

Electric Railway Journal

Published by the McGraw Publishing Company Inc.
Consolidation of STREET RAILWAY JOURNAL AND ELECTRIC RAILWAY REVIEW

Vol. XLVIII

NEW YORK, SATURDAY, NOVEMBER 4, 1916

No. 19

SETTING BUSINESS MEN TO THINKING

The appointment of a special committee by the Portland (Ore.) Chamber of Commerce to consider the financial plight of the local railway shows that the recent striking address of C. M. Clark in that city, as noted in last week's issue, has already set the business men of the community to thinking. While this does not mean an immediate assurance of that public fairness toward invested capital which is so needed by the Portland company and other Western railways, it is a marked step forward. We know of no better way to overcome that lack of interest in vested rights which is causing such concern to Eastern investors than by securing a better understanding between the investment banker and the local business man. On the one hand is the man who can fully foresee the disastrous results to the community of not carrying out its contractual obligation to protect the capital dedicated to public service, and on the other is the man who from his daily experience can appreciate the bearing of contractual integrity upon credit and by his influence can gradually bring the public to a better realization of its responsibility for utility development. From the ethical standpoint of duty as well as the practical standpoint of expediency the public ought to be honest with utility investments, but a new publicity is needed to make it understand fully its moral obligation and the common interests of utility and community. In this publicity the investment banker and the business man can be most efficient allies, and this phase of public-relations work should not be overlooked.

STANDARDIZING SMALL PURCHASES

Much emphasis is laid by H. B. Twyford, in an article published this week, on proper and uniform specifications and descriptions for materials and supplies. Without a doubt this is a matter to be carefully watched by all purchasing agents, particularly with reference to the many small articles that are bought. As Mr. Twyford states, the work of the purchasing agent in connection with heavy and highly technical purchases is largely that of specializing on prices and delivery, for the specifications to be followed are furnished by the engineering department. In the case of many small articles and miscellaneous materials, however, no standard specifications or descriptions are formulated in any department, with the result that the various parties concerned in making a requisition and order often seem widely apart in their statements of what they want. Where this condition obtains, the purchasing department has the opportunity to initiate a real reform by originating and putting into force uni-

form rules throughout the whole organization. The plan suggested by Mr. Twyford of having suitable sketches with standard specifications or descriptions placed on the purchase-order record and the storeroom record is one that would, if put into practice, result in intelligent purchasing work and save much confusion and delay, perhaps at times of emergency. Moreover, competitive bidding, the general requisite of efficient purchasing, loses its value if based upon any misconceptions of the article desired, and the desire to avoid these would alone warrant the use of such a plan as described.

SUPERVISING SECURITY ISSUES

The opinion of the Illinois Public Service Commission on the consolidation of the Illinois Northern Utilities Company, the Freeport Railway & Light Company and the Tri-County Light & Power Company, abstracted elsewhere in this issue, has to do with a case relatively insignificant from the point of view of national utility financing. It is, however, of great value in outlining the proper functions of the commission in all security issuance cases under the Illinois law, and also in laying down a general policy along this line that ought to be adopted by all public service commissions. In its broadest aspects, the decision relates to commission regulation of the old securities of consolidated companies, the new security issues of existing utilities whether consolidated or not, and the security issues of entirely new companies. In the first case the commission does not at all feel called upon to make a physical valuation of the consolidated companies, when the new consolidated stock does not exceed the sum of the capital stocks of the constituent companies, for the new stock is by nature really a reissue of old securities, with which the commission is not concerned for the purpose of correcting any evils of former years. Nevertheless, to take up the two other cases, the commission intends to see that new issues of existing utilities represent actual property (thereby in cases of over-capitalization gradually raising the general property-security ratio), and that every \$1 of securities of entirely new companies stands for \$1 of actual property.

POLICY WISELY EXPLAINED

The sanity of the platform embodied in these three cases is hardly open to question. Undoubtedly, as the commission states, a sudden upheaval of utility financing in Illinois would result if that body were to attempt to make all outstanding securities conform to present-day business ethics. Yet, to disregard this point of expediency, the commission on the grounds

of simple equity to existing security holders, maintains that it should not now constitute itself a moral censor of past practices involved in the issuance of securities under laws then publicly sanctioned. The dead past should be allowed to bury its dead. The commission is concerned with the task of enforcing a unity ratio of property to securities only in connection with new securities, which is exactly as it should be. In order, however, to give wider publicity to its security-authorizing functions, the commission in the decision cited has adopted the interesting expedient of requiring on each stock certificate of the consolidated company a recital to the effect that the authorization of the consolidated stock does not import that it has passed upon the value of the property. This is simply one phase of a general warning to investors that, later in the decision itself, finds expression in the words: "An approval by this commission of securities of any character whatsoever is not a guarantee on the part of the State as to the value of tangible property, as to an annual rate of return or as to the success of the utility's management." In buying utility securities the investor must exercise the same business judgment that he would use in buying the securities of any other sort of business. In other words, he must make the necessary investigation to determine to his own satisfaction how new securities authorized by the commission and old securities neither validated nor approved by it, will be mutually affected so as to fix the real value and future possibilities of the company in question as an investment. It would be a wise step if all commissions would explain to the public as clearly as the young Illinois body has done, that they are not banking agencies of any sort, for it would be a sorry day for regulation if the public in general should get the idea that the commissions are responsible for the success or failure of its investments.

CO-OPERATION WITH LABOR

Of the many experiments in the management of labor which have been inaugurated in recent years, few have demonstrated their practicability as conclusively as the co-operative plan instituted by the Philadelphia Rapid Transit Company in 1911. The details of the plan and its results in operation are described in an article appearing in this issue. The co-operative plan has stood the most severe test to which it could be subjected. A strike recently called was a complete failure. Not a run was missed. Less than 5 per cent of the men answered the strike call. Philadelphia was the scene of serious street railway strikes in 1909 and 1910. The co-operative plan in six years has worked a complete transformation in the relations of the men to the company, and out of the better feeling thus engendered has grown a loyalty which made the recent strike impossible of success.

Operating officials of many other properties can profitably study the Philadelphia plan. Stripped of details, its essential feature is a joint committee, composed of representatives elected by the men meeting with the division superintendents of the company. This committee passes upon a wide range of questions not affect-

ing matters of policy. The success of the plan is due, in part, to the type of operating official working under it, but it possesses in addition the great advantage of furnishing a medium by which the minor discomforts and complaints of the men may be threshed out with the officials of the company. Out of a multitude of these petty annoyances, most of which in the experience of Philadelphia can be readily adjusted, is bred the spirit of aloofness between employer and employee which furnishes the opportunity for the strike organizer. The additional advantage is secured that it brings an understanding of the difficulties of management directly to the employee. It is an easy thing to criticise some method or practice, but if the man who thus criticises is placed in a position where he is able to remove the difficulty if he can recommend a better plan, he sometimes finds that no other plan is practicable.

It would not be contended that the co-operative plan is the best solution of the labor problem on all systems. It has been an emphatic success, but it does not follow that it would meet the conditions in every community. In many respects the co-operative committee does not differ from the grievance committee on some systems. The Philadelphia officials dislike the phrase "grievance committee." They argue that it proceeds on a false psychological basis. Matters should be settled before they become grievances. The basis to be sought is one of co-operation between the company and its employees in the fullest sense of that term.

One of the most interesting features of the co-operative plan is the creation of a wage fund, to which 22 per cent of the gross earnings is appropriated and from which operating wages are paid. As the fund increases wages are advanced. The men are made, in effect, partners sharing in the gross receipts of the company. The percentage was fixed upon the basis of the amount which the men were receiving at the time the plan was put in operation. Through economies in operating methods, earnings per car-hour have been increased some 21 per cent, with a proportionate advance in wages. The success of the co-operative plan is due in a large measure to its ability to provide an advance in wages.

In securing operating economies certain adjustments of working conditions, frequently distasteful to labor, were necessary. Swing runs were substituted in part for the universal straight runs which had theretofore prevailed. Divisions were consolidated, with the result that many men with preferred runs had to take others of less desirability. These and many other changes of a like character were effected without difficulty because of the fact that advances in wages depended upon such improvements, and this could always be kept before the men.

Whether the co-operative plan will be as successful in periods of stationary or declining earnings, when wages cannot be advanced, and whether the labor situation in Philadelphia will always remain as satisfactory as at present, are matters which only the future can decide. Five years of experience, however, can leave no doubt of the great advantages of this plan as applied during that time in Philadelphia.

Every Employee a Publicity Representative



This Conductor Was Never Taught to Cultivate Good Public Relations

WHAT determines a purchaser's opinion of what he buys and of the concern he buys from?

It is the quality of the merchandise and the treatment received from the salesman.

The platform men of an electric railway are so many retail salesmen of transportation. This isn't merely a figure of speech; it is a **PLAIN FACT**.

And the platform man can make a railway liked or disliked, just as any other salesman can make friends or enemies for his concern.

A few years ago an analysis of about 800 complaints on an eastern electric railway showed that nearly 75 per cent of them were due to incivility or worse on the part of platform men.

It is evident from the nature of the electric railway business that motormen and conductors can make an appalling number of enemies for a road.

Fortunately it is just as true that they have it in their power to make a great many friends.

But the management must educate them in the business of friend-making; a few cut-and-dried paragraphs in the rule book will not do it.

Every successful merchant has it clearly in his mind and effectively impresses it upon his employees that the making of satisfied customers is **Rule No. 1**.

For some reason neither managements nor men of electric railways work very hard toward this end, though the policy of the successful merchant applies as well to the railroad as to the department store.

EVERY EMPLOYEE of a railway, especially the ones immediately in contact with the public, **IS A POTENTIAL PUBLICITY MAN**.

Good, agreeable treatment of the individual car rider will go a long way toward making a road popular.

Professions of good intent are all right, but they do not find ready lodgment in the mind of a man ranking from a row with an impudent conductor.

A passenger left standing in the rain by an unobservant motorman should be able to give an impartial hearing to a plea for fair adjustment of a franchise controversy, but, being human, he doesn't do it. It ought to be a rule on every electric railroad that in any difference of opinion between passengers and subordinate employees **THE PASSENGER IS ALWAYS RIGHT**.

For what shall it profit a railroad to collect a 5-cent fare from a man who thinks he has already paid, and thereby incur \$17 worth of ill-will?

Here is a not-often-reckoned factor in the bringing about of good public relations:

The railroad educates itself and its men at the same time it is educating the public.

Where a road is endeavoring by a frank policy of publicity to set itself right with the public, its employees are led inevitably to adopt the same attitude.

There are 99 reasons why every public service corporation should adopt a policy of publicity, but the effect of such a policy upon the men within these organizations is **ALONE** reason enough.



CALGARY STREET RAILWAY—STRING OF MOTOR CAR AND TRAILERS

964, shows the general layout of repair pits, shops and offices on this site. On the second floor over the offices the employees' club rooms are located, and there is an assembly and dance hall over the paint shop.

About one-half of the total track mileage of the system is on paved streets. Contrary to the usual practice which has descended from the days of the horse car, the Calgary Street Railway has to assume no responsibility for the care of the pavement between the tracks except for the sub-base, which consists of 4 in. of concrete. The track work consists of 60-lb. and 80-lb. Lorain Steel Company rails, with 6-in. and 7-in. sections, which are laid on ties, spaced 4 ft. apart and thoroughly grouted in cement. The rails are bonded with double compressed bonds. All special work is of manganese steel supplied by the United Steel Company and Hadfields, Manchester, England. Overhead wires are used exclusively except in the business sections of the city where the feeders and connections between the main power stations are placed underground.

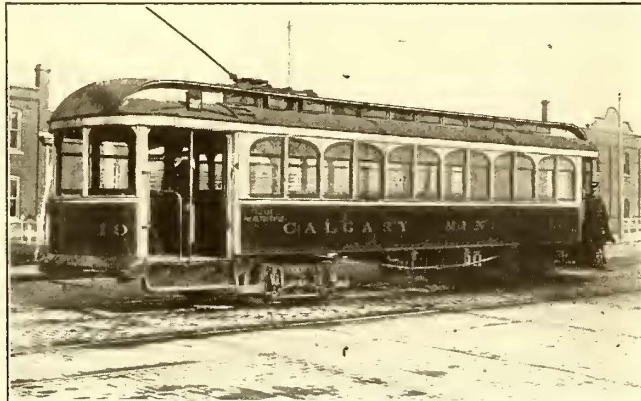
The Calgary railway, having no power plant of its own, purchases all the power which it consumes from the city at the rate of 1½ cents per kilowatt-hour. The system uses between 20,000 kw.-hr. and 30,000 kw.-hr. per day.

An unusual feature of the car equipment is the "Seeing Calgary" car which is shown in one of the accompanying illustrations. The car is 46 ft. long with the seats arranged in tiers. The panels on the side of the car are beveled plate-glass mirrors, and the fittings are nickel-plated. In the summer the car makes hourly trips over all the interesting routes of the city, the fare charged being 25 cents. It is also frequently used by the city in entertaining official visitors. This car, built

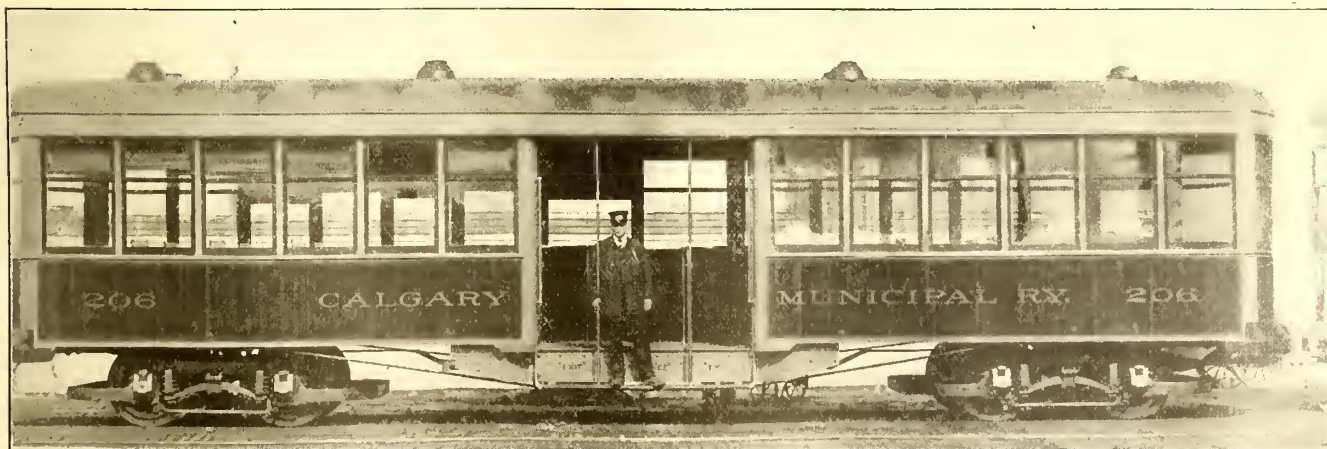
by the Preston (Ont.) Car Company, at a cost of \$7,500, has proved to be a good investment, earning as much as \$124 per nine-hour day during the prosperous times.

The motor cars of the system, which are of the pay-as-you-enter type, were built by the Ottawa Car Company and the Preston Car Company, both Canadian concerns. They include two sizes of double-truck cars. The larger car seats forty-eight passengers and is 46 ft. 6 in. long; the smaller one seats forty passengers and is 41 ft. 6 in. in length. There are also single-truck cars which seat twenty-eight passengers each. There are six trail cars built by The J. G. Brill Company of Philadelphia, Pa. These are of center-door type 41 ft. 6 in. long with a seating capacity of sixty passengers.

In order to effect economies, made necessary by the



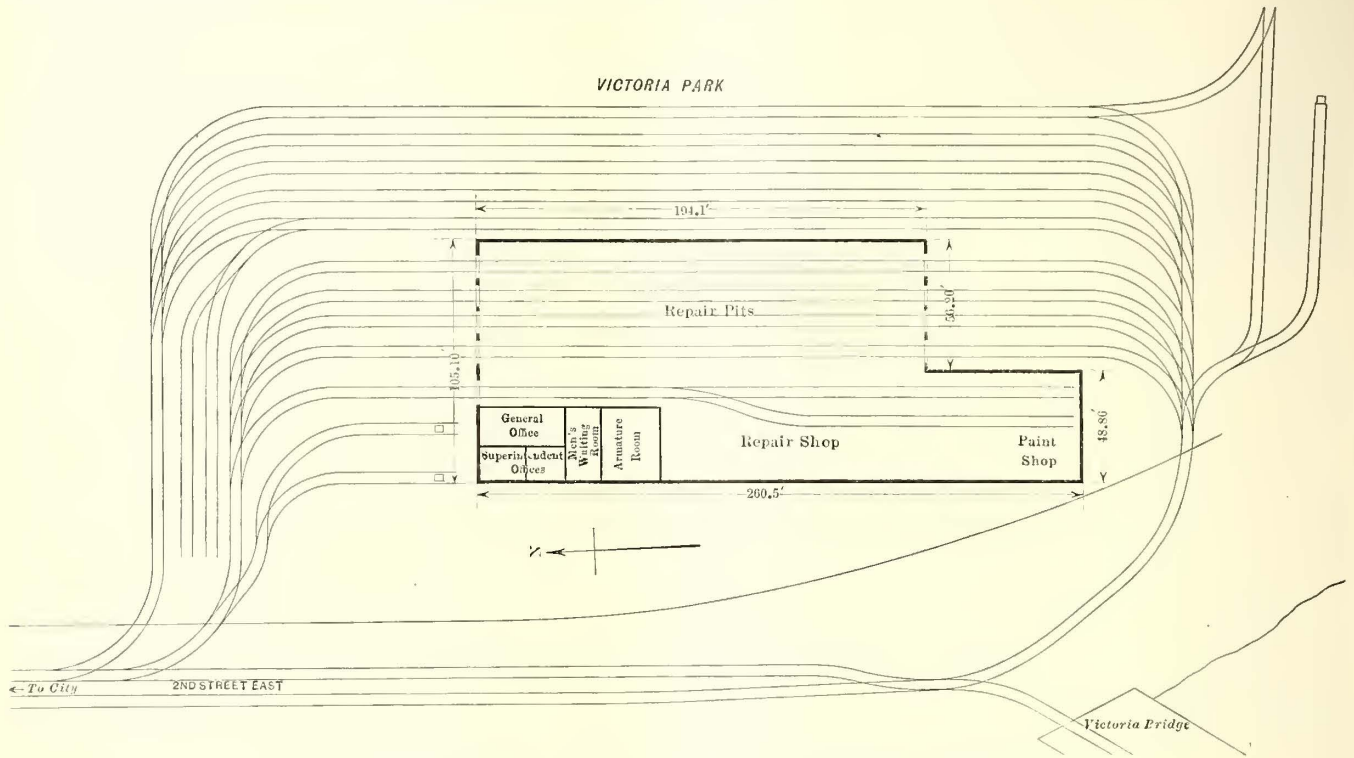
CALGARY STREET RAILWAY—TYPE OF MOTOR CAR USED



CALGARY STREET RAILWAY—VIEW OF CENTER-DOOR TRAIL CAR

war and the subsequent depression, some of the double-end motor cars have been altered for one-man operation. In making the alterations the rear door was permanently closed and the coin box was moved to the front of the car. The rear vestibule was made into a smoking compartment seating ten passengers. This is known as the

winter, however, on account of the increased traffic and snow resistance. By cutting out the insurance on all the cars of the system and supplying each with Pyrene fire extinguishers, a further saving of \$600 per year has been made. The wages of the men have not been reduced.



CALGARY STREET RAILWAY—PLAN OF OFFICES, REPAIR SHOP AND STORAGE YARD

“smoking parlor” and is greatly appreciated by the patrons. The one-man cars are being operated on the lines running to the suburbs and on other routes which do not run primarily in the business districts. They have been willingly accepted by the public, and the operation is said to be very satisfactory. The fact that a large proportion of the passengers use tickets facilitates the fare collection. The most competent and best-paid trainmen on the system are employed on the one-man cars.

There is a marked contrast between the fares established on this system and those charged by most of the privately-owned lines. There are no passes issued on the Calgary system, but five classes of special rate tickets are sold. School tickets, sold at the rate of ten for 25 cents, may be used by children at any time, and by adults traveling to and from school. Work tickets, at eight for 25 cents, may be used by all passengers from 6 a. m. to 8 a. m. and from 5 p. m. to 7 p. m. Ordinary tickets, of which twenty-five in book form are sold for \$1, are good at any time. Twice a week on market days these tickets can be purchased singly for trips to and from the public market. The civic employees have tickets sold in pads of thirty for \$1, which are paid for by the departments whose employees use them. All these tickets are good for transfers to any part of the city.

Naturally when the European war broke out the result was reflected in the operation of the railway. Expenses had to be curtailed, the number of cars operated were reduced, some of the men were laid off, and other economies were resorted to, including the operation of the one-man cars above described. During the summer time practically all of the motor cars are operated with but two 40-hp. motors per car, thus saving a large amount of power. Four motors are necessary in the

Table II gives briefly the operating data for the three years ending June 30, 1916, and while it shows the effects of the war on the railway, it also indicates

TABLE II—SHOWING THE EFFECT OF THE WAR ON THE RAILWAY OPERATION

	1914	1915	1916
Total passengers carried.....	24,037,860	19,073,378	17,486,234
Passenger car-miles	3,213,132	2,819,804	2,524,860
Freight, mail and express car-miles	500	2,895	2,550
Average fare all passengers, cents	3.014	3.058	3.058
Car earnings per mile, cents....	22.797	21.328	21.302
Operating expenses per car-mile, cents	17.752	15.191	14.868

that the reduction in the volume of traffic has not been as great in 1916 as in 1915. It is hoped therefore that the greatest depression has been reached and that an improvement will shortly take place.

Safety Films Exhibited in Schools

A room has been set aside by the Kansas City (Mo.) Railways for its safety department, under W. S. Woodland, superintendent. Equipment of portable screen, portable projecting machine, cabinets for literature and posters, and other materials have been supplied. Mr. Woodland recently received the directors of the company there, and outlined the safety work. He has started the motion-picture work in the schools, using the portable machine, with carbon filament light and slow-burning film, by which a picture in the film can be kept on the screen for ten or fifteen minutes. The school board has permitted safety programs for the schools, the picture being shown and lecture given in the school auditoriums or in the largest rooms during school hours. At each of these meetings the children receive buttons bearing the name of the school and the school colors. The company has also started its distribution of folders in its cars.

Consolidated Stock Not Limited by Fair Value

Illinois Commission Not Concerned with Past Evils—Without Valuation Allows New Stock Equal to Combined Outstanding Issues of Consolidated Companies—States Position in Recital on Each Certificate

IN permitting the consolidation of utilities, should a public service commission approve a new capitalization based on fair value of the properties involved, or should it permit new capital stock issues equal to the sum of the capital stock issues of the constituent corporations? A sensible answer to this important question in corporate financing is contained in a recent decision of the Illinois Public Utilities Commission *in re* the application of the Illinois Northern Utilities Company, the Freeport Railway & Light Company and the Tri-County Light & Power Company to be allowed to consolidate. In speaking for the majority, Commissioner O. P. Thompson holds that when the proposed capital stock issues of a consolidated company do not exceed the sum of the capital stocks of the combined companies, the commission is not required to determine the value of the property of the companies. In authorizing new issues of stock the commission always endeavors to prevent issuance except in exchange for money or property equal to the par value, but in its opinion the issuance of the stock of a consolidated corporation in lieu of a like amount of stock of the constituent companies is to be regarded as somewhat in the nature of a reissue of existing stock rather than as the issuance of wholly new stock.

In order to give wider publicity to these points, however, the commission in the present case has deemed it proper to direct the attention of the investing public to the fact that the authorization of the consolidated capital stock does not import that it has passed upon the value of the property. This is done by requiring that each certificate of stock of the consolidated company shall contain the following recital:

"The Illinois Northern Utilities Company is a corporation formed by the consolidation of the Illinois Northern Utilities Company, the Tri-County Light & Power Company and the Freeport Railway & Light Company, as authorized by the Illinois Public Utilities Commission, by its order of May 31, 1916, and the amount of stock by said order authorized to be issued on such consolidation was fixed at \$8,191,300 (being an amount equal to the aggregate outstanding stock of the constituent corporations), without investigation by said commission of the value of the assets of said corporations."

DISSENTERS HOLD DECISION TO BE CONTRARY TO LAW

The various questions involved in the decision are well brought out by the supplementary opinions filed by members of the commission, a joint dissenting opinion by Frank H. Funk and Richard Yates and a concurring opinion by Walter A. Shaw. Messrs. Funk and Yates aver that the issuance of any stock without a determination of the value behind the stock is contrary to the

spirit and purpose of the public utilities law and contrary to public policy. They are not ready to accept the view that the law radically changes the procedure to be followed in the authorization of stock for consolidation purposes from the procedure laid down for the issuance of securities generally, or that the commission

has no alternative but to issue an amount of stock equal to the sum of the stocks of the constituent companies. Furthermore, they object to the placing of the foregoing statement upon the new stock certificates because of the confusion and misrepresentation that they are sure will follow when in the future additional stock of the consolidated company is issued under the authorization of the commission without having any such statement printed on it.

COMMISSIONER SHAW SHOWS DIFFERENCE BETWEEN RE- ORGANIZATION AND CONSOLIDATION

The concurring opinion by Commissioner Shaw, however, so explicitly expounds the Illinois law and the principles of equity behind the commission's decision that it is worth giving in detail. In the first place, Commissioner Shaw points out that the Illinois law treats of consolidations separately and distinctly from reorganizations. Relative to reorganizations of public utilities in this State, he says, the Legislature has spoken quite definitely and has decreed that the capitalization shall not exceed the fair value of the property. Relative to consolidations of public utilities, however, the Legislature has spoken definitely only in limiting the capital stock to an amount not exceeding the sum of the capital stocks of the corporations consolidated and any additional sum actually paid in cash for improvements. The Legislature undoubtedly had in mind that capital stock issues of anything less than or equal to such a limit would be proper.

The Legislature no doubt foresaw that the conditions involved in a consolidation of utilities are far different from the conditions prevalent under a reorganization. A reorganization, as Commissioner Shaw describes it, is generally the last chapter in a corporate history embracing a period of poor financing, faulty management, bad investments, unlucky operations, receivership and forced sale. Upon reorganization it is essential that some properly constituted administrative body should carefully scrutinize all the details by which it is proposed to place the defunct corporation on a proper financial basis, and it is quite natural that the best criterion for guidance in a reorganization is a valuation

A GOOD PLATFORM

"Where the proposed capital stock of a consolidated company does not exceed the sum of the capital stocks of the constituent corporations, the commission is not required to determine the value of the property of the companies. . . . [Such consolidated stock] is to be regarded as somewhat in the nature of a reissue of existing stock, rather than as a wholly new issue."

"The law as written intends that this commission should see that new security issues of existing utilities represent actual property, and it does not contemplate that the commission should concern itself with past security issues for the purpose of correcting the evils of former years."

"In the case of an entirely new concern, however, \$1 of securities should stand for \$1 of actual property."

of the corporation's tangible property. In consolidations, however, the public itself is often the beneficiary, and the Legislature, in recognizing the many purposes for which consolidation may be legitimate, quite wisely refrained from making requirements to which it would be difficult to conform in effecting a consolidation. It is only fair to assume that, had the Legislature deemed it proper to require valuations to be made upon a consolidation of utility properties, it would have distinctly said so, and would not have left to the commission the determination of the rate cases wherein such a valuation might be necessary to protect the rights of the public.

INVESTOR IS FULLY ADVISED WITHOUT VALUATION

In regard to the assertion that a valuation should be required in the present consolidation case and that the total securities authorized should not exceed the value determined, Commissioner Shaw emphasizes the fact that no benefit would be derived from a valuation of the properties, even if the technical provisions of the law were different. The recital required to be placed on the new stock in effect advises all prospective purchasers that the stamped stock is issued as a result of a consolidation, that the total amount of consolidated stock is equal to the sum of the outstanding stocks of the underlying companies and that no valuation has been determined by the commission. To his mind, therefore, ample notice regarding the conditions under which the new stock has been issued is given to all prospective purchasers. In other words, the investor is advised fully that the new stock issue is no more valuable and has no more property behind it than the combined stocks of the underlying companies which it replaces, for conditions respecting the property are not changed by the decision of the commission. Had the commission refused to approve the new stock issue and thereby prevented the consolidation, the same amount of stock would be outstanding and subject to sale. Under the conditions of consolidation as stated, however, the investing public is really protected to a greater extent than formerly, for it is now advised by a recital in which the commission specifically calls attention to the fact that no valuation has been made of a property in which it (the investing public) is buying a shareholder's interest. Such a notice should tend to put a purchaser upon his guard, and to cause him to make the necessary investigation to satisfy himself as to the real value and future possibilities of the stock in which he contemplates investing his money.

RECITAL ON CERTIFICATES WILL NOT BE OBJECTIONABLE

As to printing special conditions upon the stock of the consolidated company and thereby making possible the future establishing of two styles of stock which in reality represent identical property interests, Commissioner Shaw confesses that a situation might arise wherein stock issued subsequent to the consolidation would not be stamped with the specific provision before noted. He doubts, however, that such a situation would be serious. The same situation is prevalent in almost all issues of securities which are approved by the commission for extensions and betterments. If a mixture of stock might be objectionable, it certainly could not be more objectionable than having outstanding, and in the hands of the public, stock issued prior to the creation and without the approval of the commission, and stock issued subsequently to the creation of the commission and bearing its general stamp of approval. It may be that many persons would believe that the commission's stamp of approval adds value to the one class of

stock for the reason that the commission requires that property or money to the par value of the stock be behind the issue, but the commission's approval adds no value above whatever the combined intrinsic value of all the securities may be.

USELESSNESS OF VALUATIONS IN ALL SECURITY CASES

If it should be deemed necessary to cause a valuation of the property to be made whenever consolidations are contemplated and to disapprove consolidations unless such a valuation is made, Commissioner Shaw believes that the same policy should be pursued whenever the commission authorizes a security issue for any purpose whatsoever in connection with an existing utility. In such an event, it would naturally follow that, should it develop in a given case that the outstanding securities (par value) are in excess of the value of property, no funds could be raised for additions and betterments. If the commission should create such a condition, the result doubtlessly would be that the public would receive inadequate service and higher rates, and the utility in many instances would be forced into receivership.

And even if a valuation should be made in all security issuance cases, Commissioner Shaw seriously doubts that either the present owners of stock or the general public would be greatly benefited. Possibly future purchasers of stock would benefit by the knowledge of actual tangible values of property behind the stock issuance. But after all, he says, the value of stock either to the present stockholders or to the future investors is established and determined by the net earnings which the company is able to make, by the confidence in the company's officials, by the wisdom of its management and by its prospects. He cannot believe, therefore, that the Illinois public utilities law contemplates the impractical and endless task of making valuations of every utility property against which securities are to be issued. An accurate appraisal and a proper valuation necessitate expenditures of a magnitude requiring mature consideration before inflicting them upon the taxpayers of the State.

RELATION OF OLD AND NEW SECURITIES

Commissioner Shaw then takes up the question of securities issued under the laws of the State prior to the enactment of the public utilities law, and of securities now approved by the commission. To show how these are related he cites the following example:

"Assume a quite common case of a company which was capitalized some years ago at \$100,000, which has installed plant and equipment to the value of \$50,000 and which has issued capital stock to the full amount of \$100,000. As the company grows, improvements and betterments costing another \$100,000 may be installed. Meanwhile a regulatory body has been established, and this regulatory body authorizes the issuance of another \$100,000 of capital stock against betterments which actually cost \$100,000. Now there exists a condition wherein the total capital issue is \$200,000 based on property costing \$150,000 to install. The initial stock ratio, which was 50 cents on \$1, in mingling with the new stock has reached a ratio of 75 cents on \$1. Likewise the new stock, which bears the commission's stamp of approval, signifying to all intents and purposes that such new stock represents actual property to the par value of the stock, in mingling with the old stock also reaches a ratio of 75 cents on \$1.

"Obviously, without a reorganization, the ratio of such combined stock will never reach unity, but under a continuance of regulation conditions surely will improve with time. Despite the most earnest and painstaking

efforts of regulatory bodies, it is practically impossible to remedy in a jump such past corporation practices as have done much to necessitate the regulation of public utilities. During the transition period from a careless past to a better future, the investigating public will be misled if it assumes without inquiry that the authorization which the commission causes to be stamped on all securities issued at the present time by public utilities is a guaranty of the value of tangible property."

COMMISSION IS NOT INTENDED TO CORRECT PAST EVILS

Continuing along this line, the commissioner makes the following pointed statement concerning the jurisdiction of his regulatory body over securities issued under olden-day business ethics:

"I do not believe that it is the intent of the law that this commission should undertake to correct all the evils that grew under past unregulated conditions; or that this commission should act retroactively, so to speak, by requiring valuations of all existing utility property when allowing additional securities to cover additions and betterments in cases where previously existing outstanding securities may exceed the value of the tangible property. Should the commission adopt a policy of entering upon valuations whenever security issues are involved, it is predicted that a general financial upheaval as far as the public utilities of the State of Illinois are concerned would result therefrom. In the final analysis the public would be the loser.

"The law as written intends that this commission should see that new security issues of existing utilities represent actual property, and the law does not contemplate that this commission should concern itself with past issues for the purpose of correcting the evils of former years. This commission, by insisting that new securities be represented by property, in a reasonable length of time will secure an adjustment in the relation between outstanding securities and the value of property. In the case of an entirely new concern, however, I am firmly of the opinion that \$1 of securities should stand for \$1 of actual property."

NOT EVEN SECURITIES OF NEW COMPANIES ARE GUARANTEED

Desiring, however, to reiterate the position of the commission in regard to guaranteeing even the securities of new companies, Commissioner Shaw adds:

"Even in a case where a public utility is created and organized at this time under authority of this commission, and where all securities issued by the utility are approved by this commission with the understanding that every \$1 of such securities represents an equal amount of either property or money, this commission can not state to the investing public that the investment is a good one. The commission in no manner can be held responsible for the management and future development of the property, nor may it essay to state whether or not the venture will prove a success. The commission can not, and should not, pass upon the many elements which may have a great bearing upon the earnings that reflect the value of stocks. The stockholders carry the risk. The bonds are an indebtedness which takes preference as to both principal and interest. That portion of the property and of the earnings which remains after meeting preferential obligations to the bondholders, accrues to the credit of the stockholders. In other words, after interest upon all bonded and floating indebtedness and all proper fixed charges have been met, the remainder goes to the stockholders. This residue, quite naturally, is affected by the character of the year's business, by the management, by local surroundings, by the general trend of finance and markets,

and by many other possible uncertainties—all factors not ascertainable by a commission.

"In my opinion, the public should be advised as fully as possible that an approval by this commission of securities of any character whatsoever is not a guaranty on the part of the State as to the value of tangible property, as to an annual rate-of-return or as to the success of a utility's management. Moreover, it is to be impressed upon the public that past securities are neither validated nor approved, and that necessarily all future securities must be affected by existing outstanding securities. The public should be advised that it must exercise the same business judgment in dealing in public utility securities that it exercises in dealing in securities covering any other character of business. When this commission advises the public as fully as possible and when it has complied with the substance of the law, it has performed its full duty. I believe it would be a very unfortunate condition of affairs should the public ever believe that an approval of securities by any governmental agency carries with it or implies a broad guaranty of future earnings."

New Haven Electrification Situation Discussed

Specifications for Sixty More Electric Locomotives Are Being Prepared

AT an investigation of the passenger train-service of the New York, New Haven & Hartford Railroad held by the Massachusetts Public Service Commission at Boston, Oct. 17, Howard Elliott, president of the company, stated that motive-power specifications now being drawn include sixty additional electric locomotives for passenger, freight and switching service in the zone between New York and New Haven. The installation of these units will release steam equipment for other parts of the system, indirectly improving service at present handicapped by lack of tractive power. Mr. Elliott said that until the company gets upon its feet again financially, nothing can be done in the direction of electrification at Boston, but that this problem would naturally be taken up in the event of the road's reaching a financial basis exhibiting funds applicable to such a development. The company is endeavoring at present to utilize its existing electrical equipment and electrified zone to the utmost advantage and is not considering extending the electric service beyond New Haven. Speaking of the need of additional income, Mr. Elliott said that this applies to the electric railways controlled by the company as well as to the steam lines, especially in view of the rising costs of materials and labor.

A. R. Whaley, vice-president, said that the New Haven is at present provided with overhead equipment for electric train service from New York City to New Haven, but that seventy additional electric locomotives will be required to handle the entire passenger and freight traffic electrically throughout the zone. All the passenger service between New York and Stamford is handled electrically, and as many trains between Stamford and New Haven with such portion of the freight from the Harlem River to New Haven as the number of electric locomotives available permits. A total of 170 electric locomotives is needed to handle all the passenger and freight service of the New York-New Haven zone electrically.

The electric locomotives cost at least \$50,000 a piece at present. The cost of steam locomotives has risen in some instances from \$28,000 to \$42,000 in the past three years, according to Mr. Elliott. The company cannot as yet say when it will have 100 per cent electrical operation in the New York-New Haven zone.

Solving the Labor Problem in Philadelphia

There Are Few Instances of Such a Remarkable Change in the Sentiments of Employees Toward Employer as That Furnished by the Philadelphia Rapid Transit Company—In Five Years the Company Has Built Up a Spirit of Concord and Loyalty to the Point Where a Strike Was Impossible of Success

By THOMAS CONWAY, Jr., Ph. D.

Professor of Finance, Wharton School of Finance and Commerce, University of Pennsylvania, Philadelphia, Pa.

THE details of the abortive Philadelphia strike of three months ago were given in the columns of the ELECTRIC RAILWAY JOURNAL of Aug. 12, page 288. The officials of the Amalgamated Association of Street & Electric Railway Employees of America issued a strike order effective Aug. 7. In response to this order, only 425 out of the 6200 motormen and conductors employed by the company responded. As soon as information was received that a strike was impending, the officials of the company sent out a circular letter to those men who had left its employ in good standing, stating that applications would be received from these men for re-entry into the service. This step was an exception to the rule of the company that a man who leaves its employ, no matter for what reason, will not be taken back. Impressed by the large number of men who desired to return, but who had not been able to do so because of this rule, the company felt that a considerable number of experienced motormen and conductors, familiar with operating conditions in Philadelphia, could be secured by this method. More than 2000 men applied, from which number 600 were selected to take the places of the strikers. The strike was a complete failure. Not a single trip was lost. The places of the strikers have been permanently filled by former employees.

Philadelphia has been the scene of a number of serious street railway strikes. During 1909 and 1910, the two years preceding the advent of the present management, there was a total of sixty-five days of declared strike, resulting in a loss of over \$500,000 in wages to the men, the loss of the larger portion of the normal earnings for these days to the company, and extraordinary expenses exceeding \$400,000. In addition, the city of Philadelphia was put to a heavy expense for extra police service. These strikes were symptomatic of a condition of great unrest among the employees. A record of the comparative number of conductors and motormen leaving the service for a number of years prior to the change in management follows:

	1906	Year 1907	Ending 1908	May 31 1909	1910
Resigned	3,226	3,922	2,853	1,494	3,787
Discharged	1,278	1,374	2,038	1,075	2,376
Deceased	*23	45	25	27	45
	4,527	5,341	4,916	2,596	6,208

*Includes deaths occurring between Jan. 1 and May 31, 1906, only. No record kept prior to Jan. 1, 1906.

In the year 1909-1910 the labor turn-over exceeded 85 per cent of the trainmen. Under such conditions, the creation of proper relations between the men and the company was impossible. It should be added, in passing, that these statistics do not take into consideration any of the men leaving in either strike. The

large number of men who resigned was indicative of the general attitude which labor had to employment with the company. It was regarded as a makeshift—something to which men turned in the absence of a better opening and which they gave up as soon as employment in other lines could be secured. Few men looked upon it as a permanent calling. This was doubtless due in part to the large number of discharges, which created a spirit of uneasiness among the men.

ADVENT OF THE STOTESBURY MANAGEMENT

As the result of a number of conditions, of which strikes and labor difficulties were an important element, the financial affairs of the Philadelphia Rapid Transit Company reached a serious pass in the fall of 1910. Interests representing a majority of the stock of the company decided that the situation demanded heroic action, and an invitation was extended to E. T. Stotesbury, of the firm of Drexel & Company, to take over the management of the property. After short negotiations, in which Mr. Stotesbury outlined the terms under which he would assume responsibility for the affairs of the company, a plan was evolved by which the desired end was achieved. A majority of the stock was placed in a voting trust for a period of five years, Mr. Stotesbury naming the voting trustees. At the same time a sufficient number of vacancies in the board of directors was made available to insure Mr. Stotesbury's being in a position to control thereafter the policy and the business of the company. Thomas E. Mitten, then president and operating head of the Chicago City Railway Company, was prevailed upon to come to Philadelphia as chairman of the executive committee. A well-defined program of improvement was inaugurated. This article is concerned with only one feature of the new policy, namely, the company's policy toward its employees.

THE CO-OPERATIVE PLAN

After a short investigation and the analysis of suggestions and complaints made by the men, the new management presented to its employees what has since come to be known as the "co-operative plan." The essential features of this plan are, first, the creation of a co-operative committee, composed of representatives of the men and of the company, which shall consider and pass upon all matters relating to working conditions, other than general questions of policy, and, second, the creation of a wage fund, out of which payments for wages shall be made. This plan was subsequently adopted and is still in force. It is responsible in large part for the present healthy condition of the labor situation.

The co-operative committee consists of the superin-

tendent of transportation, who acts as chairman, the division superintendents—at present there are fourteen divisions or car barns—and two representatives of the employees from each barn, elected by the men. The total membership in the committee, therefore, is forty-three. The election of barn representatives by motormen and conductors is conducted in the following manner: By the use of a voting machine each man writes in secret the name of a fellow employee for whom he desires to vote. The two men receiving the largest number of votes are elected. The reason for having two representatives from each barn is to give representation not only to a majority, but also to the larger part of the minority. The company, in its annual report for the year ending June 30, 1916, states that “over 97 per cent of the men able to vote have participated in the election of the present co-operative committee, the members of which represent the present choice of upwards of 73 per cent of all of the motormen and conductors.”

In addition to the regular meetings of the co-operative committee the individual members of the committee are free to

call upon the superintendent of transportation whenever they have matters they desire to discuss with him. At the beginning meetings were held as frequently as once a week, lasting from noon until late at night. At these meetings every committeeman is called upon to present the matters which have occurred to him or been brought to his attention by the men whom he represents. The matters thus brought up for discussion cover a wide range and relate to almost every portion of the service. In this fashion, the sources of dissatisfaction are called to the attention of the man-

agement and brought up for discussion and investigation. From the standpoint of the men, it furnishes an authoritative and direct means by which things can be brought to the attention of the company. There had always been, of course, the theoretical right of each motorman and conductor to go to the superintendent of transportation and present to him any matter connected with his employment. This right was more theoretical than practical, for the men felt that any such course of action would lead to the enmity of the division superintendents and would brand them as “kickers.”

There is also a co-operative beneficial association, which pays sick benefits of \$1 per day for 100 days following the first week's illness and a death benefit of \$150. The entrance fee is 50 cents, with monthly dues of 25 cents. The company contributes an amount equal to the entrance fees and dues paid in each month by the members and bears the expense of the management of the association.

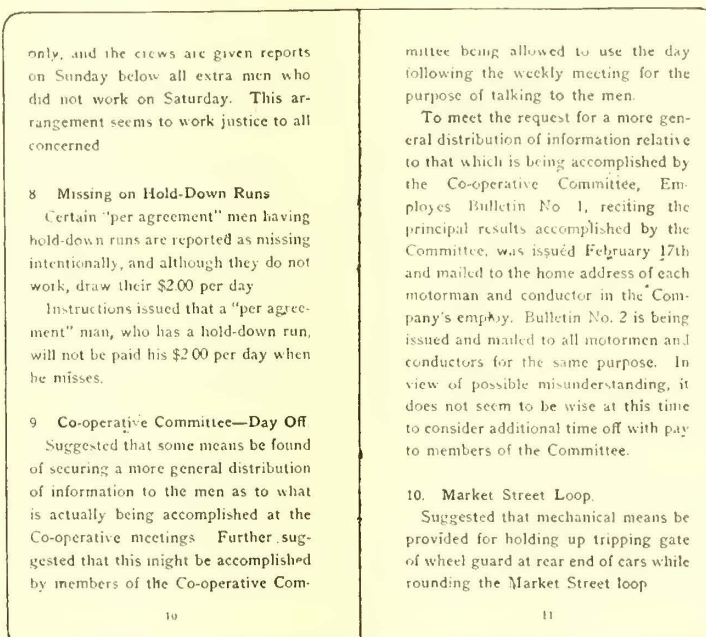
In addition, the company maintains for the benefit of all employees who have been two years or over in the service, without any cost to them, an insurance benefit

plan which includes a death benefit of \$500, and for employees over sixty-five years of age who have been twenty-five years in the service a pension of \$20 a month for the remainder of their lives. The administration of the benefit and pension plans has been in charge of M. R. Kline, president of the Co-operative Beneficial Association.

ADVANTAGES OF THE PLAN

The great advantage of the co-operative plan is that the men choose representatives who are known to them and with whom they come into daily contact. All matters of dissatisfaction are brought to the attention of these representatives, whose duty it is, if the grievance seems to be genuine, to bring it up before the co-operative committee. To the executive officials of the company many matters seem trivial which bulk large to the men who must deal with them each day. Perhaps the rest-room is not kept clean, or the roof over the passageway in a carhouse may leak, causing the men on rainy days to take an involuntary shower bath on

the way to take out their cars. Time-table adjustments may be necessary to accommodate increased traffic. These are but typical instances of the questions which have come before the co-operative committee. Thus far, the committee has been a real committee and not a “kid glove” body. The committeemen do not hesitate to present forcefully matters looking to improved working conditions. The reason for having each division superintendent a member of the committee is that both sides of the matter may be heard at the same time. The committeeman presents the men's side, whereupon the chairman calls



TYPICAL PAGES FROM A “CO-OPERATIVE BULLETIN” OF WHICH ONE WAS ISSUED ABOUT ONCE A MONTH UNTIL THE SUMMER OF 1914

upon the division superintendent to state his view of the matter. In this way the other committeemen present hear both sides of the question. Time is saved, because frequently matters can be adjusted or decided without reference for investigation. It should be stated in passing that there is no record of a division in the vote between the men and the superintendents on a decision of the committee. Matters are threshed out until a substantial agreement is reached. Many of the matters occupying the attention of the co-operative committee might appear trivial to the outsider, but they are of real concern to the men who meet them every day. They breed constant irritation, dissatisfaction and discontent—the seed from which spring strikes and discord. The co-operative plan performs the great service of eliminating these sources of discontent before they become real grievances.

It is impossible for the operating officials of a company and the chosen representatives of its employees to sit in conference over questions such as come before the co-operative committee without creating a better mutual understanding of the position which each occupies. The

officials learn, as they could not otherwise do, the viewpoint and thoughts of the men. They see the operations of the company through the men's eyes. On the other hand, the meetings of the committee teach the men the limitations governing the operation of the system. Proposals are continually made which are impracticable for financial and other reasons. Pains have always been taken to explain to the committeeman making the suggestion why it is impracticable. In this fashion, men get a good grasp of the principles of operation which inevitably filters down to the men whom they represent. It is significant that not a single member of the co-operative committee went out at the time of the recent strike, although there is and always has been a number of committeemen who are frank in their criticism of the company. Experience has demonstrated that such critics in the course of time are unconsciously educated to see the situation from a different standpoint.

ATTITUDE TOWARD ORGANIZED LABOR

One of the questions which complicated the institution of the co-operative plan was the relationship which it was to bear to organized labor. At the time the plan

Some Things Accomplished by Present Co-operative Committee

1. Less discharges than any other barn.
2. Smaller number of men being suspended.
3. Pay of runs compares with any in system.
4. Conductors and motormen are allowed their Sunday off, both early and late, as conditions permit.

Swing men work every third Sunday instead of every other Sunday as formerly.

Show Your Approval by Electing Them August 17, 1916

LEAFLET ISSUED BY MEMBERS OF CO-OPERATIVE COMMITTEE AT LAST ELECTION (AUG. 17, 1916)

was announced, two labor organizations were largely represented among the car men—the Amalgamated Association of Street & Electric Railway Employees of America, and the United Car Men's Association of America. These two organizations were antagonistic to each other. The announcement of the co-operative plan stated that:

"This management does not take a position for or against either of the organizations having membership among its motormen and conductors, but is desirous of securing a lasting peace and the earnest co-operation of its motormen and conductors, and that by the path of least resistance. If, therefore, a large majority of the motormen and conductors (say two-thirds) desire that this management deal with its motormen and conductors as an organized body, no lasting peace or unity of effort can be expected until this demand has been properly met and fairly disposed of. This management cannot, upon the other hand, so interfere with the personal liberty of any man in its employ as to arbitrarily require him to become a member of a labor organization. It can, however, in all fairness,

pay from the sum representing 22 per cent of the gross passenger earnings that amount which represents the dues of all motormen and conductors in a labor organization if that be the expressed desire of the large majority.

"The desire of two-thirds of the motormen and conductors expressed by secret ballot, under conditions which insure a fair count, may in all justice be considered as binding the minority to bear their share of such a tax.

"This management has, therefore, decided that upon a proper application being made by either or both of these organizations, a vote will be taken under such regulations as will insure a fair election; this management undertaking, upon a confirmative vote of two-thirds of its motormen and conductors, to enter into an agreement with the organization receiving such vote, which agreement shall conform both in substance and detail with the plan herein outlined.

"In the event of an agreement being entered into with the men as an organization, there would be no necessity for the wearing of union badges nor of the disturbing influence of organizers or collectors of dues, for the reason that the amount representing the dues of every motorman and conductor would then be paid directly by the company to the organization.

"Under these circumstances, the frequent contention that men were dismissed because of being affiliated with organized labor would be no longer tenable, as the company would under this arrangement be paying the dues of the new men when hired as well as those now in the service."

At various times three ballots have been taken to determine whether the company should deal with one or the other of the labor organizations. In no case have two-thirds of those voting indicated a preference for either of the labor organizations. The company has therefore dealt directly with the men without the intermediation of either organization. At the present time it is believed that only a small proportion of the men are affiliated with either union, although no definite information is available. The company has always taken the position that it makes absolutely no difference to it whether a man does or does not belong to a labor union.

It is essential, in order to maintain discipline, that the management of the company reserve the right of discharge and the final determination of all questions affecting discipline, but through his co-operative committeeman any man who feels that an injustice has been done in his case is entitled to a review of the facts. In case the employee so desires, one or both of the barn committeemen is privileged to accompany him on a visit to the superintendent of transportation when the man presents his side of the case. The superintendent of transportation makes it a practice to investigate carefully every case appealed to him, and he has not hesitated to reinstate men or modify the punishment for offenses when it seems warranted. The early "bulletins" issued to the men detailing the workings of the co-operative plan record many instances of this character. Instead of undermining discipline, this course of action has had a very salutary effect. Arbitrary discharges were discouraged, while the confidence of the men was won by the plain intention of the new management to "play fair."

EFFECTIVE WORK OF MR. TULLEY

The effectiveness of any plan is dependent upon the type of man who executes it. The co-operative plan has been unusually successful largely because of the high character of the superintendent of transportation,

H. G. Tulley. Mr. Tulley was brought from Chicago by Mr. Mitten after the new management assumed control and has been an efficient lieutenant in carrying out Mr. Mitten's policy. The new superintendent of transportation has enjoyed unusual experience in handling men. He served some years as an army officer, and thus acquired the ability to maintain strict discipline and at the same time get along with all sorts of men under trying conditions. His experience was still further enlarged in Chicago. When the Philadelphia property was taken over, with its menacing labor situation, Mr. Mitten decided that some unusual remedy must be applied. To meet this need he evolved and inaugurated the co-operative plan and intrusted to Mr. Tulley much of the responsibility for the successful carrying out of the details, particularly those relating to discipline and working conditions.

There is no doubt that Mr. Tulley is exceedingly popular with his men. He has earned this popularity as the result of five years' association with them. They are loyal to him because he has been fair to them. He has worked on the principle that he must preserve each employee's self-respect if he is to have a desirable working force. When a man has been reported as delinquent and comes in to see him, he remembers that this man is probably the head of a family, with a wife and dependent children; an average American citizen. Instead of browbeating the man and villifying him, he is courteous and finds that the men appreciate being dealt with upon this basis. In his five years' experience he has discharged but few men who, at the end of the interview, would not shake hands with him. In the last two years he has personally talked with every man entering the company's employ, endeavoring to instil in the new recruit at the outset the spirit governing employment with the company. He wants his men at the beginning to look upon their work as permanent employment. The company has employed about 800 men in the last two years, of whom only thirty went out on the recent strike. As Mr. Tulley phrases it, the time spent in talking to his new men has been very profitable to the company, for he has "kept the stream pure at its source."

TRANSITION TO A PERMANENT LABOR FORCE

The effectiveness of the policy of the new administration in building up a permanent working force is clearly seen by comparing the record of the men leaving the service prior to 1910, as given above, with the record since the new management assumed control:

	Year Ending May 31					
	1911	1912	1913	1914	1915	1916
Resigned	1,390	913	956	337	175	275
Discharged . . .	1,635	855	536	334	142	117
Deceased	41	49	55	53	42	59
	3,066	1,817	1,547	724	359	451

The progressive decrease in the number of men who have been discharged is very significant. It will be remembered that in the last year preceding the advent of the new management, the total number of changes was 85 per cent of the entire platform force, while the number of discharges was 2376, or almost 50 per cent of the total number of men employed as conductors and motormen. The marked reductions which have occurred in each year since that time is the best index of the working of the co-operative plan. In the year just closing, only 117 men were discharged. In the year 1909-10, almost 3800 men voluntarily left the employ of the company. In 1914-15, the number so leaving was only 175. The increase in resignations to 275 in the last year represents the attraction of the high wages paid by the munitions factories and other industrial

establishments which play an important part in Philadelphia's industrial life.

THE TWENTY-TWO-PER-CENT FUND

The second important feature of the co-operative plan provided for the establishment of a wage fund from which wages should be paid and by which increases in wages should be governed. Investigation showed that the proportion which the wages paid to motormen and conductors in the year ending June 30, 1911, bore to the gross passenger earnings of that year was 21.81 per cent. The company took the position in its co-operative plan that the men should share in the hoped for prosperity of future years, and announced that it would "commencing as of July 1, 1911, pay to its trainmen that amount which, in total, will represent twenty-two cents out of every dollar collected out of the payment of fares. . . . The introduction of larger cars and better operating methods, together with proper co-operation between the men and the management should very materially improve the operating efficiency of the company, thereby making possible an increased scale of wages." The wages paid the men in April, 1911 were as follows:

New men, 22 cents per hour.

After one year's service, 23 cents per hour.

At the present time, the new men are receiving 27 cents per hour, the scale advancing 1 cent for each year of service, so that employees who have been with the company over five years are receiving 32 cents per hour. The motormen and conductors' wages have therefore been increased about 39 per cent in the last five years.

REASONS FOR WAGE INCREASE

Inasmuch as this increase was paid out of 22 per cent of the gross earnings of the company, it is obvious that the higher wages were the result of more economical operation, or to be exact, larger revenues per car-hour. The more important factors which have enabled the company to make this increase in car-hour earnings and in wages have been:

1. Adjustment of time-tables to eliminate wasted car-hours.
2. Introduction of cars of larger seating capacity.
3. An increase in the average rate of speed.
4. Rerouting of lines so as to increase the rush-hour capacity of the tracks in the downtown district and secure the most direct movement of traffic.
5. Improvement of discipline and of operating methods, which has resulted in a marked decrease in accidents.

The last named factor is contributorily rather than directly responsible for the increase in earnings and, hence, in the wage fund. It is significant as pointing to the fact that the establishment of cordial relations between the company and the men was not achieved at the expense of discipline and efficient operation.

In many ways the company was fortunate in so far as increasing wages was concerned in being able to institute so many important improvements. The compromise forced upon the company in the 1910 strike provided for straight runs. This uneconomical method of operation resulted in a large excess of car mileage during the middle of the day and in the early morning and evening, and a deficiency of service during the traffic peaks. The new management put it up to the men that if wages were to be increased, economical operating methods must be adopted. The wastefulness of unnecessary service was demonstrated, and the men were asked to co-operate in readjusting runs in order that facilities might be made to fit traffic needs. It was provided that wherever swing runs were to

be inaugurated, the men should be able to complete nine hours of work in fourteen hours of time. The necessary number of swing runs were introduced without serious objections from the men. It might be said, in passing, that when a new time-table is put out, it is submitted to the committeemen of the divisions affected. They are told that the company is indifferent as to whether the men shall have a nine or a ten-hour day, and, so far as possible, the new schedules will be planned to fit their convenience. The committeemen will ascertain the sentiment of the majority of the men and report the results. After schedules have been prepared upon the basis of this investigation, the men are allowed to select their runs according to seniority, the oldest men in point of service having the first choice, and so on.

The elimination of unnecessary straight runs reduced to a considerable extent the number of car-hours and hence indirectly increased the percentage of the wage fund available for each employee, because increases in the number of men were not proportionate to the increase in the volume of business handled.

The reconstruction of the time-tables has been in charge of Leon Jewell, superintendent of time-tables, who had previously had many years' experience in making schedules in Chicago. Mr. Jewell, in arranging the time-tables in Philadelphia to provide the increased car capacity during the morning and evening rush hours, has found it possible so to divide the required hours of service into runs as to meet to a remarkable degree the preferences of the men, expressed through the co-operative committeemen.

One of the most important factors in bringing about higher wages was the purchase and introduction of 1500 "near side" cars, which replaced small cars of antiquated type previously operated. Through better schedules and larger cars, the earnings per car-hour have been steadily increased.

Gradually and almost imperceptibly, the scheduled running time was quickened with the introduction of new cars. At present it is safe to say that the scheduled speed is 2 m.p.h. faster than it was when the new management assumed control. That this is not accomplished by recklessness is proved by the fact that accidents have been materially reduced.

Routing of lines was very unscientific when the new management assumed control. The existing system of routes had been criticized by the expert engineers employed by the Pennsylvania State Railroad Commission in its investigation of the company made in 1910. The old routes were relics of the horse-car days, most of them having been instituted during the competitive régime of the fifties, sixties and seventies. Using as a starting point the recommendations of the expert engineers to the State Railroad Commission and after careful study of the changes in traffic occurring since that investigation was made, the company, by a series of successive steps, rerouted the car lines in every part of the city. Routes were shortened, decreasing the time required to travel from any part of the city to the central business district, and improvements in general traffic conditions effected as the result of these changes. In this manner the earnings which a car could make in a day, and consequently the earnings per car-hour were materially increased.

CO-OPERATION FOR OPERATING EFFICIENCY

It is significant to note that the importance of the improvement in operating conditions was never lost sight of by the employees of the company. They were anxious to increase as rapidly as possible the 22 per cent wage fund. Any change which would increase that

fund was a matter of great interest to them. This 22 per cent fund probably did more to bring home to the men the essential elements of partnership between the employees and management of a street railway than any other feature of the co-operative plan.

The company looks forward to even more harmonious relations with its employees in the future. The strike has automatically cut off most of the dissatisfied employees. Their places have been taken by men who have had experience with the company and who desired to return to its service. At the present time the company believes that it has a body of satisfied employees, who desire to continue the co-operative plan and believe in its efficiency.

Steam Railroad Revenues in 1916

The revenues of steam railroads in 1916 amounted to \$3,508,529,950, according to statistics compiled by the Bureau of Railway News and Statistics. These figures were compiled from the monthly returns to the Interstate Commerce Commission for an average of 258,988 miles of line operated during the year ended June 30, 1916. For this year the operating expenses and taxes totaled \$2,452,022,700, thus giving a net operating income of \$1,056,507,250. The ratio of expenses to revenues was 65.54 per cent, and the ratio of operating expenses and taxes to revenue was 69.88 per cent.

The bureau states that in the eight years from 1907 to 1915 the revenues of the steam railroads increased only 15 per cent or less than 2 per cent a year, whereas for the single year 1915-1916 they showed an abnormal growth of nearly 18 per cent. This result was mostly due to an increase of \$438,000,000 in freight receipts. Such receipts constituted 70.93 per cent of the total operating revenues, the highest in the record of American railways. As a corollary to the phenomenal increase in freight revenues, the proportion of receipts from passengers was reduced far below the average. This, however, was partly due to an actual recession in passenger revenues from the figures of 1913 and 1914.

The amount paid by the steam railroads in taxes in 1916 was 103.08 per cent more than that paid ten years ago. The net operating income amounted to barely 6.05 per cent on a net capitalization of \$67,400 per mile. This is the highest percentage since 1906, the amount then being 5.74 per cent. Four times in the last ten years the return was below 5 per cent.

An Appeal for Brickbats

Don Marquis, in his column in the New York *Evening Sun*, a few evenings ago had this comment on the appeal for financial support of the men still on strike in New York:

"The striking carmen have organ grinders stationed about the streets of New York City with signs begging financial help for the strikers from the general public.

"At the same time they or their sympathizers are stoning the cars in which the general public must ride.

"It is all beautifully simple. You give the strikers a nickel and they buy a brick with it and soak you with the brick.

"Any man who isn't willing to pay a little something toward having his skull fractured must be a d—d capitalist, a grinder of the faces of the poor, a tightwad, an enemy of the republic and a low-life.

"If you are a gentleman and a true sympathizer with the Down Trodden you will give them a quarter so they can buy enough bricks not only to maim yourself, but to shatter your wife's cranium and cripple your little girl as well."

Specifications and Standard Definitions

Correct and Uniform Descriptions and Specifications of All Materials and Supplies Are of Great Importance to Purchasing Departments

BY H. B. TWYFORD

Formerly Purchasing Agent Underground Electric Railways of London, Ltd.

ONE of the fundamental principles of good purchasing is the proper selection of the sources from which supplies are obtained. The importance of this phase of the work of the purchasing department was dwelt upon in the ELECTRIC RAILWAY JOURNAL of June 10, 1916.

Another matter which is of equal importance, although it does not offer so much scope for imagination and creative work on the part of the purchasing agent, is the correct and uniform specifying of all materials and supplies. In fact, with these two features thoroughly and efficiently covered the purely mechanical and physical work of the department should proceed smoothly and quickly. Moreover, more than half the battle of getting the right price is won if these two essentials are properly secured. The knowledge that the companies asked to quote are positively the best to give the right articles and service insures the competition being sound, and this, combined with the fact that the material or article is properly specified and described, gives absolute assurance that all bidders are quoting on exactly the same grade, quality, finish, size, etc.

The average buyer is commercially rather than technically trained and it is not to be assumed that a man buying a wide variety of materials can be so well informed technically as to be able to accurately specify each one of his purchases. Nevertheless, he should have some superficial knowledge of technical and mechanical subjects and this in itself must be considered a definite accomplishment. In general, the man who buys a specific grade of material in large quantities at regular intervals will not suffer from a lack of knowledge concerning the technical characteristics of that material. He will from observation, if not sheer necessity, acquire all points of information required for the satisfactory and economic purchase of the commodity.

SPECIFICATIONS

The purchasing departments of railroads, public service corporations and many manufacturing plants depend on the engineering staff to furnish them with correct specifications for their heavy purchases, and also those which require description in detailed technical terms. To a large extent this means that the purchasing agent's work is a matter of specializing on price and delivery because the question of what to buy has been predetermined by exhaustive practical experiments, the results of which are contained in the standard specifications furnished to him and which he uses in canvassing the market and placing his orders. It must not be inferred from this that his work is merely clerical, for it is necessary for him to know something of the material he is buying and the antecedent manufacturing processes through which it has passed.

It is not the purpose of this article to discuss these specifications. They should be printed or typewritten in suitable quantities properly numbered and indexed and kept in the files of the purchasing department in readiness to send out with inquiries and orders.

STANDARD DEFINITIONS FOR SMALL ARTICLES AND MATERIAL

There are, however, a large number of small articles purchased which are frequently improperly described or for which there are no standard definitions. The fore-

man on some track work or the man in charge of an emergency or breakdown job needs something for which he applies to the storekeeper. The storekeeper may make a requisition on the purchasing agent, who places an order. It frequently happens that these three men will use varying methods or descriptions of the same article. This leads to confusion and reference back to each other, causing delay and expense. Moreover, how many persons in the purchasing department could give offhand the correct method of specifying the dimensions of a simple article such as a cotter-pin and tell whether the length should be given over all or under the head?

Specifications must always Read as Follows:
Quantity, Diam. Length, Material, Article

Example: 193 1/4" x 3" Steel Cotter Pins

Reqs. No.	Order No.	Date	Seller	Weight or Quantity	Size	Material	Price

STANDARDIZING PURCHASES—FORM I—SHOWING PURCHASE-ORDER RECORD WITH SKETCH OF ARTICLE AND SPECIFICATIONS

Similar questions might be asked in regard to rivets, nuts, carbon brushes, mica washers and many other small articles.

The rectification of these conditions can be undertaken by the purchasing department and uniform descriptions of all small articles standardized and put into force throughout the organization. An excellent plan is to have sketches made which can be suitably reduced in size and printed with the specifications on the purchase-order record. An illustration (Form I) of these is presented herewith, from which it will be seen that when an article may be thus visualized, it becomes second nature always to use the same procedure in giving the dimensions or description.

Such a purchase-order record as that illustrated is valuable for reference purposes. From it can be obtained:

1. A complete index of all orders under the name of the material.
2. A list of all vendors from whom the material has been purchased.
3. A record of prices paid, the fluctuations being easily followed by glancing down the last column.

Article Location
Specify: Quantity, Diam. (D) Length (L), Threaded U.S.S., Length of Thread (L₁) should only be Spec. when Special

Ordered		Received		Issued		Issued		Max.	Verified	Sheet
Date	Order No. Quantity	Date	Order No. Quantity	Date	Req. No. Quantity Balance	Date	Req. No. Quantity Balance	Min.		No.

STANDARDIZING PURCHASES—FORM II—SHOWING STORE-KEEPER'S STOCK RECORD WITH ILLUSTRATION OF ARTICLE

4. A compilation of the total quantity of material purchased over any period.
5. A standardization of specifications and definitions.

Whenever possible a sketch should appear on the record, but with such things as sheet mica, sheet fiber, cotton waste, etc., the standard method of specifying should be printed across the top of the page, e.g., "100 lb. clear North Carolina mica cut 1 1/2 in. x 4 in.—standard for testing purposes must be submitted before order is placed."

Illustrations should also be placed on the forms used by the storekeeper in keeping his store records, because his descriptions will then harmonize with those of the purchasing department. Form II is an illustration of a storekeeper's stock record (card or loose-leaf sheet)

showing the method of specifying hexagon-head cap screws. This, of course, should be uniform with the method of specifying shown on the purchase-order record for the same article. It may be possible also to furnish the superintendent and foremen with copies of the standard definitions, thereby securing uniformity throughout the organization.

The writer has had to handle large batches of requisitions as they came into the purchasing department daily, and many of these would have been unintelligible or would have needed explanation or better description if placed before vendors and suppliers. This meant that the purchasing department had to beat them into shape before any action could be taken either in getting quotations or in placing orders. It frequently happened that the requisition was too obscure to be correctly deciphered and had to be referred back to the maker. This was bad enough in its influence on the internal economic administration of the establishment, but in those cases where the material was needed for an emergency job it might have been very serious.

The prime considerations in specifying small articles and material are accuracy and brevity, but at the same time nothing essential should be omitted. Sometimes two or three words will suffice and the inclusion of an unnecessary word may lead to misconception and uncertainty.

TECHNICAL AND MECHANICAL TRAINING FOR PURCHASING DEPARTMENT EMPLOYEES

It is a practice with many large manufacturing corporations to give their salesmen a course in the shop, where familiarity with the manufacturing processes can be acquired as part of their education and training. It would be of great value to public service corporations if they offered facilities for all employees in their purchasing departments to become acquainted by practical experience with the requirements of their construction, operating and repair work. It would put them in close touch with the needs of the organization, which is a prime requisite in good buying.

Every purchasing agent has substitutes offered to him, and the natural tendency in such cases is to refuse to entertain any suggestions regarding these which would involve paying a higher price. A person, however, with an intimate knowledge of the use to which the material was to be put might see where a saving could be effected even if the actual price paid per unit was higher. This knowledge, too, is often valuable in the cases of emergency requisitions for repair work, when the actual material specified cannot be obtained promptly, but a substitute can be purchased for immediate delivery which will answer equally well.

ECONOMIC BENEFITS OF BETTER SERVICE

Inaccurate, inadequate or loosely worded descriptions of material are far too common. In many purchasing departments the straightening out of trouble caused by them is looked upon as a necessary evil, and as part of the routine work of the department. It has already been pointed out that where these conditions prevail the department and the organization are working at a serious economic disadvantage. An inordinate amount of time may be consumed in getting requisitions into intelligent shape. This means delay in placing orders with the contingent possibility of delaying emergency and repair work.

If correct definitions are not applied to all materials and articles as the requisitions arrive in the purchasing department, and inquiries and orders carrying an ambiguous meaning are sent out to suppliers and vendors, the trouble is sown broadcast among these, causing fur-

ther losses and delays. Many business houses could testify to this result, for they come in contact with it daily. By better methods in the purchasing department a very large percentage of the trouble and loss can be prevented if it is not entirely eliminated.

Initial Resistance to Car Motion

Some Measurements of the Forces Necessary to Start Different Types of Cars Are Described in This Article

BY D. D. EWING

Associate Professor of Electric Railway Engineering, Purdue University, Lafayette, Ind.

IN connection with the attempts which many roads are making to reduce energy consumption and starting peaks, data on the forces which oppose car motion at the instant of starting should be of interest. The energy losses which can be traced directly to high initial train resistance are, of course, small. Since a car of high initial resistance will, other things being equal, accelerate at a lower rate than one of low initial resistance, however, certain indirect energy losses of more importance than the direct losses may result from high initial train resistance. These losses, combined with the fact that, by affecting the accelerating rate, the initial train resistance also affects the schedule speed, make the problem of investigating the initial resistance to car motion worth while.

In the ELECTRIC RAILWAY JOURNAL for Aug. 14, 1915, page 279, the writer discussed the results of some

TABLE I—DESCRIPTION OF CARS

CAR	WEIGHT		Gage of Wheels, Ft.-In.	Diameter of Wheels In.	CONDITION OF	
	Light	Total			Wheels	Bearings
Ft. W. & N. I. T.	659	14,200	4-8½	33	Worn, rusty	Dry
Ft. W. & N. I. T.	146	23,500	4-8½	34	Worn	Well lubricated
Ft. W. & N. I. T.	227	25,500	4-8½	31	Worn	Well lubricated
Ft. W. & N. I. T.	251	40,400	4-8½	33	Fair	Well lubricated
Purdue Test car	54,000	54,000	4-8½	33	Good	Well lubricated
Ft. W. & N. I. T.	303	70,700	4-8¾	36	Fair	Well lubricated
C. T. H. & S. E.	7,426	38,800	4-8	33	Good	Well lubricated
C. T. H. & S. E.	7,737	38,700	4-9	33	Worn	Well lubricated
C. T. H. & S. E.	7,173	38,700	4-8¾	33	Good	Well lubricated
C. T. H. & S. E.	7,218	38,800	4-8¾	33	Good	Well lubricated
L. & N.	69,569	35,600	4-8	33	Good	Well lubricated
C. T. H. & S. E.	7,589	38,800	4-8¾	33	Good	Well lubricated
Penn.	302,147	38,800	4-8½	33	Good	Well lubricated

tests made on the Purdue test car. In these tests the initial friction was determined for several conditions of track by two independent methods, namely, the current-input method and the dynamometer method. As the values obtained were higher than those ordinarily assumed it was decided to continue the investigation by making tests on other cars, and within the last year tests on several different types of cars have been made. In these later tests the dynamometer method only was used.

Some of the main features of the cars tested are tabulated in Table I. The first three are single-truck motor cars, the second three, double-truck motor cars and the balance, steel coal cars selected at random from cars placed on the university power-house tracks. As indicated by the figures in the weight columns all of the motor cars and the last two coal cars were not loaded.

RESULTS OF TESTS

Table II is a summary of the test results. In the column headed, "Average Pull, Pounds," is given the av-

erage force, applied at the drawbar, necessary to produce a perceptible movement of the car. This average force was determined by averaging the dynamometer readings for the number of observations listed in the next column. The average pounds pull per ton listed in the last column was obtained by dividing the average dynamometer reading by the weight of the car in tons. That some of the individual readings deviated from the average value is indicated by the figures for the maximum and minimum "Pounds Pull per Ton." As in the preceding tests, however, the majority of the observations gave results which were quite close to the average.

Car No. 659 had been standing in the barns for several months prior to the test. In order to limber it up, it was run back and forth over the test track for some time. Even with this preliminary limbering up its av-

of initial train resistance usually assumed are too low.

The tests were carried out as thesis work by R. B. Nichols, R. F. Stuart and G. C. Waples. To them and to Jack Abbot, superintendent Fort Wayne & Northern Indiana Traction Company, who gave material assistance in making the tests, the writer desires to express his indebtedness.

Shop Lighting and Other Subjects Discussed by Railway Electrical Engineers

Importance of Monthly Cleanings for Lamps in Shop Lighting Costs—Data on Electrical Equipment for Steam Railroads—Electric Versus Pneumatic Tools

AT the ninth annual convention of the American Railway Electrical Engineers' Association, which was held at the Hotel LaSalle, Chicago, Oct. 31-Nov. 3, a number of committee reports of interest in the electric railway field were presented, among them being one covering the subject of maintenance of illuminating equipment. This report applied especially to the illumination of railway shops, and attention was called to the fact that in modern industrial plants it is considered good practice for the cost of light range from 0.5 per cent to 1 per cent of the total wages paid to employees in the shop. This does not appear high when it is considered that only four minutes of the average workman's time costs the same amount as the illumination of his work for an eight-hour day, and that insufficient light may cause him to lose time far in excess of this amount.

MAINTENANCE OF SHOP-LIGHTING EQUIPMENT

The report submitted approximate data covering the total annual operating costs of a 1000-watt gas-filled lamp with porcelain reflector and a 750-watt quartz lamp by which it was shown that the total effective lumens of the two were 13,400 and 12,500, approximately the same in either case, while the first costs were respectively \$10 and \$60. The annual fixed charges, including 75 cents for cleaning, were respectively \$1.71 and \$8.64, while the maintenance costs per year of 4000 hours were assumed to be the same at \$20 per year. Energy delivered to each lamp at 2 cents per kilowatt-hour amounted respectively to \$80 and \$60, making a total operating cost for the gas-filled lamp of \$101.74 and for the quartz lamp of \$88.64. Among these items the largest one is the cost of energy, and in general, this item averages about 75 per cent of the total annual operating cost. Hence efficiency of the unit is really of first importance.

However, with regard to the various lighting units that are competitors for railway shop lighting, the report favored the tungsten lamp on account of its reliability, low first cost, simplicity and ease of maintenance. With this lamp the influence of cleaning was stated to be of considerable importance, and a curve was submitted to show that the loss at the end of twelve months without cleaning in an average railway shop equipped with 1000-watt gas-filled lamps and porcelain reflectors approximates \$22 per lamp, the loss during the last month being at the rate of \$34 a year. From this it was deduced that money spent for cleaning once each month brings a return of more than 60 per cent.

The following materials were recommended for use in cleaning lamps: (1) Soap and water; (2) Gasoline or benzine; (3) Denatured alcohol; (4) Ammonia. For ordinary conditions soap and hot water will thoroughly clean lamps and reflectors, although in most railway shop buildings where smoke and oily fumes are present

TABLE II—RESISTANCE DATA

Test Number	Car Number	Car Weight, Tons	Air Temp. Deg. Fahr.	Average Pull, Pound	Number Observations	Pounds Pull per Ton		
						Maximum	Minimum	Average
1	659	7.1	36	515	104	105	46	72
2	659	7.1	38	475	100	86	55	67
3	146	11.75	34	385	204	53	24	33
4	227	12.75	38	480	167	46	26	38
5	251	20.2	40	620	175	42	22	31
6	Test car	27.0	57	1,070	100	47	34	40
7	303	35.0	40	1,450	100	46	37	41
8	7,426	69.0	32	1,000	11	19	12	14
9	7,737	67.0	27	1,600	51	28	21	24
10	7,173	68.75	27	1,425	79	25	18	21
11	7,218	68.75	27	730	68	15	8	11
12	69,569	55.6	28	1,425	80	23	22	26
13	7,589	19.4	33	800	84	43	35	41
14	302,147	19.4	52	925	167	56	41	48

erage initial train resistance was 72 lb. per ton. The second test made on the same car after the bearings had been carefully repacked and lubricated gave 67 lb. per ton. With the exception of the Purdue car all of the other motor cars were taken out of regular service for test. For the Purdue car the average pull of 1070 lb. checks very closely the average of 1060 lb. obtained with a different dynamometer the preceding year. Tests were attempted on two other motor cars, one of 40 tons weight and the other of 44 tons. Although the attempts to pull these cars were made immediately after the cars came in from a 115-mile run the forces necessary to start them were beyond the range of the dynamometer which had a capacity of 2500 lb. Apparently their initial train resistance exceeded 60 lb. per ton.

The freight cars were all moved a sufficient distance to turn the wheels over several times before the readings, which were averaged to give the results listed in the table, were taken. Pulls made after the cars had been standing a number of hours indicated that the pull necessary "to break a car loose" after it had been standing awhile was from one and one-half to two times that listed in the table. Other experiments showed that the force necessary to keep a car moving at approximately 1½ m.p.h. varied from 0.4 to 0.75 of the average given in the table. It was observed in all cases that the resistance to car motion decreased very rapidly with slight increases of speed.

The values given in the table are for straight level track. In taking the readings the pulling force was applied gradually so as to reduce the rate of acceleration and, therefore, the portion of the applied force necessary to accelerate the car mass to a minimum. While no really definite conclusions can be drawn from the above data regarding the relations between type or light weight of car and initial train resistance, the results taken as a whole seem to indicate that the values

it is necessary to use some ammonia. Denatured alcohol will cut dirt much more quickly and better than gasoline and less of it is required per lamp. Hence, although alcohol costs approximately twice as much as gasoline it is cheaper in the end. One gallon of alcohol will clean ninety 750-watt units with 18-in. bowl reflectors, the process being to dampen a small piece of waste for wiping the lamp and reflector and to follow this with a handful of dry waste. Gasoline or alcohol should not be used on aluminized reflectors, for which the manufacturers recommend only soap and water or a very weak solution of ammonia. It has been found that approximately six minutes are required per unit to clean a 750-watt lamp and an 18-in. porcelain enameled steel reflector, amounting approximately to 75 cents per unit for monthly cleaning. Thus the cost of cleaning is a very small percentage of the total.

In many buildings it is a very good investment to keep the walls and ceilings white, since this increases the illumination by as much as 25 per cent. On this basis it becomes profitable to expend 0.2 per cent of the total annual wage in a shop for keeping up the white paint, assuming a benefit only to the artificial lighting. In modern shops white walls and ceiling are part of the illuminating system, and the maintenance of their color should be included as a part of the allowance for maintaining lighting equipment.

ELECTRICAL EQUIPMENT FOR RAILWAYS

Another interesting report that was presented at the convention was that of the committee on data and information, in which figures covering a large number of steam railroads of the country were submitted. It was shown that, in connection with the electric lighting of steam railroad cars, there had been a decrease during the past year in the use of lead battery cells, while there had been a remarkable increase in the use of nickel-iron storage batteries. The figures also displayed the fact that a large proportion of the axle-lighting generators used for steam railroad cars were now equipped with ball bearings, an increase from 1652 to 5417 having taken place during the year 1916. Also, in the growth of electrically-operated industrial trucks for baggage handling and in freight houses and shops there had been an increase of practically 50 per cent over the number in service in 1915.

A feature of the report was the statement that the number of direct-gasoline-driven, self-propelled cars in service on steam railroads had decreased from 197 in 1914 to 112 in 1916, and while the gas-electric cars in use in 1914 numbered thirty, the number in 1916 was only thirty-two. For electric headlights for steam locomotives the figures showed a slight decrease in use of the arc type and a very marked increase in the incandescent-lamp type, the totals for 1916 being 16,306 arc lamps and 3510 incandescent lamps, as against the 1915 totals of 16,446 and 1287.

The total number of arc lamps in use for shop and yard lighting showed a large increase, but the detailed figures displayed the fact that the number of flaming-arc and Cooper-Hewitt lamps had decreased to a marked degree. The data on incandescent lamps showed that although there had been a big increase in the number of 100-watt vacuum type Mazda lamps, there had been no increase in the larger sizes. The gas-filled type of incandescent lamp, on the other hand, showed a remarkable increase in all sizes.

Another feature of this report was the statement that a total of 192 equipments for electric-arc welding were in service on the steam railroads of the country at the present time. In fact, the widespread interest in this subject was displayed by an elaborate report on elec-

tric-arc welding that was made by a special committee. In this it was said that the application of the electric-arc welding process to repair work in locomotive shops was a very profitable proposition, and curves were shown which indicated that the cost of the electric arc was somewhat less than that of the oxy-acetylene flame, these being based on prices of 1 cent per cubic foot for acetylene, and 2 cents per cubic foot for oxygen, while electric power from a 75-volt line was assumed to cost 1 cent per kilowatt-hour.

ELECTRIC VERSUS PNEUMATIC TOOLS

A report on the application of compressed air in repair shops included an extended statement on the relative advantages of electric and pneumatic operation for portable tools. This divided portable tools into two classes, namely, rotating tools such as drills, and reciprocating tools such as riveting hammers. For the reciprocating class the electric tool in its present stage of development seems to have no advantages although there are such tools upon the market. In the case of rotating tools, however, there is a strong competition between the two types.

The pneumatic tool is considerably lighter and, consequently, is easier to handle than the electric machine, the increased weight of an electric drill over a pneumatic drill varying roughly from 10 per cent in the larger sizes to 25 per cent in the smaller. However, the electric tool has the advantage that a portable electric cord is much easier to handle than an air hose, and sometimes it develops that two men with an electric drill will accomplish more than twice as much work as one man with a pneumatic drill.

Efficient operation is the chief advantage that the electric tool has over the pneumatic tool. This is especially the case when the work varies from second to second, a portable pneumatic machine speeding up the instant when the load is removed and thus taking more power as the load is released. Even on continuous full load the efficiency of the electric drill varies from 30 per cent in the smaller sizes to as much as 80 per cent in the larger, whereas the efficiency of the pneumatic tool varies from 18 per cent to 35 per cent. The system of generation and transmission is usually more efficient in the case of electricity than in the case of air, and it should be noted that the instant when current is turned off of the electric tool the demand for energy ceases since there are, of course, no leaks.

In regard to first cost, the pneumatic tool is less expensive than the electric tool. The latter, however, is free from the annoyance that air tools often give by freezing up during the winter time. On the cost of maintenance no accurate figures were obtained by the committee, but it was stated that electric tools would not stand the abuse that could be applied to pneumatic tools. However, where the equipment was not abused, it was considered probable that the maintenance of the electric tool was considerably less costly than that of the pneumatic one.

BUSINESS MEETING

The registration was the largest in the history of the association, and there was an extensive exhibit of railway electrical supplies. The officers elected were: President, C. J. Causland, electrician Chicago Terminal Division, Pennsylvania Lines; vice-presidents, J. E. Gardner, electrical engineer Chicago, Burlington & Quincy Railroad, and L. S. Billau, assistant electrical engineer Baltimore & Ohio Railroad; secretary-treasurer, Joseph A. Andreucetti, Chicago & Northwestern Railroad. The meeting place of the next annual convention is to be Chicago at a date to be set by the executive committee.

Mechanical Design of Electric Locomotives*

Action of High-Speed Steam and Electric Locomotives on Curves Analyzed—Simplicity in Design Vitaly Important

BY A. F. BATCHELDER, SCHENECTADY, N. Y.
Member American Society of Mechanical Engineers

THE steam locomotive has what now seems to be natural characteristics to allow high-speed operation in one direction. These characteristics include a low center of gravity at the front end which is carried on the center pin of a two-axle guiding truck. This tends to prevent rolling over and has but little effect on the guiding. Also, there is a high center of gravity at the rear end which is provided with inside journal bearings, allowing the locomotive to roll and increasing the time element, which thus reduces and distributes the lateral pressure against the rail over a longer distance. This increases the vertical pressure on the rail, holding it more firmly in place. These same characteristics can be obtained in electric locomotives by the sacrifice of double-end operation.

However, the advantages gained in operating the electric locomotive in either direction are so important that means should be provided for satisfactory double-end operation. One way of doing this is by using a four-wheel guiding truck at each end of the locomotive. With the use of the extra truck, however, the importance of a high center of gravity largely disappears. The lateral pressure against the rail at the rear end now appears at the truck flanges rather than at the flanges of the driving wheels, and the high center of gravity no longer provides the same increased vertical pressure on the outer rail at the point of the maximum lateral pressure. The lateral stresses from guiding the main frame are taken at the center pins of the two guiding trucks, and the additional vertical pressure on the outer rail is dependent upon the height of their center pins rather than upon the height of the center of gravity of the main frame above the wheel hubs. Thus less advantage is left to be derived from a high center of gravity.

To demonstrate more clearly, it is well to consider what happens to a locomotive when entering a curve, which is also illustrative of its action on tangent track when oscillating from one side to the other inside of the normal clearance between gage line of track and the wheel flanges.

A locomotive with a high center of gravity which is equipped with two driving axles and a four-wheeled swivel truck will serve to illustrate the action. As the locomotive enters a curve, its tendency is to continue on in a straight line, but the flange of the leading wheel gradually comes in contact with the outer rail. This gives the guiding truck an angular motion about its outer rear wheel and exerts a lateral pressure against the center pin, thus giving the main frame an angular motion around its outer rear wheel.

The lateral pressure that tends to displace the rail at the leading wheel is the force required to slip the two inner truck wheels and to accelerate the truck around its outer rear wheel, plus one-half the force required to slip the two leading drivers and the rear inner driver and to accelerate the main frame around its rear driving wheel, plus a portion of the centrifugal force of the whole locomotive.

The lateral pressure that tends to displace the outer rail at the rear wheel of the leading truck is the amount of reaction that comes from slipping the two inner truck

wheels and from the angular acceleration of the truck, plus one-half of the force required to slip the two leading drivers and the rear inner driver and to accelerate the main frame around its rear outer driving wheel, plus a portion of the centrifugal force of the whole locomotive.

The lateral pressure tending to displace the outer rail at the rear wheel of the main frame is the amount of reaction that comes from slipping the two leading drivers as well as the inner rear driver and from the angular acceleration of the main frame, plus a portion of the centrifugal force of the whole locomotive.

Because the greater part of the weight is concentrated at the drivers, and because the distance of the truck center pin from the main truck wheels is relatively great, and also because there is but one wheel to take the strain, it follows that the point of the greatest concentrated lateral pressure is at the rear outer driving wheel.

The above disregards the important factor of time in the accelerating and centrifugal forces due to the rolling. This is governed by the height of the center of gravity above the wheel hubs, which tends to reduce the lateral pressure at the rear outer driving wheel. With a high center of gravity the accelerating and centrifugal forces also tend to tip the locomotive up on the outer driving wheels, reducing the weight upon the inner wheels and lessening the force required to slip them. At the same time this action increases the adhesion between the outer rail and tie by the additional weight.

If this locomotive is operated in the opposite direction, the lateral stresses at the wheels are of the reverse order. In this case, the guiding force is applied at the driving-wheel flanges and the reaction taken through the center pin to the truck-wheel flanges. The swivel truck, now trailing, is free to oscillate from one side to the other, and it is possible that the reaction from the force of turning the main frame may be applied at the center pin at the instant when the truck-wheel flanges are tight against the inner rail, allowing the force to accelerate the truck as well as the main frame through the gage clearance to the outer rail. This will add momentum, the value of which depends upon the lateral distance through which the truck is moved, and since the vertical pressure on the rail is limited to the normal weight at the wheels, plus the vertical component of the force that is applied at the height of the center pin of the truck, the relation of the lateral pressure to the vertical pressure at the wheels of the truck may be greatly increased. A number of observations have appeared to confirm the fact that the action of the trailing truck above described is important in producing excessive lateral pressures against the rail in a symmetrically-built electric locomotive with similar trucks at both ends.

REPRODUCING THE ACTION OF HIGH CENTER-OF-GRAVITY SINGLE-END LOCOMOTIVES

It will be seen, therefore, that while the swivel truck is desirable as a guiding agent at the front end, it is not as desirable at the rear end. If it is used at the rear end of the locomotive, means must be provided to prevent oscillation of the truck and to accomplish the same results as the high center of gravity of a single-end locomotive. To accomplish these results, it is necessary to reduce the momentum effect and to reproduce the equivalent of the time-element factor, as well as the equivalent of the increase of vertical pressure on the outer rail.

The momentum effect at the truck can be reduced by providing resistance against swivelling, thus restricting the truck from oscillating from one side to the other of the track, and the amount of this resistance is

*Abstract of a paper written for presentation at the annual meeting, December, 1916, of The American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York.

determined by the allowable force that can safely be applied to the truck when leading. To reproduce the time-element factor, lateral movement can be given to the truck center pin by any of the several methods for giving lateral movement to the leading-truck center pins on steam locomotives. However, the writer has obtained the best results with the method that is the nearest to constant pressure and dead beat, as this also tends to prevent oscillating.

To increase the vertical pressure on the outer rail, the center bearing of the truck can be made wide, thus allowing the vertical component of the lateral pressure at the center of gravity to be transferred through the bearing to the wheel. Also, with a narrow center bearing the height may be made such that the lateral pressure at that point will result in an increased vertical component independent of the height of the center of gravity.

It is the writer's opinion that the double-end locomotive, while its characteristics are different, can be designed for high speed with a degree of safety equal to that of the single-end locomotive, and this may be done regardless of the height of the center of gravity.

ADAPTABILITY TO SERVICE CONDITIONS

When the design is such that it is safe to operate at the required speeds and is proper for the curves and other service requirements, and liberal factor of safety is provided for the parts subjected to strain, there are still many other features to be considered in the mechanical details. Thus, reliability in service as affected by the mechanical part of the locomotive depends mainly upon the bearings, their lubrication, and the method of power transmission from the motors to the drivers. It is necessary, therefore, to provide effective lubrication with as few bearings and as simple driving mechanism as the design of the motors will allow.

The power efficiency as affected by the mechanical design is governed largely by the type of the traction-motor support, and the various types may be given the following order in this regard: The gearless motor mounted directly on the axle; the gearless motor mounted on a quill and driving through springs to the wheels; the single-reduction-gear motor; the single-reduction-gear motor driving through gears and side rods to the wheels; the gearless motor driving through side rods and jack shaft to the wheels.

The service time factor is dependent upon the ability of the locomotive to operate under all its service conditions and without undue strains which requires a liberal design of its wearing parts. In addition to this it depends on the simplicity of the design and the ease with which the parts can be inspected, adjusted, repaired or replaced.

The cost of maintenance of the permanent way is a very important item and can be increased or reduced by the design of the locomotive, and the lowest cost is obtained when the locomotive meets its service requirements without undue strains on track, and when the rotating parts are balanced, the weights per axle are suitable for the structures, a suitable equalizing system maintains the proper weight distribution and when provision is made to protect against flange wear.

The cost of maintenance of the locomotive is dependent upon its safety of operation, its adaptability to service conditions, its reliability, its convenience of arrangement, and the same items that enter into its service time factor. It is also governed by the same conditions that affect maintenance of the permanent way.

The first cost of a locomotive will depend largely upon the design chosen, but its importance, except at the time of purchase, becomes of little moment when taking into consideration the foregoing features. With two locomo-

tives designed for the same service the cost of the difference in the efficiency and in the locomotive maintenance alone for one year may, when capitalized, amount to a sum representing a considerable proportion of the first cost of one of the locomotives. In fact, too much importance cannot be given to developing to the utmost the electric locomotive that is the simplest in design and is the highest in efficiency.

In conclusion it may be said that, from the present outlook, the locomotive types that lend themselves best to simplicity and low cost of maintenance are, for high-speed passenger service, the design providing for a gearless motor having an armature mounted directly on the axle, while for freight and switching service the preferred design is that with the single-reduction-gear motor mounted on and geared to the axle.

AMERICAN ASSOCIATION NEWS

Mid-Year Meeting and Dinner Committee

Secretary Burritt announces the full personnel of the committee which will have charge of the 1917 mid-year meeting and dinner at Boston. As stated last week, the date has been tentatively set for Feb. 2. The names of the members of the committee follow:

M. C. Brush, (chairman), Boston; Charles C. Peirce, Boston; Col. T. S. Williams, Brooklyn; E. L. Janes, New York; John J. Stanley, Cleveland; B. A. Hegeman, New York; Myles B. Lambert, Pittsburgh; C. Loomis Allen, Syracuse; C. R. Ellicott, New York; C. P. Dennett, Boston; H. E. Reynolds, Boston; Harlow C. Clark, New York; E. B. Burritt, New York.

Public Service Company Section

The Public Service Company Section has under way a membership contest at the end of which \$20 in gold will be awarded by Martin Schreiber, engineer maintenance of way, Public Service Railway, to the man who obtains the largest number of new members between Oct. 30 and Dec. 15. The award will be made at the annual smoker to be held on Dec. 21.

The slogan of the section is "600 Members by Christmas."

Hampton Section Inaugurates Night School Work

The first regular meeting of the Newport News & Hampton Railway, Gas & Electric Company section was held in Newport News on Oct. 20. The committee on night school reported that twenty men had signified their desire to attend such a school and that the first class would be held at once. Reports were received from representatives who had attended the Atlantic City convention as to the exhibits and the company section activities at the convention.

The following officers were elected for the ensuing year: President, E. C. Kelly; vice-president, R. H. Lassiter; secretary, J. W. Howard; treasurer, W. J. Smith.

Denver Tramway Section

The thirty-eighth monthly meeting of the section was held in the company's auditorium on Oct. 19. There were thirty-five persons in attendance.

After the display of a "movie" entitled "Roping a Sweetheart," the annual election of officers for the ensuing year was conducted with the following results: President, W. H. McAloney, superintendent rolling of stock; vice-president, W. M. Casey, superintendent

transportation; secretary-treasurer, H. G. Mundhenk, chief clerk, transportation department; director for two years, G. E. Ames, motorman East division; director for one more year, W. E. Casey, chief electrician; director ex-officio, F. W. Hild, general manager.

Following the election, a general discussion concerning the welfare of the section, together with ways and means which might be employed to add to the attractiveness of the meetings, was entered into, many good points and suggestions being offered.

COMMUNICATION

A Plea for Unification of Accounting Classifications

Oct. 28, 1916.

To the Editors:

I have read with interest the address of Homer A. Dunn before the recent convention of the American Electric Railway Accountants' Association, as well as the very able editorial in your issue of Oct. 14 and the comments of W. H. Forse, Jr., in the issue of Oct. 28.

Members of the Accountants' Association realize, more fully than anyone else, the able work done by their representatives in connection with the uniform classifications of accounts for electric railways. Any differences of opinion concerning the handling of certain accounts should not be taken as a criticism of the members of the classification committee, but should be seriously considered with a view of determining whether the suggestions are desirable from a modern accounting standpoint—not necessarily from the standpoint of electric railway accounting as heretofore practised, but from the standpoint of principles of general accounting for all utilities.

Mr. Dunn touches on some inconsistencies but does not, in his short paper, mention all differences between the electric and steam railway classifications. It is not expected that all accountants will agree with everything said by Mr. Dunn, but there are points brought out by him which should be discussed frankly and with all seriousness. A comparison of the electric railway classification adopted in 1908 with the classification adopted in 1914, shows many differences and improvements in the latter classification. Why should we not be willing to continue improving our classification by discussing all points in a free and open manner? If steam railway accountants have succeeded in handling certain items in a more correct manner than electric railway accountants, the latter should be willing to acknowledge the improvement and modify their methods accordingly. If electric railway accountants handle certain items more correctly, steam railway accountants should be willing to change their methods to conform to the better practice.

Steam railway accountants, I regret to say, have almost entirely ignored the existence of an Accountants' Association connected with the electric railway industry, notwithstanding the fact that the amount of capital invested in electric railways necessitates expert accounting, and some electric railway accountants are just as competent and able as accountants of steam railways. On the other hand, there has been a disposition on the part of some electric railway accountants, as soon as steam railway methods are suggested, to make objection to their adoption, apparently for the reason that the method is a steam railway method and was not originated by electric railways. I do not say that this is the

case in all instances, but I have noticed this disposition a number of times.

It is understood that the Interstate Commerce Commission has desired for many years to make the steam and electric railway classifications as nearly uniform as possible, and the electrification of portions of many steam railways would seem to constitute an argument for uniformity, although it is asserted by some that the electrification is, after all, only a change in motive power. If this is granted to be the case, however, it would seem desirable that two companies operating the whole or a portion of their lines with the same motive power should keep their accounts in a uniform manner. I have never felt that a satisfactory classification for both steam and electric railways could not be devised. The large number of operating expense accounts necessary in a consolidated classification would be practically the only objection. This is not a valid one, because a number of accounts would not be used by electric railways because of the nature of their business, and a number of other accounts would not be used by steam railways. But this is a matter which depends on the wishes of the Interstate Commerce Commission and the wishes of the owners of electric and steam railways, who may or may not desire the information given them to be uniform.

A very serious question for accountants to consider, however, is the different classifications required by the various railroad and public service commissions of the several states. A number of states have adopted as standard the Interstate Commerce Classification, but others have their own views and insist upon practices which may or may not be more desirable than the Interstate methods. It would be a great advantage to all if it were possible for the American Electric Railway Accountants' Association to recommend a classification which could withstand the attacks of all accountants and prove satisfactory to all commissions.

What we accountants have to deal with is the present system of accounts, and we should all be willing to receive suggestions from every source, consider each carefully, and recommend and adopt such changes as may seem best, regardless of whether or not it necessitates a change in our former methods. The closing sentences of your editorial of Oct. 14, are so admirably expressed that I repeat them here:

"Whether the future may bring actual changes or not, however, it is vitally necessary that the members of the Accountants' Association continue to hold an open mind on the subject, and that in mutually felicitating themselves as to past accomplishments they do not neglect to consider with all seriousness the best in modern accounting, wherever developed or by whomsoever suggested. Blind worship of the past or a Pharisaic attitude of superiority would only dim the luster of past accomplishments." "ACCOUNTANT."

Navy Yard Power Plant Inspector

The United States Civil Service Commission announces an open competitive examination for an electrical engineer to supervise the operation of all the navy-yard power plants. He should also be able to give expert advice upon, and be responsible for, the design of new projects for the economical distribution of power. Graduation with the degree of mechanical engineer or electrical engineer from a college of recognized standing and at least ten years' subsequent experience in responsible charge of a central electric power station are prerequisites for the position, which pays \$12.48 per day. Applications should be filed with the commission by Nov. 14.

Some Recent Advances in EQUIPMENT AND ITS MAINTENANCE

Convenient Gage for Cutting Rubber—Riveting and
Welding Track Joints for \$2.55 Each—Maintenance of
Coasting Recorders—A Two-in-One Car—Recent Design
of Underfeed Stoker—Other Items of Practical Interest

One Car Made from Two

At About \$1,500 per Unit the United Traction
Company Is Converting Pairs of Single-
Truck Cars into Double-Truck Center
Door Cars for Rush-Hour Service

High platform expense and greater liability of platform accidents have made the old-style car obsolete from the operating standpoint, no matter how sound its construction and equipment may be. Appreciating this fact, the United Traction Company, Albany, N. Y., has begun to convert pairs of its single-truck cars into center-door cars with modern safety and traffic accelerating features. This change has more than doubled the seating capacity per unit, thereby affording better service for the rush-hour conditions for which these cars will be used.

The first unit, completed during July, 1916, was made up of two 18-ft. cars. Fifty-seven 20-ft. cars and seventy-one cars 18 ft. long are also available for rebuilding. Each of these cars is of the single-truck type and has a seating capacity of twenty-four, whereas the center-entrance unit seats fifty-one on the same basis of 18 in. per passenger. All seats are longitudinal. The first of

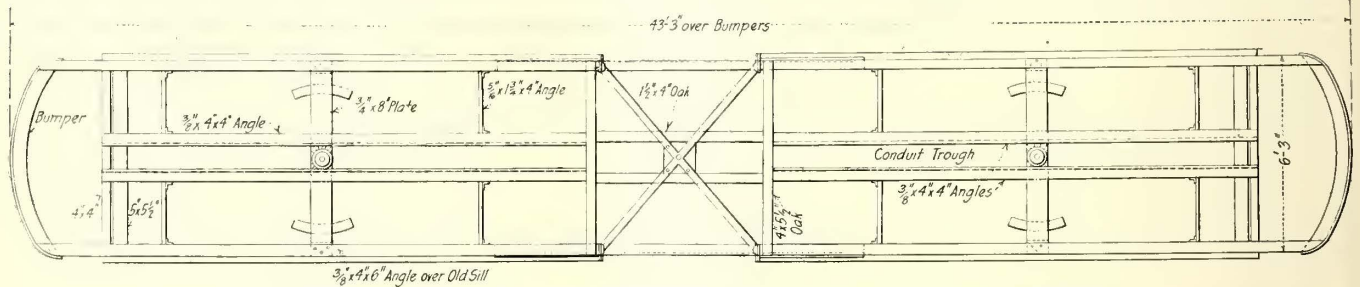
these rebuilt cars, now in use on the Pine Hills line, has the following general dimensions and weights which will be approximately the same in future cars of this type that are built.

Length	43 ft. 3 in.
Weight	35,000 lb.
Seats	51
Total passengers	100
Weight per passenger, seated load.....	686 lb.
Weight per passenger, total load.....	350 lb.

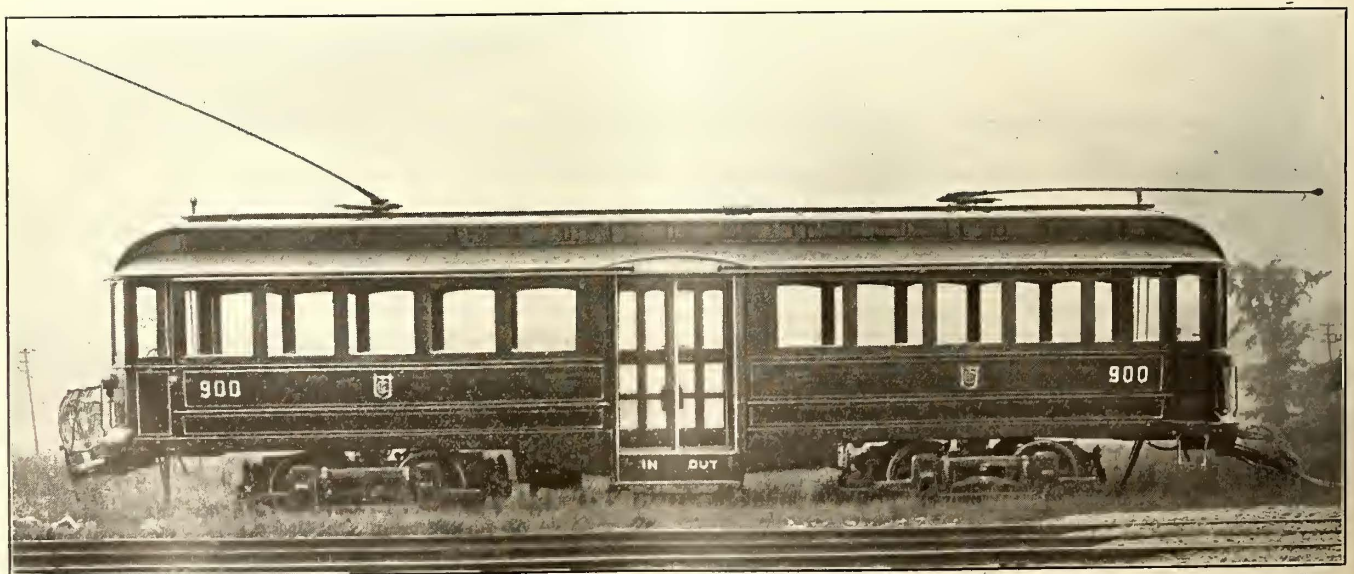
The first of these cars was constructed at a cost of \$1,740. The cost of future units, however, will approximate only \$1,500, the cost of the first having included patterns, experimenting with various details in the design and other items peculiar to any new construction.

THE RECONSTRUCTION

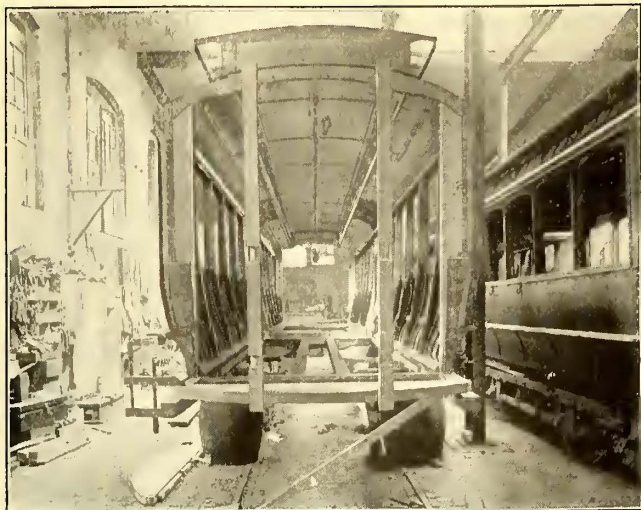
The original cars were stripped of their platforms and bulkheads, and each body was shortened one window by cutting through beyond the platform knees at the ends to be spliced. The roof, however, was not disturbed as it was left to be dovetailed over the well of the rebuilt car. While the roof and sides of the cars were salvaged, a new underframe was necessary. The principal



UNDERFRAMING OF REBUILT CAR SHOWING THE TWO SECTIONS SPLICED TOGETHER



ALBANY (N. Y.) REBUILT CAR MADE OF TWO SINGLE-TRUCK UNITS



CAR BODIES READY FOR RECONSTRUCTION



INTERIOR VIEW OF CAR

BILL OF MATERIAL AND LABOR FOR REMODELLING CARS

<p>234 ft. 5/8-in. whitewood 172 ft. 1-in. oak 128 ft. 1-in. white pine 282 ft. 4-in. ash 63 ft. 2-in. ash 240 ft. 1 1/2 in. ash 80 ft. 3-in. oak 61 ft. 1-in. ash 25 ft. 3-in. ash 262 ft. 4-in. oak 152 ft. 2-in. oak 44 ft. 1 1/4-in. ash 53 ft. 2-in. spruce 120 ft. 1 1/2 in. cherry 13 ft. 1-in. cherry 688 ft. 13/16 in. yellow pine flooring 408 ft. 13/16 in. corrugated maple flooring 140 ft. 1-in. maple flooring 750 ft. 3/8-in. basswood roofing Six 1/2-in. x 2-in. step irons 15 yd. 54-in. canvas 15 yd. 72-in. canvas 3 lb. tacks 4 gross 1 1/2-in. No. 10 flat head, bright screws 3 gross 1-in. No. 14 flat head, bright screws 1 gross 1 1/4-in. No. 14 flat head, bright screws 1 gross 1 1/2-in. No. 14 flat head, bright screws 1 gross 3/4-in. No. 10 flat head, bright screws</p>	<p>1 gross 1-in. No. 10 flat head, bright screws 1 gross 1 1/2-in. No. 10 flathead, bright screws 1 gross 1 1/4-in. No. 10 oval head, brass screws 4 gross 1-in. No. 9 flat head, bright screws 1 gross 2 1/2-in. No. 20 flat head, bright screws 1 gross 1-in. No. 10 oval head, brass screws 1 gross 3/4-in. No. 9 oval head, brass screws 3 gross 1-in. No. 14 round head, blue screws 1 gross 1 1/4-in. No. 14 round head, blue screws 1 gross 1 1/2 in. No. 14 round head, blue screws 24 ft. 3/4-in. round iron 8 ft. 1/2-in. x 2-in. iron 42 ft. 1-in. black iron pipe 56 ft. 3/4-in. black iron pipe 70 ft. 4-in. x 4-in. angle iron 42 ft. 1 1/2-in. x 4-in. channel iron 100 ft. 1-in. x 6-in. angle iron 56 ft. 2 1/2-in. x 2 1/2-in. angle iron 60 lb. 3 1/2-in. safety treads 4 sheets 1/4-in. x 19-in. x 3-ft. 6-in. sheet steel 11 sheets No. 18, 36-in. x 96-in. sheet steel 2 sheets No. 14, 24-in. x 84-in. sheet steel 16 ft. 1 1/2-in. band iron 68 ft. 3/8-in. half-oval iron Four brass transom catches Six 2-in. x 2 1/2-in. brass butts</p>	<p>Twelve 3-in. x 2 1/2-in. brass butts 8 lb. 5/8-in. x 4 1/2-in. coach screws 10 lb. 13/16-in. flat washers 12 lb. No. 6 wire nails 4 lb. 1-in. flat head, wire nails 1 lb. 1 1/4-in. flat head, wire nails Seventy 5/8-in. x 5 1/2-in. machine bolts Sixty 3/4-in. x 5-in. machine bolts Thirty-two 1/2-in. x 6 1/2-in. machine bolts Twenty 3/4-in. x 2-in. machine bolts Eight 5/8-in. x 1 1/2-in. machine bolts Eight 3/4-in. x 1 1-in. machine bolts Twelve 1/2-in. x 1 1/2-in. machine bolts Twelve 5/8-in. x 10 1/2-in. machine bolts Four 5/8-in. x 11-in. machine bolts Thirty-two 3/4-in. x 3 1/2-in. machine bolts Twelve 1 1/2-in. x 8-in. machine bolts Eight 5/8-in. x 2-in. machine bolts Eight 3/4-in. x 8-in. machine bolts Fifty 5/16-in. x 2-in. carriage bolts Twenty 5/16-in. x 4 1/2-in. carriage bolts Twelve 5/16-in. x 3-in. carriage bolts Eight 1/2-in. x 7-in. carriage bolts 100 1/4-in. x 2 1/2-in. stove bolts</p>
--	--	---

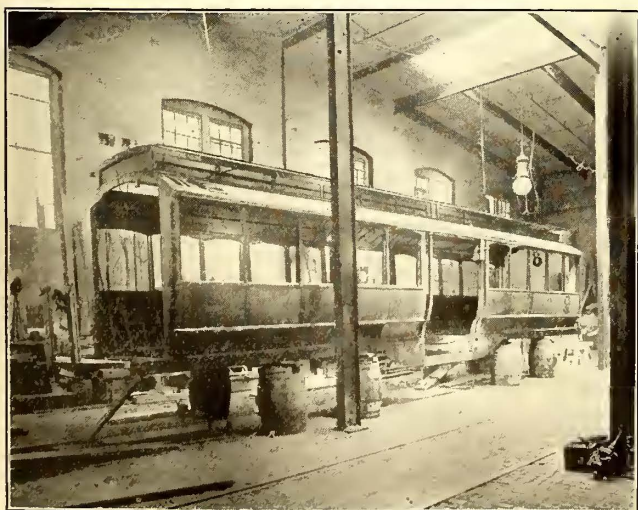
Labor on Each Car

Carpenters	1,350 hours
Machinist	100 hours
Blacksmith and helpers.....	150 hours
	1,600 hours

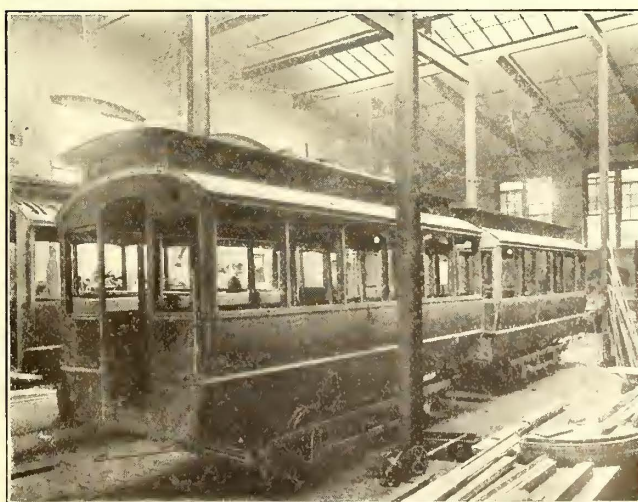
members are a pair of 3/8-in. x 4-in. x 4-in. angles which form a pair of center sills running up to the sides of the well. These angles with the aid of nailing strips form a trough 11 in. wide to carry the rubber-lined canvas hose which is used for conduit. Although the monitor roof was retained, it was modernized from the ventilation standpoint by installing twelve automatic ventila-

tors. The interior was thoroughly renovated to dispel the gloomy aspect of the old cars.

These cars are unusually narrow, and the desire to use the available trucks and motors made it impossible to adapt stepless construction. However, by using 30-in. wheels the entrance steps were kept within 15 in. The well has a riser of 11 in. The folding doors and steps



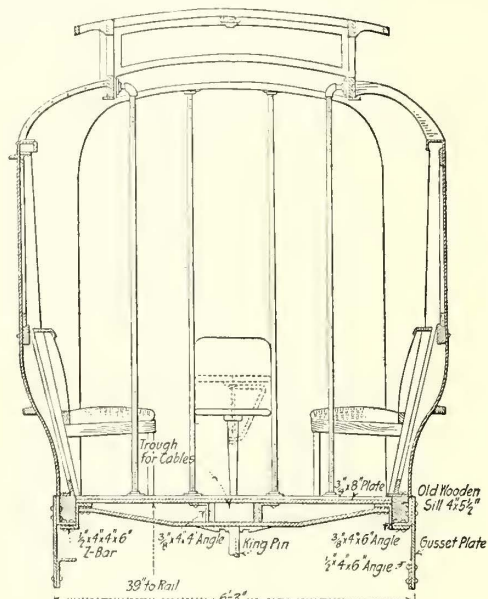
TWO CAR BODIES SPLICED TOGETHER



TWO SINGLE-TRUCK CARS WITH PLATFORMS STRIPPED OFF

are operated in unison by hand from an unusual stanchion made by the United Traction Company. This stanchion has but one stem for the handles used to operate the doors on both sides of the car. Furthermore, the stanchion has a swiveling feature by which the Dayton fare box can be swung around to the operating side with but half a turn.

The use of original longitudinal seats for this narrow car permits high speed in passenger handling. Additional bench seats are let down alongside of the idle center doors, and there is a seat for one passenger back of the motorman's seat. The National Pneumatic Company's interlocking safety door control is to be installed



SECTION VIEW OF REBUILT CAR

on these cars at an early date. This control, through reducing standing time, has cut the running time on the Albany line where it is already in use 8 per cent.

The first unit is mounted on available Brill 27-G trucks; the four next units will be mounted on available Taylor trucks. These trucks are of 4 ft. 6 in. wheelbase. Each unit is fitted also with four Westinghouse 12-A motors and two K-35 controllers. Only the General Electric air brakes with CP-27 compressors are new.

Before going back into service the cars will be fin-

ished off neatly by painting them with the company's standard colors according to the five coat, six to eight-day system.

The accompanying illustrations show the cross-section and the underframing of the car and the different steps in its construction. The material required in this work is shown in the tables on page 981.

A Riveted and Welded Track Joint of Low Cost

The Cost of This Joint Is About \$2.55 Complete for 7-in., T-Rail

BY D. P. FALCONER

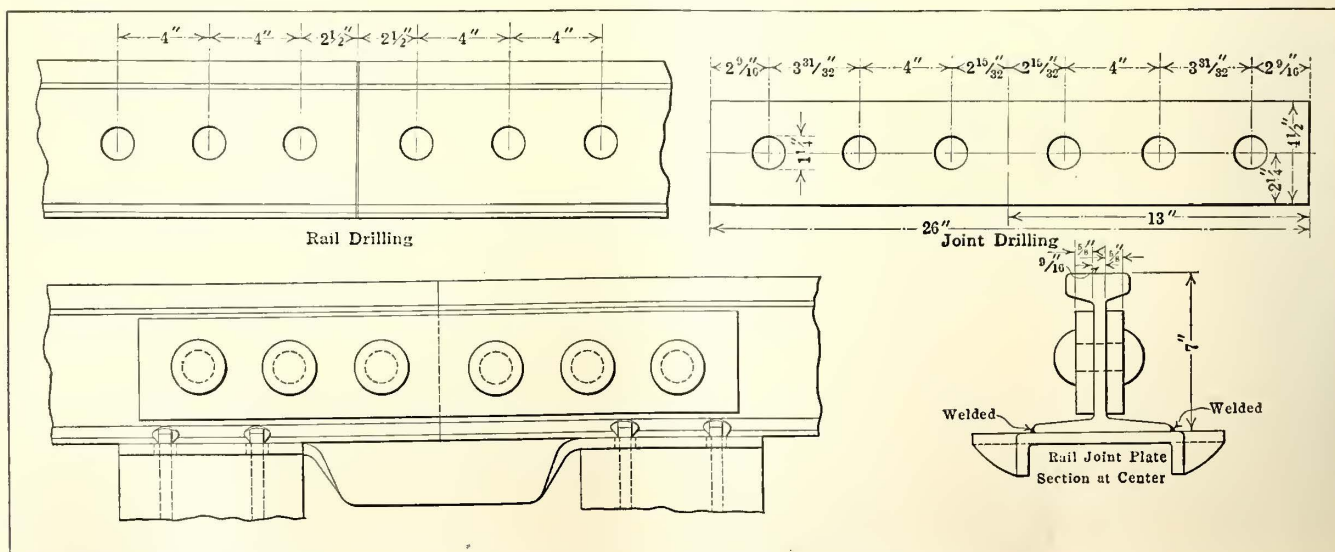
Engineer Maintenance of Way New York State Railways, Rochester Lines

For the last two years or more this company has been using a type of riveted and welded joint that has proved both smooth riding and durable, while at the same time it is quite inexpensive. Its construction is shown in the accompanying illustration.

Briefly, the joint consists of a pair of plates riveted when hot to the web of the rail, and a joint plate placed under the base of the rail and welded to it. The holes in the plates are drilled on shorter centers than those in the rail, the difference being about 1/8 in. between extreme holes. Before application the plates are heated so that the holes register with those in the rail and they are then riveted in place with 1 1/8-in. rivets, six in all. In Rochester the riveting is done with a pneumatic riveter or "air gun."

The purpose of the application of the plates in a heated condition is to produce, on cooling, a powerful force drawing the ends of the rails together. If the ends are in contact before the application of the plates they are drawn together with a powerful force after the joint has cooled and this keeps the plates in tension. If there is an initial opening between the rail ends, shims are inserted to insure this tension. The plates used are of mild steel which has been found to be amply strong both for this purpose and for the rivets.

To support the joint the Abbot joint plate is used with wood ties, while with steel ties the ties themselves are utilized for this purpose. The illustration shows how the Abbot plate is employed. When the joint is cold the base of the rail is first spot welded to the plate at the ends and the middle for the pur-



ELEVATIONS AND DETAILS OF RIVETED AND WELDED JOINT USED BY NEW YORK STATE RAILWAYS, ROCHESTER LINES

pose of preventing the setting up of internal stresses which would result from the heating of the metal if the attempt were made to join the base of the rail continuously to the joint plate all at once. After spot welding the edge of the rail base is welded to the plate from end to end of the latter. The electric arc is used for this purpose.

From our experience we find that the cost of applying this joint in lots of fifty to Lorain section 91-375 7-in. T-rail is practically as follows:

Abbot plate	\$0.77
Welding steel10
Two bars60
Six rivets21
Rivetting51
Welding26
Moving equipment to job10
Total	\$2.55

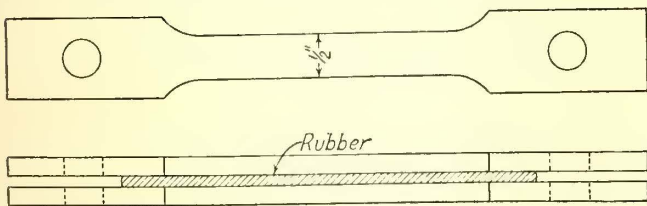
In addition to the advantages of this joint already enumerated a point that appeals to us is that this joint carries the wheel load across the joint with a base support, a fact which gives it smooth riding qualities. The ends of the rail are pulled together so tightly that the writer has at times had difficulty in locating the joints. The original feature of this joint by which the joint plates are held in tension were made the basis of letters patent which have been granted to E. J. Cook and the writer. The Lackawanna Steel Company showed an example of the joint at the Atlantic City convention. As the track men in attendance seemed interested in it the above description has been prepared at the suggestion of the editors of the ELECTRIC RAILWAY JOURNAL.

Easily-Made Gage for Cutting Rubber Accurately

BY G. H. MCKELWAY

Line Engineer, Brooklyn Rapid Transit Company

While many of the specifications for rubber insulated wire call for a tensile test on the rubber of perhaps 800 lb. per square inch, yet this test, as generally made, is only an approximate one. The reason for the failure to obtain accurate information as to the strength of the rubber is due not to the instruments used in making the tests, but to the difficulty in cutting the rubber to



GAGE MADE OF TWO THIN METAL STRIPS FOR CUTTING RUBBER ACCURATELY

the exact width at its narrowest point. This, of course, is the point at which it almost always fails.

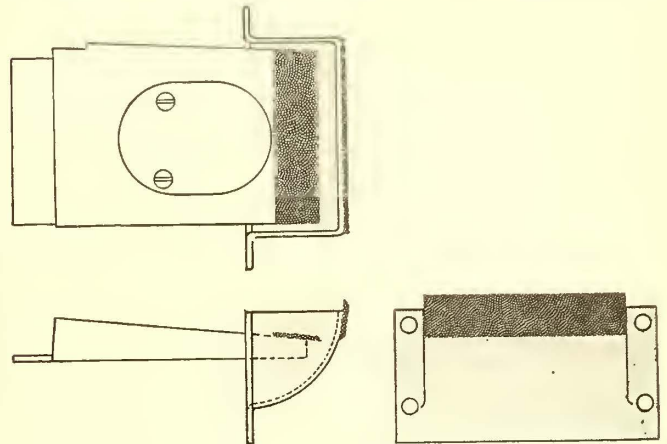
In order to overcome this difficulty one of the large rubber companies is now using the gage shown in the accompanying illustration. As may be seen, this is a simple and easily-made gage, consisting of but two small thin strips of metal with holes at the ends through which the bolts pass for clamping the strips tightly over the sample of rubber. As the width of the narrowest portion of the gage is just 1/2 in., the rubber, when placed between the two portions of the gage, can be cut easily to the exact width with a sharp knife, and it is then ready for test.

Maintaining Coasting Recorders on the Long Island Railroad

BY GEORGE H. BLACKWEDEL

Inspector Long Island Railroad, Morris Park, L. I.

As the cost of power is one of the largest items included under operating expense, the Long Island Railroad, in order to determine carefully the amount of energy saving possible with coasting recorders, placed in service ten Rico coasting recorders in 1910, twenty-five more in 1912, and an additional twenty in 1915, all of which have proved satisfactory. Of these fifty-five coasting recorders, fifty are in service in combination passenger and baggage cars, and five in the smaller equipments. As most of the trains are equipped with



PIECES OF HACKSAW BLADE INSTALLED ON THE EDGES OF THE PAPER GUARD AND PAPER CHUTE

the combination passenger and baggage cars, this number of recorders practically covers a large percentage of the mileage of the entire road.

One inspector does all the maintenance work required on the recorders in addition to his regular work, the tape renewals and the making of minor repairs being taken care of at the different inspection points. All records, percentages and clerical work are handled by the operating department.

In cases where records show a recorder to be out of order the mechanical department is notified through the department handling the records. The recorders are inspected periodically, approximately monthly. The adjustment of the magnets is checked by means of a voltmeter, an adjustable resistance and two dry cells. The magnets are set to pick up the operating lever at 1.2 volts, and to drop it at 0.4 volt. The clock mechanism is checked by means of an ordinary stop watch. Through the adjustment made on the magnets, the recorders are made to cut in at the speed of 4 m.p.h. or more. Little if any difficulty, however, is experienced in keeping the machines in adjustment.

The coasting recorders as originally received from the makers were equipped with 2-amp. fuses. It was found that these blew frequently, due to the peculiarities of the motors, and 10-amp. fuses were accordingly adopted as a standard. These seldom blow, but when they do it is usually the result of the motors having been reversed, or of trouble with them.

For a long time trouble was experienced with the paper tape sticking, and when this occurred the paper chute became clogged. As many as fifty-nine cases of this kind were reported in one month. This trouble was remedied by installing pieces of hacksaw blades, with sharp edges, on the edges of both the paper guard and the paper chute as shown in the above sketch. These

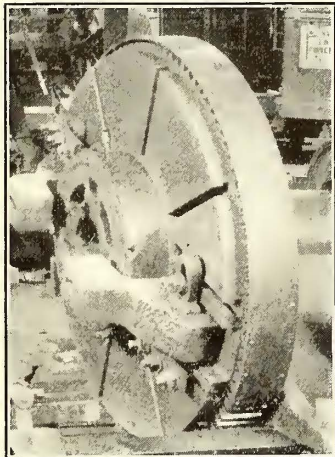
are so arranged that no matter how the paper is torn in removing it from the recorder, it will always tear clean and keep the chute from being clogged. By this method the number of paper troubles for the last few months has been reduced to four. All recorders are equipped with this improvement.

The relays are overhauled every six months, new residual pieces being fastened to the armature, the contacts filed and renewed where necessary, the air cylinders cleaned and oiled, and all contacts, terminals, etc., are examined and tightened. It is found that this inspection is ample to keep the relays in first-class condition. All defective recorders have a small copper tag, marked "out of order," inserted between the cover and the clock movement, in such manner that the stamping key cannot be inserted.

Wheel Turning Operation Improved

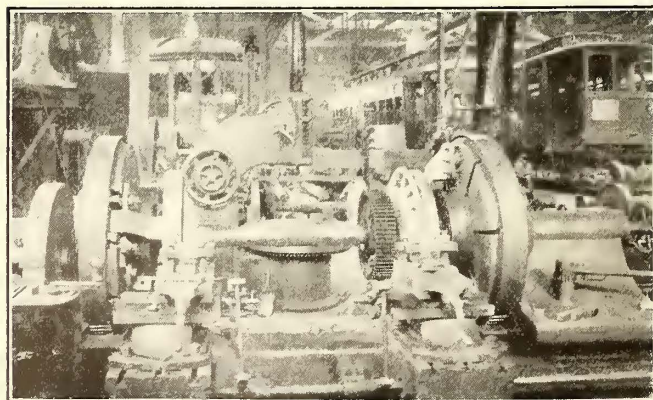
Time Required to Set Up the Work and Turn the Wheels Is Reduced by Use of Lugs of Special Design

There are many different methods of holding car wheels in a lathe while they are being turned, and each method no doubt has its advantages. The accompanying illustrations show the heavy lugs which have been designed for this purpose and a pair of wheels set up in the lathe ready to be turned. The pictures were taken in the Madison Street shops of the Lehigh Valley Transit Company. Harry Branson, superintendent of equipment of the company, is responsible for the design of the lugs and the method of turning the wheels.



LATHE FACE-PLATE SHOWING LUGS FOR HOLDING WHEELS

In operation two lugs are securely bolted to each face-plate. The axle on which the wheels are mounted is set into the lathe and accurately aligned by the lathe centers. The wheels fit over the outside of the lugs to which they are fastened by $\frac{3}{4}$ -in. bolts. The tightening of these bolts clamps the wheels firmly against the lugs, thus stiffening the axle and at the same time providing a means of driving the pair of wheels. The arrange-



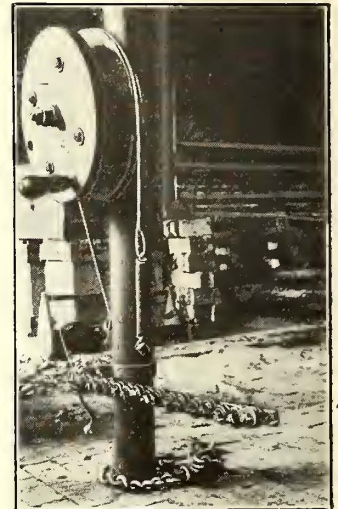
PAIR OF WHEELS SET UP IN LATHE READY TO BE TURNED

ment is so rigid that the two wheels can be turned at the same time and all chattering is eliminated.

Before these lugs were devised it was a difficult matter to hold the wheels in the lathe firmly while the turning operation was being performed, and it required two days to turn one and one-half pairs of wheels. By the use of the lugs six pairs of wheels can be turned out in a day.

Home-Made Armature-Banding Tensioner

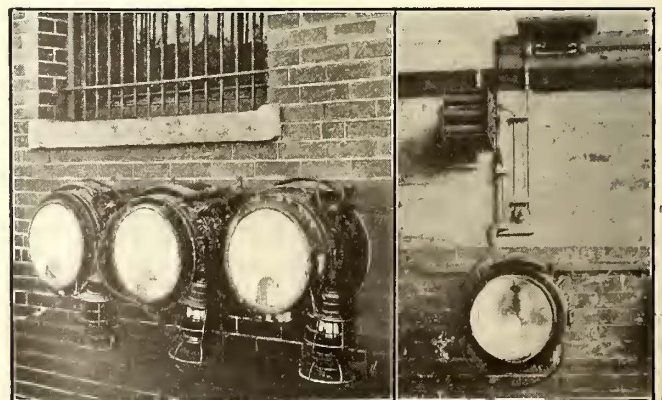
A home-made device which provides about 250-lb. tension in the armature-banding wire, has been constructed by the mechanical department of the Galesburg Railway, Lighting & Power Company, Galesburg, Ill. This tensioner consists of sixteen steel spools, 1 in. in diameter, mounted on bearings set on a steel bar at $1\frac{1}{2}$ -in. centers. As shown in the accompanying illustration, this bar is bent to form a clamp around a pipe standard. The wire is threaded through the spools in the usual manner, and thirteen spools are used to obtain 250-lb. tension in the banding wire. The supply of banding wire is contained on a reel mounted on the pipe standard above the tensioner. In order to obviate the slack wire between the reel and the tension spools, a bell cord is placed in a groove cut in the periphery of one of the sides of the reel and attached by a spring to the standard.



HOME-MADE ARMATURE-BANDING TENSIONER

Sand-Blasting and Testing Headlights

On the Portland (Me.) city and suburban lines of the Cumberland County Power & Light Company the glare of headlights is being virtually eliminated by sand-blasting the glass fronts, as shown in the accompanying illustration. The headlights are of Crouse-Hinds design, and are combination arc and incandescent units. The glass fronts are 12 in. in diameter. At the bottom of the glass a clear area of parabolic shape, about



SAND-BLASTED HEADLIGHTS ON RACK AT CARHOUSE; HEADLIGHT TEST SET INSTALLED ON WALL OF CARHOUSE

4¼ in. high and 4½ in. wide is left to provide an unobstructed outlet for the light from the incandescent unit used in downtown service. The headlights in the illustration are supported on a 3/16-in. x 1-in. x 6-ft. strap-iron rack attached to the outside brick wall of the carhouse by strap-iron braces, the location enabling trainmen to obtain them with minimum loss of time when the late afternoon runs begin.

A permanent test circuit for electric headlights is installed in this property, as shown in the accompanying illustration. The headlights are hung on a narrow bar of strap-iron which is grounded. The positive line from the shop trolley is brought down to about 6 ft. above the floor and wired to a terminal, an inclosed fuse, snap switch and resistance being included in the feed.

Horizontal-Retort Underfeed Stoker with Novel Features

While the general principle of using horizontal-top retorts fed by horizontal rams, as is done in the new Moloch underfeed stoker, represents no innovation, this make of stoker embodies some details of construction which are rather ingenious. Among them are the use of rotary grinders parallel to each retort for disposing of the ashes and stirring up the fire; arrangements for minimizing the strains in parts subjected to excessive mechanical stresses and intense temperatures, and provisions for economically controlling the fuel feed.

As shown by the accompanying sectional views, the stoker is made up of units, each consisting of a horizontal-top, V-shaped retort, along the upper edges of which are mounted tuyere blocks, through which air is supplied under pressure. Fuel is fed into the retort by a steam-operated ram, which is supplied with coal from a hopper attached to the ram case outside the furnace. Between each retort and along each side wall, where the products of combustion are deposited, are rotary grinders which are operated intermittently in the same manner as the fuel-feeding mechanism. The frequency of operation, as well as the relative amounts of rotation of each grinder can be varied as conditions require.

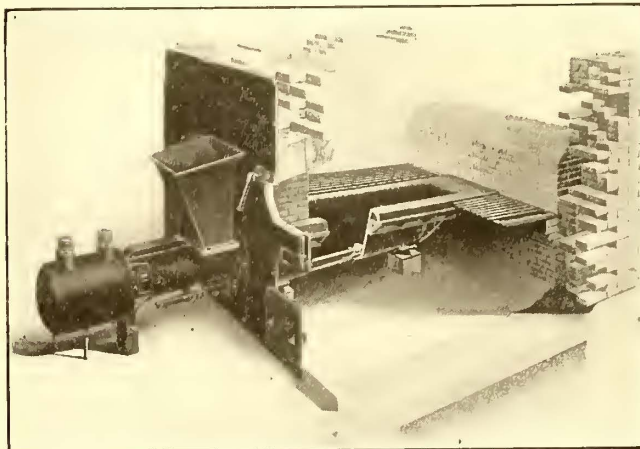
Two methods of stoker control may be employed: One is to actuate the steam-cylinder valves by steam and the other is to control them by solenoids. In either case the master control is attached either directly or indirectly to the fan prime-mover, so that fuel is fed into the furnace at a rate proportional to the air supply. When steam control of the fuel feed is employed the fan mechanism operates a pilot valve controlling the steam inlet and exhaust parts. With electrical operation the fan actuates a contactor, which in turn performs the previous-mentioned operations by means of solenoids. The master control shuts off the steam supplied to the ram cylinders after a certain portion of the piston stroke is completed, so economical steam consumption is assured. Main steam and exhaust headers are placed in a trench beneath the stoker cylinders to simplify piping and reduce radiation therefrom.

On account of the intense heat and severe expansion and contraction stresses to which the retort walls are subjected, they are made in sections, thus eliminating the necessity of replacing large parts when defects occur. The lower section of the retort is divided into a large front and rear section, and the upper part into sections 20 in. long. All parts are closely fitted and the sections firmly bolted together and well ribbed to prevent cracking. Any section which becomes cracked will remain in position for service, and can be replaced without disturbing any other section.

The retorts are supported on each side throughout

their entire length to allow for expansion without injury. The air boxes which are made of cast-iron plates are attached to and hung from the retort supports, and are built in sections with removable bottoms.

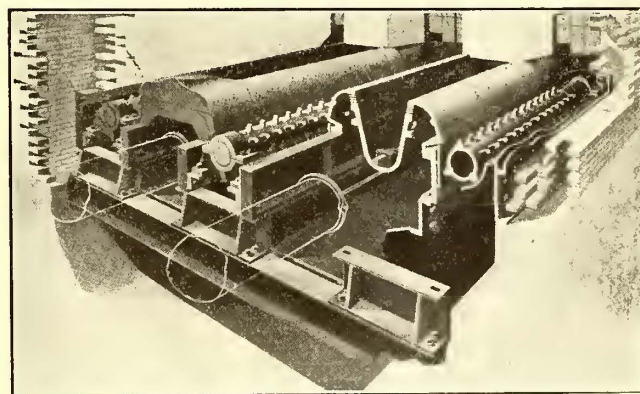
The tuyere blocks consist of heavy castings which are locked in place, the surface which is in contact with the fire being provided with fins on the under side. These serve the double purpose of absorbing heat from the



CYLINDER OPERATING FUEL RAM AND INTERIOR OF FURNACE

fire and dissipating it to the incoming air. The lower edges of the stokers are attached to an angle iron which extends across the entire furnace, thus preventing the stoker movement from bulging the boiler front, and allowing for expansion and contraction. The fire doors are equipped with cast-in-place fire-brick linings, to avoid the trouble sometimes caused by brick becoming loose and falling out.

The one-ended cylinders with steam ports cast in the walls are employed to permit the use of short and simple steam connections. By removing the cap screws fastening the cylinder to the ram case the entire coal-feeding portion of the stoker may be dismantled. Upon the cylinder being removed, the piston, stuffing box,



PERSPECTIVE SECTION RETORT AND ASH REMOVER

gland, piston rod and ram can be withdrawn and the stoker exposed for inspection or renewals. All valve bodies are interchangeable.

For small installations the Moloch stoker is made in the manually-cleaned type. With this or the self-cleaning type as many stokers can be combined under one boiler as the space and conditions require. Their installation is not confined to new boiler equipment, as no special brick work or fire arches are required. Where a basement exists for the storage of refuse or ash, the design can be readily altered to receive the stokers. Where

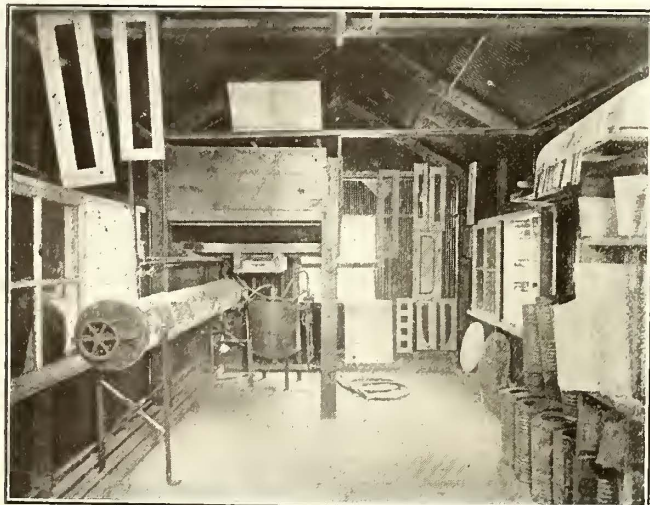
a basement or ash tunnel does not exist, a pit directly under the boiler furnace can usually be arranged. On account of the fuel bed being horizontal the boiler does not have to be set as high as with an inclined fuel bed. Where possible, however, a relatively high setting is recommended by the manufacturer.

This stoker is manufactured by the Moloch Stoker Company, Chicago, Ill.

Sand Blasting Makes Scrap Glass Usable

The portable sand blasting plant installed by the Northern Ohio Traction & Light Company, Akron, Ohio, in addition to performing its usual functions, has been found to be useful for making clear scrap glass usable. Both clear and Florentine glass are used in this company's cars, the latter serving exclusively in the deck sashes and door panels. Since both of these are of small dimensions, it frequently occurs that there is clear scrap glass which could be used at these points if it were chipped. The chipping is accomplished by applying one coat of cheap glue to the sand-blasted clear glass. The glue in drying curls and chips the surface of the glass, and to hasten this drying process electric heaters are frequently used. The margins of this chipped glass are left sanded and, in some instances, as in the case of the door panels, the lettering is sand blasted on the glass. This sand-blast equipment is also used for lettering clear glass, for such signs as "Have Your Fare Ready," "No Smoking," "Passengers Must Not Talk to Motormen," or any others which may be readily displayed on the sashes and glass door panels.

At first a home-made sand-blasting outfit was provided, but so many useful things could be accomplished by sand blasting that a special outfit was purchased from

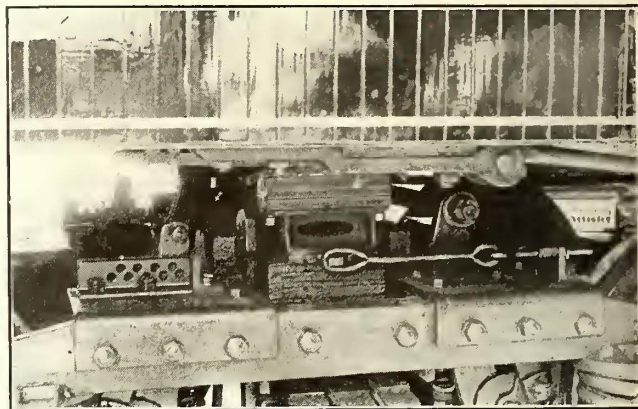


SAND-BLASTING PLANT OF NORTHERN OHIO TRACTION & LIGHT COMPANY

the American Foundry & Equipment Company. As a general proposition the sand-blasting is done in a building especially provided for that purpose, which is shown in the accompanying illustration. All work that can be brought to the sand-blasting plant is handled in this building, but when it is necessary to sand-blast cars in the paint shop the outfit is moved to that point. The operation of the sand-blasting equipment is in charge of the upholsterer, as it is only required two or three days a month. Whenever the stock of sand-blasted or Florentine glass becomes low, he replenishes it, and as occasion demands, performs other sand-blasting operations.

Overhauling of Old-Style M.C.B. Trucks

Better operation has been obtained at a reduced maintenance cost by embodying several improvements in overhauling a number of Brill-27 M. C. B. trucks used by the Northern Ohio Traction & Light Company, Akron, Ohio. One of these changes included cutting out the radius bar and substituting a bar between the upright brake levers or at a point much closer to the bolster. The brake pull-rod was extended to connect to this new bar with a clevis and 1¼-in. pin bearing. This



NORTHERN OHIO TRACTION TRUCK IMPROVEMENTS—VIEW OF TRUCK SHOWING MOTOR LEADS, DAMPENER AND CHANGED BRAKE RIGGING

type of connection was substituted for the old-style wheel and clevis attachment to the radius bar. This change permits more flexibility in rounding curves and obviates the worn pull-rod wheels. Moreover, the brake rigging is now clear of the trucks and does not become damaged when a switch is split accidentally. At the same time, this arrangement reduces the friction in these working parts of the brake rigging, eliminates the release springs and thereby obviates their maintenance. The old brake levers were used in making this change which also permitted a 300-lb. reduction in the weight of the truck. These features may be observed in the accompanying illustration.

A dampener attached to the truck and bolster of single-end cars was another improvement provided at this time. This fixes the relative position of the bolster and the truck, eliminates wear on the chafing plates and improves the riding qualities. It is also shown in the illustration. The arrangement of the motor leads were changed by bringing them out at the top No. 1 and No. 4 motors and placing them in ¾-in. rubber hose for protection against chafing and the weather. The leads from No. 2 and No. 3 motors were carried down under the bolster instead of over or through it, and they are brought up between the motor and the bolster at a point near the king bolt. This arrangement permitted the cable leads to be drawn up tightly, no slack being required because the leads are so close to the king bolt.

A standardized system of piping all the cars of the Northern Ohio Traction & Light Company greatly facilitates making repairs and thereby reduces the cost of doing this work. All cars of the same type are piped in a standard way and to a standard dimension. In case of a break in any portion of the pipe system, it is possible to cut a new section of pipe at the general shop and send it to a running repair shop anywhere on the system for replacing. Furthermore, those sections needed in replacements frequently can be carried in stock at the different carhouses.

NEWS OF ELECTRIC RAILWAYS

SUPREME COURT UPHOLDS RAILWAYS

Illinois Body Reverses Arbitrary Commission Order Requiring Companies to Suspend Rates Increased Before Utility Law Went Into Effect

A peculiar case arising under the terms of the Illinois Public Utilities Commission law has been decided by the State Supreme Court in favor of the railways involved, the court holding that the commission had no power to suspend without investigation and formal finding rates first filed with it, even if these rates did include an increase made before the utilities law went into effect. The case arose as follows:

On Dec. 30, 1913, the Chicago & West Towns Railway and the Suburban Railroad, operating under the same management, made an increase in their rates which became effective on Dec. 31, 1913, and in January, 1914, they filed with the commission their schedules showing all the rates then in force. The public utilities act went into effect on Jan. 1, 1914. On March 27, 1914, the commission issued a general order stating that any increase in rates after July 1, 1913, were illegal unless they had been consented to by the commission, and that any utility so increasing its rates must return to the old rates and continue them in force until the commission had given its consent to the proposed changes. In the cases in point, however, the increased rates were continued in force by the two companies until October, 1914, when the commission directed them to return to the fares in effect on July 1, 1913, until the commission could fix just and reasonable rates. A petition for rehearing was overruled by the commission. The companies then appealed to the Circuit Court of Sangamon County, and the order of the commission was affirmed. The companies then prosecuted an appeal to the Supreme Court of Illinois.

The Supreme Court, in its reversal of the judgment of the Circuit Court, says that it was the first duty of the commission to determine what were reasonable and just rates to be charged passengers riding on the cars on the appellants' lines. The commission in its order in the case clearly set forth that it could not determine, under the evidence offered, what was a just and reasonable rate until further evidence was introduced, and it continued the case for further evidence without finally disposing of it. This order it had the right and power to make, but it did not have the right or power to make the order requiring the appellants to return to the schedules of rates of July 1, 1913, before or pending the determining of the issues in the case. The commission was without authority to make such an order except upon a full hearing and a finding upon the evidence that the old rate of July 1, 1913, was a just and reasonable rate.

The decision of the court on this point is based on the fact that the public utilities act did not take effect until Jan. 1, 1914, and the commission had no legal existence before this date. Therefore it had no authority to prevent the placing into effect of increased rates made previous to this date. It could, of course, proceed to determine whether or not such rates were just and reasonable and order reparation if necessary, but it had no power to nullify these rates until it was established that they were not just and reasonable. After the law became operative no change in rates could be made without good cause shown and a finding of justification by the commission, and pending this finding the proposed change could not be put into effect, but the law did not contemplate that the original schedules should not go into effect pending a hearing.

In answer to a charge of violation of Section 4 of Article II of the State constitution by the public utilities act the court holds that that provision is simply a limitation of the general powers of the Legislature, and in one particular only. This provides, in substance, that the Legislature may not grant the right to construct and operate a street railroad within a municipality without requiring the consent of the local authorities having control of the streets or highways proposed to be occupied. This section of the constitution

does not, by implication or otherwise, attempt to divest the State of its paramount authority and control of streets and highways. It is equally clear that this section of the constitution does not deprive the Legislature of its power to fix rates for such companies. The power of the State to regulate the rates that may be charged by railroads and other carriers cannot be successfully questioned, and this regulation may be carried on by means of a commission.

PREPARING FOR STRAW VOTE IN DALLAS

Consolidation of Railways and Reorganization of Lighting Company Hinge on Vote to Be Taken During Week of No. 6

Only two points remain to be settled before the straw vote is taken in which the voters of the city of Dallas, Tex., are expected to settle the traction and electric lighting problems of the city. The proposed consolidation of the street railways of Dallas and the reorganization of the lighting company hinge upon the result of this straw vote. If the voters approve a valuation of \$8,500,000, as asked by the street railway companies, instead of the valuation of \$7,100,000 as fixed by E. W. Bemis, utility expert, the proposed consolidation is expected to be put into effect at once.

Two points remain to be settled before this straw vote is taken. They are the fixing of the valuation of the new interurban terminal building in Dallas, which is said by the owners to be worth \$1,500,000, and the examination of the lease executed by the Northern Texas Traction Company, by which the consolidated street railway company, headed by J. F. Strickland and C. W. Hobson, and backed by the General Electric Company, will take over the Oak Cliff lines and operate them under one management with the lines in the city of Dallas proper. Both these matters, however, are in a fair way to being cleared up at once. The City Commission has appointed Commissioners Otto H. Lang and A. C. Cason to make a survey of the terminal building and fix its valuation. Under the proposed franchise the terminal building is to be taken over and operated by the Strickland-Hobson interests, but entry to the terminal is not to be denied any other interurban that may build into Dallas.

The terms of the lease by which the Strickland-Hobson interests will take over the Oak Cliff lines from the Northern Texas Traction Company have not been made public and will not be made known until the form of the lease has been examined by the legal department of the city and approved. The lease gives to the Strickland-Hobson interests control over all street car lines in Oak Cliff, both within and without the city limits. The Dallas-Fort Worth Interurban is not leased, but remains under the operation and control of the Northern Texas Traction Company. The Strickland-Hobson interests, however, will control the ingress and egress of the cars on this line to and from the city of Dallas.

The city legal department is drafting franchises covering the new features of the traction and lighting situation as disclosed in the agreement recently reached between Mayor Lindsley and representatives of the Strickland-Hobson interests and Stone & Webster in the conferences at New York and Boston and explained in the statement given to the public by Mayor Lindsley on his return. Several material changes in the franchises, as adopted in the city election last April, will be made. The cumulative interest feature will be removed. Under the former franchise a rate of 8 per cent on the investment was proposed for the lighting system and 7 per cent for the railways, and if in any one year either property failed to earn this maximum rate then an added return would be allowed in succeeding years at the rate of 1 per cent a year until the deficit was overcome. Under the new franchises if a property fails to earn the stipulated rate of 7 per cent in any one year it may all be made up in the next succeeding year, provided the gross earnings are large enough. The straw vote on the valuation proposition will be taken during the week beginning Nov. 6.

REVIEW OF SPRINGFIELD STRIKE INJUNCTION

Men Reject Arbitration After It Is Advised by the Court as a Means of Disclosing Reasons for Discharge of Accused Employee

The case of the Springfield (Mo.) Traction Company against its employees to prevent them from going on strike was reviewed briefly in the *ELECTRIC RAILWAY JOURNAL* of Oct. 28, page 946. The developments in connection with the matter are interesting. The company originally obtained from Judge Van Valkenburgh on Sept. 27 a writ of restraint to prevent the union employees from carrying out their threat of going on strike in retaliation for what they claimed was an unjust discharge of a conductor. The company's contract with the union stipulated that the company had the right to discharge any employee for the violation of its rules and regulations. The man in question had been accused and admitted his guilt. The grievance committee also admitted that the man violated the rules. As both the discharged employee and the grievance committee admitted the violation of the rules the company refused to arbitrate. The union then threatened to call a strike. In consequence the company endeavored to prevent this by enjoining the men from striking. The original writ of restraint was heard before Judge Woodrough at Omaha, Neb. His opinion was to the effect that the guilt or innocence of the discharged conductor should be arbitrated, not because it was not an acknowledged fact, but so as to disclose to the remaining members of the union why the man was discharged.

Immediately after this decision, the company offered to arbitrate. The attorney for the union is understood to have advised the men to arbitrate, but they did not follow his advice, due, it is generally believed, to the fact that Judge Woodrough stated if there was any evidence of fraud in the conduct of the arbitration committee his court was open to either party. Moreover, the discharged employee had acknowledged his guilt and the arbitration board under Judge Woodrough's decision could only determine his guilt or innocence. The purpose of the union was in short to secure the reinstatement of the discharged employee without respect to the merits of the case. Joseph C. Colgan, of the general executive board of the Amalgamated Association, called on the management of the company shortly after its offer to arbitrate and demanded the immediate reinstatement of the discharged employee. This meant that the men expected that the company would pay the discharged employee for the entire time lost since the date of his discharge. The management of the company endeavored to go into the merits of the case with Mr. Colgan, but he is said to have made the statement that he was not present to discuss the merits of the case and left the conference after the management had refused to reinstate the discharged employee without arbitration.

The next day sixty-two of the ninety-four union employees of the company struck, the remaining thirty-two casting their lot with the company. The first cars were operated at 1 p. m. the day on which the strike was declared. The company has continued adding cars since that date, and on Oct. 24 was operating from 6 a. m. until 10 p. m. and had men to furnish 75 per cent of the regular service.

On Oct. 10, Judge Pollock of the Federal Court granted a writ of restraint preventing interference on the part of the strikers or their sympathizers with the operation of the cars of the company. This temporary writ of restraint was returnable in ten days in accordance with the Clayton Amendment to the Sherman Anti-Trust Law, and this hearing was held before Judge Van Valkenburgh of the Federal Court at Kansas City, Mo., on Oct. 20. The company's side of the case was presented by T. J. Delaney, counsel, and was supported by affidavits from seventy-five citizens of Springfield, among them lawyers, bankers, doctors, dentists, school teachers and clerks. On Oct. 23, Judge Van Valkenburgh granted a temporary writ of injunction as prayed for. This action on the part of the court has met with general approval, except from the labor element. The Judge said in his decision that it was evident that some of the members of the Police Department were in sympathy with the striking employees of the company, but that the disciplining of these men was a matter for the city authorities.

AMALGAMATED SEEKS CONTRACT IN INDIANAPOLIS

Although 80 Per Cent of Employees Have Signed New Individual Contracts Amalgamated Advances Contract of Its Own

A committee representing those employees of the Indianapolis Traction & Terminal Company who are members of the Amalgamated Association has presented to Robert I. Todd, president of the company, a form of contract which it is seeking to enter into with the company, as the award contract of the Public Service Commission under which the men have been working since the settlement of the strike in 1913 expires on Nov. 7. The majority of the car service men have already accepted the new wage scale offered by the company last June and reported in the *ELECTRIC RAILWAY JOURNAL* for July 15, page 114, which provided a scale of 22 cents to 30 cents an hour, an increase of approximately 8 per cent, and a continuation of the working conditions provided by the company's form of individual contract. These rates of pay become effective on Jan. 1, 1917, but all men signing the new wage agreement before that time received a bonus equal to the difference between their present rate of wages and the new scale from the date of signing the agreement to Jan. 1, 1917. About 80 per cent of the car service men have signed the new individual working contracts.

The tentative contract presented by the organized employees asks for a closed shop agreement with the Amalgamated Association, a wage scale for trainmen of 30 cents an hour the first year and 35 cents thereafter. The contract is proposed for a period to April 30, 1918, and may be renewed from year to year thereafter. It asks for the usual "three-men" board of arbitration; provides for a nine-hour day, the establishment of all regular runs as "straight earlies" and "straight lates," with twenty minutes for meal time with pay; a layover of three minutes at the end of each trip on all lines; tripper runs making less than five hours to be paid five hours' time, and runs of more than five and less than eight to be paid eight hours' time; extra men to be paid from reporting time until relieved; ten minutes to be given for reporting time; time for checking in and making out accident reports; allowance for running time from relief points to barns; carhouse seniority rights and runs opened for choice every four months; privilege of posting all association notices and collecting dues at carhouses.

The committee presenting the proposed agreement, which also covers large wage increases for shop men and power-station employees, acknowledged that it represented only a portion of the employees of the company, but refused to state its method of procedure in arriving at the basis for wage increases which it asked, or how many employees had been consulted or were represented by it. Mr. Todd advised the committee that he would take the matter under consideration and appoint a time for another meeting to discuss the demands which have been presented by the organization.

The form of individual contract in force in Indianapolis was discussed in an article in the *ELECTRIC RAILWAY JOURNAL* of Sept. 30, page 679, in which the form of working agreement was published in full.

ST. LOUIS COMPANY ASKING FOR A CONFERENCE

H. S. Priest, general counsel for the United Railways, St. Louis, Mo., has asked the city for a conference between committees representing the city and the company to take up the question of adjustment of the mill tax and of the duration of franchises under which the company operates. By judgment affirmed by the United States Supreme Court the company has been compelled to pay the back mill tax and there yet remains about \$1,500,000 unadjudicated. Mr. Priest stated that unless adjustment of these differences is made the United Railways will be forced into receivership. In urging the conference he stated that with bonds of underlying companies maturing, lack of surplus earnings would prevent their being paid out of income and thus they could be provided for only by an issue of new bonds which under present conditions surrounding the company cannot be made to investors at any fair price to the company.

PORTLAND APPOINTS COMMITTEE TO INVESTIGATE TRACTION COMPANY

The appointment of a special committee to investigate the plight of the Portland Railway, Light & Power Company, with reference to jitney competition, was announced on Oct. 18, by E. L. Thompson, chairman of the members' council of the Chamber of Commerce of Portland, Ore. This committee was authorized at a luncheon called by the members' council, following the speech made by C. M. Clark, chairman of the executive committee of the company, reported on page 944, of the *ELECTRIC RAILWAY JOURNAL* for Oct. 28.

Other evidences that the statements made by Mr. Clark have set the city to thinking is furnished by the editorial comment in the daily newspapers. The Portland *Oregonian* said in part:

"It ought not to be necessary to say one word in support of the representations of C. M. Clark, of the Portland Railway, Light & Power Company. They reflect the most elementary justice imaginable. The enterprise which he represents has made its investments in Portland on a contractual basis. It has agreed in return for certain privileges to provide certain service for the public, to pay certain taxes, to do certain paving, to submit to certain other exactions upon its revenues.

"The failure of Portland to regulate the jitneys—to tax them on the same basis as the street railway is taxed, to require them to bear a portion of paving costs as does the street railway, to collect from them a bridge toll, to compel them to give transfers, to give service where service is needed, to insist that they be bonded for protection of their patrons—this failure has been termed an exhibition of bad faith, as one of unfairness toward invested capital. It is worse. It is downright dishonesty."

The Portland *Telegram* said in part:

"C. M. Clark, chairman of the board of directors of the Portland Railway, Light & Power Company, puts the case of the jitney versus the trolley squarely before the public. There is no good reason to doubt the seriousness of the situation as Mr. Clark presents it. The conditions are not those which insure the square deal, and for that reason they should be amended. It is not right, and it does not appeal to the public sense of justice that we should play favorites in this matter of the public service. If the jitney is to serve we should make it serve as reliably as the street car. Within reasonable consideration of all the conditions involved we should insist upon a jitney service that is definite, reliable, and backed by adequate and tangible responsibility. Those are the elements of free and fair competition as between the jitney and the trolley."

DECISION IN TORONTO DEVIATION CASE

The Imperial Privy Council, sitting at London, England, has allowed the appeal of the Toronto & York Radial Railway in connection with the proposed deviation of a portion of the railway track on Yonge Street, Toronto.

Some three years ago the Toronto & York Radial Railway applied to the Ontario Railway & Municipal Board at Toronto for permission to deviate its railway from Yonge Street at Farnham Avenue, on to private right-of-way west of Yonge Street. The application was opposed by the city of Toronto, which has since obtained control of the franchise on Yonge Street, and running south from Farnham Avenue. The matter subsequently reached the High Courts of Ontario, which decided in favor of the contention of the city corporation. The company then appealed to the Imperial Privy Council, which has allowed the appeal in favor of the company.

The judgment of the Privy Council, delivered on Oct. 23, finds that the company, for the purpose of operating its line, has the franchise which it claimed in respect to Yonge Street and adjoining the lands proposed to be used. On the second point, concerning the matter of obtaining the consent of the City Council of Toronto before the Ontario Railway Board could approve the plans, the judgment says it is clear that before construction is commenced the plans setting forth the proposed location of the tracks must be approved by the committee appointed by the Council, and the location cannot subsequently be altered without the consent of the committee.

INDETERMINATE FRANCHISE VOTES

Mayor Samuel C. Irving and Commissioners Robson, Gompertz, Harms and Hoff have provided for the submission to the electors of Berkeley, Cal., of resettlement franchise amendments to the Berkeley Charter, identical in substance with those proposed to the citizens of Oakland through initiative petition.

The Board of Supervisors of the county has made provision for the placing of these amendments, both of Oakland and Berkeley, on the November ballot. Thus an expression of public opinion upon these important transportation matters will be secured at the election to be held on Nov. 7.

It is anticipated that the Boards of Freeholders who are now considering new charters for Alameda and Richmond will insert in their new organic laws provisions covering the same subject.

The railway company, under the short-term franchises which it now holds on some of the principal portions of its lines has found it impossible to procure the needed money with which to meet the demands of improved service, and more particularly of extension and street reconstruction, which are constantly presenting themselves in the growing and prosperous communities through which it operates. It is confidently believed, however, that means will be available, and that people will lend their money through the purchase of railway securities, when the proposed resettlement franchise plan has been carried out.

Under the new grants the railways will have the privilege of operating the road until such time as the community desires to purchase it; the right to purchase being reserved, and to be exercised by the communities granting the resettlement franchise only with the approval of the electors.

CINCINNATI LOOP QUESTIONS CONSIDERED

In a conference with the Rapid Transit Commission of Cincinnati, Ohio, on Oct. 25, Walter A. Draper, vice-president of the Cincinnati Traction Company, told the members that 13 per cent of the gross earnings of the company were now being paid in taxes. Mr. Draper intimated that at some time in the future the city will have to waive at least a portion of the 6 per cent on the gross earnings which it is now receiving as a franchise tax, or devise some other means of lifting the burden from the company, especially if it assumes the responsibility of the rapid transit loop.

The meeting was called to discuss plans by which the company may lease and operate the loop in connection with its own lines. Mr. Draper repeated a former statement to the effect that the company regards the leasing of the loop as an untried venture, the entire risk of which it is unwilling to assume. With the increasing cost of labor and materials, the lease may become an added burden and expense.

J. P. Orr, chairman of the transportation committee of the Business Men's Club, told the commission that he regarded the lease of the loop to the company as the logical plan of operation, but that the city should retain control of the operation so that no interurban road could be kept out of the city. Mr. Draper said that the traction company was now receiving revenue from all the interurban lines using its tracks and that this would perhaps cause another complication.

E. W. Edwards, chairman of the commission, is opposed to any plan that will increase the rate of fare. He said that a 5-cent fare should be the rule, with universal transfers. Councilman Michael Mullen suggested that the city establish a fund to enable it to share the losses of the company for the first few years of the operation of the loop. Mr. Draper replied that this might be worked out in the pending revision of the franchise ordinance.

W. L. Woodward, chairman of the transportation committee of the Federated Improvement Association, took the ground that the operation of the loop would tend to decrease the operating expenses of the company, since a large proportion of the passengers could be handled much more quickly and at less cost for labor. Chairman Edwards coincided with this view.

A. P. Birnbaum, contractor, began making borings on Walnut Street on Oct. 26, to determine the nature of the subsurface for the proposed loop.

NEW TOLEDO FRANCHISE DRAFT PRESENTED

An entirely new draft of the proposed street railway franchise for Toledo, Ohio, was presented to the Street Railway Commission and Henry L. Doherty by President Johnston Thurston and Judge Emery on Oct. 26. Judge Bailey appeared as counsel for Mr. Doherty. This and the succeeding day were spent in discussing the ordinance.

Mr. Doherty said that extreme care should be taken to guard the company from the payment of excessive damage claims. Such claims against the company amount to about \$200,000 annually, and not more than 20 per cent of them were legitimate. Mr. Doherty said that in some cities 1 cent of every fare went to the settlement of damage claims. The amount for such claims in Toledo was probably not more than three-fourths of a cent. Mr. Doherty objected to the provision requiring the company to keep pavements between the tracks in smooth and uniform condition. This he feared would lay the company open to damage claims, as the slightest irregularity would be clear evidence of negligence, with the requirement standing as it was written.

Another clause provides that after thirty days' notice from the city of a violation of any part of the franchise, in case of failure to correct, the franchise was automatically forfeited. Mr. Doherty characterized this as too drastic. He also advised that the prohibition of steam cars from the tracks be eliminated. A steam motor for street cars was now being perfected and the time might come when it would be desirable to use such power on the cars in Toledo.

Mr. Doherty told the commission that his criticisms were not made for selfish reasons, but because he desired to see the plan mapped out be made successful. He said that if the plan went through the present management would have no part in the ownership, as it would be to the advantage of everybody to have Ohio people own the 6 per cent guaranteed stock of the company. Should any one now connected with the company have any part in the ownership or management, it would be for sentimental and not business reasons.

At the conference held on Oct. 30 Mr. Doherty objected to the clause providing that the city may lease the line by agreeing to purchase, and paying a rental amounting to 6 per cent on the par value of the stock and an additional 2 per cent to go toward the purchase price. Mr. Doherty said that there should be a cash payment. President Thurston suggested 15 per cent, but Mr. Doherty thought it should be 25 per cent. Member N. D. Cochran was inclined to agree with Mr. Doherty, as was Nat C. Wright. The matter was left open.

Mr. Doherty objected to a maximum 5-cent fare on the ground that extensions beyond the city limits might make a higher fare desirable there. He also suggested that the city might want to adopt the zone system at some time, as the tendency seemed to be toward the idea of making the charge in proportion to the distance. He also thought that a higher charge would probably be made for "owl" cars. They have never paid at the regular rate of fare.

On the following day the discussion related to interurban lines which use the local tracks. Representatives of the interurban roads present were D. D. Schenk, president of the Toledo & Indiana Railroad; Edward E. Burrill, general manager of the Northwestern Ohio, and F. W. Coen, general manager of the Lake Shore Electric Railway. Nothing definite was decided, but the interurban men expressed satisfaction in a measure with the arrangements now in effect with the Toledo Railways & Light Company. They now pay the company 3 cents for each passenger brought into Toledo.

Another Increase in Taxes in Ohio.—The Tax Commission of Ohio announced on Oct. 20 that the valuation of street and interurban railway properties in the State had been increased \$5,445,360 over the figures used last year.

Increase for Southern Public Utilities Men.—Z. V. Taylor, president of the Southern Public Utilities Company, Charlotte, N. C., has announced an increase of 1 cent an hour in the rate of pay for all conductors and motormen in the service.

Special Election on Utility Purchase.—An ordinance has been passed at Hoquiam, Wash., providing for a special

election to be held at the time of the November general election on the project to bond the city for \$175,000 for purchasing or condemning the power distributing plant of the Grays Harbor Railway & Light Company or to construct a municipal system. As the measure carried an emergency clause it went into effect as soon as it passed, instead of being laid on the table subject to the referendum vote of the people for a period of thirty days.

Home Rule Measure for Washington.—An initiative measure which proposes to give incorporated municipalities the right to grant and revoke franchises and regulate vehicles within the city limits was filed recently in the office of Secretary of State I. M. Howell by W. J. Dowling of Seattle. In effect, the measure would make the State jitney bond law inoperative and place the power of regulation of the jitneys, as well as street railway systems, in the hands of the cities. The bill will go before the State Legislature at its next session. It is known as initiative measure No. 27.

Chicago Terminal Plans Do Not Include Electrification.—The proposals for the new Illinois Central terminal, which were expected to be presented in ordinance form to the Council committee on terminals on Nov. 1, do not include plans for electrifying any part of the service. Alderman Geiger, chairman of the committee, has declared that unless electrification is included he will not present the measure to the committee for consideration. He is quoted as saying: "The members of the committee favor electrification, and to submit a measure with that element eliminated would be a waste of their time."

Buffalo & Wellsville Road Abandoned.—After ten months of unsuccessful operation, the Buffalo & Wellsville Railroad, formerly the Buffalo & Susquehanna Railway, plans to discontinue its freight and passenger service. Rolling stock, rails and other equipment will be scrapped and the right-of-way sold. In the ten months the line has been operated under the new ownership, C. A. Finnegan, president, Buffalo, says it has lost \$45,000. The line connects Buffalo and Wellsville by way of Blasdell, Springville and Arcade. For some time before it was sold the road was operated at a loss by receivers and there was some talk of electrifying the line in an effort to make it pay.

Extension of Three-Cent Fare Privilege.—Robert S. Sloan, president of the Manhattan & Queens Traction Corporation, Long Island City, N. Y., has advised the Chamber of Commerce of the Borough of Queens that its request to have the 3-cent service of the company extended across Diagonal Street viaduct, Long Island City, has been presented to his board of directors, who have taken favorable action thereon. The corporation has announced that immediate application will be made to the Public Service Commission for the necessary permission for the change of fare, and that it will begin service as soon as such permission is obtained and the required physical changes are made.

Why Brooklyn Transit Employees Are Loyal.—The magazine supplement of the New York Times for Oct. 15 contained a long illustrated article, "Why Brooklyn's Transit Employees Are Loyal," giving the reasons why the strike missionaries had no success in Brooklyn. Among other things the article reviewed the welfare work in the interest of the men, referred to from time to time in the ELECTRIC RAILWAY JOURNAL as the activities of the company in this respect have been broadened. The article was graced with portraits of William Siebert, superintendent of surface lines, and John J. Dempsey, superintendent of elevated lines, both of whom are mentioned as being in very close personal touch with the employees and with the public.

Conference on Railway Problems in Spokane Proposed.—Members of the City Council of Spokane, Wash., and officials of the Washington Water Power Company and the Spokane Traction Company will confer soon for the purpose of considering ways of eliminating the parallel railway lines in the city. It has been stated that the companies are losing \$1,000 daily at the present time, owing to the duplication of lines. It is also stated that 17 per cent of the mileage covered by the systems is practically in duplicate. At the conference the City Commissioners plan

to ask for universal transfers, and a physical connection of the competing systems. It is understood that the railways are ready to consider proposals for affiliation, but will demand stricter regulation of jitney buses and a new franchise, with stipulations with respect to street-improvement and up-keep requirements different from those contained in the present grants.

Changes in Detroit Operating Department.—A number of appointments and changes have been made in the operating department of the Detroit (Mich.) United Railway. Richard Dawson becomes superintendent of the Fourteenth and Crosstown divisions, succeeding Albert Bath, transferred to the car accountant's department. D. A. Smith, formerly assistant superintendent of the Mack, Michigan, Brush and Davison lines, succeeds Mr. Dawson as night superintendent. J. H. Hobbs and C. W. Knight, respectively carhouse foremen at Baker & Kercheval carhouses, become assistant superintendents of the Mack, Michigan, Brush and Davison lines. J. E. Spurgeon is appointed inspector of service of the same divisions. G. H. Gehling, G. H. Williams and E. T. Cain are appointed carhouse foremen at Baker, Kercheval and Woodward carhouses.

Plea for Double-Tracking in Vancouver Rejected.—George Kidd, general manager of the British Columbia Electric Railway, Vancouver, B. C., has made definite declaration to the City Council that his company does not intend to make any further expenditures for extensions or developments of the existing street railway system until such time as the city shall place the jitneys under the regulations similar to those that govern the street railway. The company, accordingly, rejected the request of the City Council that the line on Hastings Street, from Renfrew Street to Boundary Road, be double-tracked. Mr. Kidd states that the attitude adopted by the municipal authorities in refusing adequately to control the jitney in the same way as the company is controlled under acts passed by the Provincial Legislature and under agreements with the city and surrounding municipalities has prejudiced the company's credit to such an extent that it is now impossible to make further expenditure on the local railway system.

PROGRAMS OF ASSOCIATION MEETINGS

Railway Business Association

It is announced that the annual meeting of the Railway Business Association will be held at the Waldorf-Astoria Hotel, New York, on Jan. 16, 1917. The sessions will be a business meeting at 11 a. m., election of officers 1.30 p. m. and dinner at 7 p. m. promptly. The program of speakers will be announced later.

National Association of Railway Commissioners

The twenty-eighth annual convention of the National Association of Railway Commissioners will meet in the hearing room of the Interstate Commerce Commission in Washington, D. C., on Tuesday, Nov. 14, at 10 o'clock a. m. Sessions will continue up to and including Friday, Nov. 17.

According to a change adopted at the convention last year, the committees of the association are now divided as follows: executive, one; steam railroads, seven; other public utilities, four, and general, four. Outside of the committee on statistics and accounts of public utilities, which supersedes the former similar committee for electric railways, the public utility committees are all new and their reports should be of interest.

The committees most closely associated with the electric railway field are as follows:

- (a) Public Utility Rates, Thomas W. D. Worthen of New Hampshire, chairman;
- (b) Service of Public Utility Companies, Richard Yates of Illinois, chairman;
- (c) Safety of Operation of Public Utility Companies, James O. Carr of New York, Second District, chairman;
- (d) Statistics and Accounts of Public Utility Companies, A. F. Weber, chief statistician of New York, First District, chairman;
- (e) General Valuation, Charles E. Elmquist of Minnesota, chairman;
- (f) Capitalization and Intercorporate Relations, Edwin C. Edgerton of California, chairman;
- (g) State and Federal Legislation, Laurence B. Finn of Kentucky, chairman.

Financial and Corporate

ANNUAL REPORTS

Kentucky Securities Corporation

The combined comparative income statement of the Kentucky Traction & Terminal Company and the Lexington Utilities Company, the operating companies owned by the Kentucky Securities Corporation, for the years ended June 30, 1915 and 1916, is as follows with inter-company charges omitted:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Operating revenue	\$850,685	100.0	\$811,628	100.0
Operating expenses	438,163	51.5	432,402	53.3
Net operating revenue.....	\$412,522	48.5	\$379,226	46.7
Miscellaneous income	29,206	3.3	28,288	3.4
Gross income	\$441,728	51.8	\$407,514	50.1
Fixed charges, etc.....	245,576	28.8	237,230	29.2
Net income	\$196,152	23.0	\$170,284	20.9

The combined operating revenues of all the departments showed an increase of \$39,057 or 4.8 per cent during the year. Operating expenses showed only a slight increase, so that the net operating revenue increased \$33,296 or 8.7 per cent. Miscellaneous income gained slightly, and fixed charges rose \$3,346 or 3.5 per cent, with the result that the net income for the period showed a gain of \$25,868 or 15.2 per cent.

The railway gross earnings reflected the improved business conditions which prevailed during the year, and the receipts showed an increase of 5.4 per cent. The gains were the largest on the interurban lines. The number of passengers carried, including transfers, etc., were as follows: Lexington city lines, 1916, 4,389,905; 1915, 4,277,241; interurban lines, 1916, 1,482,881; 1915, 1,341,452, and other cities, 1916, 497,054; 1915, 466,017. This improvement was shown without materially increasing the number of car-hours or car-miles run. The appropriations for maintenance in the railway department were equivalent to 16.5 per cent of the gross earnings.

In the city of Lexington, where the company supplies all retail electric service, there was shown a substantial increase in the number of customers and connected load. The new-business department gave close attention to procuring new customers and to increasing both the sales and service rendered to those already on the books. Power is being supplied at wholesale, under satisfactory long-term contracts, to other lighting companies in the central Kentucky district. The results for the year showed a small gain in receipts from these sources. The ice department had a generally satisfactory year.

During the year just ended the companies spent \$94,217 on additions and betterments. Among the largest items were: poles and fixtures, \$15,658; gas department, \$13,548; meters and transformers, \$12,225; paving, \$11,906; transmission system, \$10,611, and ice department, \$2,962. These expenditures were in accordance with the construction program approved early in the year, and comprised the necessary additions which were required by the increased business of the system. There is now under construction an addition to the power plant building, in which are being installed two additional boilers. It will shortly be necessary to add an additional turbine to the power equipment, to take care of the increased business.

BOSTON ELEVATED HEARINGS RESUMED

Hearings in the Boston Elevated inquiry, relative to the company's financial condition, were resumed at Boston, Mass., on Oct. 27. Following the presentation of the company's brief at previous sessions, the officers of the road held themselves in readiness to meet any further inquiries by the special legislative commission sitting in the case or by others interested in the proceedings. At the annual banquet of the Boston Chamber of Commerce in the Copley-Plaza Hotel on Oct. 26, attended by nearly 700 members, Charles F. Weed, president of the chamber, in his inaugural

address pointed out the importance to all citizens of Greater Boston of the financial condition of the company, stating that if the Boston Elevated Railway substantiates its claims it will be clearly in the public interest to grant such relief as will enable it to raise new capital. The chamber has undertaken to study the question, but has not yet made its report.

STATISTICS OF OPERATION IN NEW JERSEY

The Board of Public Utility Commissioners of New Jersey has just issued a report containing statistics of the operation of public utilities in the State for the year ended Dec. 31, 1914. Included in the 450 reporting utilities are twenty-nine operating and thirty-nine non-operating electric railways. The gross revenues of the various groups, the net revenues (the amount remaining after deducting operating expenses, taxes and uncollectible bills), the ratio of net to gross and the ratio of net to capitalization are shown in the following table:

Class of Utility	Gross Revenue	Net Revenue	Per Cent of Net Revenue to Gross	Per Cent of Net Revenue to Capitalization
Gas	\$13,070,000	\$5,380,000	41.2	5.79
Electric	11,410,000	5,400,000	47.3	6.30
Municipal electric	170,000	39,000	23.1	2.2
Water	4,870,000	2,480,000	51.1	6.27
Municipal water	5,120,000	2,985,000	58.3	6.1
Sewer	250,000	95,000	38.0	5.11
Telephone	9,000,000	2,525,000	28.1	6.81
Street railways	19,040,000	6,410,000	33.7	3.86
All utilities	\$62,930,000	\$25,314,000	40.2	5.2*

*Average.

On account of the interstate character of their business, the revenues of both the Hudson & Manhattan Railroad and the American Telephone & Telegraph Company have been excluded from the preceding tabulation. Moreover, for the New York Telephone Company there is included only the revenues pertaining solely to New Jersey.

The total 1914 capitalization of the utilities in the State was \$422,950,000, made up of \$210,060,000 of funded debt and \$212,890,000 of capital stock. For electric railways the total capitalization was \$165,830,000—\$92,720,000 for funded debt and \$73,110,000 for stock. The per cent of total dividends to the par value of all capital stock in 1914 was 5.5 for all utilities and 2.4 for electric railways. The per cent of total dividends to the par value of dividend-paying stocks was 5.9 for all companies and 2.06 for electric railways. A total of 44.09 per cent of all utilities paid dividends, but only 34 per cent of the electric railways did so. Of these companies nine paid less than 5 per cent, ten

between 5 per cent and 10 per cent, and two more than 10 per cent.

The report of the commission contains organization data for all electric railways, with capitalization figures for non-operating companies and, in addition to these, income figures for the operating lines. Detailed revenue and expense figures per car-mile are also given for each operating railway, and other mileage, traffic and miscellaneous statistics as shown in the accompanying table.

Birmingham, Ensley & Bessemer Railway, Birmingham, Ala.—The Alabama Public Service Commission has authorized the substitution of the Birmingham-Tidewater Railway, the entire capital stock of which is owned by the Birmingham Railway, Light & Power Company, for J. D. Kirkpatrick as purchaser of the Birmingham, Ensley & Bessemer Railroad at the foreclosure sale. The bondholders were not in a position to refinance the road. It is understood that the property of the Birmingham, Ensley & Bessemer Railway was taken over for approximately \$1,500,000, which is much less than the original cost of the system. References to the sale of the property under foreclosure and to the subsequent negotiations for turning it over to the Birmingham Railway, Light & Power Company were contained in the ELECTRIC RAILWAY JOURNAL for Jan. 15, April 1 and 8, and Sept. 9.

Brazilian Traction, Light & Power Company, Toronto, Ontario.—William A. Read & Company, New York, N. Y., are offering \$7,500,000 of three-year 6 per cent gold notes of the Brazilian Traction, Light & Power Company at 99, yielding about 6% per cent to the investor. The notes are the only funded debt of the company and are secured by the pledge of \$15,000,000 of bonds of subsidiary companies. The new notes precede \$10,000,000 of 6 per cent cumulative preferred stock and \$106,289,000 of common stock which has paid dividends since issued. The collateral to secure the notes, which will be deposited in New York, includes about \$5,000,000 of Rio de Janeiro Tramway, Light & Power Company general mortgage 5 per cent bonds, about \$2,500,000 of Sao Paulo Tramway, Light & Power Company general mortgage 5 per cent bonds and \$7,500,000 Rio de Janeiro & Sao Paulo Telephone Company first mortgage collateral trust 6 per cent bonds. The company was incorporated in Canada in 1912. The banking house announced on Nov. 2 that all the \$7,500,000 of notes of the Brazilian Traction, Light & Power Company had been sold. The Read group of bankers, it is said, expects to put out other issues of South American public utility securities, but they are not yet prepared to make any announcement concerning the next flotation.

MILEAGE, TRAFFIC AND MISCELLANEOUS STATISTICS OF NEW JERSEY STREET RAILWAYS FOR 1914

	Miles of Track Owned	Capitalization Per Mile of Track	Miles of Road Operated	Operating Revenues Per Mile of Road	Revenue Car-Miles Per Mile of Road	Revenue Car-Miles Per Car-Hour	Average Fare Per Revenue Passenger (Cents)	Transportation Revenue Per Car-Mile (Cents)	Transportation Revenue Per Car-Hour (Cents)	Total Railway Revenues Per Car-Mile (Cents)	Operating Expenses Per Car-Mile (Cents)	Operating Ratio (Per Cent)
Atlantic & Suburban Railway	17.0	\$49,476	16.0	\$5,302	29,974	11.8	4.76	17.6	\$2.07	17.7	13.2	74.7
Atlantic City & Shore Railroad	7.7	253,247	24.5	25,495	71,567	11.2	4.75	35.4	3.95	35.9	22.3	62.1
Atlantic Coast Electric Railway	36.1	77,562	20.3	21,080	65,998	9.4	5.00	24.6	3.32	31.9	18.6	58.1
Bridgeton & Millville Traction Company	37.9	26,385	36.3	3,564	16,375	9.5	4.31	21.5	2.04	21.8	16.7	76.6
Burlington County Transit Company	14.8	8,108	15.8	4,454	23,277	9.5	5.00	18.2	1.74	19.1	18.6	97.4
Cape May, Delaware Bay & Sewell's Point Railroad	13.7	21,898	15.1	1,856	12,324	...	5.00	13.6	...	15.0	16.4	108.6
Central Passenger Railway	2.8	103,571	4.0	14,416	53,781	6.0	2.17	20.0	1.19	26.8	23.0	85.9
Five Mile Beach Electric Railway	5.7	44,859	4.9	11,143	64,390	8.9	5.00	16.9	1.51	17.3	10.4	59.9
Jersey Central Traction Company	41.2	72,815	36.8	6,231	25,072	11.6	4.90	23.2	2.68	24.9	14.4	57.8
Millville Traction Company	12.5	30,640	12.5	4,106	25,858	9.1	4.85	15.2	1.38	15.9	17.5	110.1
Monmouth County Electric Company	17.7	46,610	15.0	6,143	34,136	10.1	5.00	17.4	1.76	18.0	14.9	83.1
Morris County Traction Company	66.6	67,784	50.6	6,124	25,085	10.1	5.02	24.2	2.46	24.4	16.7	68.5
New Jersey & Pennsylvania Traction Company	14.9	107,382	13.3	5,729	23,767	14.9	4.95	23.8	3.55	24.1	16.0	66.3
New Jersey Rapid Transit Company	6.0	53,333	6.0	523	7,362	12.0	5.00	7.1	0.85	7.1	11.3	159.0
Northampton-Easton & Washington Traction Company	18.0	112,431	18.0	3,288	11,846	16.6	5.00	27.2	4.51	27.8	15.7	56.5
North Jersey Rapid Transit Company	14.5	110,345	15.2	4,117	19,427	15.1	9.16	20.7	3.12	21.2	14.7	69.2
Ocean City Electric Railroad	10.0	17,500	10.0	2,555	19,547	9.2	4.98	13.0	1.20	13.1	12.3	94.0
Phillipsburg Horse Car Railroad	7.1	4,225	6.9	13,987	72,511	8.0	5.00	19.1	1.53	19.3	14.5	75.1
Point Pleasant Traction Company	3.2	125,000	3.1	2,686	12,964	6.7	5.00	20.3	1.35	20.7	15.1	72.7
Public Service Railroad	*43.7	†47,749	38.4	3,394	15,444	21.7	20.40	21.8	4.73	22.0	18.9	86.1
Public Service Railway	*832.2	†162,095	492.1	31,838	102,023	8.9	4.98	30.9	2.75	31.2	17.9	57.5
Trenton & Mercer County Traction Corporation	*74.1	†67,312	53.2	14,551	62,089	8.7	4.32	23.1	2.00	23.4	13.5	57.7

*Miles of track operated.

†Capitalization per mile of track operated, including capitalization of lessor companies.

Chicago (Ill.) Railways.—Chauncey B. Borland and Wallace Heckman have been elected to the board of directors of the Chicago Railways to succeed R. C. Chandler and Arthur B. Jones, resigned. The other directors of the company were re-elected.

Chicago, Milwaukee & St. Paul Railway, Chicago, Ill.—The annual report of the Chicago, Milwaukee & St. Paul Railway for the fiscal year ended June 30, 1916, states that during the last year the company added to its equipment twenty electric locomotives at a cost of \$2,286,962. Other additions and betterments included the expenditure of \$3,870,411 for power stations, transmission systems, etc. It is said also that authority has been given for the purchase or building of additional equipment, including twenty-three electric locomotives. Electrical operation of the Rocky Mountain division between Deer Lodge and Three Forks, Mont., a distance of 112.2 miles, was started in December, 1915, and between Three Forks and Harlowton, Mont., a distance of 114.2 miles, in April, 1916. Work on the Missoula division between Avery, Idaho, and Deer Lodge, Mont., is progressing at a rate which indicates the completion of the electrical construction work on this division by the end of the present calendar year. During the last year the company expended for maintenance \$2,612 on power-plant buildings, \$425 on power substation buildings, \$144 on power transmission systems, \$18,764 on power distribution systems and \$1,147 on power line poles and fixtures. The repairs to other than steam locomotives cost \$36,754 during the year, while the depreciation covering the same items amounted to \$9,460.

Cincinnati, Dayton & Toledo Traction Company, Hamilton, Ohio.—Benton S. Oppenheimer, receiver of the Cincinnati, Dayton & Toledo Traction Company, has made application to the Common Pleas Court of Hamilton County for authority to pay the interest due on Nov. 1, 1915, on \$1,350,000 of bonds of the Southern Ohio Traction Company, a subsidiary of the Cincinnati, Dayton & Toledo Traction Company. This is part of the property included in an order of sale issued by Judge Geoghegan. The interest is payable at the office of the Cleveland Trust Company, Cleveland, Ohio.

Elmira Water, Light & Railroad Company, Elmira, N. Y.—The Elmira Water, Light & Railroad Company has applied to the Public Service Commission for the Second District of New York for authority to issue \$222,000 of 5 per cent fifty-year gold bonds under the first consolidated mortgage of the company.

Federal Light & Traction Company, New York, N. Y.—At a special meeting of the Federal Light & Traction Company, Anson W. Burchard, vice-president of the General Electric Company, Harrison Williams, F. L. Dame and R. E. Breed resigned from the board and Guy E. Tripp, chairman of the Westinghouse Electric & Manufacturing Company, Calvert Townley and Samuel Insull were elected directors, leaving one vacancy to be filled. Mr. Breed, one of the retiring directors, is president of the American Gas & Electric Company, with which the name of General Electric Company has been associated, while Mr. Dame is associated with Harrison Williams. Samuel Insull is president of the Commonwealth Edison Company, Chicago, Ill., and an officer of many railroads and other utilities.

Mexico (Mex.) Tramways.—At meetings of the bondholders of the Mexico Tramways and its associate companies held in London in October, the resolutions referred to in the *ELECTRIC RAILWAY JOURNAL* of Sept. 16, page 511, concerning the conduct of the system pending the return of conditions in Mexico favorable to reorganization were approved. The report of Messrs. Phippen and Trowbridge, who visited the Mexican properties in the interest of the trustee for the bonds, was reviewed at length in the *ELECTRIC RAILWAY JOURNAL* for July 15, page 118.

Municipal Railway, San Francisco, Cal.—The bookkeeping bureau of the Department of Public Works has just issued a statement giving the receipts, actual disbursements, and cash transfers for the municipal lines from the beginning of operation, Dec. 28, 1912, to Aug. 31, 1916. According to this statement, the actual receipts during this period amounted to \$4,851,754, while the disbursements and transfers totaled \$4,669,100, thus giving excess receipts of \$182,654. The

gross revenues of the lines for the period were \$4,830,769, while the operating expenditures (audited) amounted to \$2,728,308. The statement also reports the conditions of the reserve funds, showing that the depreciation fund has \$547,643 invested in bonds, a cash balance of \$180,713 and a balance of \$22,913 for interest on bonds owned, making a cash total of \$203,626. The injury insurance fund has a cash balance of \$53,250, and the investment fund a cash balance of \$200,000, thus giving a total of \$456,876 for cash in all the funds and \$547,643 for bonds invested in the funds.

Muscatine & Iowa City Railway, Muscatine, Iowa.—The Muscatine & Iowa City Railway, which passed into the hands of John A. Bartemeier as receiver on July 1 and suspended operation on Aug. 11, has been turned over to the Chicago, Rock Island & Pacific Railway, which is now operating the line.

Republic Railway & Light Company, Youngstown, Ohio.—The Republic Railway & Light Company has drawn for redemption on Dec. 1, at par and accrued interest, payment to be made by the Fidelity Trust Company, Philadelphia, \$484,000 of its three-year 5 per cent secured gold notes. Under the trust agreement, holders of these notes have the right to convert them, par for par, into the 7 per cent preferred stock of the Mahoning & Shenango Railway & Light Company, the operating subsidiary of the Republic Railway & Light.

Southern New York Power & Railway Company, Coopers-town, N. Y.—The Public Service Commission for the Second District of New York has approved the plan for refinancing the Southern New York Power & Railway Company, formerly the Otsego & Herkimer Railroad. In the readjustment control is acquired of the Colliers Light, Heat & Power Company, and through the latter corporation control of the Deposit Electric Company, the Hartwick Power Company, and Southern New York Power Company. The company has been authorized to issue \$200,000 of stock and \$500,000 of bonds with which to take up the securities of the smaller companies, and, in addition, is authorized to issue \$1,200,000 of 5 per cent first mortgage bonds with which to refund, if it desires to do so, an equal amount of bonds now outstanding of the Otsego & Herkimer Railroad.

Tidewater Southern Railway, Stockton, Cal.—The Tidewater Southern Railway has filed with the California Railroad Commission applications for authority to extend its line from Hatch, Stanislaus County, to Irwin City, Merced County, 8 miles, and to issue securities to pay for this extension, for freight terminals in Modesto and for other improvements of its system. The company wants to issue \$600,000 of its common stock now in its treasury, to net \$480,000 cash. It operates a standard gage railroad between Stockton and Turlock, 50 miles, with a number of branches. The extension, equipped, will cost \$109,700. The remainder of the \$480,000 will be devoted to procuring freight terminals in Modesto, and additional terminals at Turlock, changing its entrance and route into Stockton, the construction of interchange tracks at Ortega, electrifying the present lines from Modesto to Turlock, installing an interlocking crossing of the Southern Pacific Company tracks south of Modesto, purchase of three additional freight motors, two passenger cars and other equipment, and the paying off \$88,717 of the company's notes.

United Light & Railways Company, Grand Rapids, Mich.—Announcement has been made of the sale by United Light & Railways Company to William P. Bonbright & Company, Inc., New York, N. Y., of \$1,000,000 first and refunding 5 per cent bonds and \$1,500,000 of 6 per cent ten-year debentures. The price at which the securities will be sold has not yet been made public. They are to be offered about Nov. 10. The proceeds of the sale will be used to retire \$750,000 of short-time notes now outstanding and to provide funds for liquidation of all floating debt of the company and will give in addition substantially \$1,000,000 for additions and extensions to operated properties.

United Railways, St. Louis, Mo.—Kentucky stockholders of the United Railways have been asked to send proxies to a committee composed of John W. Barr, J. A. Cheek and George W. Norton in an effort to obtain concerted action among the stockholders.

DIVIDENDS DECLARED

Connecticut Railway & Lighting Company, Bridgeport, Conn., quarterly, 1 per cent, preferred; quarterly, 1 per cent, common.

Grand Rapids (Mich.) Railway, quarterly, 1 1/4 per cent, preferred.

Illinois Traction Company, Peoria, Ill., quarterly, three-quarters of 1 per cent, common.

Massachusetts Consolidated Railways, Greenfield, Mass., quarterly, 1 1/2 per cent, preferred.

Monongahela Valley Traction Company, Fairmont, W. Va., quarterly, 1 1/4 per cent, preferred.

Union Street Railway, New Bedford, Mass., quarterly, 2 per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period	Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$74,833	*\$38,244	\$36,589	\$18,164	\$18,425
1 " " '15	71,400	*35,960	35,440	17,450	17,990
12 " " '16	810,403	*440,681	369,722	212,565	157,157
12 " " '15	783,707	*387,671	396,036	211,970	184,066

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.

1m., Aug., '16	\$35,264	*\$19,185	\$16,079	\$6,568	\$9,511
1 " " '15	33,225	*18,160	15,066	6,603	8,463
12 " " '16	385,278	*225,932	159,346	78,532	80,814
12 " " '15	338,506	*206,903	131,603	78,999	52,604

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Sept., '16	\$105,056	*\$72,995	\$32,061	\$29,528	\$2,533
1 " " '15	94,588	*61,079	33,509	30,121	3,388
12 " " '16	1,214,613	*766,421	488,192	356,152	92,040
12 " " '15	1,047,202	*719,406	327,796	355,230	†27,434

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., Sept., '16	\$722,054	\$21,531	\$700,523	\$340	\$700,183
1 " " '15	349,456	14,302	335,154	40,833	294,321
12 " " '16	7,522,547	226,667	7,295,880	380,510	6,915,370
12 " " '15	4,121,621	159,571	3,962,050	490,000	3,472,050

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

1m., Sept., '16	\$289,975	*\$177,917	\$112,058	\$42,862	\$69,196
1 " " '15	266,435	*154,383	112,052	40,200	71,852
12 " " '16	3,426,016	*2,007,953	1,418,063	509,659	908,404
12 " " '15	3,066,603	*1,819,624	1,246,979	471,860	775,119

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m., Sept., '16	\$1,434,201	*\$799,304	\$634,897	\$421,048	\$213,849
1 " " '15	1,211,588	*660,915	550,673	372,360	178,313
12 " " '16	16,340,522	*8,746,988	7,593,534	4,961,774	2,631,760
12 " " '15	14,116,576	*7,527,018	6,589,558	4,336,950	2,222,608

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., Sept., '16	\$260,888	*\$152,922	\$107,966	\$63,150	\$44,816
1 " " '15	206,405	*122,453	83,952	62,904	21,048
12 " " '16	2,862,052	*1,701,537	1,160,465	752,969	407,496
12 " " '15	2,424,763	*1,441,513	983,250	759,927	223,323

EL PASO (TEX.) ELECTRIC COMPANY

1m., Aug., '16	\$84,156	*\$78,121	\$6,035	\$4,920	\$1,115
1 " " '15	75,111	*42,680	32,431	4,204	28,227
12 " " '16	1,504,363	*603,227	451,136	54,883	396,253
12 " " '15	979,877	*527,608	452,269	50,361	401,908

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

1m., Sept., '16	\$475,988	*\$218,846	\$257,142	\$214,390	\$42,752
1 " " '15	435,789	*185,768	250,021	211,295	38,726
3 " " '16	1,370,638	*629,238	741,400	643,739	97,661
3 " " '15	1,290,898	*566,812	724,086	634,533	89,553

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

1m., Aug., '16	\$26,157	*\$17,627	\$8,530	\$7,163	\$1,367
1 " " '15	23,550	*14,253	9,297	7,535	1,762
12 " " '16	307,276	*198,215	109,061	87,692	21,369
12 " " '15	290,205	*182,704	107,501	91,837	15,664

PENSACOLA (FLA.) ELECTRIC COMPANY

1m., Aug., '16	\$24,398	*\$13,379	\$11,019	\$7,712	\$3,307
1 " " '15	22,075	*12,511	9,564	7,090	2,474
12 " " '16	278,596	*154,295	124,301	89,934	34,367
12 " " '15	245,485	*148,256	97,229	86,849	10,380

TAMPA (FLA.) ELECTRIC COMPANY

1m., Aug., '16	\$74,194	*\$43,219	\$30,975	\$4,398	\$26,577
1 " " '15	78,924	*40,365	38,559	4,352	34,207
12 " " '16	966,144	*522,216	443,928	52,334	391,594
12 " " '15	978,209	*502,026	476,183	52,639	423,544

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Sept., '16	\$854,747	\$504,810	\$349,937	\$149,828	\$200,109
1 " " '15	817,922	502,569	315,353	140,418	174,935
9 " " '16	7,594,988	4,692,777	2,902,211	1,292,995	1,609,216
9 " " '15	7,014,857	4,531,392	2,483,465	1,272,247	1,211,218

*Includes taxes. †Deficit.

Traffic and Transportation

1,898,735,615 CARRIED IN NEW YORK IN YEAR

Public Service Commission Reports This Total for Greater New York Lines

There was an increase of 91,000,000 passengers carried on the surface, subway and elevated lines of Greater New York for the year ended June 30, 1916, over the preceding year. This increase was bigger than that of any other year except 1906 and 1910, when the increases were 120,000,000 and 128,000,000 respectively. A pamphlet soon to be published by the Public Service Commission of the First District of New York will contain some tables, of which the most interesting will show the number of passengers carried every year by all of the city lines and the increases since 1900, and the per capita fares since 1860. The latter table is presented to prove that street railway passenger travel within the city increases at a very much more rapid rate than the population. Here are the figures:

Year Ended June 30	Number of Passengers	Annual Increase
1900	846,353,058	
1901	881,344,501	34,991,743
1902	938,989,964	57,645,163
1903	1,000,767,483	61,777,519
1904	1,065,984,910	65,217,427
1905	1,130,982,696	64,997,786
1906	1,251,841,175	120,858,479
1907	1,315,381,388	63,540,213
1908	1,358,000,407	42,619,019
1909	1,402,417,642	44,417,235
1910	1,531,262,914	128,845,272
1911	1,603,901,397	72,638,483
1912	1,680,913,935	77,012,538
1913	1,769,876,508	88,962,573
1914	1,813,204,356	43,327,848
1915	1,807,632,726	*5,571,630
1916	1,898,735,615	91,102,889

*Decrease.

Year	Fares Per Capita	Year	Fares Per Capita
1860	43	1900	246
1870	103	1905	233
1880	152	1910	321
1890	218	1916	356

The commission says:

"The increase for the year 1915-16 serves in a measure as a thermometer of the conditions of business in New York City, inasmuch as the year 1914-15, which reflected the worst business conditions seen in the city in a great many years, showed a decrease in passenger travel of more than 5,000,000 for the year. Eliminating the decrease of 1914-15, the year 1915-16 shows a net increase over 1913-14 of about 85,000,000. The year 1914-15 is the first year to show a decrease since the consolidation of the greater city.

"Passenger traffic, by the methods mentioned, has increased in the city more than 1,000,000,000 in sixteen years. The total number of passengers carried on all the lines for the year 1915-16 was 1,898,735,615. In the year 1900 traffic was only 846,353,058. The first increase after that date in the figures of travel appears in the figures of 1905-06, when there is a sudden increase of traffic of 120,858,000 for the year, reflecting the first year of full reports from the operation of the subway."

The statement of the commission contains some analyses and explanations. For instance, during the Hudson-Fulton celebration in 1909 there was a big increase in traffic, for which the celebration received credit. Then the statement says that the new subways, with the old elevated lines operated by the New York Consolidated Railroad of Brooklyn and the first subway operated by the Interborough Rapid Transit Company, contributed almost equally to the year's increase in passenger travel. This increase, including elevated and subway lines, was 26,667,600 according to one report and 25,919,569 according to another. Then the commission's statement says:

"The Interborough's elevated division reports an increase of 10,454,279 passengers, due undoubtedly to the new third tracks which were placed in operation on Jan. 17, 1916, and which have since carried big crowds.

"The surface lines operated by the New York Railways carried 8,454,084 more cash passengers than in the year

preceding. The increase on the Brooklyn Rapid Transit Company's surface lines amounted to 6,174,408, and that on the lines of the Third Avenue Railway, including the Bronx and North River line, but excluding the Yonkers line, amounted to 6,587,738. The Second Avenue line in Manhattan was one of the few railroads to show a decrease, reporting for the year 186,157 fewer fares than in the year previous.

"The Hudson & Manhattan Railroad reported an increase of 4,327,120 passengers, and there was an increase of 1,481,295 on the lines of the New York & Queens County Railway, operating in the Borough of Queens, excepting lines of the Brooklyn Rapid Transit Company."

The following table shows the increases by boroughs in street surface railway travel as distinguished from passenger travel on the elevated and in the subway lines:

	Revenue Pas- sengers, 1916	Increase Over 1915
Borough of Manhattan.....	427,373,847	11,822,731
Borough of the Bronx.....	84,535,737	3,032,934
Borough of Brooklyn.....	363,568,755	8,868,642
Borough of Queens (excluding B. R. T.)	54,167,403	1,481,295
Borough of Richmond.....	14,884,534	572,525
Total	944,530,276	25,778,127

I. T. S. ST. LOUIS FARE CASE ARGUED

Interstate Commerce Commission Hears Argument in Case Involving Fare Increase from 5 Cents to 10 Cents

The Interstate Commerce Commission resumed work on Oct. 4 after the summer vacation. Among the first matters heard was the argument in the Illinois Traction System fare case at St. Louis, referred to previously in the ELECTRIC RAILWAY JOURNAL of April 29, page 840, in which is involved the right of the company to increase its passenger fares between St. Louis, Mo., and Granite City, Madison and Venice, Ill., from 5 cents to 10 cents. Henry I. Green, attorney for the company, appeared for it, and Charles H. Daus, city counsel, and C. E. Smith, civil engineer, appeared for the city.

The company operates in St. Louis under an ordinance granted by the city of St. Louis, which limits the fare to be charged between St. Louis and Granite City, or to intermediate points, to 5 cents a trip. The haul is 7½ miles and includes passage over the McKinley Bridge. The investment in the bridge and railway properties amounts to about \$6 000,000.

The city takes the position that the ordinance constitutes a contract, binding upon the Interstate Commerce Commission, and that the fare cannot be increased except by agreement with the city. The city also claims on one hand that the company has no right to do a freight business in St. Louis, and on the other hand urges that the company increase its freight business so as to make up for the deficit in the passenger business.

Mr. Green argued before the Interstate Commerce Commission that there was abundant precedent in the previous action of the commission in other cases, and also in the decisions of the United States Supreme Court, to the effect that any attempt to fix interstate fares by an ordinance passed by the City Council was invalid as against an order of the Interstate Commerce Commission fixing the reasonable tariffs and charges.

Mr. Green in his brief last May explained that by the new tariffs filed no change is made in the fare between any point in St. Louis and the east end of the McKinley Bridge in Illinois, which is designated as the Main Street station in Venice. The new tariffs, suspended by order of the commission until December, provide for a cash fare of 5 cents between any point in St. Louis and the Main Street station in Venice and an additional 5-cent fare to any point east of the Main Street station in Venice. Mr. Green urged that the important inquiry in the case was whether or not necessity existed for the increase in passenger fares sought by the tariffs under investigation. He said that it was proved conclusively that the St. Louis Electric Terminal Railway had failed each year since the operation of its line to earn sufficient to meet its fixed charges, and that the amount of the deficit at present was more than \$1 000,000, or approximately a net loss in operation of \$200 000 annually. It was to remedy in part this growing deficit that the company sought approval of the new tariff.

In presenting and discussing the evidence in the case Mr. Green took up in turn the questions of the character and the value and investment of the properties, the earnings, the competitive traffic conditions and the anticipated results from the proposed increase in fares. He said that the decision in the case rested primarily upon the questions whether the Interstate Commerce Commission has jurisdiction to hear and determine the case, whether the city has the power to preclude by ordinance the determination of the case by its attempt to fix rates for interstate commerce in and out of St. Louis, and whether the proposed increases as stated in the tariffs under suspension were justified under the existing facts and conditions. Mr. Green contended that the Steubenville Tri-State Railway case, the Covington & Cincinnati bridge case, the South Covington & Cincinnati Street Railway case, the Washington-Virginia case and the New York-Jersey City ferry case established conclusively that the commission had jurisdiction in the present proceeding, which involved interstate fares over an interstate bridge. With respect to the power of the city of St. Louis to fix rates he said that the provisions of the ordinance of the city in attempting to limit the fare were illegal and void and not binding upon the commission. With respect to the proposed increase in passenger fares in St. Louis and Granite City he said that there was abundant evidence to justify them.

Mr. Daus, for St. Louis, challenged the jurisdiction of the commission on the authority of the Omaha-Council Bluffs Street Railroad case. Mr. Green in his reply briefly characterized this as ingenious and peculiar. He said that the language of the Supreme Court in the Omaha case was clearly in support of the jurisdiction of the commission in the present case. The quotation from the Omaha case in the brief of the protestant, Mr. Green said, was directly antagonistic in its effect to the conclusion stated by counsel for the city, predicated thereon.

HEARING ON BOSTON FREIGHT SERVICE PLANS

The Public Service Commission of Massachusetts held a hearing on Oct. 16 upon plans of the Boston Elevated Railway for handling bulk freight on its system both locally and in conjunction with the Bay State Street Railway and the Boston & Worcester Street Railway. H. B. Potter, assistant to the president, outlined the company's plans. These, in the main, include the operation of freight service on an off-peak basis, carload hauls being the basis of the work. Mr. Potter said that the company preferred to do a bulk freight business to handling pick-up and delivery business and that it desired to utilize the existing investment in rolling stock and tracks to the utmost so as to keep down the overhead charges and avoid interference with its existing passenger traffic. Thus, it is intended to utilize motor-driven snow plows as locomotives in winter and motor-driven dump cars in summer. The elevated company does not wish to invest in additional locomotive units for this business under present conditions.

Both the Boston Elevated Railway and the Bay State Street Railway are asking the commission for authority to operate freight trailers. One of the problems discussed was the projected handling of Boston garbage and ashes by the former company. Conferences have been held with the Boston Sanitary Disposal Company relative to the transportation of ashes and garbage in special trailer cars from collecting bins in various parts of the city to the wharf or sorting station. It is estimated that with this system in operation about \$20 000 a year could be saved the city of Boston, and the streets would be relieved of many of the garbage and ash teams now hauled through the highways. Mr. Potter also suggested that the company could effect economies in the handling of crushed stone and rock for the city.

In the near future the Boston Elevated Railway will begin to haul molasses cars between Copps Hill Wharf and the plant of the Purity Distilling Company in East Cambridge, about two miles, by surface line route. Six cars will accomplish the work of about thirty-five teams. The molasses will be loaded from a 2,500,000-gal. tank on the waterfront and the road will haul tank cars owned by the Distilling company, using its own motive power. Plans are also under consideration for hauling fish in carload lots from the Commonwealth Fish Pier in South Boston to interior points in eastern Massachusetts.

ALBANY FARE INCREASE ALLOWED

The Public Service Commission for the Second District of New York has rendered a decision favorable to the company in connection with the application of the United Traction Company, Albany, for permission to increase its fares between Albany and Troy from 10 cents to 15 cents. Arguments before the commission were closed on May 17. The proposed tariff, effective on Nov. 25, operates to increase the cost to each passenger 5 cents for travel as follows: Between points in the local zone (a) Albany-Rensselaer, or (b) Troy-Watervliet-Cohoes-Waterford-Green Island not reached by the through zone car lines and points in the town of Colonie between Albany (north city line) and Watervliet (south city line); between points in local zone Albany-Rensselaer not reached by the through zone car lines and the termini of through zone car lines in Troy or Cohoes; between points in local zone Troy-Watervliet-Cohoes-Waterford-Green Island not reached by the through zone car lines and the terminal of through zone car lines in Albany; between points in local zone Albany-Rensselaer not reached by the through zone car lines and points in local zone Troy-Watervliet-Cohoes-Waterford-Green Island not reached by the through zone car lines.

The new tariff proposes to divide the territory served by the company into two local zones and one through zone. The local zones are (a) Albany-Rensselaer, which covers territory reached by local car lines operating wholly within the corporate limits of the cities of Albany or Rensselaer, and also through car lines operating from and to points in Albany to and from points in Rensselaer, and (b) Troy-Watervliet-Cohoes-Waterford-Green Island, which covers territory reached by the local car lines operating wholly within the corporate limits of the cities of Troy, Watervliet and Cohoes and the villages of Waterford and Green Island, and through car lines operating wholly within this zone. The through zone terminal points are the Plaza in Albany, Broadway and Third Streets in Troy, and Mohawk and Remsen Streets in Cohoes, the territory covered being that reached by through car lines operating wholly between such terminals.

Points in the town of Colonie between Albany (north city line) and Watervliet (south city line) are taken from the present Albany and Troy local zones and placed in the proposed through zone. The through zone car lines are not to carry local passengers between points in the cities of Albany, Troy or Cohoes, and no transfers will be given to passengers traveling from points in the through zone to points in either of the local zones, or vice versa.

Endless Chain Revived in Kansas City.—A company operating an endless chain coupon selling plan, involving the distribution of street car tickets, has started in Kansas City, and is under investigation. The plan is worked along the old line. The company sells a book of coupons for \$1. The purchaser sells the three coupons it contains for 25 cents each, thus getting back 75 cents of his investment. When each of the three on any one coupon book has purchased a book, the original holder may exchange his coupon book cover for twenty-five tickets worth \$1.25.

Shop Early Campaign in Washington.—For the purpose of starting a "shop early for Christmas" campaign, the Washington Railway & Electric Company, Washington, D. C., has placed its new private parlor car "Columbia" at the disposal of the board of governors of the Retail Merchants' Association for trips to nearby points on the company's lines and those of the Washington-Virginia Railway. The first trip, a journey to Alexandria, Va., is planned for Nov. 13.

Railway Man Appointed to Traffic Committee.—Thomas Penney, vice-president and general counsel of the International Railway, Buffalo, N. Y., has been appointed a member of the special committee named by Mayor Louis P. Fuhrmann to study traffic conditions in the congested business centers with a view of establishing safety zones, and enacting new traffic ordinances. Others on the committee represent taxi-cab companies, trucking associations and the automobile club. The Mayor has returned from a tour of cities in the middle west, where he made a study of safety zones and traffic ordinances.

Company Must Publish Transfer Regulations.—Although rules and regulations governing the use of transfers have been printed by the International Railway, Buffalo, N. Y., on the reverse side of its transfers for many years, Justice Wheeler in the Supreme Court of Erie County, has reversed the decision of a city court judge and holds that the company must publish its transfer rules and regulations before enforcing them. The case is that of an action brought against the company by a passenger who was ejected from a car while trying to make a round trip on a transfer. The company's regulation printed on the reverse side of all transfers says passengers must take the most direct route to their destination, while the passenger who brought the action against the company was taking a long indirect route which would bring him back to the starting point. The city court dismissed the action, but an appeal was taken to the Supreme Court and the decision of the lower court is reversed and the company is ordered to publish its transfer regulations. The company will probably take an appeal from this decision.

Springfield Passes Strict Jitney Ordinance.—After extended deliberation and much public discussion, the City Council of Springfield, Mass., on Oct. 23 passed an ordinance regulating jitney traffic. The ordinance took effect on Nov. 1. In addition to strict requirements as to the routing of jitanies, age of operators, obtaining of certificates from the city, etc., it contains a provision that every motor vehicle so licensed shall be operated for six or more hours a day in every day during the term of its license; that no such vehicle shall be operated by any person more than twelve hours a day; and that no solicitation of passengers by outcry or noise shall be permitted. No motor-vehicle in the jitney class is allowed to take on passengers on any street within 35 ft. of any white post or other designated street railway stopping place; no passenger with a child in arms or seated on the lap is permitted to ride on any front seat of the vehicle, and no person is permitted to stand upon any running board, fender or step, or to sit upon any fender, dash, top or door. No passenger can be charged more than 5 cents for being carried in a motor vehicle so licensed between any two points in the city within the circle having a radius of 2.5 miles from Court Square. A \$1,000 bond is required and strict police supervision of routes and standing places is specified. License fees are \$15 for every motor vehicle licensed to carry seven passengers or less and \$5 additional for passengers authorized in excess of seven.

Model Jitney Ordinance for Portland Explained.—Commissioner Dieck of Portland, Ore., is working on a model jitney franchise ordinance along the lines adopted by a majority of the Council recently. This measure will provide that jitanies shall not operate along street railway lines, except where absolutely necessary to reach the congested districts, but shall operate over streets to districts not now served by other transportation facilities; that jitney franchise-holders shall be required to file substantial bonds to indemnify the city or the public against damage and as a guaranty of the faithful performance of the terms of the grant; that they shall be required to make payments commensurate with those now being made by the Portland Railway, Light & Power Company to the city for the privilege of operating. Commissioner Daly, alone of the five members of the Council, held out for more liberal handling of the problem from the jitney standpoint. Undismayed by the decision of the Council to place jitanies under adequate franchise restrictions, L. B. Jones, et al, has filed a petition with the Council for a franchise to operate a line of jitanies between Portland and Linnton. The petitioners ask for a franchise for five years, and agree to operate cars every fifteen minutes from 6 a. m. until midnight, and give bond of \$500 as a guarantee of the faithful performance. They request the right to charge a 10-cent fare. "Jitney Regulation" was the principal topic discussed at a recent meeting of the Oregon Civic League. F. I. Fuller of the Portland Railway, Light & Power Company, presented the side of the street railway. Arthur I. Moulton, attorney for Chauffeurs' Union, presented the side of the jitney drivers. Commissioners Dieck and Daly of the Portland City Council, explained the view that the Council now takes of the matter.

Personal Mention

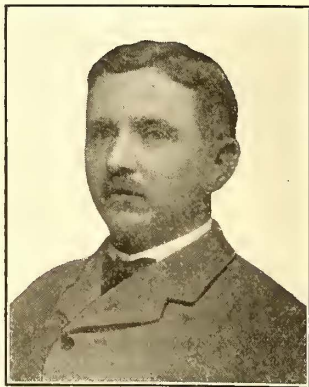
George Bullock has resigned as president of the United Gas & Electric Corporation, New York, N. Y., and has been elected chairman of the board of the company. Mr. Bullock is succeeded as president of the company by Edward G. Connette, as noted elsewhere in this column.

Thomas Ahearn, president of the Ottawa (Ont.) Electric Railway, motored from Ottawa to New York to see the Harkness trophy contest at Sheepshead Bay on Oct. 28. Mr. Ahearn holds the record for the fastest run between New York and Ottawa—458 miles in thirteen hours twenty minutes.

Arthur H. Sarvis has resigned from the Detroit (Mich.) United Railway and severs his connection with *Electric Railway Service*, published by that company, with which he has been connected as associate editor since the beginning of the publication more than three years ago. Mr. Sarvis goes to Flint, Mich., as one of the executive staff of the Flint Varnish & Color Works.

Joseph O. Gauthier, superintendent of rolling stock and shops of the Middlesex & Boston Street Railway, Newtonville, Mass., was tendered a reception recently by the employees of the mechanical department, on the occasion of the completion of his twenty-fifth year in the employ of the company. The affair was planned while Mr. Gauthier was in attendance at the convention of the American Electric Railway Association in Atlantic City. On his return home from that meeting Mr. Gauthier was surprised at his son's house by the employees, headed by George M. Cox, vice-president and general manager of the company. Mr. Cox complimented Mr. Gauthier on his length of service with the company, and in behalf of the men he presented to Mr. Gauthier a Waltham watch and \$25 in gold from the directors of the company. Mr. Gauthier started to work twenty-five years ago for the Newton Street Railway at the West Newton carhouse. In a short time he was made foreman, and when the Newton roads were consolidated in 1902, he took charge of repairs at the Waltham station. This station was made the central repair shop a few years ago, and Mr. Gauthier was appointed superintendent of rolling stock and shops in charge of the car repairs for the whole system.

Edward G. Connette, president of the International Railway, Buffalo, N. Y., vice-president of the International Traction Company, and since January a vice-president of the United Gas & Electric Corporation, New York, N. Y., was elected president of the United Gas & Electric Corporation on Oct. 26 to succeed George Bullock, who becomes chairman of the board. Mr. Connette will remain as president of the International Railway. Mr. Connette was born in Austin, Ind., on Dec. 29, 1863. He obtained his early education in the public schools. In 1879 he secured his first employment, this being in the capacity of telegraph operator on the Louisville Division of the Pennsylvania Railroad. Later he accepted an appointment as telegraph operator at the general offices of the Louisville, Cincinnati & Lexington Railroad at Louisville, Ky. He was subsequently transferred to the office of the general superintendent of the company. Shortly afterward the Louisville, Cincinnati & Lexington Railroad was purchased by the Louisville & Nashville Railroad and Mr. Connette was transferred to the engineering department of the company. Two years later Mr. Connette was made chief clerk of the Henderson Division of the company with headquarters at Henderson, Ky. He was next



E. G. CONNETTE

appointed assistant to the superintendent of the company at Nashville, Tenn., and when the street railways in that city were consolidated in 1890, Mr. Connette accepted the position of superintendent of the consolidated company. In 1891 he was made general manager of the company and in 1897 became chief engineer of the Cumberland Electric Light & Power Company, which position he held in addition to that of general manager of the street railway company. On April 1, 1900, Mr. Connette accepted the appointment of vice-president of the Syracuse (N. Y.) Rapid Transit Company, in which position he continued until 1905, when he was appointed general manager of the Worcester (Mass.) Consolidated Street Railway. In 1909 he accepted the position of transportation engineer of the Public Service Commission, First District, New York State. Mr. Connette on May 1, 1912, was elected vice-president of the International Railway, continuing in this capacity until Jan. 1, 1913, when he was made president of the company. Besides holding the office of president, he is also a director and member of the executive committee of the International Railway. He is also vice-president, a director and member of the executive committee of the International Traction Company. The United Gas & Electric Corporation, of which Mr. Connette has been made president, is one of the largest public utility holding companies in the United States. The properties which it controls include in addition to the International Railway electric railways, gas and fuel companies and light, heat and power companies located mostly in the East, the Middle West and the South.

OBITUARY

George H. Hart, at one time superintendent of the Pawcattuck Street Railway, Westerly, R. I., died at New London, Conn., recently.

James Grady, who was connected with the Columbia Machine Works & Malleable Iron Company, Brooklyn, N. Y., for twenty-two years and was for many years vice-president and general manager of the company, died at his home in Brooklyn on Oct. 28. Mr. Grady had not been well for some time and more than a year ago disposed of his interest in the company and retired from the management. He was born in New York City on Sept. 6, 1857. He is survived by his widow and nine children.

William C. Cuntz, managing director of the Goldschmidt Thermit Company of New York, died Nov. 2 at Auburndale, Mass., in his forty-fifth year. He had not been well for several weeks and about a year ago had an operation for appendicitis. Mr. Cuntz was born and educated in Hoboken and started his business career with the Pennsylvania Steel Company of Steelton, Pa., first with the bridge and construction department. Later he entered the sales department, which he represented in Boston, Philadelphia, and London, England. He became connected with the Goldschmidt Thermit Company in 1910. Mr. Cuntz was as large of heart as he was of frame and well known in electric railway circles. He is survived by a widow and two sons. He was a member of the American Society of Civil Engineers, the American Iron & Steel Institute, the Engineers' Club of New York and many other organizations.

Charles Wilcox Hotchkiss, president and director of the Richmond Light & Railroad Company, Staten Island, New York, died on Oct. 29 at Battle Creek, Mich., from organic heart disease. He was in his fifty-fourth year. Mr. Hotchkiss was born in Unadilla Forks, N. Y. He entered railroad-ing in 1881, when he became a rodman on the New York, West Shore & Buffalo Railroad. In 1886 he became assistant engineer of the Michigan Central Railroad and in 1895 was appointed chief engineer of the Chicago Junction Railway, where he remained until 1899, when he became president of the Indiana Harbor Railroad. Mr. Hotchkiss later became general manager of the Chicago, Indiana & Southern Railroad and of the Indiana Harbor Railroad. On May 1, 1912, he was chosen president of the Chicago Tunnel Company, which office he held at the time of his death. He was also president and a director of the Chicago Utilities Company, president and a director of the Staten Island Midland Railway, and chairman of the board of directors and of the executive committee of the Virginian Railway. In 1913 Mr. Hotchkiss was elected president of the Rail Joint Company of America and of the Staten Island properties.

Construction News

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

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

RECENT INCORPORATIONS

*Rumford Falls & Bethel Street Railway, Rumford, Me.—This company has been granted a charter by the Legislature to construct an electric railway. It is proposed to issue \$200,000 in stock and bonds, the proceeds to build and equip the line, and \$50,000 to pay for organization services, surveys, right-of-way, and financing.

*Amityville-Stowe Electric Railway, Amityville, Pa.—Chartered to operate an electric railway between Amityville and Stowe. Capital stock \$50,000. Peoples Brothers, Inc., Philadelphia, are reported interested.

FRANCHISES

Peoria Heights, Ill.—The Peoria & Chillicothe Electric Railway has asked the Council for a franchise in Peoria Heights.

What Cheer, Iowa.—The Burlington Railway & Light Company has received a twenty-five year franchise from the Council to supply electricity in What Cheer. A street-lighting system, to cost about \$5,000, will be installed.

Galena, Kan.—The Southwest Missouri Railroad will soon ask the Councils of Galena and Baxter Springs for franchises to construct its proposed extensions in those cities.

*Ashland, Ky.—Dr. L. M. Hunter, Owensboro, who plans the construction of a line between Ashland and Russell, will ask the City Council of Ashland for a franchise.

Henderson, Ky.—No bids were received for the franchise recently advertised for sale in Henderson. A new franchise was drawn up some time ago which it was proposed the Henderson Traction Company should purchase to take the place of the franchise that expired on Oct. 22. The City Council has approved a suggestion that cars be permitted to continue operating without the franchise, and a meeting has been called to consider the situation.

Springfield, Mass.—The Springfield Street Railway has completed plans for the Carew Street extension and a petition for a franchise is being drawn up and will soon be submitted to the City Council.

Buffalo, N. Y.—The Frontier Electric Railway, which will operate an express service between Buffalo and Niagara Falls, has filed an acceptance of a city franchise with the City Clerk which will permit the construction of a short stretch of track in North Main Street.

Walla Walla, Wash.—The proposition of granting a franchise to the Walla Walla Valley Railway for construction and maintenance of an electric line on South Ninth Street, from Orchard Street to Main Street, will be placed before the voters of Walla Walla at the November election. The Walla Walla Valley Railway petitioned for the franchise last summer.

TRACK AND ROADWAY

*Clarksville, Ark.—It is reported that the construction of an electric railway from Clarksville to Hagarville, Silex and other points is proposed. Address Railroad Committee, Clarksville.

Fort Smith Light & Traction Company, Fort Smith, Ark.—This company is reconstructing its tracks on Grand Avenue, laying heavier rails on a concrete base. The improvements are being made by the company prior to paving by the city.

Visalia Electric Company, Exeter, Cal.—Construction work will soon be begun on an extension of this company's line from Exeter in a general southeasterly and southerly direction to Ducor, Tulare County, a distance of approximately 33 miles.

Pacific Electric Railway, Los Angeles, Cal.—It is reported that this company will construct a double-track extension on Fourth Street between Ross and Minter Streets. The cost is estimated at \$20,990.

Municipal Railways of San Francisco, San Francisco, Cal.—Bids were recently opened by the Board of Works for the construction of an extension of the Potrero Avenue car-line, the lowest bidder being Eaton & Smith, San Francisco, at \$6,380.

Tidewater Southern Company, Stockton, Cal.—This company has filed with the Railroad Commission of California applications for authority to extend its line from Hatch to Irwin City, 8 miles, and to issue securities to pay for this extension, for freight terminals in Modesto and for other improvements of its system. The company wants to issue \$600,000 of its common stock now in its treasury, to net \$480,000 cash. The extension will cost \$109,700. The remainder of the \$480,000 will be devoted to procuring additional terminals.

Gainesville Railway & Power Company, Gainesville, Ga.—This company reports that it has just completed a 1-mile addition to its lines.

Savannah (Ga.) Electric Company.—It is reported that this company contemplates the construction of a 4-mile extension of its Millhaven line to Port Wentworth.

Chicago, Fox Lake & Northern Electric Railway, Chicago, Ill.—This company, which proposes to construct a line from Evanston to Palatine, has filed a petition with the Public Utilities Commission of Illinois asking for authority to issue capital stock to the amount of \$362,700, to execute a mortgage for \$2,000,000 and to issue bonds under the mortgage to the amount of \$750,000. [Aug. 19, '16.]

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—This company will rehabilitate all of its tracks in Waukegan. Work has already been begun on the County Street line.

Union Traction Company, Anderson, Ind.—This company has begun work on a new switch to be laid on South Meridian Street between Sixteenth and Seventeenth Streets. The switch will be permanent and will cost \$2,000.

*Richmond, Ind.—Plans are being proposed for the construction of an electric railway between Richmond and Fort Wayne, via Union City, Winchester, Portland and Decatur. E. J. Skehan, formerly general manager of the Muncie & Portland Traction Company, now leased by the Union Traction Company of Indiana, and D. C. Moore of Richmond are interested.

Iowa Railway & Light Company, Cedar Rapids, Iowa.—This company contemplates the construction of about 2 miles of track extensions to its present lines in Boone.

Bay State Street Railway, Boston, Mass.—This company will construct an extension to the Country Club at Nashua, N. H.

St. Paul Southern Electric Railway, St. Paul, Minn.—It is reported that this company will construct an extension to Cresco, Iowa.

Kansas City, Mo.—The W. K. Palmer Company, 919 Baltimore Avenue, Kansas City, Mo., announces that it is in the market for about 35 miles of interurban railway, including rails, ties, all track and overhead material, cars and substation equipment. The W. K. Palmer Company, consulting engineers, are in charge of the engineering and business matters connected with the Oklahoma & Northern Traction Company which proposes to construct a line from Bartlesville east to Miami and thence to Joplin, with a branch from Miami to Columbus, Kan., and another to Baxter Springs, from 130 to 135 miles.

Southwest Missouri Railroad, Webb City, Mo.—Work will be begun at once by the Southwest Missouri Railroad on the construction of an extension from Galena to Baxter Springs, Kan., and it is expected that the line will be in operation within eight months.

Salem & Pennsgrove Traction Company, Salem, N. J.—Plans are being contemplated by the Salem & Pennsgrove Traction Company to construct an extension from Salem to Quinton. Carl N. Martin, Philadelphia, secretary.

International Railway, Buffalo, N. Y.—So eager are officials of the International Railway to complete the new Buffalo-Niagara Falls express line and have it in operation early in 1917, that construction work through Tonawanda and North Tonawanda is now being rushed twenty-four hours a day. Most of the fill has been completed through these two cities and concrete abutments for most of the bridges are ready for the structural steel. Rails have been laid for part of the distance between Buffalo and Tonawanda and ties are now being laid between North Tonawanda and Niagara Falls. It is expected that one track will be laid before Dec. 31.

Panama Traction Company, Jamestown, N. Y.—It is reported that operation of gasoline cars has been begun by this company between Youngsville and Sugar Grove, 11 miles. Last spring rights-of-way were secured from Sugar Grove to Busti and surveys were made for two spurs from Busti, one extending to Jamestown and the other connecting with the Erie Railroad at Ashville. Rights-of-way have been secured from Ashville to Panama Rocks and construction work will be begun at once. This line will be extended to Erie, Pa. Several months ago the Panama Traction Company secured an option on Panama Rock and plans to develop it into a summer resort. R. L. Davis, Jamestown, is general manager. [April 22, '16.]

Toronto (Ont.) Suburban Railway.—The Ontario Railway Board is considering the advisability of constructing an extension of the Toronto Suburban Railway on Pape Avenue from Gerard Street.

Wilkes-Barre & Hazleton Railway, Hazleton, Pa.—It is reported that this company plans to construct an extension to Tamaqua.

South Fork-Portage Railway, Johnstown, Pa.—This company reports that it will place in operation the latter part of this month one-half of its proposed line between South Fork and Portage and the rest of the road will be rushed to completion. Robert Pearce, Portage, president. [March 25, '16.]

Citizens Traction Company, Oil City, Pa.—Work has been begun by this company reconstructing its track on Pearl Avenue from Seeley Street to the junction of the Hoffman and Pearl Avenue lines at Stout Street and Harriott Avenue.

Three Rivers (Que.) Traction Company.—This company reports that operation will soon be begun on its extension to Cap de la Madeleine. The total mileage, including the Wyagamack branch, is 4.2 miles, the trackage comprising 7500 ft. of 60-lb. rail and 14,750 ft. of 75-lb. rail. All special work is of flange bearing manganese insert construction. The overhead construction is the usual cross span, direct suspension system with No. 000 trolley and aluminum feeders. Derail protection, with light signals, has been provided at two steam railroad crossings.

Saskatoon (Sask.) Municipal Railway.—The City Council of Saskatoon is considering the connection of the Clarence Avenue line with the Second Avenue line via the new Twenty-fifth Street bridge. The estimated cost is \$10,000.

Charleston & Summerville Interurban Railway, Charleston, S. C.—It is reported that the Charleston & Summerville Interurban Railway has filed deeds to right-of-way preliminary to resuming work on its proposed line between Charleston and Summerville, about 22 miles. J. L. David, Charleston, president. [April 11, '14.]

Chattanooga Railway & Light Company, Chattanooga, Tenn.—A report from this company states that it has just completed the construction of 9.5 miles of track.

Fort Worth & Denton Traction Company, Fort Worth, Tex.—A certificate of dissolution has been filed at Austin by the Fort Worth & Denton Traction Company. This company was organized several years ago to promote the construction of an electric interurban line from Fort Worth to Denton. The project has now been abandoned, and a movement has been set on foot for a line from Dallas to Denton. [Nov. 20, '15.]

Tarrant County Traction Company, Ft. Worth, Tex.—The proposition of an extension of the Tarrant County Traction Company to Hillsboro via Grandview and Itasca, has been taken up by the Cleburne Commercial Club. The matter is being favorably considered by the company.

SHOPS AND BUILDINGS

Kankakee & Urbana Traction Company, Urbana, Ill.—A contract has been awarded by this company for the construction of a small carhouse at Paxton.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York has awarded a contract to Snare & Triest Company, New York, at \$52,654, for the construction of concrete track floors and platforms over the mezzanines of eleven stations on the Culver line now under construction in Brooklyn.

Sand Springs Interurban Railway, Tulsa, Okla.—Announcement is made that work will be begun at once by the Sand Springs Interurban Railway on the construction of a four-story fireproof building at Main and Archer Streets for its general offices and terminal passenger station. The company will also erect a passenger station at the crossing on Third Street. The improvement will cost \$150,000.

Johnstown (Pa.) Traction Company.—This company is rebuilding its office and shop building to give new locker and rest rooms for its trainmen.

San Antonio, Gonzales & Houston Interurban Railway, Houston, Tex.—This company, which proposes to construct a line from Houston to San Antonio, contemplates the erection of a number of small stations. Steeve Holmes, Leesville, president.

West Virginia Traction & Electric Company, Wheeling, W. Va.—This company will construct a new station at Atkinson's crossing near Reed's Mills.

POWER HOUSES AND SUBSTATIONS

San Diego (Cal.) Electric Railway.—This company contemplates the construction of a substation at Chula Vista.

United Railways & Electric Company, Baltimore, Md.—Work is under way by the United Railways & Electric Company on its new Belvedere Avenue substation. The West Construction Company, Baltimore, has the contract for the building and the Westinghouse Electric & Manufacturing Company has the contract for the complete electrical equipment, consisting of three 1500-kw., 375-r.p.m. rotary converters, nine 550-kva., 13,000-volt air-blast transformers, two blower sets, an air compressor and a small motor-generator set, necessary switchboards and switching equipment. The electrical apparatus will be installed early next year.

Interborough Rapid Transit Company, New York, N. Y.—A substation will be constructed by the Interborough Rapid Transit Company at 139th Street near Alexander Avenue. The structure will be 60 ft. x 100 ft., one story high, and will cost about \$40,000.

Tidewater Power Company, Wilmington, N. C.—A report from this company states that it is constructing an extension to its boiler room and is installing a new boiler.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—The capacity of the Lowellville power house of the Mahoning & Shenango Railway & Light Company will be increased at once. The capacity of the generating station was doubled last spring, when a 20,000-hp. turbo-generator was installed, making the capacity of the powerhouse 40,000 hp. Another General Electric turbo-generator will now be installed, bringing the total capacity up to 60,000 hp. The contract for the addition has been let to the Stone & Webster Engineering Corporation, which erected the addition completed only a few months ago. In all, considerably more than \$1,000,000 will be spent on the improvement, which will include the new 20,000-hp. unit, batteries of Wilcox & Babcock boilers, even more extensive than those placed last spring; automatic stokers, a new big concrete stack, coal carrying and crushing equipment, and all other accessory equipment. All will be virtually duplicates of the equipment now in use. All will be housed in an addition to the powerhouse which will be approximately half the size of the present structure.

Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis.—It is reported that this company has purchased a tract of land at Neenah for the construction of an electric light and power plant.

Manufactures and Supplies

EDWARD N. HURLEY ON THE INDUSTRIAL SITUATION

American Industries Should Prepare Now for Stiff Competition After the War—Function of the Trade Journals

In an address before the Associated Business Papers at New York on Oct. 27, Edward N. Hurley, chairman of the Federal Trade Commission, discussed the need for business efficiency and industrial improvement after the war. He said that we think of Europe as a continent engulfed in war, devastated and disordered, but actually, under the stress of a life and death struggle, every effort is being made to obtain the highest efficiency in the production, distribution and use of commodities of all kinds. Conservatism in industrial ideas and methods has been blasted and shattered to pieces in the shock of war. New processes are being discovered, new inventions are being made and new forms of organization are being created. Books on efficiency and scientific management are being bought by the hundreds and studied. Great Britain has made thirty years of industrial progress in thirty months, and in Germany, which before the war was probably the most highly organized and efficient manufacturing country in the world, organization and efficiency have been still further developed. All this calls for greater manufacturing and merchandising efficiency in this country.

Mr. Hurley spoke of various methods by which this efficiency could be obtained. One is by the prompt publication in the trade journals of any industry of the improvements in that industry and the utilization of this information by the business men in that industry. Another is by a more exact cost accounting system, particularly among the smaller manufacturers. Another is by co-operation in trade associations. Another is by more close association between government and business. If government and business could once understand each other, one-half of the problem of successful co-operation among American business men for legitimate and necessary ends will be solved. The members of Congress wish to do the right thing by the people of the country, but they cannot be expected to be familiar with business problems unless an active effort is made to bring the facts of business to their attention.

In conclusion Mr. Hurley discussed the functions of the trade paper in improving industrial efficiency and said, in part:

"In the last analysis success in business depends upon the intelligence of the individual manufacturer. If he does not understand both the details and the broad aspects of the industry of which he is a part, he cannot expect to be successful. Our foreign competitors read most every article published upon their business with great care and thoroughness. Many of them have duplicate copies of their favorite trade paper sent to their homes so that they may read them away from their business without being disturbed. Many foreign manufacturers contribute articles to these journals on phases of the business with which they are most familiar. Such articles are bound to be helpful and give a constructive effect. Our trade journals and technical papers are the best in the world. These papers are preaching the gospel of sound business on practical lines and are helpful not only to business, but to the country as a whole."

FOREHANDEDNESS IN ORDERING CARS BENEFITS PURCHASER AND MANUFACTURER

Referring to the article on "Forehandedness Desirable in Buying," which appeared on page 915 of this paper for Oct. 21, a prominent car builder in a letter just received confirms some of the arguments made and states that the subject should excite interest and action.

He points out that up to the present year there had not

been more than half a dozen car orders placed by the railway companies sufficiently in advance of their requirements to enable the manufacturers properly to schedule the various shop operations so that the cars could be built at a minimum cost. This year, however, the situation has been different. It has been next to impossible for the car builder to get his raw materials, particularly metals, in anything like the regular period, so that of a necessity an opportunity has been accorded in several instances to lay out properly the schedule and run the cars through the shops for a minimum cost.

Another typical reason for delay in ordering has been the desire on the part of the railway company to avail itself of the very latest ideas in construction. This state of mind has operated against the purchasing at an early time in the hopes of obtaining results from later developments.

The car builder also cited the fact that market conditions with the possibilities of rising and falling markets, always influence the buyer to delay ordering until the very last minute. If the market is high he hopes that it will drop and if it is low invariably he hopes that it will go lower. The only condition that really gives impetus to buying is a rising market, and everybody buys more rapidly and more favorably on a rising market than on a falling market.

INCREASE IN CAR WHEEL WEIGHTS DESIRABLE

Recommendations of Association of Manufacturers of Chilled Car Wheels Call for Increased Weight in Wheels and Increase in Metal of Flange at Gaging Point

The following are extracts from the annual address of President George W. Lyndon, delivered at the annual meeting of the Association of Manufacturers of Chilled Car Wheels:

"The work of our association during the past year has been based largely upon the recommendations made to the Master Car Builders' wheel committee during the year of 1914. At this time we not only outlined a plan of procedure for the improvement of the chilled iron car wheel by which the safety element stood out prominently, but accompanied our recommendation with full data pointing out the weaknesses of the present M. C. B. standards. We also gave our reasons for recommended changes based upon the knowledge acquired from service records and the lifelong experience of the manufacture and service of the chilled iron wheel. Our recommendations were substantially as follows:

"1. An increase in the weights of the 625 and 725-lb. M. C. B. wheel;

"2. An 850-lb. wheel for cars of 140,000 lb. capacity;

"3. A flange for the 850-lb. wheel for use under the 70-ton cars with as much of an increase as would be acceptable to the American Railway Engineering Association.

"Since our organization in the year 1909, we have steadfastly maintained that the varied service in the 60,000-lb. class of cars made it imperative that the weight of the wheel should either be increased to meet the maximum conditions of service, or that we should have two standards in this class. The variation in service arises from the variations in the light weight of the car in the 60,000 lb. capacity class, and as the standard of operation is to brake the cars 60 per cent of their light weight, it must follow that any class of cars in which there is 100 per cent variation in light weight (which is common in the 60,000-lb. class) cannot with safety carry the same weight of wheel, and this is what the manufacturers have been required to do.

"The standard wheel specified for the 60,000-lb. class weighs 625 lb. and the light weights of the cars vary from 20,000 lb. to 53,000 lb. Our association recommended that the weight of the wheel be increased to 675 lb., which would provide a standard wheel which would meet the maximum conditions of service as to load and brake. In asking for an increase in weight of the two standards 625 and 725 M. C. B. wheels, we were not actuated by commercial considerations, but purely from the standpoint of safety.

"It is estimated that there are 2,500,000 chilled iron wheel renewals annually. If the weights should be increased 50 lb. each the additional metal to be purchased would approximate 62,500 tons, providing all the renewals required an increase, which is by no means the case. Many of the

prominent railroads in the country representing more than a fourth of all the cars in use, are already introducing advanced standards and are using wheels much heavier than the present M. C. B. standards. The heaviest 725-lb. M. C. B. standard chilled iron wheel for 50-ton cars is lighter than the rolled steel wheel. Hence there is no good reason why the chilled iron wheel should be so limited in weight, particularly when the increase involves the nominal expenditure of \$10 per ton, this being the difference between the scrap value of the old wheel, which is accepted in part payment for the new. The reduction in accident hazards would more than absorb the increased expense due to the nominal increase in weight.

"Ever since the introduction of the 50-ton car, our association has recommended an increase in the metal of the flange at the gaging point. A committee of the American Railway Engineering Association appointed for the purpose has reported that the manufacturers could increase this flange width 3/16 in. without any change in the present flangeways of track. The Master Car Builders' wheel committee has reported in convention that there be no changes in the dimensions and contour of flanges of car wheels as adopted in the year 1909. This flange was an improvement over the M. C. B. design and through the recommendation of our association we succeeded in reducing its height from 1 1/2 in. to 1 in., which gave it greater strength and we know that we can make further improvements. It needs no argument to prove that a stronger flange is required for the 70-ton cars than for the 30-ton cars.

"Our association has made a very satisfactory arrangement with the University of Illinois through Dean W. F. N. Goss, in which it is agreed that the university experiment station will undertake an investigation concerning the stresses and behavior of chilled iron car wheels.

"In submitting a draft of this arrangement to the President of the University of Illinois, Dean Goss called attention to the fact that there are now in operation in the country approximately 20,000,000 freight car wheels, and the demand for renewals alone involves the manufacture of 2,500,000 chilled iron car wheels per year.

"No other type of wheel has ever made serious inroads on the chilled iron wheel and never will, providing we are all alive to the increased demands of service, and for two-thirds of a century the chilled iron car wheel has remained the standard for the nation's commerce."

The officers elected for the ensuing year are the following: George W. Lyndon, president-treasurer; E. F. Carry and J. A. Kilpatrick, vice-presidents; George F. Griffin, secretary; F. K. Vial, consulting engineer. The board of directors is as follows: E. F. Carry, president Haskell & Barker Car Company; W. S. Atwood, chief engineer, Canadian Car & Foundry Company; Charles A. Lindstrom, assistant to president Central Carwheel Company; F. K. Vial, chief engineer Griffin Wheel Company; A. G. Wellington, president Maryland Carwheel Works; W. C. Arthurs, president Mount Vernon Car Manufacturing Company; J. D. Rhodes, president National Carwheel Company; F. B. Cooley, president New York Carwheel Company; A. J. Miller, general manager Ramapo Foundry & Wheel Works; William F. Cutler, vice-president Southern Wheel Company, and J. A. Kilpatrick, president Albany Carwheel Company.

F. O. GRAYSON PREDICTS BETTER BUSINESS IN THE SOUTHWEST

General Business Conditions Are Improving, Traffic Reviving, One-Man Cars Popular

"Practically no new railway work has lately been started in the Southwestern states, but general conditions are such that the railway supply people may look for good business from there before long." This statement was made recently by F. O. Grayson, president Grayson Railway Supply Company, St. Louis, Mo. Mr. Grayson for years has enjoyed intimate sales contact with the electric railways of the South and Southwest, particularly in the states of Missouri, Oklahoma, Texas, Arkansas and Louisiana.

Speaking of conditions in Texas, Mr. Grayson said that the electric roads had recently been buying only operating necessities. Revenues and expenses were such that no other course could be followed. For example, the jitney competi-

tion in many other parts of the country had largely become an unimportant factor, but in most parts of Texas the jitneys were still doing 75 per cent as much business as they ever did. Street railway traffic, however, Mr. Grayson said, was showing a steady growth and even with the jitneys as persistent as they are some roads were beginning to show increases over earlier days.

The underlying conditions in the cotton states warrant the statement that railway supply business will be much better within a year. The cotton growers last year were but slowly recovering from the previous year's loss on the cotton crop. Now cotton is priced around 18 cents a pound—more than twice the prices of 1914. By the end of this year the former will have received their money for this year's crop and they will then commence local buying. This means better business at once for the trolley lines and, in turn, more orders for the material manufacturers.

In Mr. Grayson's opinion the small, light, safety type of car, which can be operated by one man, will be largely bought by the Southwestern roads when the traffic requires additional equipment.

COMMERCE BUREAU REQUESTS CATALOGS FOR VALPARAISO, CHILE

The Bureau of Foreign and Domestic Commerce through Norman L. Anderson, commercial agent of the Chicago office, 504 Federal Building, advises that the National City Bank of New York will soon open a branch in Valparaiso, Chile, and that it will be glad to receive catalogs of American manufacturers to be placed on file for the use of interested parties. Copies of catalogs should be sent post-paid to the National City Bank of New York, Box 1508, Valparaiso, Chile.

ROLLING STOCK

Central Illinois Public Service Company, Mattoon, Ill., is reported to be considering the purchase of nine small cars.

Jackson Railway & Light Company, Jackson, Tenn., noted in the *ELECTRIC RAILWAY JOURNAL* of Sept. 9, 1916, as being in the market for two one-man car bodies, has purchased this equipment from the Southern Car Company, High Point, N. C.

Oklahoma & Northern Traction Company, Bartlesville, Okla., through its consulting engineers, the W. K. Palmer Company, Kansas City, Mo., is receiving bids on four inter-urban cars, three city cars, two baggage cars and two electric locomotives.

TRADE NOTES

Charles N. Wood Company, Boston, Mass., has recently moved from 79 Milk Street to 14 Federal Street.

U. S. Metal & Manufacturing Company, New York, N. Y., has received an order from the United Traction Company of Albany, N. Y., for twenty Johnson fare boxes.

Perry Ventilator Company, New Bedford, Mass., has received an order to equip with ventilators the forty-two cars recently ordered by the Boston Elevated Company from the Pressed Steel Car Company.

Barnes & Kobert Manufacturing Company, New Britain, Conn., announce that the corporate name of the firm has been changed to the B & K Manufacturing Company. The executive and general offices of the company are now located at the New Britain factory.

George O. Smalley has been promoted to first vice-president and general manager of the Bound Brook Oil-less Bearing Company, Bound Brook, N. J., succeeding the late Leigh S. Bache. Mr. Smalley has been connected with this company for the last ten years, for the last four years in the capacity of assistant general manager and assistant treasurer. He is therefore thoroughly conversant with the methods of both the sales and production departments of this rapidly growing business.

Westinghouse Air Brake Company, Wilmerding, Pa., at the annual meeting of stockholders held on Oct. 17, re-elected the president and board of directors for the coming year. Under a new arrangement the ranking officer of the company, H. H. Westinghouse, will be the chairman of the board. The other officers elected to complete the organiza-

tion are: John F. Miller, president; A. L. Humphrey, vice-president and general manager; S. C. McConahey, acting vice-president; R. F. Emery, secretary and treasurer, and Charles A. Rowan, controller.

T. C. White & Company, St. Louis, Mo., report that the overhead line material manufacturers have been forced to raise their prices in accordance with the increases in the costs to them of copper, tin, zinc and malleable castings. Thus the prices for the ordinary styles of insulated trolley hangers have so increased that the porcelain insulated trolley hangers may now be sold on a more equal price basis. The porcelain insulated hanger manufactured and sold by this company consists of but three parts: a hanger bolt, a porcelain spool through which the bolt passes, and a malleable-iron yoke surrounding the spool and hooking over the span wire for support. For several years it has been necessary to base the claims for the sale of this type of hanger on its long life due to non-deterioration of the insulation and on the high insulating qualities gained from the use of porcelain rather than composition. Now the increase in the price of bronze has brought the cost of ordinary hangers up to such a point that it comes within the selling range of the porcelain insulated hanger. This evening of prices is bringing about an increase in the number of porcelain insulated hangers sold. The white type F porcelain trolley hanger has been regularly used since March, 1914, when it was first installed in actual service on the lines of the East St. Louis & Suburban Railway. Samples have been under test for three and one-half years. Mr. White states that his company has a generously large reserve supply of malleable yokes on hand and that the porcelains, which are made by the dry process, can be obtained readily, so that deliveries on porcelain insulated hangers can be made within a week. In addition to an increased number of inquiries from local roads, Mr. White reports an exceptional number of foreign inquiries.

ADVERTISING LITERATURE

E. C. Atkins & Co., Indianapolis, Ind., has issued a pamphlet on the Atkins "Kwik-Kut" power hack saw machine.

American Cotter Pin Company, Pittsburgh, Pa., has issued a bulletin on its Kelkoter self-spreading cotter pin.

Ohmer Fare Register Company, Dayton, Ohio, has issued a catalog of parts for fare registers and equipments.

McQuay-Norris Manufacturing Company, St. Louis, Mo., has issued a pamphlet on its leakproof piston rings.

U. S. Metal & Manufacturing Company, New York, N. Y., has issued a pamphlet on Clapp's fire resisting paints.

Eclipse Railway Supply Company, Cleveland, Ohio, has issued a folder describing and illustrating its Acme fender, Eclipse wheel guards and Eclipse life guards.

Sangamo Electric Company, Springfield, Ill., has just issued an illustrated pamphlet describing its type D5 two-wire and three-wire direct-current watt-hour meters.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued circular No. 1571 describing and illustrating its drum-type controllers for railway service.

Joseph Dixon Crucible Company, Jersey City, N. J., has issued a little booklet on "Paint for Roofs" containing testimonials from a number of users of its silica-graphite paint.

Anglo-American Varnish Company through its agent, the U. S. Metal & Manufacturing Company, has issued a bulletin on the AA shop cleaner for scouring and cleaning coaches.

Wasson Engineering & Supply Company, Milwaukee, Wis., through its agents, Holden & White, has issued a pamphlet on the Wasson type NR. non-retrieving trolley base for city cars.

Reliance Ball-Bearing Door-Hanger Company, New York, N. Y., which is represented by the Elcon Company, has issued an illustrated catalog describing its door hangers and appliances.

Electric Service Supplies Company, Philadelphia, Pa., has issued a pamphlet on a wear-proof mat. This mat is constructed from units composed of felt and metal strips. The mat rolls up like a rug and can be conveniently stored.

The Elcon Company, New York, N. Y., has issued a pamphlet showing the installation of its white porcelain enameled stanchions with special metal fittings installed in one of the new cars of the New York Municipal Railway Corporation.

Indianapolis Switch & Frog Company, Springfield, Ohio, has issued a pamphlet giving a partial list of users of Indianapolis electric welders and welded joints. This pamphlet also shows the different types of Apex and Simplex joints for girder and high T-rails.

Peter Smith Heater Company, Detroit, Mich., has issued bulletin No. 8 on thermostats for electric car heaters. This bulletin shows schematic diagrams of the electric car heater thermostat control along with descriptions and illustrations of the automatic switch, interlock knife switch and of a thermometer.

Nachod Signal Company, Louisville, Ky., has issued a booklet describing signal systems which includes a number of types. In this pamphlet are illustrated a few representative illustrations of this company's equipment showing their application to both city and interurban requirements.

C. D. Pruden Company, Baltimore, Md., has issued a catalog on its Prudential portable fireproof steel buildings and garages. One of the garages which is described and illustrated is that owned by the Rapid Transit Subway Construction Company and is installed at Madison Avenue and Forty-second Street, New York, N. Y.

Railway Improvement Company, New York, N. Y., has issued an operating and engineering data book on its Rico coasting recorder. This twenty-four-page publication contains descriptions and illustrations of coasting time recorders and terminal clocks installed on several large city railways and also shows graphically the entire operation of the coasting recorder system.

Gurney Ball-Bearing Company, Jamestown, N. Y., has just issued Catalog H2 on Gurney ball-bearing hangers. This forty-page catalog describes and illustrates drop hangers, post hangers, adapter bearings, floor stands, rigid pillow blocks and loose pulley adapters. Six pages of this catalog are devoted to pulley and belt data, horsepower of shafting, size of keys, etc. In addition application of some of these above-named devices are illustrated.

Goldschmidt Thermit Company, New York, has just issued pamphlet No. 12 on the thermit process of rail welding. The method of inserting the weld, preheating the rails and completing the weld with thermit by which a liquid steel is created at 5000 deg. Fahr. and poured around the rail is fully described and illustrated. The welding of a compromise rail joint between the "T" rail and groove rail and also the modification of the "Clark" joint is given in considerable detail.

General Electric Company, Schenectady, N. Y., has just issued bulletin No. 44,419 on railway motor gears and pinions. This bulletin describes and illustrates forged gears, solid cast-steel gears, split cast-steel gears, composite gears and spring gears. It also shows types of popular wheel-press jigs and a pinion pulley. A section of the bulletin containing ten pages is devoted to gear formulas, classification and principal dimensions of General Electric and Westinghouse gears and comparative sizes of gear and pinion teeth.

NEW PUBLICATIONS

Reasonableness and Legal Right of Minimum Charge in Public Utility Service. By Samuel S. Wyer, Columbus, Ohio. Reprinted by American Gas Institute, 29 West Thirty-ninth Street, New York, N. Y. Eighty-two pages. Paper, \$1.

The necessity of the minimum charge to prevent discrimination and compel each class of consumer to pay for the service received, is demonstrated in this book, as well as the fact that there are ample precedents for making the minimum charge proportional to the size of the consumer's demand for service. The various decisions underlying these principles are quoted, and two alphabetical tables of adjudicated and non-adjudicated monetary allowances for such charges in existing rate schedules are presented. Extra copies of the book can be secured from the secretary of the American Gas Institute, George G. Ramsdell, at the following prices: Twenty-five copies, \$20; 100 copies, \$50, and 500 copies, \$200.