended position. The take-up is furnished with a flat end to fit the jaw end of the cylinder tie-rod, and the other end is a jaw which fits over the equalizing lever. The total weight amounts only to approximately 35 lb., and the length in extended position is 28 in.

For its operation in case a supply of air for the brake application to test the piston travel is not obtainable, the take-up can be retracted until the brake-cylinder piston is forced against the head of brake cylinder, permitting a number of the shims to drop behind the end of the plunger. When the brakeshoes are pressing hard against the wheels a number of the fallen shims whose combined thickness corresponds to the amount of standard piston travel are lifted in the box or yoke that holds them. The pinion is then released and the plunger is forced inward by the recoil of the brake rigging, passing through the holes in the lifted shims and coming to a bearing against those shims that are not lifted.

This slack take-up is not an automatic brake adjuster,



TAKE-UP IN EXTENDED AND PARTLY-EXTENDED POSITIONS

and for this reason the device is stated by the makers not to conflict in any way with existing types of automatic apparatus designed for brake adjustment. It has, however, been manufactured primarily to accomplish the service now performed only by automatic adjusters, providing approximately equivalent results at a materially reduced expense. Therefore, it is especially suitable for equipment other than high-speed passenger cars where the question of first cost is not of primary importance. The device is listed at a price of \$6, thus making it available even for installation on freight cars.

# News of Electric Railways

## PORTLAND VALUATION BRIEF FILED

**Company Places Value at \$62,000,000—Brief Contains 347 Printed Pages—Cost to Company for Preparation \$100,000**

The Portland Railway, Light & Power Company, Portland, Ore., has filed its brief in the valuation case initiated by the Public Service Commission of Oregon. The company contends, that a fair and just valuation of its property lies somewhere between \$61,795,629 and \$62,134,542. The former figure is given as the value of the property as determined by its original cost plus subsequent increments. The latter figure is given as the value of the property as determined by the reproduction analysis, considering the going value of the concern. The brief was filed at the Portland office of the commission. It comprises 347 printed pages. The valuation of the company's properties involved a cost to the company of something like \$100,000.

Among other things the company contends that a just and equitable return upon the investments already made must be allowed by the commission if Oregon is to encourage the investment of other capital; that 8 per cent is the minimum rate of return which a public utility should be allowed to earn, not as a matter of abstract justice, but as a business proposition to be decided in view of the demands which the financial structure of the utility make; that utility investments are subjected to the hazards of unregulated competition and to the agitation of municipal ownership; that impairment of the credit of a utility is of more serious consequence than the temporary reduction of rates; that there has been no concerted nor sound demand for the reduction of the company's rates, and that the State should view the problem of regulation purely from a business standpoint.

In its general argument the brief says in part:

"Credit is the life-blood of the industry, and its impairment is of a more serious consequence to the utility than a temporary reduction of rates. Earnings are variable, but the rate base, as once determined, is likely to be permanent. This consideration of the direct result of the commission's finding upon the credit of the company is one of the most important considerations to be kept in mind in the decision of the case, when considered in conjunction with the fact that we are now passing through a time of depression, perhaps more acute in the Pacific Coast States than that of 1893; a time when almost every industry on the coast is subject to serious strains and when the earnings of this utility show a distressing decrease. The effect of the utility show a distressing decrease. The effect of the European war is a source of uncertainty sufficient to unsettle the financial world, and the ultimate effect of which cannot be foreseen. This depression, together with the presence of an unregulated jitney competition combined with the competition of a rival electric company serving only the short haul of the power business makes imperative a careful consideration by the commission of the fact that in the practical regulation of this investment in such times, a state must exercise care, because drastic or careless action will result in damage other than confiscation, and against which the courts provide no protection.

"In this relation there is a similar consideration, the importance of which is increased by the influence which the ultimate finding of fair value by the commission will have upon the securities and credit of the corporation. The utility is not earning and cannot earn under its present rate schedules and the present industrial depression a full 8 per cent upon the value of the property which it devotes to the public service. In this situation the utility will suffer irreparable injury if the commission in determining value and rates, in a circuitous manner, fixes the value of the property at such a point as will apparently justify the rate schedule determined.

"With the present acute depression, accentuated by unregulated and unfair competition, no sound policy of State dictates that the credit of this utility shall be impaired by a finding of a low rate base. This is particularly a fact,

when, in its railway lines, the earnings are such and the lengths of haul such that a reduction of rates is clearly impossible, and when in its electric light and power business the rates are clearly reasonable and kept so by free and active competition. This is particularly true, also, in view of what we regard as the most significant feature of this valuation proceeding; that, although the entire State knew of the investigation and all of the municipalities interested were notified, the rates of the company are such and the treatment of its customers such that, excepting in the unimportant and purely preliminary hearing, and excepting for the filing of a seventeen-page brief by the city, setting forth in a general way certain abstract principles of law, no municipality entered an appearance, and that out of the one-third of the population of the State served by the utility, the only person sufficiently interested in this proceeding to appear was one Charles P. Church.

"It cannot be said reasonably that there is a public demand for regulation of the company's rates. None of these appearances were made by persons or municipalities claiming an unreasonableness of rates or service. This is an investigation made by the commission upon its own motion, and properly so made, but in fairness to the utility it cannot be said that its rates are such as to demand, in the present economic situation, interference by public authority which in any way possibly can impair the credit of the enterprise.

"The eyes of the financial world are on the case, and this decision will be taken as a declaration of the policy of Oregon toward such investments. Investment capital is a commodity for which there is the same competition as for wheat and lumber. This competition exists between communities and states. Capital is cowardly. It follows the line of best return and least adversity. In the money market of this country the securities of this company must compete with the 4600 separate and distinct issues of investment bonds of a similar character from all other investment centers of the country."

## NEW YORK BUS FRANCHISE OPPOSED

**Interborough Rapid Transit Company, to Operate New City-Owned Lines, Surprised at City's Willingness to Compete with Itself**

The Board of Estimate of New York City received on Oct. 22 the report of its franchise committee, recommending that the franchise for the new motor bus routes referred to in the *ELECTRIC RAILWAY JOURNAL* of Oct. 23, page 882, should be awarded to the New York Motor Bus Company. The Interborough Rapid Transit Company, which is interested in the Fifth Avenue Coach Company, entered a protest. It raised the point that as in London and Paris the subway system had been seriously injured by the competition of the motor bus lines, it was extraordinary that the city which was just about to become a partner in the subway system in New York should set up a competitor to itself. J. L. Quackenbush, general attorney of the Interborough Rapid Transit Company, operating the subway and elevated lines in Manhattan and the Bronx, said that the bus matter had seemed so important to the company that it had dispatched two of its chief officials to London and Paris to investigate the experience there, and he thought that what they had ascertained should be considered by the city. Bainbridge Colby, who, with William R. Willcox, appeared for the New York Motor Bus Company, replied that it was for the city to decide the bus question according to the traffic needs of the population. A formal protest to the grant of the franchise to the rival concern was handed in by Richard W. Meade, president of the Fifth Avenue Coach Company, with a request for a rehearing. He contended that the franchise committee had ignored the advantages of one unified bus system throughout the city, and the coach company's offer to give the city one-half of the net profits. The board fixed Nov. 8 as the date for a public hearing on the general question of motor buses and Nov. 19 as the date for a public hearing on the specific application of the New York Motor Bus Company.

## DEAN COOLEY'S DETROIT VALUATION FIGURES

## \$56,184,165 Fixed as Reproduction Value, Including Franchises, of Property in One-Fare Zone

In his appraisal of the properties of the Detroit (Mich.) United Railway and its subsidiary companies, as of Jan. 1, 1915, Prof. M. E. Cooley, dean of the engineering department of the University of Michigan, fixes the reproduction value including franchises at \$56,184,165 and the depreciated value at \$50,815,063. The appraisal was made for the State Railroad Commission to establish a value upon which the company may be permitted to issue bonds. The appraisal specifically exempts from consideration the value of unified operation, terminal rights, operation on private right-of-way, entity of system, development charges, etc. In this connection Professor Cooley states: "These several items and others have not been considered in this appraisal for the reason and in the belief that the commission would itself wish to pass upon this." The property of the Sandwich, Windsor & Amherstburg Railway, located in Canada, was not included in the appraisal. Subdivided into corporate units, Professor Cooley fixes his values as follows:

	Reproduction	Depreciated
Detroit United Railway.....	\$34,072,511	\$30,263,925
Detroit, Jackson & Chicago Railway.....	3,846,060	3,336,869
Detroit, Monroe & Toledo Railway.....	3,792,218	3,431,997
Rapid Railway.....	5,107,038	4,502,446
Supplies, cash, etc.....	1,582,937	1,496,425
Total.....	\$48,400,764	\$43,031,662
Franchises.....	7,783,401	7,783,401
Grand total.....	\$56,184,165	\$50,815,063

The appraisal fixes the reproduction value of the physical property within the one-fare zone at \$26,563,435 and the depreciated value at \$23,609,765. Franchise values within this area are fixed at \$6,105,214, making a total valuation of the one-fare zone property of \$29,714,979. This is the property upon which the municipal ownership vote will be held in Detroit on Nov. 2. Since the appraisal was made the company has expended more than \$1,000,000 in track improvement within the one-fare zone.

The only comment made by the company in connection with the appraisal appears in its own weekly publication, in which it is stated that the Cooley appraisal justifies the statements of the company that it had a much greater investment than is represented by its stocks and bonds.

## OBJECTIONS TO WASHINGTON POWER ORDER

The Public Utilities Commission of the District of Columbia continued on Oct. 25 its inquiry into the intercorporate relations of the Washington Railway & Electric Company and the Potomac Electric Power Company. The hearing was to determine why proposed orders of the commission mentioned briefly in the ELECTRIC RAILWAY JOURNAL of Sept. 18, page 602, should not be issued.

John S. Barbour, attorney for the companies, presented the brief of the companies. This reviewed at length the history of the Washington Railway & Electric Company and its subsidiaries and the developments leading up to the present business practice of both that company and the Potomac Electric Power Company.

Among other things the commission is seeking to require the companies to return to the conditions under which they operated under a contract entered into on June 23, 1906, and subsequently modified. The companies claim that the terms of this contract were altered by mutual consent for a valuable consideration and are no longer in force. Objecting to the requirement of the proposed order that would compel the Potomac Electric Power Company to reduce its rates to consumers to an amount to offset any increased amounts received by it from carrying out the commission's order, the company contended that there would be no increase in revenue if it complied with the order; that the present rates are not unjust or discriminatory; that the commission has not ascertained and determined proper and adequate rates of depreciation as provided in the public utilities law, and that the commission has not yet ascertained the value of the property of the power company in accordance with the public utilities act. The commission expects to hear oral arguments during the week ended Nov. 6.

## PROPOSED CHICAGO ELEVATED WAGE SCALE

Negotiations between the elevated railroads of Chicago and an employees' committee which were begun on Oct. 9 have resulted in a proposed contract, the terms of which it was intended to submit to the vote of the employees on Oct. 29. No essential changes were made in the working conditions, but substantial increases in pay were granted to all classes of employees. The graduated scale for regular motormen was wiped out. This required one year at 30½ cents before the maximum of 34 cents was allowed. Regular motormen, under the new contract, will receive 36 cents an hour, which amount will be increased to 38 cents an hour beginning with the second year of the contract. The previously existing minimum for extra motormen was increased from 28 cents to 32 cents an hour, and the maximum which obtained after two years' service was increased from 29½ cents to 34 cents an hour. The existing hourly wage of conductors was increased from 27 cents to 29 cents an hour for the present year, and for the year commencing June 1, 1916, this amount will be further increased to 31 cents an hour. The present minimum for conductors which obtained before the first year of service was 25½ cents. The wages of regular guards, it was decided, should be increased from 24 cents to 26 cents an hour for the present year, and commencing June 1, 1916, this will be further increased to 28 cents an hour. The minimum for extra guards was increased from 21 cents to 23 cents an hour, and the maximum which obtains after three years of service was increased from 24 cents to 26 cents an hour. Wages of switchmen, switch tenders, towermen and bridgemen were generally increased about 2 cents an hour, and the wages of flagmen, ticket agents, shop and roadway employees were also substantially increased.

## SENATOR BORAH ON POST-BELLUM ISSUES

## He Sees Government Ownership of Public Utilities as the Next Great Political Issue

United States Senator William E. Borah, regarded as one of the ablest Senators in the upper House and an avowed candidate for the Republican Presidential nomination, discussed in an interview in the New York *Sun* of Oct. 25 the post-bellum issues which he regards as likely to be raised. He believes that the message "Prepare for Peace," is the one that should be conveyed with emphasis equal to the movement in favor of military preparedness. The Senator from Idaho predicts that the Republican party in the next national convention will write the most advanced and liberal platform that it has adopted since 1860. He regards the recent action taken by the party in conservative Massachusetts as indicating what may be expected from the next national convention.

In discussing the great national issues Senator Borah is reported to have said:

"In the language of a brilliant editor in the West: 'There has arisen a new conscience in relation to things both governmental and social; new ideas and new standards possess the mind and stand fixed in universal judgment.' The views of the Republicans of the old commonwealth of Massachusetts, as evidenced by the broad and liberal platform adopted, indicate what we may fairly expect at the next national convention. The progressive movement in this country is just as forceful as ever and will not be content with anything on the hitherside of a pronounced declaration of liberal policies. We have moved on and we do not propose to return to the practices and precepts which sprang up under a long lease of power and by reason of the arrogance of continued success.

"The next great political issue in this country is going to be that involving government ownership of public utilities. Regulation in the minds of many people has broken down. It is not satisfactory to the public nor to the owner of the property. Efficiency in this war has come from those most highly and pronouncedly given over to state socialism, and even France and England have made tremendous strides in that direction out of sheer necessity. The question will be asked, If it gives efficiency in war why shall we doubt that it will give efficiency in peace? And we will have the question of public ownership up for consideration."

### WILKES-BARRE STRIKE

The striking employees of the Wilkes-Barre (Pa.) Railway have ten days in which to return to work. This was made known by the company officials and in the meantime T. A. Wright, the general manager, declared that no attempt will be made to operate cars.

The sliding scale fixed by the arbitrators in their original award will be paid. The company desires to operate its lines with the men who have been in its employ and no effort has been made to secure men to take the places of the strikers. After announcing its policy, company officials settled down to a condition of watchful waiting.

A notice was posted at the offices of the company to the effect that all men turning in company property such as punches, whistles, etc., for which the men made a deposit with the company upon entering its employ, would receive all money due them. Union officials, learning of this, at once set to work, and in a few hours had sent nearly every union man to the company's office to turn in his property.

A late development of the strike situation is the agreement by Mr. Wright to meet the members of the executive board of the union, provided that they have something new to offer. National board members of the union have left Wilkes-Barre to confer with the president of the international at Detroit and it is probable that nothing will be done until after return.

The latest development in the strike situation has been supplied by the officials of the union in the statement given out as a result of the conference with International President W. D. Mahon, at Detroit, that "we can see no other course than to stick to our present demands and fight it out, unless we get what we believe is due us."

This stand of the union leaders, coupled with the determination of the company officials not to recede from the position they assumed after the strike was called, gives little hope for a peaceful settlement of the strike, particularly as the company is continuing preparations to resume the operation of cars on Nov. 1.

The union has turned a deaf ear to the proposition to refer to the local courts the question of right of the arbitrators to repudiate their award.

### FORT WAYNE STRIKE INJUNCTION CASE ACTION

A request for a temporary injunction against Mayor Hosey and other city officials of Fort Wayne, Ind., Joseph C. Colgan, executive officer of the Amalgamated Association, and officers and members of various labor unions has been filed in the federal court at Indianapolis by the United States Mortgage & Trust Company in behalf of the bondholders of the Fort Wayne & Northern Indiana Traction Company. The filing of this suit followed the withdrawal of the former suit for an injunction against Colgan and other Amalgamated Association officials and members for attempting to bring about a strike in Fort Wayne, a permanent restraining order being now unnecessary on account of the company being able to operate all its cars on full schedule with new men. Mayor Hosey and officers of the municipal lighting plant at Fort Wayne are brought into the new suit for an injunction. They are charged with attempting to cripple the electric lighting business of the traction company by trying to induce patrons of the company's lighting plant to violate their contracts and make new contracts with the municipal plant. The bill of complaint asks that other defendants be enjoined from using intimidation, threats and displaying posters and placards to prevent persons from riding on the street cars and also to prevent labor unions from printing notices in newspapers threatening to impose fines on members who ride on the cars. The application for the new restraining order will be argued by attorneys for the plaintiff on Nov. 8.

**New Haven Suit Progress.**—The testimony introduced by the government in its suit in the Federal District Court in New York against directors of the New York, New Haven & Hartford Railroad has so far all been concerned with the early history of the company and with its operations in the maritime field and with other steam railroads. C. S. Mellen, former president of the company, has been the principal witness.

**Holyoke Arbitration Postponed.**—Following a recent inspection trip over the property of the Holyoke (Mass.) Street Railway, the arbitration board sitting in the wages dispute between the company and the local branch of the Amalgamated association adjourned sessions until Nov. 3. Efforts are being made to limit the presentation of testimony to three days for each side, with a seventh day for arguments.

**Inquiry Into New York Elevated Contracts.**—The Thompson legislative committee, which is inquiring at this time into the rapid transit contracts made in New York City, interrogated J. P. Morgan on Oct. 27. The inquiry had to do particularly with the elevated third-tracking awards of the Interborough Rapid Transit Company let originally on the basis of cost plus 15 per cent and subsequently relet to the extent of about 80 per cent on the basis of cost plus 5 per cent.

**Chicago Electrification Report to Be Released on Nov. 23.**—Nov. 23 has been definitely fixed by the Chicago Chamber of Commerce as the date when the smoke abatement and terminal electrification committee will submit its report to the city. On that day a dinner will be tendered to Mayor Thompson, his cabinet and the members of the City Council. Much importance is attached to the electrification report because of the exhaustive study the engineers have made of the subjects of smoke pollution and terminal electrification.

**Salt Lake-Idaho Interurban Opens.**—The first through train between Salt Lake and Preston, Idaho, over the interurban lines of the Ogden, Logan & Idaho Railway left Salt Lake on Oct. 14. Simultaneously with the departure of the train a new time-table went into effect, placing in service sixteen trains daily between Salt Lake and Preston and two between Salt Lake and Brigham City. All the north-bound trains are scheduled to make the trip from Salt Lake to Preston in five hours. The south-bound trains cover the distance in four hours and fifty minutes.

**Springfield Trolley Pole Removals.**—Negotiations are proceeding favorably at Springfield, Mass., between the Springfield Street Railway and the property owners on Main Street for the removal of trolley poles between State Street and the Union Station. Through the efforts of the city planning commission several banks and merchants have agreed to the plan, which contemplates the installation of span suspensions attached to buildings in the zone where the poles now stand. About fifty poles are to be removed and about forty owners are expected to send signed agreements to the commission in the near future.

**Cleveland's Municipal Ownership Vote.**—In Cleveland, Ohio, the City Council recently turned down an ordinance to hold a special election on Nov. 2 to vote on the city taking over the lines of the Cleveland Railway for approximately \$34,700,000, but the Socialists secured enough signatures to petitions to put the proposition on the ballot at the election. Under the law Cleveland could not issue \$34,700,000 of bonds in any event as a general obligation of the city, as its limit for additional bonds, even by vote of its people is now about \$17,000,000. Under the franchise the city has the right to take over the property on six months' notice under an agreed valuation. There is practically no campaign for the passage of this ordinance.

**Oakland Grievance Withdrawn.**—In the ELECTRIC RAILWAY JOURNAL of Oct. 23, page 884, brief mention was made of the refusal by the San Francisco-Oakland Terminal Railways, Oakland, Cal., to submit to arbitration representation made in behalf of the employees with respect to working conditions. At 2.30 a. m., on Oct. 10, at a mass meeting of Division 192 of the carmen's union, the Key Division grievance committee presented its report to the division with recommendation that the grievances regarding the reinstatement of the two deckhands and request for arbitration as to interpretation of the contract with the company be withdrawn. This report and recommendation were adopted almost unanimously by members of the division.

**Seattle Paving Case Before Corporation Counsel.**—The refusal of the Puget Sound Traction, Light & Power Company, Seattle, Wash., to comply with the order of the Board of Public Works to pave its right-of-way in certain streets now being paved by the city has been referred to Corpora-

tion Counsel Bradford for such action as may be necessary to force compliance with alleged provisions of the company's franchises, which also require the payment to the city of 2 per cent of the company's gross earnings. The company points out that it has applied to the State Public Service Commission for an order relieving it of certain of its franchise obligations, including the paving of its right-of-way, and that until some disposition is made of the petition, it desires to make temporary improvements by planking that portion of various streets occupied by track. As heretofore reported, the company has offered to advance to the Public Service Commission the sum of \$10,000 in order that the valuation of the company's property in Seattle may be determined. This valuation is regarded as necessary before the commission can act upon the application.

**Committee on Removal of Brooklyn Elevated Reports.**—The committee of five, appointed early this year by the Brooklyn committee of one hundred, to investigate and report upon the possibilities of assessing land values within Brooklyn for the purpose of removing the elevated tracks of the Brooklyn (N. Y.) Rapid Transit Company from Fulton Street and relocating the line in a subway on Livingston Street, has issued a preliminary report. The committee has also presented extensive maps and other details, which are to be first submitted to the property owners within the proposed area of assessment and then reported back to the committee of one hundred. The plan of the committee to relocate the Fulton Street elevated lines in a subway on Livingston Street is intended to prevent the rebuilding and reconstruction of the elevated structure along Fulton Street. The committee in its findings says that the proposed subway beginning at Cumberland Street to Lafayette Avenue to Livingston Street to Clinton Street and the Brooklyn Bridge, with a connection at Ashland Place at Fulton Street with the new subway now being constructed, would cost about \$5,500,000, and this could be met in whole or in part by levying an assessment in ten annual installments upon land values in the specified areas set forth.

#### PROGRAMS OF ASSOCIATION MEETINGS

##### Public Utilities Association of West Virginia.

The Public Utilities Association of West Virginia will meet at White Sulphur Springs, W. Va., on Nov. 18 and 19.

##### Railway Development Association

The Railway Development Association will hold its annual convention at the Hotel McAlpin on Nov. 9-11. The afternoon of Nov. 10 will be occupied by a boat trip around New York Harbor and in the evening the annual banquet will take place at the McAlpin. S. C. Mead, secretary of the Merchants' Association of New York, will act as toastmaster at the banquet. The speakers will be Howard Elliott, president of the New York, New Haven & Hartford Railroad, J. W. Weeks, United States Senator from Massachusetts, and Ralph Peters, president of the Long Island Railroad.

##### Philadelphia Valuation Conference

The program has been announced for the conference on the principles and methods of valuing public utilities, to be held under the auspices of the Utilities Bureau at the Hotel Adelphia, Philadelphia, Pa., on Nov. 10, 11 and 12. The arrangement of the sessions provides for the consideration of the subject "The Reproduction Theory" on Wednesday, Nov. 10, the consideration of the subjects "Original Cost," "Franchise Values" and "Valuing Land" on Thursday, Nov. 11, and the consideration of the subjects "Depreciation," "Going Value" and "Valuation and the Future in Public Utilities" on Friday, Nov. 12.

The session of Nov. 10 will be opened at 8 o'clock in the evening. The presiding officer will be Rudolph Blankenburg, Mayor of Philadelphia. The opening remarks will be made by Morris Llewellyn Cooke, director of public works of Philadelphia and acting director of the Utilities Bureau. The subjects and the speakers at this session follow:

"Criticism of Reproduction Theory of Valuation," by John H. Eshleman, Lieutenant-Governor of California and former president of the California Railroad Commission.

"Reproduction Values vs. Fair Value," by H. Findlay French, attorney-at-law, Baltimore, Md.

The discussion of these subjects will be opened by Prof. Morris Knowles, consulting engineer, Pittsburgh, Pa., director of the course in valuation of public utilities at the University of Pittsburgh.

The second session will be opened at 10 a. m. on Nov. 11. The presiding officer will be C. W. Kutz, chairman of the Public Utilities Commission of the District of Columbia. The subjects and the speakers at this session follow:

"Actual Cost as a Basis for Fair Value," by George W. Anderson, attorney-at-law, Boston, Mass.

"Original Cost as the Chief Basis for Fair Value," by Prof. Edward W. Bemis, Board of Supervising Engineers, Chicago, and member of the advisory board to the division of valuation of the Interstate Commerce Commission.

"The Making and Maintenance of Priced Inventories," by Charles L. Pillsbury, chief engineer, Valuation Bureau of the Public Utilities Commission of the District of Columbia.

The discussion of the first two of these subjects will be opened by Dr. Robert H. Whitten, secretary to the Board of Estimate committee on the city plan, New York; Henry E. Elrod, engineer, Dallas, Tex., and Edward P. Burch, consulting engineer, Detroit, Mich. The discussion of the paper by Mr. Pillsbury will be opened by James W. Phillips, grade crossing division, Bureau of Survey, Philadelphia; F. W. Ballard, commissioner and chief engineer, division of light and heat, City of Cleveland, Ohio, and R. J. Meigs, Western Union Telegraph Company, New York, N. Y.

The third session will be opened at 2.15 p. m. on Nov. 11. The presiding officer will be Dr. L. S. Rowe, president of the American Academy of Political and Social Science. The subjects and the speakers at this session follow:

"Valuation by Approximation," by John G. Morse, appraiser, Associated Factory Mutual Fire Insurance Companies, Boston, Mass.

"Franchise Values," by Dr. Delos F. Wilcox, consulting franchise and public utility expert, New York City, and Deputy Commissioner, Department of Water Supply, Gas & Electricity, New York.

The discussion of "Valuation by Approximation" will be opened by Morris Llewellyn Cooke, director of Public Works of Philadelphia, and John R. Freeman, president of the Manufacturers Mutual Fire Insurance Company, Providence, R. I. The discussion of "Franchise Values" will be opened by Henry De Forest, president and counsel, Queens County Water Company, New York; Chester A. McLain, lecturer, Harvard University, and Alfred Bettman, attorney-at-law, Cincinnati, Ohio.

The fourth session will be opened at 8.15 p. m. on Nov. 11. The subject and the speaker follow:

"Principles to Be Applied to Valuing Land," by Hammond V. Hayes, consulting engineer, Boston, Mass.

The discussion will be opened by Edward W. Doty, of the Columbus Railway, Power & Light Company, and Milo Roy Maltbie, of the advisory board of the division of valuation of the Interstate Commerce Commission.

The fifth session will be opened at 10 a. m. on Nov. 12. The subjects and the speakers follow:

"Court Decisions on Depreciation," by J. H. Goetz, of counsel for the Public Service Commission for the First District of New York.

"Depreciation as a Factor in Fair Value," by Halford Erickson, of the Wisconsin Railroad Commission.

Among those who will open the discussion are Philip J. Kealy, of the board of control of the Kansas City Railways.

The sixth session will be opened at 2.15 on Nov. 12. The subject and the speaker follow:

"Going Value as an Element in Fair Value," by Clifford Thorne, chairman of the Iowa Board of Railroad Commissioners.

Among those who will participate in the discussion are Ray Palmer, Chicago, and William J. Hagenah, Chicago.

A dinner will be held on Friday evening at 6.30 o'clock. The presiding officer will be Dr. Charles R. Van Hise, president of the University of Wisconsin. Addresses will be made by Charles A. Prouty on "The Meaning of the Constitutional Protection in Valuation," by William D. Kerr on "Constitutional Protection in Valuation," by Prof. John H. Gray on "Opinion Testimony," and by Mr. Maltbie on "Valuation and the Future in Public Utilities." All the meeting will be open to the public.

# Financial and Corporate

## ANNUAL REPORTS

### Aurora, Elgin & Chicago Railroad

The statement of income, profit and loss of the Aurora, Elgin & Chicago Railroad, Wheaton, Ill., for the year ended June 30, 1915, follows:

Gross earnings and other income:	
Revenue from transportation.....	\$1,632,083
Revenue from operations other than transportation...	336,285
Interest .....	278
Miscellaneous .....	581
Total gross earnings and other income.....	\$1,969,227
Operating expenses and taxes:	
Maintenance of way and structures.....	\$194,590
Maintenance of equipment.....	132,555
Power .....	235,933
Traffic .....	20,896
Conducting transportation.....	411,506
Other operations.....	31,270
General and miscellaneous.....	295,596
Total .....	\$1,322,346
Less undistributed operating credits.....	4,955
Remainder .....	\$1,317,391
Taxes .....	41,956
Total operating expenses and taxes.....	\$1,359,347
Gross income .....	\$609,880
Deductions from income.....	443,437
Net income.....	\$166,443
Profit and loss surplus at beginning of year.....	557,718
Adjustment of liability on interchangeable coupons..	17,450
Balance in reserve for replacements and renewals, June 30, 1914.....	24,063
Profit and loss—gross surplus.....	\$765,676
Dividends on preferred stock.....	186,000
Discount applicable to prior period.....	591
Profit and loss—surplus at end of year.....	\$579,085

The annual report states that the results of the year's operations were very disappointing to the officers. For the first time in the history of the company its gross income suffered a material decrease. In the absence of jitney or other unusual competition and conditions, the officers have concluded that the loss was caused by the prevailing industrial conditions obtaining in and around Chicago, by the unusually backward summer and by the fact that Saturdays, Sundays and holidays during the last months were almost invariably rainy days. In regard to the first point, a recent detailed analysis of conditions prevailing in the Fox River Valley made by the traffic department indicated a decrease in hours of employment approximating 30 per cent.

Although no comparative figures are published in the report for the last fiscal year, a comparison of this report with that for the preceding year, analyzed in the *ELECTRIC RAILWAY JOURNAL* of Dec. 19, 1914, shows that the revenue from transportation in the year just ended was \$1,632,083 as compared to \$1,726,724 for the year previous, a decrease of \$94,641 or 5.4 per cent. The total gross earnings and other income dropped from \$2,096,183 to \$1,969,227, a decrease of \$126,956 or 6.0 per cent. The total operating expenses and taxes decreased from \$1,396,791 to \$1,359,347, an amount of \$37,444 or 2.7 per cent.

In thus comparing the two years it should be noted that the company, following the ruling of the Interstate Commerce Commission effective on July 1, 1914, charged during the last year to operating expenses and against income respectively, and credited to reserves: For depreciation of equipment, \$31,493, and for amortization of discount on bonds, \$10,287. It should also be noted that the inclusion of the new operating expense account "power" for the last year renders a comparison of the various operating expense divisions for the two years useless without an extended analysis of the previous accounting for all power items.

The taxes for the last year decreased \$11,984 or 22.2 per cent, and the gross income decreased \$89,512 or 12.8 per cent. Deductions from income, however, showed an increase of \$24,678 or 5.9 per cent, and the net income decreased \$114,190 or 40.7 per cent. Owing largely to certain profit and loss credits, however, as indicated in the forego-

ing statement, with also a decrease of \$93,000 in the debit for dividends, the surplus at the end of the year showed an increase of \$21,366.

### New South Wales Government Railways & Tramways

The report of the chief commissioner of the New South Wales (Australia) Government Railways & Tramways for the year ended June 30, 1915, shows the following comparative results:

	Tramways		Railways	
	1915	1914	1915	1914
Earnings .....	£1,986,060	£1,934,164	£7,616,511	£7,742,241
Working expenses .....	1,611,286	1,669,033	5,311,162	5,409,820
Balance .....	£374,774	£265,131	£2,305,349	£2,332,421
Interest .....	284,639	263,451	2,328,680	2,123,054
Surplus .....	£90,135	£1,680	*£23,331	£209,367

\*Deficit.

From the above it will be observed that the railway earnings decreased £125,730 or 1.62 per cent during the last fiscal year, on account of war conditions, while the surplus of £209,367 in 1914 fell off by £232,698 to a deficit of £23,331 in 1915 on account of a smaller decrease in working expenses and an increase in interest. On the other hand, the tramway earnings made a much better showing in the last year than in the one preceding. The earnings increased £51,896 or 2.68 per cent, and the working expenses decreased £57,747 or 3.4 per cent. The net result, after providing for a small increase in interest, was a surplus of £90,135 as compared to the preceding year's surplus of £1,680, an increase of £88,455. This tramway surplus would have been turned into a deficit, however, and the railway deficit would have been greatly increased, had it not been for the increased fares granted late in the preceding year, which added £148,666 to the railway and £155,000 to the tramway earnings during the last year. Without these increases the railways would have shown a decrease in surplus of 0.58 per cent on capital account instead of a decrease of 0.35 per cent, while the tramways would have suffered a decrease of 0.83 per cent on capital account instead of an increase of 1.1 per cent.

During the last year 217 officers and 1805 men joined the expeditionary forces at the front. The list of casualties covered 185 at the end the year. The permanent employees at the front are paid the difference between their wages as employees and the military allowance, which involves a cost of about £46,000 per annum. Furthermore, the positions of the men are to be kept open for them.

### SECTION OF ROCK ISLAND LEASED

The receivers of the Rock Island Railroad have ended negotiations for leasing to the newly organized Muscatine & Iowa City Railway, Muscatine, Iowa, 104 miles of the Rock Island lines between Muscatine and Montezuma with branches to Iowa City and What Cheer, Iowa. The new company will substitute gasoline-electric motive power for steam power, and will furnish both a passenger and a freight service to twenty-two cities and villages. Arrangements have been made with the Iowa Railway & Light Company, Cedar Rapids, Iowa, whereby a portion of its line will be used for entrance into the business district of Iowa City. The new organization was formed by business men of Muscatine, Iowa City, Wellman and Montezuma. A. D. Bowen, Muscatine, has been elected president.

**Boston (Mass.) Elevated Railway.**—Authority to issue \$3,286,000 of additional bonds is asked by the Boston Elevated Railway in a petition filed with the Massachusetts Public Service Commission. The bonds are to provide for construction and equipment, floating debt and property.

**Boston & Maine Railroad, Boston, Mass.**—The annual report of the Boston & Maine Railroad for the year ended June 30, 1915, covers the operations of the two owned electric railway branches, the Portsmouth (N. H.) Electric Railway and the Concord & Manchester (N. H.) Electric Branch, and the one leased line, the Conway (Mass.) Electric Street Railway. The combined operating revenues of these first two lines for the last fiscal year were \$250,889, a decrease of \$14,930 as compared to \$265,819 in the pre-



ceding year. The total operating expenses increased from \$177,685 to \$185,575, an amount of \$7,890, so that the net revenue decreased by \$22,820 from \$88,133 to \$65,313. The number of passengers carried decreased from 5,204,740 to 4,916,019, or 288,721, and the number of car miles run from 1,134,386 to 1,090,202, or 44,184. The operating revenue of the Conway Electric Street Railway decreased slightly from \$11,346 in 1914 to \$11,107 in 1915, but the operating expenses increased from \$9,786 to \$16,006, resulting in a deficit of \$4,899 in net revenue for 1915, as compared to a plus item of \$1,560 for 1914.

**Chicago & Milwaukee Electric Railroad, Highwood, Ill.**—Judge Landis in the United States District Court recently entered an order authorizing W. O. Johnson, receiver Chicago & Milwaukee Electric Railroad, to issue receiver's certificates for the construction of a bridge to cost \$40,000. The certificates are to bear interest at the rate of 5½ per cent.

**Choctaw Railway & Lighting Company, McAlester, Okla.**—L. E. Fischer and Allen Wright have been appointed receivers of the Choctaw Railway & Lighting Company. This act is the result of a suit filed by the Guaranty Trust Company, New York, to foreclose on a mortgage covering \$894,000 of outstanding bonds, mentioned in the ELECTRIC RAILWAY JOURNAL of Oct. 9.

**Columbia Railway, Gas & Electric Securities Company, Columbia, S. C.**—Redmond & Company, New York, are offering at 99½ and interest convertible 6 per cent secured gold coupon notes, series B, of the Columbia Railway, Gas & Electric Securities Company. These notes are dated April 1, 1915, and are due on Oct. 1, 1917. They are convertible at the option of the holder, on any interest date at ten days' notice, into an equal par value of deposited first mortgage bonds and \$120 in cash per note, making the net cost of the bond 88 (a 5¼ per cent basis). The notes are secured by the deposit of first mortgage 5 per cent bonds of the Parr Shoals Power Company, guaranteed principal, interest and sinking fund by the Columbia Railway, Gas & Electric Company, each \$1,000 note being secured by \$1,350 par value of bonds. The Columbia Railway, Gas & Electric Securities Company is a subsidiary of this guarantor company, organized for the purpose of selling securities.

**Humboldt Transit Company, Eureka, Cal.**—The California Railroad Commission on Oct. 4 issued an order authorizing the Humboldt Transit Company to issue to William Butterworth a one-year promissory note for \$4,000 at 5 per cent and to pledge as collateral security therefor \$8,000 of first mortgage 5 per cent sinking-fund thirty-year gold bonds.

**Long Island Railroad, New York, N. Y.**—Because the operating companies (the Interborough Rapid Transit Company and the New York Municipal Railway Corporation) have challenged the right of the Public Service Commission for the First District of New York under the dual system contracts to compel them to operate leased private roads, the commission has asked its counsel to give an opinion relative to the proposition of the Long Island Railroad to lease to the city its Whitestone and Little Neck branches. These lines were to be operated by the two companies as extensions of the Corona elevated line. The commission has also requested the Board of Estimate and Apportionment to take up this matter, to the end that the corporation counsel's opinion can also be obtained. The Long Island Railroad on Sept. 30 offered to rent these branches to the city at \$125,000 per annum, plus certain additional charges, for a term of ten years, with the privilege of a ten-year renewal. Previous reference to this matter was made in the ELECTRIC RAILWAY JOURNAL of April 17, May 15 and Oct. 16.

**Los Angeles & San Diego Beach Railway, San Diego, Cal.**—The Los Angeles & San Diego Beach Railway has received permission from the California Railroad Commission to sell bonds of the par value of \$370,000 before Nov. 15, 1916. The company received authority on Nov. 25, 1914, to issue \$375,000 of bonds, but it has sold only \$5,000 of them.

**Memphis (Tenn.) Street Railway.**—Transcripts of the records of two big damage suits from the United States

District Court at Memphis were filed by the Memphis Street Railway in the United States Circuit Court of Appeals at Cincinnati on Oct. 11. S. C. Moore and E. O. McCoy had brought suits against this company for damages because of injuries received when a street car collided with a train on the Illinois Central Railroad. The jury awarded them \$25,000 and \$20,000 respectively. Motions for new trials were filed, but the court issued an order overruling them, provided the plaintiffs would accept remittitur to \$17,500 and \$12,500 respectively, which they did. The company then appealed on error from the judgment of the United States District Court.

**Metropolitan Street Railway, Kansas City, Mo.**—The receivers of the Metropolitan Street Railway filed in the Federal Court at Kansas City on Oct. 26 a statement including the report of the managers of the reorganization plan, showing that about 98 per cent of the securities holders had agreed to Judge Hook's plan. It is expected that Judge Hook will formally take up within a few days the disposal of the receivership, and the inception of the ownership of the property by the Kansas City Railways, the company provided for in the new franchise. The report of the committee was signed by Kuhn, Loeb & Company, Lee, Higginson & Company and Blair & Company, and by H. L. Stuart representing Judge Hook.

**Monongahela Valley Traction Company, Fairmont, W. Va.**—The Monongahela Valley Traction Company has declared a quarterly dividend of 1¼ per cent on its preferred stock, payable on Nov. 2 to stock of record on Oct. 27. In the past the company has paid semi-annual dividends of 2½ per cent, but from this time on dividends will be declared quarterly at the regular 5 per cent rate.

**New York (N. Y.) Municipal Railway Corporation.**—The Public Service Commission for the First District of New York has granted permission to the New York Municipal Railway Corporation to issue \$20,000,000 of 5 per cent sinking-fund gold bonds under its \$100,000,000 mortgage to the Central Trust Company dated July 1, 1912. The application for this issue was noted in the ELECTRIC RAILWAY JOURNAL of Oct. 23. The bonds will be sold at not less than 97, and will mature on Jan. 1, 1966. They are to be redeemable at 107½ on any semi-annual interest date, and are to be amortized before maturity by the sinking fund provided for in the terms of the mortgage. All the bonds must be sold before Jan. 1, 1916.

**Pacific Gas & Electric Company, San Francisco, Cal.**—The California Railroad Commission has issued an order authorizing the Pacific Gas & Electric Company to acquire, and the trustees in liquidation of the West Sacramento Electric Company to transfer all the property formerly owned by the latter company. The application for this sale was made by the trustees of the West Sacramento Electric Company, who stated that the Pacific Gas & Electric Company had already acquired and paid for all the capital stock. The authorization for the stock purchase was noted in the ELECTRIC RAILWAY JOURNAL of Aug. 14. The Pacific Gas & Electric Company already owns and operates the electric railway lines in the territory served by the purchased company.

**Philadelphia Company, Pittsburgh, Pa.**—Charles Hayden has been elected a director of the Philadelphia Company and the Duquesne Light Company.

**Public Service Corporation of New Jersey, Newark, N. J.**—A gain of more than 5 per cent in gross business for September, 1915, over the corresponding month of last year is shown in the financial statement just issued by the Public Service Corporation of New Jersey. The gross figures cover the corporation's railway, gas and electric business. To be exact, the gross increase in total business for last September was \$162,430, a percentage of increase of 5.3 per cent over September, 1914. The balance available—after payment of operating expenses, fixed charges, sinking fund requirement, etc.—for amortization, dividends and surplus, was \$411,444, and the increase in surplus available for dividends was \$48,819. For the nine months ended Sept. 30, 1915, the gross increase in total business was \$968,712, a percentage of increase of 3.7 per cent. The balance available for amortization, dividends and surplus was \$2,506,391,

and the increase in surplus available for dividends was \$194,202.

**Quebec Railway, Light, Heat & Power Company, Quebec, Que.**—The gross earnings from operation of the Quebec Railway, Light, Heat & Power Company for the year ended June 30, 1915, were \$1,548,096 as compared with \$1,531,221 in 1914, an increase of \$16,875. After adding miscellaneous income of \$235,978, the total revenue from all sources amounted to \$1,784,074, an increase of \$17,076. The operating and maintenance expenses were \$924,817 as compared to \$913,101, an increase of \$11,716. The fixed charges and taxes of all kinds totaled \$739,482, leaving a net surplus of \$119,775. This, added to that of last year, made a total surplus to date of \$347,499. The report states that the properties of the company and its various subsidiaries have been maintained on the usual basis, \$193,898 having been expended on maintenance account during the year.

**Sacramento Valley Electric Railroad, Dixon, Cal.**—In the foreclosure suit of S. H. Palmer and A. D. McBride, contractors against the Sacramento Valley Electric Railroad, Judge O'Donnell has rendered judgment for \$27,388 in favor of the plaintiffs. Roscoe M. Griffin has been appointed commissioner to sell the property and satisfy the judgment. The line at present consists of a 12-mile unit operated under lease by the Oakland, Antioch & Eastern Railway from Dixon to Dixon Junction. This unit is a part of the electric line planned from Red Bluff, Tehama County, through Willows, Glenn County, and Woodland, Yolo County. Inability to collect on stock subscriptions on account of financial conditions for the last few years is the cause of the non-payment on the cost of contract.

**San Francisco-Oakland Terminal Railways, Oakland, Cal.**—In addition to the issues noted in the ELECTRIC RAILWAY JOURNAL of Sept. 11 and Oct. 23, the San Francisco-Oakland Terminal Railways is now paying deferred interest on September coupons of the Oakland Transit Company first 6's and the Twenty-third Avenue Electric Railway first 6's and on July coupons of the East Shore & Suburban Railway first 5's.

**Scioto Valley Traction Company, Columbus, Ohio.**—At the annual meeting of the Scioto Valley Traction Company Sylvio Casparis was elected a director to succeed the late George D. Eustis. The report for the year ended June 30, 1915, showed a decrease of \$22,526 in gross earnings, which was offset to some extent by a decrease of \$13,000 in operating expenses and taxes. The final net income for the year available for dividends was \$97,421, of which \$75,000 was paid out in preferred dividends, leaving a balance of \$21,446 for the common stock, a decrease of \$9,608. The profit and loss surplus on June 30, 1915, aggregated \$188,985.

**Seattle (Wash.) Municipal Street Railway.**—Seattle's municipal lines, Divisions "A" and "C," were operated during September at a loss of \$2,977. The revenues of Division "A" amounted to \$1,699, while the cost of operation was \$1,994. An addition for interest made the total loss for this line \$1,918. It cost \$2,462 to operate the Lake Burien line, Division "C," while the revenues amounted to \$1,403, making a loss of \$1,059.

**Stockton Terminal & Eastern Railroad, Stockton, Cal.**—It is reported that an assessment of \$10 a share, delinquent on Nov. 10, has been levied on the stock of the Stockton Terminal & Eastern Railroad.

**United Railways Investment Company, San Francisco, Cal.**—Benjamin Altheimer, St. Louis, Mo., has been elected a director of the United Railways Investment Company to succeed Emil Loeb, resigned. The committee of directors which was appointed at the annual meeting in 1914 to readjust finances has reported that owing to prevailing conditions it was not able to accomplish anything, and it has been discharged.

**Wilmington & Philadelphia Traction Company, Wilmington, Del.**—The Wilmington & Philadelphia Traction Company has secured control of the Wilmington, New Castle & Delaware City Railway, which operates a 10.5 mile line between New Castle and Delaware City. This purchase, together with that of the Wilmington Southern Traction Company, noted in the ELECTRIC RAILWAY JOURNAL of Oct. 9, places all the trolley lines south of Wilmington in the

hands of the Wilmington & Philadelphia Traction Company. Plans of the incoming management include the general improvement and speeding up of the service. The line from New Castle to Delaware City, heretofore operated on the storage-battery system, will be converted to the overhead type of construction, and the entire line from Wilmington to Delaware City will receive extensive improvements. Under the new plan the system will operate from Darby, along the Delaware River, through Eddystone, Chester, Marcus Hook, Wilmington and New Castle to Delaware City, as well as on the line in Media and the lines connecting Media with Chester and Philadelphia.

#### DIVIDENDS DECLARED

Bangor Railway & Electric Company, Bangor, Me., quarterly, one-half of 1 per cent, common.

Brazilian Traction, Light & Power Company, Ltd., Toronto, Ont., quarterly, one-half of 1 per cent, ordinary.

Cape Breton Electric Company, Ltd., Sydney, N. S., 3 per cent, preferred; 1½ per cent, common.

East St. Louis & Suburban Company, East St. Louis, Ill., quarterly, three-fourths of 1 per cent, preferred.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., quarterly, 1½ per cent, preferred.

Lincoln (Neb.) Traction Company, quarterly, 1½ per cent, preferred.

Montreal (Que.) Tramways, quarterly, 2½ per cent, common.

Tampa (Fla.) Electric Company, quarterly, 2½ per cent.

#### ELECTRIC RAILWAY MONTHLY EARNINGS

##### BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Aug., '15	\$91,619	*\$67,116	\$24,503	\$16,964	†\$7,680
1 " " '14	100,430	*73,836	26,594	17,185	†9,694
2 " " '15	182,862	*129,298	53,564	33,986	†19,839
2 " " '14	198,084	*154,765	43,319	34,106	†9,608

##### CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., Aug., '15	\$312,737	\$14,567	\$298,170	\$40,833	\$257,337
1 " " '14	264,881	12,300	252,581	40,833	211,748
12 " " '15	4,051,578	155,846	3,895,732	490,000	3,405,732
12 " " '14	3,671,480	100,015	3,571,465	346,443	3,225,022

##### CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO

1m., Aug., '15	\$43,453	*\$20,138	\$23,315	\$10,974	\$12,341
1 " " '14	43,789	*23,374	20,415	11,388	9,027
8 " " '15	267,845	*148,328	119,527	87,784	51,733
8 " " '14	276,140	*147,129	129,011	88,416	40,595

##### HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

1m., Aug., '15	\$427,195	*\$191,113	\$236,082	\$212,031	\$24,051
1 " " '14	424,660	*184,753	239,907	211,549	28,308
2 " " '15	855,110	*381,045	474,065	423,238	50,827
2 " " '14	863,480	*368,015	495,465	426,824	68,641

##### LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

1m., Aug., '15	\$144,480	*\$81,033	\$63,447	\$36,209	\$27,238
1 " " '14	156,219	*84,494	71,725	35,944	35,781
8 " " '15	906,050	*594,432	311,618	288,706	22,912
8 " " '14	966,324	*595,361	370,963	283,433	87,530

##### NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.

1m., Aug., '15	\$46,258	*\$29,936	\$16,322	\$8,000	†\$8,391
1 " " '14	52,391	*32,486	19,905	7,876	†12,080
2 " " '15	96,041	*60,737	35,304	16,000	†19,444
2 " " '14	102,058	*63,425	38,633	15,751	†22,999

##### NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

1m., Aug., '15	\$50,118	*\$38,407	\$11,711	\$41,521	†\$11,300
1 " " '14	42,723	*39,878	2,845	40,729	†16,657
2 " " '15	99,009	*74,580	24,429	83,042	†13,717
2 " " '14	86,150	*83,717	2,433	80,937	†12,871

##### NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

1m., Aug., '15	\$360,055	*\$214,559	\$145,496	\$53,319	\$92,177
1 " " '14	343,543	*201,845	141,698	51,136	90,562
8 " " '15	2,488,442	*1,535,909	952,533	413,588	538,945
8 " " '14	2,416,902	*1,467,650	949,252	403,820	545,432

##### REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.

1m., Sept., '15	\$266,302	*\$153,933	\$112,369	\$58,483	†\$53,999
1 " " '14	244,649	*154,823	89,826	57,250	†32,997
9 " " '15	2,234,921	*1,372,515	862,406	518,131	†345,459
9 " " '14	2,248,108	*1,386,729	861,379	507,361	†355,673

##### TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Aug., '15	\$797,662	\$496,687	\$300,975	\$137,751	†\$163,464
1 " " '14	796,204	493,588	302,836	133,494	†171,498
8 " " '15	6,180,302	4,028,823	2,151,479	1,076,354	†1,090,757
8 " " '14	6,133,344	3,844,788	2,288,556	1,047,961	†1,248,437

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

# Traffic and Transportation

## JITNEY JOTTINGS

### Operators of Jitneys in Brooklyn Required to Apply to Commission—Decision Expected in Philadelphia Case

The Public Service Commission for the First District of New York has notified Marius Jorgenson and the Cook Sight Seeing Company that it will be necessary for them to apply to the commission to continue the operation of jitney lines which they have started in Brooklyn. Mr. Jorgenson is running a line in the Bay Ridge section of Brooklyn, and the Cook Sight Seeing Company is operating a line along Atlantic Avenue, from Nostrand Avenue to Flatbush Avenue. The commission has already approved the application of one company to operate jitneys in Greater New York. This was the application of the Far Rockaway Transportation Company, Inc., dated July 15, 1915. The company started the operation of three routes in and around Far Rockaway.

The threatened civil proceedings to be brought by the Philadelphia City Solicitor's office to recover the fines and costs imposed by magistrates on drivers of automobiles arrested for violating the jitney ordinance has been stayed by an order made by Judge Patterson, in the Quarter Sessions Court. Harry M. Berkowitz, an attorney, appealed from the summary conviction of Charles Helig before Magistrate Beaton. Helig was arrested on Oct. 4 and fined \$5 and costs by the magistrate. He was unable to pay the penalty and the magistrate discharged him, it being stated that civil suits would be begun by the City Solicitor against all individuals arrested under similar circumstances who refused to pay their fines. Judge Patterson decided not to hear the appeal at this time for the reason that he is preparing an opinion in another case which would probably cover all the points to be raised on this appeal. It is expected that the opinion referred to will settle the heretofore confused status of the jitney in Philadelphia.

The Supreme Court of Tennessee has upheld the law passed by the Legislature last winter providing that previous to operation jitney lines must secure a municipal franchise and file indemnity bonds with the state.

The San Joaquin Light & Power Corporation on Oct. 15 put in service a fleet of automobiles to supplement the service of its street car system. The machines are to be replaced later, it is reported, by ten-passenger motor buses. The service is in districts hitherto dependent upon jitneys.

Judge Thornton W. Sargent of the District Court of Sedgewick County, Kan., recently held valid Wichita's ordinance regulating jitneys, and dissolved an order restraining the city officials from enforcing the ordinance. The ordinance requires jitney owners to pay licenses ranging from \$25 to \$50 a year, according to the capacity of the car. A further provision is that if the jitneys are to operate on streets where there are street car lines, the licenses shall range from \$300 to \$400 a year. The ordinance was contested on the ground that it was discriminatory because it exacted a greater license for the jitneys on streets where there were car tracks than on streets unoccupied by such tracks. The court held that there was no discrimination among jitney owners, and that the purpose to protect the street car business was laudable and proper.

No decision has been rendered by the Eleventh District Court in the case of the Houston, Tex., jitney ordinance. This ordinance is temporarily restrained by injunction, but 200 operators had paid the yearly license fee of \$72 before the injunction was granted. These operators claim that the ordinance is beneficial to the business and should be strictly enforced. Other jitney men who are contesting the ordinance are operating in competition with those who have paid the license fee, claiming that it is impossible to operate under the ordinance at a profit. If the court upholds the ordinance it will doubtless be amended to require an indemnity bond. The City Commission has been advised by an insurance company that a bond protecting both passengers and pedestrians to the extent of \$2,500 would be written for \$225 a year. For a premium of \$150 a year the company will write a bond for pedestrians only.

## FIRST JITNEY CASE BEFORE NEW YORK PUBLIC SERVICE COMMISSION

### Commission Lays Down the Principles Which Will Govern It in Future Applications

The principles which guided the Public Service Commission of the Second District of New York in granting certificates for four of the six jitney routes provided for in the franchises granted in New Rochelle, to which brief reference was made in the *ELECTRIC RAILWAY JOURNAL* of Oct. 22, page 890, were as follows:

The duty of the commission to protect already established utilities under its jurisdiction from unnecessary competition is reiterated.

It is held that the commission's duty to the public, entitled at least to some individual liberty in their choice of means of transportation, should come before its duty to protect vested capital except where such choice would lead to competition surely ruinous to interests which the public assumes to regulate.

It is recognized that owing to recent improvements in automobile construction and maintenance of public highways the motor-bus line rather than the trolley will be the relief sought by persons residing away from existing trolley lines who desire transportation facilities.

The four routes authorized run on the same streets with existing trolley lines only for the short distances necessary to reach the New Haven Railroad station, which, due to the commuting nature of New Rochelle's population, is the heart of its urban transit system; with this exception they run on other streets, many of them not parallel to and many some distance away from existing trolley lines. This is held not to be competition which the commission should prevent, but a healthy growth toward the further development of the community tending to aid rather than to hurt the existing transportation agencies. In other words both "convenience" and "necessity" are held to have been proved in the case of these routes.

The two routes for which certificates are refused would have run parallel to and on the same streets with existing trolley lines through their entire route, and through a territory sparsely built up by persons of wealth many of whom maintain their own private means of transportation. While it is held that the contention of the applicant, that the increased facilities provided by his bus lines would help develop this territory and add to the convenience of its inhabitants might have been sustained, no proof was adduced of the "necessity" of these lines and their authorization was refused.

The commission refuses to pass upon the validity of the franchise as it may be affected by the contention of the trolley corporation that it was irregularly advertised or as to the manner in which the action of the commission in approving some and disapproving other routes may affect the validity of the franchise. The opinion confines the decision specifically to the question of the public convenience and necessity of the routes proposed and leaves other questions to "other tribunals."

The provisions of the franchise for these lines which Commissioner Emmet mentions as "designed to be of benefit to the local traveling public" are that the buses shall seat from ten to seventeen persons; that they shall be of the pay-as-you-enter type; that they shall have pneumatic tires; that they shall be kept in good condition and that all passengers shall have seats; that the fare for any continuous ride on any route shall be 5 cents; that children under five and policemen and firemen on duty shall be carried free; that buses shall run on at least a twenty-minute schedule from 6.30 a. m. to 1.30 a. m., that the franchise shall expire in ten years; that 3 per cent of the gross earnings shall be paid quarterly to the city; that a bond shall be given to insure prompt payment of this and other obligations; that the buses shall stop upon signal at the near side of street crossings, and shall be subject to present and future traffic regulations of the city, and that the franchise shall be forfeited in the event of the insolvency of the holder or of failure to operate the system in accordance with the terms of the franchise.

As to the position of the commission with regard to the

prevention of undue competition with already established utilities, Mr. Emmet says:

"That it (Westchester Electric Railroad) and all other companies similarly situated, are entitled to such protection up to a certain point is a fact beyond any possible question. It was one of the wise and just provisions of the public service commissions law to vest in the commission requisite authority to prevent wasteful and unprofitable competition between privately-owned enterprises engaged in any public utility field. The reasons for doing this were obvious. The people of New York State in their collective capacity have not as yet seen fit to engage largely in any form of government-operated utility enterprise. Individual courage, energy, foresight and a willingness on the part of private investors to risk large sums in bringing modern conveniences within the reach of all men—these have been the only agencies through which, speaking generally, it has hitherto been possible for the people of the State of New York to enjoy the benefits attaching to such necessities of modern life as improved transit, lighting, telephonic and telegraphic facilities. Doubtless, therefore, when it passed the public service commissions law, the Legislature included among its provisions the one we are discussing very largely from a sense of fairness to the private interests already engaged in these fields of work."

Speaking of the effect of this case on future applications to the commission, Mr. Emmet's opinion says:

"Broadly speaking what must guide the commission in all such cases is an enlightened view of what will best, in the long run, serve the public at large. In the last analysis, the protection of investments which have already been made in public utility enterprises in good faith, will be seen to harmonize pretty well with the idea that the public ought always get the benefit of the very best there is in the way of transportation and other similar facilities. The best there is, in the most cases, can probably be most certainly achieved through the policy of protecting our well-managed public service corporations from the sort of competition that in the end leads to the bankruptcy of both competitors to the ultimate injury of the public itself."

#### KEEPING RAILWAY EMPLOYEES ALERT

Reliability of service resulting in practically 100 per cent efficiency in keeping trains on time has been obtained by the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., by frequent checks on the employees' alertness. Subject to the order of the superintendent, power may be cut off the line for a thirty-second interval at any time. The superintendent issues an order to the dispatcher, who in turn promptly transmits it to the chief engineer of the power house. The promptness with which the chief engineer responds to the order is made a matter of record, and all way stations along the line are required to report immediately the exact time power was cut off. If any of these agents fail to report, an explanation is required. This check assures the superintendent that all way-station agents are alert and on duty and that the power-house crew is ready on short notice to meet any emergency.

The automatic block signals between Gary and South Bend, a distance of 59 miles, afford a similar check on the trainmen. These checks are also made by the superintendent, who always carries a device for short-circuiting a signal, thus allowing the blade to drop to the stop position. This check also includes extinguishing the signal lamp, a condition which has been found difficult for motormen to observe at any considerable distance from the signal, and particularly when the roundel is within the range of the headlight. Efficiency of signal observation is tested once each month, and since the first few times the tests were applied and men were reprimanded, the superintendent has found that the percentage of observations is perfect. The signal in the stop position also tests the dispatcher, who under no condition is authorized to issue an order to the crew to disregard the signal. The dispatcher, however, is permitted to authorize the crew to proceed, but in accordance with the rule which provides that when a signal is in the stop position and no regular meet is scheduled nor order issued for a meet at that point and the telephone is out of order, a train may proceed to the next clear signal

at a speed not to exceed 15 m.p.h. These checks on the alertness of the employees and their adherence to the rules have served materially to increase the efficiency of the service.

#### FOUR-CENT TICKETS TO BE DISCONTINUED IN THE CITY OF FORT SMITH

The Fort Smith Light & Traction Company, Fort Smith, Ark., has published over the signature of H. C. Hoagland, general manager, the following statement announcing the decision of the company to discontinue the sale of 4-cent tickets on its lines:

"This company has for many years sold twenty-five street car tickets for \$1, or at the rate of 4 cents each. It is necessary to withdraw this privilege, and it is due our patrons that the company give the reasons which have compelled this reluctant decision.

"The principal reason for the sale of tickets at a reduced rate is to increase travel—to induce those who would not otherwise use the cars to do so in order that vacant space be occupied. Railroads on the same principle sell excursion, commutation and 1000-mile tickets at lower rates than their fixed ones.

"The sale of tickets is not increasing the travel on the street cars. Our records show that for the seven months of this year only 15.14 per cent of all pay passengers used tickets, and on the Eleventh Street line only 11.65 per cent used them. If the company was making money under the present rates, it would not withdraw this privilege, but it, like most other business enterprises, is suffering from the general depression, and from other causes.

"The increase in the use of automobiles for pleasure, business and as public utilities, is cutting into street car receipts all over the country. Prohibition has curtailed travel to Fort Smith; it may be argued that it was an undesirable travel, but it did exist, and now it does not exist.

"For two years a 2-cent per mile rate prevailed on the Iron Mountain to and from Van Buren and a 3-cent rate to and from Fort Smith, owing to the trains making an interstate journey to reach and leave the city. To avoid paying the 3-cent rate, the travel on that road largely bought transportation to and from Van Buren and used the street cars between the cities. After this company lost the use of the bridge, the railroad largely retained this travel; and now, should the company again use the bridge, it would only be partially restored, as the railroad has through an injunction secured a restoration of the 3-cent rate.

"The loss of the use of the bridge, and the consequent diversion of much travel over it to railroads, taxis and jitneys, has also cut into the receipts of the company, while not diminishing the expenses.

"Irrespective of this analysis, the figures are the vital facts: The year 1912 was the high tide of the company's business. The gross receipts from the street cars that year were \$226,250. In 1914 (notwithstanding the company still had the use of the bridge) they fell to \$192,368, while the operating expenses fell only \$8,347, a net loss of \$25,535. For the first seven months of 1915, the gross receipts were \$85,875, or at the rate of \$147,212 for the year.

"The operating expenses—and by that is meant bare expenses of operation and taxes (not including fixed charges for interest, dividends on preferred or common stock, or depreciation) did not fall in like proportion because the service maintained and the up-keep of the property, notwithstanding rigid economy, did not permit it.

"For seven months of 1915 the net receipts—only deducting expenses of operation and taxes from its gross receipts—were \$4,337, or at the rate of \$7,504 for the year—a sum insufficient to meet depreciation alone, to say nothing of interest or return on the investment.

"The company has only once paid a dividend on its common stock, and that was in 1911, and has paid no dividend on its preferred stock since April, 1913. It is apparent that the company must increase its gross receipts as it cannot decrease its expenses without impairment of its service, and it feels that the public is entitled to the best service its resources permit. For these reasons, much to our regret and owing to causes over which we have no control, 4-cent tickets will not be sold hereafter."

### WISCONSIN COMMISSION LIKELY TO CALL FOR SUBMISSION OF OPERATING RULES

On Oct. 21 the Railroad Commission of Wisconsin held a formal hearing at the capitol in Madison on the subject of rules for the operation of electric railroads and standards for certain features of construction which affect the adequacy and safety of the service rendered. While the commission used as a basis for the discussion the standard city and interurban codes of the American Electric Railway Association, Commissioner Walter Alexander indicated that the commission probably would not enter an order establishing any set of rules as standard for all roads in Wisconsin.

Only those rules directly affecting safety and adequacy of service were discussed, and it developed that practically all roads wanted substantial modifications of the rules to fit local conditions. This was particularly true of the smaller roads which operate low-speed interurban service without written train orders or regular dispatchers. Opinion of the Wisconsin operating men on the question of color signals, whistle and bell signals, markers and flags was divided.

The subject of car steps, platforms, doors, etc., was discussed at some length. The tentative suggestion of the commission that the first step should not exceed 15 in. above the rail for both city and interurban cars met considerable opposition. The one-man car was given some prominence by the fact that the commission recognized its use and asked for a full discussion of the subject in view of its probably further use throughout the State.

Commissioner Alexander indicated that the commission would probably enter an order requiring each company to submit its operating rules for approval and requiring each company to submit plans for all new and remodeled cars for approval. In this manner the local conditions could be considered in each case.

### TRENTON FARE HEARING BEGUN

#### Case in Which Trenton & Mercer County Traction Corporation Seeks to Substitute Five-Cent Fare for Six Tickets for a Quarter

The case of the Trenton & Mercer County Traction Corporation, Trenton, N. J., before the State Board of Public Utility Commissioners, in which the company is seeking to abolish the sale of strip tickets at the rate of six for a quarter and to substitute a straight 5-cent fare, was begun before the board at Trenton on Oct. 25. With former Mayor Frank S. Katzenbach as its counsel, the company opened its case by the submission of testimony on the part of Rankin Johnson, the president of the corporation. The city of Trenton is represented by City Counsel Charles E. Bird and George L. Record as special counsel. Frank Sommer appears as counsel for the Public Utility Board. The reasons advanced by Mr. Johnson for the change may be summarized as follows:

1. A 5-cent rate of fare is the customary rate, not only in New Jersey, but elsewhere.
2. The franchises of the company provide for a 5-cent rate of fare, and when the principal franchise was granted in 1894 the company assumed many additional obligations.
3. The gross receipts should be sufficient to meet the requirements of operation, maintenance charges, replacements, return on capital invested, and investments for extensions. The public demand a constantly increasing standard of service.
4. The gross receipts were not sufficient to meet the operating expenses, maintenance and other charges.

Mr. Johnson said that the practice used in securing the basis for fixing the rate was to consider the cost of reproduction with reasonable allowances for charges that do not appear and also the value of the proposition as a going concern.

The company then introduced into the record the report made to the Board of Public Utility Commissioners in 1910 by Inspector Philander Betts of the commission. This report was made at the time the Trenton & Mercer County Traction Corporation applied to the board for the approval of the

leases by which it took over the Trenton Street Railway, Trenton, Hamilton & Ewing Traction Company, Mercer County Traction Company and the Trenton, Pennington & Hopewell Railroad. It was upon this report that the utility board approved the leases. The report was admitted as evidence in the case with the distinct understanding that it was accepted merely as the report of Inspector Betts, giving his conclusions as to the valuation of the properties, and was not to be taken in any sense as the finding of the board as to the valuation.

At the continuation of the case on Oct. 26 there were many tilts between counsel as to the details that should be permitted to be entered in the record. Mr. Johnson testified that in 1914 the total receipts of the company were \$776,548 and the operating expenses, replacements, taxes and pay-rolls \$523,861. Since 1910 the company had expended \$821,833 in improvements.

**Prizes Awarded for Illinois Traction Scenarios.**—Mrs. Rose Marion Boylan, East St. Louis, Ill., won the first prize of \$10 for the best scenario woven about the work of the Illinois Traction System. Mrs. George Alfs, Peoria, Ill., won the second prize of \$5. The title of the first scenario was "Interest on a Loan," and the subject of the second prize was "The Elopers."

**Chicago Service Order Before Court.**—The Corporation Counsel of Chicago, Ill., filed suit on Oct. 28 in the Circuit Court before Judge Baldwin against the Illinois Public Utilities Commission and the Chicago Surface Lines praying for a temporary restraining order to prevent the railway from complying with the service order recently issued by the commission and summarized in the ELECTRIC RAILWAY JOURNAL of Oct. 9, page 775.

**Reduction in Round-Trip Fare.**—The Puget Sound Electric Company, Tacoma, Wash., has filed an emergency tariff with the Public Service Commission of Washington which reduces the round-trip fare between Tacoma and Puyallup from 40 cents to 25 cents. The 25-cent rate will also apply to any of the midway stations where the round-trip fare now exceeds 25 cents. The reduction will place the fare at the prices of two years ago. The return to the fare previously in force is said to have been made imperative by the competition of the auto bus.

**Appeal to I. C. C. in Louisville-Indianapolis Case.**—Following the decision of the Interstate Commerce of several months ago by which the commission directed the electric railways operating north into Indiana out of Louisville to divide rates, the Louisville Board of Trade took up the matter of arranging for through shipments of freight north from Indianapolis. Recently it developed that the lines north of Indianapolis and those south of Indianapolis had been unable to agree on the question of divisions of rates. Negotiations between the Louisville Board of Trade and the individual lines north of Indianapolis failed to get results satisfactory to both sides and this question now has been referred to the commission for settlement.

**Noon-Day Shop Meetings in New York.**—The first of the series of regular Thursday noon-day shop meetings to be held during the forthcoming fall and winter season for the benefit of all employees of the Interborough Rapid Transit Company, New York, N. Y., was held on Sept. 30 in Hedley Hall, attached to the recreation rooms at 240th Street. The meeting was conducted by E. Dana Caulkins, who outlined the plan and scope of the proposed work for the coming year, under which the men themselves will have complete charge of all meetings. The noon-day shop meetings are non-sectarian. Music, short talks on current topics, or advice on matters of health, safety first, economy, food, air, etc., are some of the subjects with which the meetings are concerned.

**Reconciling Steam and Electric Freight Rates.**—Revision of the rates on heavy freight out of Louisville, Ky., to points on its lines has been begun by the Louisville & Interurban Railway. This is a revision downward, to put these rates on building materials, such as sand and gravel, lumber, concrete blocks and cement and fertilizer, etc., more nearly on a par with the rates of the steam lines for short hauls out of Louisville. As planned, the reduced rates will still remain higher than those of steam lines at competing

points. Seventy-five per cent of the freight haul of the Louisville & Interurban Railway, however, is main-line un-load, which means service that the steam lines cannot give. Some discussion of industrial trackage is being indulged in by officers of the company.

**The Gong As a Time-Killer.**—That the gong on the front of a car can be made a time-killer as well as a time-saver was the point made by A. F. Connelly, chief inspector of the Louisville (Ky.) Railway, in an address to the trainmen. Mr. Connelly said that such ringing of a gong as will cause resentment on the part of the man driving a wagon or other vehicle on the tracks ahead is a time-wasting practice. The gong, if sounded only as a signal, is generally enough to cause the average driver to pull out, but if the motorman sounds it imperatively and keeps on sounding it after he knows the driver ahead has heard his signal, he is very likely to lose rather than gain. Not only that, but he is likely to be vexed and an accident may result while he is speeding in an effort to catch up with the schedule.

**Additional Transfer Ordered in New York.**—On the recommendation of Commissioner William Hayward, the Public Service Commission for the First District has ordered the Belt Line Railway Corporation and the Forty-second Street, Manhattanville & St. Nicholas Avenue Railroad, New York, N. Y., to exchange transfers in a manner to enable passengers to ride direct through Fifty-ninth Street to and over the Queensboro Bridge to Long Island City. The order is to take effect on Nov. 15. Under the new order it will be possible for a passenger coming south, for instance, on Broadway in a Third Avenue car to transfer at Fifty-ninth Street to the Belt Line car and then retransfer at Third Avenue to the Forty-second Street Manhattanville car, which goes over the bridge. Heretofore this transfer privilege has not been in effect.

**Safety on the Chicago Elevated.**—*Elevated News* for September, published by the Chicago (Ill.) Elevated Railways for the purpose of acquainting the people of Chicago with their elevated railway system, contains a reprint of the article "Safety of Trains on the Chicago Elevated," which appeared in the *ELECTRIC RAILWAY JOURNAL* of Aug. 21. Referring to its train accident record the company says: "During the ten-year period ended Dec. 31, 1914, the elevated railroads carried 1,526,632,751 passengers. During this period two passengers met fatal accidents while on trains. This shows the rate of fatal accidents to passengers on trains as one to every 763,316,375 passengers carried. The aggregate number of train trips made per annum is 1,740,416, or a total of 49,015,593 car miles run. This shows the great volume of train movement and compared with the fatal accident record above stated, indicates that elevated service has fewer accidents than any other method of transportation."

**Suppressing the Rowdy in New York.**—The *New York World* published in its issue of Oct. 24 the second of a series of articles on the suppression of the car rowdy. In introducing the article the *World* said: "The new figures of arrests in car rowdy cases establish the fact of the astounding growth of disorderliness on New York's transit lines. When Sunday rowdyism on subway, elevated and trolleys become so pronounced that 1350 arrests are made for part of a year, as against 622 for the entire year preceding, evidence is not lacking that the special efforts of the police have been made at a time when the conditions were approaching the intolerable. The *World* Sunday, Oct. 17, presented facts showing that thousands of people in New York were forced to remain at home rather than face the dangers incident to travel on the cars when they are commandeered by the rowdy element. It will present further facts bearing on the situation on Sunday, Oct. 31. Police Commissioner Woods, in an authorized statement, tells of the department's efforts to stop the rapidly increasing menace. The number of arrests show that the department is making headway. But before New York's car lines are safe, so that decent citizens may ride to our parks with freedom from insult and attack, further progress must be achieved. 'The police department is after street car rowdyism with all the power at its command,' says the Commissioner."

## Personal Mention

**Mr. Thomas R. Crumley**, who has been superintendent of motive power of the Evansville (Ind.) Railways, has resigned to engage in other work.

**Mr. Ira Berry**, assistant treasurer of the Galveston (Tex.) Electric Company, has been transferred to the treasurer's department of Stone & Webster at Boston.

**Mr. Frank B. Flahive**, assistant treasurer of the Paducah Traction & Light Company, Paducah, Ky., has been transferred to the Galveston (Tex.) Electric Company as assistant treasurer of the company to succeed Mr. Ira Berry.

**Mr. C. C. Long**, electrical engineer of the Reading Transit & Light Company, Reading, Pa., will be relieved of certain duties formerly performed by him by the appointment of Mr. D. S. Miller as manager of power of the company. Mr. Long will continue to report to the president and will devote more of his time to the development of the light and power department. Mr. Long has been with the company twenty-one years.

**Mr. W. H. Ogborn** has been appointed traffic manager of the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., which has announced that it has decided to go into the carload freight business immediately. The line of the company connects with a number of steam railroads in the industrial district bordering on the shores of Lake Michigan southeast of Chicago. Mr. Ogborn will organize a new department to develop the freight business.

**Mr. Glen E. Votaw**, superintendent of the Superior and Mesaba Division of the Great Northern Railway, with headquarters in Superior, Wis., has been appointed superintendent of the Spokane, Portland & Seattle Railway, Oregon Trunk Railway, Oregon Electric Railway and the Columbia & Astoria River Railway to succeed Mr. A. J. Davidson, who has been appointed to the Spokane & Inland Empire Railroad, as noted elsewhere in this column.

**Mr. A. H. Purdy**, who was elected president of the Kansas Public Service Association, successor to the Kansas Gas, Water, Electric Light & Street Railway Association, at the annual meeting of the association in Topeka on Oct. 21, 22 and 23, is general superintendent of the Topeka Edison Company. Mr. Purdy has been connected with the company since he was sixteen years old. He was made secretary and assistant treasurer of the company in 1905 and was promoted to the office of general superintendent of the company in 1910.

**Mr. A. J. Davidson**, superintendent of the Spokane, Portland & Seattle Railway, with headquarters in Portland, Ore., will become superintendent of the Spokane & Inland Empire Railroad and the Spokane (Wash.) Traction Company on Nov. 1 to succeed Mr. E. E. Lillie, who is to be transferred. In addition to being superintendent of the Spokane, Portland & Seattle Railway, Mr. Davidson is superintendent of the Oregon Trunk Railway, Oregon Electric Railway, United Railways, Portland, and the Columbia & Astoria River Railway.

**Mr. D. S. Miller** has been appointed manager of power and lines covering the properties of the Reading Transit & Light Company, Reading, Pa., and its affiliated companies. Mr. Miller was graduated from the Pennsylvania State College in the class of 1900 as an electrical engineer. He spent a year with the General Electric Company in the testing department and on outside construction work and later on with the Sprague Electric Company, New York, as erecting engineer. For about three years he was with the Boston (Mass.) Elevated Railway as assistant engineer. He has been with electric properties controlled by the New York, New Haven & Hartford Railroad for the last nine years, these lines embracing electric railways in Connecticut, Massachusetts, Rhode Island and part of New York State. During his connection with the New York, New Haven & Hartford Railroad he was for three years assistant superintendent of power and lines, for two years was electrical engineer and was supervisor of power and lines of the company's electric railway properties when leaving New Haven to assume his new work in Reading.

Mr. H. C. Mason, general manager of the Benton Harbor-St. Joe Railway & Light Company, Benton Harbor, Mich., one of the pioneers in the electric railway and lighting field of the Central West, has resigned, effective on Dec. 1, 1915. Mr. Mason was born in Mason County, Ky., in 1860, and began his street railway career in 1881 as a conductor with the old Newport & Dayton Railway, Dayton, Ky., a horse-car line 3 miles in length. Later he was advanced to superintendent, and on this property he began his business association, with Mr. W. Worth Bean. In 1889 Mr. Bean sold his interest in the Dayton property, now a part of the South Covington & Cincinnati Street Railway, and purchased an old horse-car line in Benton Harbor, Mich., the original Benton Harbor & St. Joe Railway. Soon after taking hold of this property Mr. Mason was made superintendent, and he installed an electric lighting system which since has been extended so that it now supplies electricity to practically all of Berrian County, Mich. In 1892 the horse-car line was electrified under Mr. Mason's supervision and, from time to time, the city lines were extended until they now include 25 miles of track. Later the street railway lines were built beyond the city limits and in time, formed the 50-mile interurban system which now is a part of this property. In 1906 Mr. Bean and Mr. C. B. Holmes, Chicago, sold this lighting and railway property to the C. K. Minary interests. Mr. Mason continued with the property and was made manager. In recent years the Michigan Fruit Belt district has grown rapidly, and a large share of the fruit has been transported over the interurban lines of the Benton Harbor-St. Joe Railway & Light Company to connecting railways and boat lines. Shortly after Mr. Mason's resignation takes effect he will leave for California, where he has a home in Alhambra, and after an extended vacation he will again return to active railway work.

Mr. D. A. Hegarty has resigned as general manager of the Houston Lighting & Power Company 1905, effective on Nov. 1, having been elected president of the Texas Southern Electric Company, Houston, Tex., which operates a number of electric light and power, gas, ice and cold storage plants in Texas. Mr. Hegarty was born in Philadelphia and was educated at the University of Pennsylvania. Leaving the University to become affiliated with the engineering department of the Pennsylvania Railroad, he passed through the various grades of service until he became assistant engineer of construction. He resigned from that position to become associated with Mr. A. Langstaff Johnston in charge of the work of electrifying the railways in Philadelphia. Mr. Hegarty was engineer in charge of construction and became general manager and chief engineer of the Hestonville, Mantua & Fairmount Passenger Railway. When the companies in Philadelphia were merged Mr. Hegarty resigned and accepted a position with the Norfolk (Va.) Railway. He next became manager of the Railways Company General, an operating and construction company with railways, electric light and gas plants in Michigan, New York and Pennsylvania. Resigning from this position Mr. Hegarty became vice-president, treasurer and general manager of the Little Rock Railway & Electric Company, Little Rock, Ark., and was transferred from Little Rock to the management of the railway and lighting department of the New Orleans Railway & Light Company and thence to the general managership of the Houston Lighting & Power Company in 1905. In 1913 he was elected president of the American Electric Railway Transportation & Traffic Association. He is a member of the National Electric Light Association and is a committeeman on the wiring committee of that body. He is also chairman of the illuminator committee of the No-Tsu-Oh Association of Houston, Tex.

#### OBITUARY

William C. Hudson, political writer and author, is dead. Governor Cleveland secured his appointment as secretary of the State Board of Railroad Commissioners in 1883. He is said to have been one of the first to urge the theory that competition is not necessarily an advantage to the community; that it needs to be checked as often as it needs to be encouraged, and that a money-making railroad is the only sort that ever gives public satisfaction in its service. Mr. Hudson held his place on the commission from 1883 to 1894.

## Construction News

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

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

#### RECENT INCORPORATIONS

\*Patterson & Western Railroad, San Francisco, Cal.—Incorporated in California to construct a railway in Santa Clara and Stanislaus Counties, R. J. Pratt, 3388 Clay Street, San Francisco, is interested.

#### FRANCHISES

Anniston, Ala.—The Alabama Power Company has received a thirty-year franchise from the Council to construct an extension of its line from Sixth and Lapsley Streets to the Anniston Country Club.

Montgomery, Ala.—The Montgomery Light & Traction Company has asked the Council for a franchise to extend its line from the Day Street terminus west to the city limits.

Stockton, Cal.—The Tidewater Southern Railway's application for a franchise to construct a line on Sutter Street from Hazelton Avenue to Main Street has been denied by the Council.

Peoria, Ill.—The Illinois Traction System has asked the Council for an extension of time for the laying of tracks at the intersection of Hamilton and Jefferson Avenues and for the construction of the traction terminal building. The company says it has expended \$20,000 on the site and has \$30,000 worth of steel in storage in Peoria. Unsettled business conditions constitute the reason for asking this extension.

Newton, Kan.—The Arkansas Valley Interurban Railway has asked the Council for a new franchise at Newton. The former franchise was granted to the company as a street railway. The new one recognizes the company as an interurban railway. It will also give the company additional trackage rights on Newton streets.

Mount Clemens, Mich.—The Council has refused to grant the Detroit United Railway an extension of its franchise in Mount Clemens. The Council ordered the city attorney to advise the company that it must fulfill requirements of its present franchise, which has ten years more to run. The company asked for a franchise extension in consideration of rebuilding the Macomb Street bridge at a cost of \$17,000. The Council's latest action requires the company to place the bridge in a safe condition for operation of cars or forfeit its franchise. Cars are now operated to either end of the structure and passengers are compelled to walk across the bridge.

St. Louis, Mo. — The United Railways of St. Louis has received permits from the Board of Public Service to construct about thirty loops, curves and extensions to facilitate traffic in the rush hours. The improvements will cost about \$125,000. A new system of downtown loops will be installed, car lines will be combined and linked together so transfers may be issued, and the curve at Thirteenth and Locust Streets will be eliminated.

New York, N. Y.—The New York Railways have asked the Board of Estimate of New York for a franchise to construct a double-track line from Central Park through Eighty-sixth Street to Broadway.

Astoria, Ore.—The Pacific Power & Light Company has asked the Council for a thirty-year franchise on Franklin Avenue, Astoria.

Seattle, Wash.—The Puget Sound Traction, Light & Power Company has petitioned the Council for the right to surrender its franchise on Blewett Street, from Fremont Avenue to Albion Place, and on Albion Place, from Blewett Street to Woodland Park Avenue.

Seattle, Wash.—The Council has refused the application of the Seattle, Snohomish & Everett Railway for a two-year extension of time on its franchise to complete its line between Seattle, Snohomish and Everett. David Swank, Seattle, is interested. [Sept. 25, '15.]

## TRACK AND ROADWAY

**Alabama Power Company, Anniston, Ala.**—Work has been begun by this company repairing its tracks on Noble Street at Tenth and Thirteenth Streets. It is estimated that the cost will be about \$3,500. Following the completion of this work the company will begin work on the extension of the line to the Anniston Country Club.

**Phoenix (Ariz.) Railway.**—Operation has been begun on this company's new Fourth Street line. The old line on First Street between Pierce and Roosevelt Streets and on Roosevelt Street between First and Fourth Streets has been abandoned.

**Northern Electric Railway, Chico, Cal.**—This company's bridge across the Sacramento River, which was washed out by a flood last February, has been opened for traffic. Train service over the Marysville and Colusa branch of the road, which had been suspended for eight months, has been resumed. The reconstruction of the bridge and its approaches cost about \$50,000, and \$40,000 more was expended in repairing washouts in the roadbed. The cost was apportioned among the counties of Sutter and Colusa, which maintain a highway across the bridge, and the Northern Electric Railway.

**Wilmington & Philadelphia Traction Company, Wilmington, Del.**—This company has secured control of the Wilmington, New Castle & Delaware City Railway operating between New Castle and Delaware City. This purchase, together with that of the Wilmington Southern Traction Company, places all the trolley lines south of Wilmington in the hands of the Wilmington & Philadelphia Traction Company. Plans of the incoming management include the general improvement and speeding up of the service. The line from New Castle to Delaware City, heretofore operated on the electric storage-battery system, will be converted to the overhead type of construction, and the entire line from Wilmington to Delaware City will be subjected to extensive improvements. Under the new plan the system will operate from Darby, along the Delaware River, through Eddystone, Chester, Marcus Hook, Wilmington and New Castle to Delaware City, as well as on the line in Media and the lines connecting Media with Chester and Philadelphia.

**Jacksonville (Fla.) Traction Company.**—Work will soon be begun by this company on the construction of double track through Springfield Park from Pearl to Hogan Street.

**Waycross Street & Suburban Railway, Waycross, Ga.**—Material will soon be received by this company for the completion of its Washington Avenue extension and for extending its Hebardville line through the suburbs northwest of Waycross.

**Chicago & Interurban Traction Company, Chicago, Ill.**—This company is improving its roadbed at Crete, Ill., the track to be resurfaced with crushed rock.

**Chicago & Milwaukee Electric Railroad, Highwood, Ill.**—W. O. Johnson, receiver for this company, was recently authorized by Judge Landis of the United States District Court to issue receiver's certificates for the construction of a bridge to cost \$40,000. The certificates are to bear interest at 5½ per cent.

**Kankakee & Urbana Traction Company, Urbana, Ill.**—This company on Nov. 1 will begin to lay track on its extension between Ludlow and Paxton. Grading has been completed to the stream 3½ miles north of Ludlow. Work on the bridge across the stream will be rapidly pushed, and it is believed that cars will be running into Paxton by Jan. 1.

**Fort Wayne, Decatur & Southern Traction Company, Decatur, Ind.**—This company, which has recently taken over the Fort Wayne & Springfield Railway, plans to build an extension from Decatur to Berne, 12 miles.

**Evansville, Chrisney & Eastern Railway, Evansville, Ind.**—A report from this company states that construction will be begun about Jan. 1, 1916. Work has been delayed on account of litigation which has been decided in the company's favor. It is proposed to build a line from Boonville to Chrisney, 13 miles, and a line from Boonville to Lynnville, 11 miles. Surveys have been made of the proposed route. J. P. Chrisney, Chrisney, president. [March 13, '15.]

**Tri-City Railway Company of Iowa, Davenport, Iowa.**—This company's lease on the skating rink at Watch Tower, Moline, Ill., has expired, and the work of wrecking the rink has been begun. Plans are being considered for a new inn and for the rearrangement of the entire park. Cars will enter the grounds proper instead of following the ravine to the north of the park. The ground now covered by the skating rink will be used for a loop.

**Inter-Urban Railway, Des Moines, Iowa.**—Plans are being made by this company to build an extension of its line from Colfax to Newton via Metz, 12 miles. Surveys are being made from Colfax east and options for right-of-way are being secured. All materials are to be contracted for winter delivery and the heavier grading will be done through the winter with the view of having the extension ready for operation in July. An extension from Colfax to Jefferson and one from Woodward northwest are also to be begun within the next two years.

**Hutchinson (Kan.) Interurban Railway.**—This company will begin work at once on the construction of a loop beginning at Main and Carpenter Streets, extending east on Carpenter Street to Elm Street, north on Elm Street to Avenue F, and on Avenue F to Main Street.

**Newton, Kansas & Nebraska Railway, Newton, Kan.**—A contract has been awarded to the Newton (Kan.) Construction Company for the construction of this company's line through Harvey, McPherson, Dickinson, Saline, Clay and Washington Counties. S. O. Waddell, Newton, chief engineer. [Sept. 25, '15.]

**Cumberland Traction Company, Edmonton, Ky.**—The capital stock of this company, which proposes to build a line between Edmonton and Elizabethtown, has been increased from \$50,000 to \$250,000. H. P. Rogers, Elizabethtown, has been retained to dispose of the new stock issue. L. J. Metcalfe, Elizabethtown, president. [Sept. 4, '15.]

**St. Tammany & New Orleans Railway & Ferry Company, Mandeville, La.**—This company has been awarded a five-year contract by the Council for the lighting of streets in Mandeville.

**South Boston, Mass.**—Bids will be received by the Boston Transit Commission until Nov. 11 for the construction of Section G, Dorchester Tunnel, on Dorchester Avenue between West Fourth Street and Old Colony Avenue, South Boston, about 1200 ft. The structure will be mainly of reinforced concrete. The work includes a pump well with an emergency exit, a ventilating chamber with an emergency exit, an open incline for surface cars, a 6 ft., 6 in., tide-gate chamber on the B Street outfall sewer and sewer changes. Specifications and forms of contract may be obtained at 15 Beacon Street.

**Worcester (Mass.) Consolidated Street Railway.**—Installation of new block signals and improvements on some of the block signal systems on suburban lines of the Worcester Consolidated Street Railway are under way by men in the employ of the wire and track departments of the company. The most important work is to be done on the Worcester and Clinton lines. Several new signals are to be installed between Woods switch, near the city line, to the Lancaster mills. Other signals are to be installed on the Holden and Northboro lines.

**Duluth (Minn.) Street Railway.**—Work has been begun by this company on an extension of its lines to Morgan Park. It is expected that the line will be in operation by Dec. 15.

**International Railway, Buffalo, N. Y.**—Work will be begun between Nov. 1 and Nov. 10 on the extension of this company's line on Eleventh Street to College Avenue, Niagara Falls.

**Long Island Railroad, New York, N. Y.**—It is reported that this company has ordered 3000 tons of bridge steel from the American Bridge Company.

**Hiawasse Valley Railway, Andrews, N. C.**—It is reported that grading will be completed within thirty days on this company's line from Andrews to Hayesville. The maximum grades will be 2.5 per cent and the maximum curvature 16 deg. Two steel bridges will be built on the line. S. E. Cover, Andrews, president. [Oct. 9, '15.]



**Piedmont & Northern Railway, Charlotte, N. C.**—Work has been begun by this company on the construction of an extension from Belmont Junction to Belmont, 4 miles. A contract with the Charlotte Construction Company provides for the completion of this track within forty-five days from Oct. 22. Freight and passenger service will be inaugurated within fifteen days thereafter.

**Sapulpa & Oil Field Railway, Sapulpa, Okla.**—This company plans to build an electric line from Drumright to Depew or Stroud. J. A. Frates, general superintendent of the first district of the St. Louis & San Francisco Railroad, St. Louis, Mo., has been elected president of the company. C. F. Hopkins, superintendent of the western division of the St. Louis & San Francisco Railroad, Sapulpa, is vice-president and general manager.

**Rhode Island Company, Providence, R. I.**—Repairs have been begun by this company on its track on Elmwood Avenue, between Harrington and Third Avenues, Norwood.

**South Carolina Light, Power & Railways Company, Spartanburg, S. C.**—The subject of extensions into property to be selected by the city as a public park is now under consideration by officials of the South Carolina Light, Power & Railways Company. Four sites have been offered the city without price for use as a park with the understanding that the street car lines will be extended into the property so as to make it easily accessible to the entire public.

**Chicago & Wisconsin Valley Railroad, Madison, Wis.**—Herbert Green & Company, who will finance this company's line, as announced in the last issue of the *ELECTRIC RAILWAY JOURNAL*, state that arrangements have been made with the Illinois Steel Company, Chicago, for 5000 tons of rail to be delivered in February and March. In a letter to the Council of Madison, the company states that, if desired, the work can be begun on Nov. 20, but the company asks that permission be granted to delay the construction work until next spring. [Oct. 23, '15.]

#### SHOPS AND BUILDINGS

**New York Municipal Railway, Brooklyn, N. Y.**—The date for the reception of bids for the construction of station finish work on the New Utrecht Avenue elevated line in Brooklyn has been postponed from Oct. 26 to Nov. 5 by the Public Service Commission for the First District of New York. The postponement was made to allow for a change in the form of contract. As the contract first stood, all work was to be completed within six months. Under the new form all stations as far south as Sixty-second Street must be completed within three months. This will allow the operation of the Fourth Avenue subway trains through the Thirty-eighth Street cut and along New Utrecht Avenue to Sixty-second Street, where transfer can be made with the Sea Beach line much earlier than would have been possible under the first form of contract.

**Piedmont & Northern Railway, Charlotte, N. C.**—This company has purchased property in the heart of Belmont upon which a freight and passenger station of standard design will be erected at once, to be completed by Dec. 21.

**Ogden, Logan & Idaho Railway, Ogden, Utah.**—This company has awarded a \$125,000 contract to C. F. Dinsmore, Ogden, for the construction of its repair shops and car-houses at Ogden.

**Salt Lake & Utah Railroad, Salt Lake City, Utah.**—Plans to erect a \$250,000 terminal station in Salt Lake City for the joint use of the Salt Lake & Ogden Railway and the Salt Lake & Utah Railroad are complete. Negotiations for a terminal site on the northwest corner of South Temple and West Temple Streets have been broken off, and unless officials of the railway and the Mormon Church, which owns the property, can get together on the matter, another site must be obtained. As soon as the site is secured, contracts will be let and work rushed.

#### POWER HOUSES AND SUBSTATIONS

**Duluth (Minn.) Street Railway.**—Work has been begun by this company on the construction of a new substation at Ninety-second Avenue West and Grand Avenue, Duluth. The station will furnish power for the new extension being built to Morgan Park. It is estimated that the structure and equipment will cost \$25,000.

## Manufactures and Supplies

### ROLLING STOCK

**Des Moines (Ia.) City Railway** will order, upon the acceptance of its new franchise, fifty new center-entrance motor cars, instead of twenty-five, as reported in the *ELECTRIC RAILWAY JOURNAL* of Oct. 23.

**Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio,** is having four freight cars constructed in its shops at Elyria. The cars are 52 ft. in length and constructed on the regular standard adopted some time ago by the company.

**Muscatine & Iowa City Railway, Muscatine, Iowa,** which has acquired a section of the Rock Island lines, as noted in the Financial and Corporate news of this issue, will substitute gasoline-electric motive power for steam power. Negotiations for gas-electric passenger cars and freight locomotives are under way.

**Southern Public Utilities Company, Charlotte, N. C.,** has ordered from the Southern Car Company five one-man arch-roof cars for the street railway system at Anderson, S. C. Three of these cars will be equipped with GE-219-B motors and the other two with Westinghouse "Wee" motors. Taylor trucks with 7-ft. 6-in. wheelbase and 30-in. wheels, will be furnished. The length of these cars is to be 26 ft. They will be all-steel, having steel framing and steel siding. The doors are to be operated by the motorman, and will be folding with a folding step on Southern Car Company's door and step ball-bearing mechanism. Fare boxes are to be located in each end of the car. Ohmer fare registers, Peacock adjustable brakes of the McWhirter type and the Railway Utilities Company's exhaust type ventilators are also specified. This railway company is also having constructed by the Southern Car Company, a one-man car for operation between Belmont and Belmont Junction.

### TRADE NOTES

**James M. Brown,** formerly of the Lorain Steel Company, has been appointed as Western sales manager of the Electric Cable Company, Chicago, Ill., with headquarters in Chicago.

**James W. White,** formerly manager of the Western sales office of the Electric Cable Company, Chicago, Ill., has resigned and accepted a position with the General Railway Signal Company, as assistant to the vice-president in charge of sales.

**General Electric Company, Schenectady, N. Y.,** has received an order to equip with GE-247 two-motor equipment and K controllers the ten city cars which were recently ordered by the Buffalo & Lake Erie Traction Company from the Southern Car Company.

**Carbo Steel Post Company, Chicago, Ill.,** has changed its name to the Carbo Corporation. No change in the personnel of the organization has been made. Extension of the company's business from its primary trade in the manufacture of fence posts into the manufacture of fence supporting systems, power transmission poles, lighting systems and various types of utilities made of steel for use in the construction of small buildings, has been the cause for the change of the company's name.

**N. A. Christensen, Milwaukee, Wis.,** has received a favorable decision in the United States Circuit Court of Appeals for the Seventh Circuit in the suit brought by him against the National Brake & Electric Company of Milwaukee for infringement of his patent No. 621,324, issued March 21, 1899. The Court held that the combination, covered by Mr. Christensen's patent of "(a) oil-holding, gear-inclosing case, in which the one end of the crankshaft terminated and by which it was protected, dispensing with the undesirable stuffing box, and (b) the compressor case with its parts so arranged as to utilize the oil for both lubricating and cooling purposes, if the motor should be attached to the pump as stated in the other claims," showed more than mere mechanical skill and was a real invention. The decision also discusses the method in which the patent was issued and declared it to have been valid. The attorneys for the National Brake & Electric Company state that they are going

to take up the case to the United States Supreme Court in an application for a writ of certiorari. It is understood that the form of motor compressor on which this suit against the National Brake & Electric Company was brought is not employed by the Westinghouse Company or the General Electric Company in the manufacture of their motor compressors.

#### ADVERTISING LITERATURE

**Roller-Smith Company, New York, N. Y.**, has issued a catalog describing and illustrating its "Junior Imps," small ammeters and voltmeters for battery charging outfits, small switchboards and similar applications.

**Carbo Corporation, Chicago, Ill.**, formerly known as the Carbo Steel Post Company, has issued a catalog describing its system for supporting right-of-way fencing by means of rigid terminals and earth-cushioned spring supports.

**General Electric Company, Schenectady, N. Y.**, has issued a bulletin describing and illustrating in detail its standard unit d.c. switch panels for railway service, for 600 to 1500-volt operation, which are of single polarity, and of the three-section type, 90 in. or 99 in. high.

**Ohmer Fare Register Company, Dayton, Ohio**, has issued a pamphlet entitled, "Your Business and Ours." The bulletin quotes testimonial letters in regard to the successful operation of the fare register system of this company by the Pacific Electric Railway, Lehigh Valley Transit Company, Peoples Railway, Denver Tramway, and Southern Public Utilities Company.

**Carnegie Steel Company, Pittsburgh, Pa.**, has issued a catalog containing illustrations of its various types and sizes of bulb angles and bulb beams. The catalog shows a number of sizes of the bulb angle sections particularly designed for strengthening the tops of all-steel gondola freight cars, for which purpose they have now come into use. The pamphlet also contains tables and data on all the profiles of bulb sections at present rolled by this company.

**Fadgl Auto Train, Inc., San Francisco, Cal.**, has issued reprints of illustrated descriptions published in *Leslie's Weekly*, *California Motor Driver*, *Exhibitor's Weekly Bulletin*, *Automobile Topics*, *San Francisco Examiner* and *San Francisco Hotel Journal* of the Fadgl auto trains, which are in operation at the Panama-Pacific International Exposition at San Francisco, and which are suitable for handling transportation in expositions, parks or other similar places. The company has also issued reprints of a number of complimentary letters on the valuable service performed by these trains at the San Francisco exposition.

**A. H. Bickmore & Company, New York, N. Y.**, have issued an eighteen-page booklet describing the United Light & Railways Company, Grand Rapids, Mich. This contains a description of the properties, a statement of capitalization and securities owned, a general financial statement, a description of its bonds and preferred stock, general information regarding its management, etc., a list of officers and directors, a map of territory served, a map of the Tri-City Railway & Light Company system, a map of the Grand Rapids, Grand Haven & Muskegon Railway, and a chart showing the inter-corporate relation between the United Light & Railways Company and its subsidiary companies. The publication is a praiseworthy example of this company's policy of "complete information for the investor."

**Searchlight Company, Chicago, Ill.**, has issued a booklet containing specific information on the welding and cutting of metals by the oxy-acetylene process, together with a catalog of the equipment necessary for such work. The basis of the oxy-acetylene process is the fact that oxygen and acetylene when burned together at the mouth of a blow pipe torch will produce a temperature of 6300 deg. Fahr., which is twice as great as the melting point of steel. In welding the process consists of applying this intense heat to two pieces of the metal so that their melting edges fuse into one piece. In cutting practically the same process is followed, except that a special cutting torch is employed which uses an extra jet of oxygen. This process has done away largely with the necessity of discarding broken or worn parts and has made the cutting of iron and steel as rapid as the cutting of wood. All that is necessary for welding operations are a cylinder of oxygen, a cylinder of acetylene, a Searchlight torch, and the necessary pressure

regulators with gages. Other useful features have been added, such as extra welding tips for different kinds of work and extra torches for different purposes. For cutting, the only necessary extra outfit is a special cutting torch.

#### NEW PUBLICATIONS

**Accounts—Their Construction and Interpretation.** By William Morse Cole. Houghton Mifflin Company, Boston, Mass. 445 pages. Cloth, \$2.25 net.

This revised and enlarged work by Mr. Cole, who is associate professor of accounting in Harvard University, doubtless needs no introduction to electric railway accountants, for this writer is widely known as an unquestioned authority on accounting. The new edition takes up various accounting problems that have lately arisen, adds series of transactions for the visualization of principles and offers rewritten comments on such important topics as depreciation. The first general and non-professional treatise in the accounting field, this book has survived the test of years. It is in no sense an accounting primer, but by virtue of its lucid discussion of accounting principles and its clear-cut analysis of fundamentals, it occupies a place by itself in accounting literature for business men and investors who desire a not too technical but thoroughly sound and modern treatment of corporation accounting.

**Financing an Enterprise.** By Francis Cooper. The Ronald Press, New York. 524 pages. Cloth, \$3.

The general purpose of this "manual of information and suggestion for promoters, investors and business men generally" is to assist in honest promoting. Hence its scope takes in the investigation of an enterprise, its protection, its capitalization, the presentation to investors and the public, and special features of promotion. The author keeps in view at all times the two parties concerned—the man with the enterprise and the man with the money. One especially valuable feature is the appendix of comprehensive and pertinent questions that will occur to the investor. A careful study of all the points brought out here cannot fail to have a deterrent effect upon expensive and often disastrous mistakes of financing new enterprises. The book has no specific application to electric railway operation, but the principles evolved are basic and as applicable to this as to any industry. The general investor can find in it a wealth of facts he should know about promotion work.

**Railroad Accounting.** By William E. Hooper. D. Appleton & Company, New York. 461 pages. Cloth, \$2.

This publication is apparently designed for steam railroad investors and students as well as for steam railroad accountants, but only the last-named class will be appreciably aided by the book. The first part, dealing with the forms of accounts and methods of accounting prescribed by the Interstate Commerce Commission, purports to show the "why" involved, but it does little more than show the "what" of the accounts, with infrequent and inconclusive excursions into the critical on points already much mooted. In short, this portion of the book is simply a technical abstract of existing commission classifications for steam railroads, containing for its real substance the complete official text of such classifications. Investors and students who desire a comprehensive and critical analysis of steam railroad accounting can find greater satisfaction in other books previously published.

Nor will the latter portion of the book, dealing with departmental organization and concrete accounting practices, be of interest to the average investor. Yet students of steam railroad accounting practice and accountants in this and allied fields will here find much to interest them. The elaborate system and routine methods that are necessary in railroad accounting and auditing are difficult to describe, and little literature can be found on this general topic. Hence in concretely and lucidly describing the organizations and practices of some of the largest railroads, Mr. Hooper has performed a real service to the profession and atoned as far as possible for the shortcomings of his preceding analytical efforts. Of particularly absorbing interest is the up-to-the-minute concluding chapter on the allocation of revenues and expenses between freight and passenger service. This and the other descriptive chapters will undoubtedly prove instructive and broadening to many accountants in the electric railway field.