

Electric Railway Journal

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

Vol. XLV

NEW YORK, SATURDAY, JANUARY 30, 1915

No. 5

SPIRIT OF THE WASHINGTON MEETING

Simplicity, dignity, concentration, sincerity characterized the mid-year meeting of the American Electric Railway Association to which we appropriately devote a large part of this issue. Divested of the usually-attendant committee meetings, with the President of the United States an honored guest, and amid inspiring surroundings, the meeting was an unqualified success. By the design of the committee in charge and the inclination of the members in attendance, the focus of interest was the code of principles, which was discussed from every angle. To use a musical simile the high notes struck in the addresses evoked responsive chords in an appreciative audience indicative of continuing harmonies. Apparently the time has come for harmony, not only in and among our electric railways but in the whole public utility orchestra. If one depresses the "loud" pedal of a piano and strikes a key firmly, many strings other than the one first set vibrating will sound by sympathy. Just so yesterday's audience responded to the eloquent and therefore stirring phrases of men of experience and acumen. What appealed to us most forcibly was the notion that the acceptance of the code of principles gives liberty of expression to those who have secretly cherished many of the ideas therein set forth but who hesitated to express them for fear of giving offence. The past ten years have seen among public utility men the gradual crystallization of the sentiments so tersely expressed in the code by processes closely analogous to those involved in the growth of natural crystals in saturated solutions of chemical compounds. The next ten years will see a new public appreciation of the railways and other utilities both as public servants and investment opportunities, at least they will if the spirit of the Washington meeting is significant.

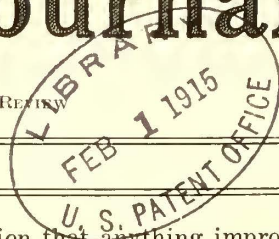
THE PRESIDENT'S ADDRESS

The address of President Wilson at the Washington meeting was an assurance to the electric railway men and manufacturers present that the Government and public are not jealous of bigness or prosperity in bigness. The president laid great stress on the advantage which business will have in knowing what kind of regulation is proposed and to have dissipated the mists of uncertainty which have existed in the past. The public has never been suspicious of big business as such, but bigness should not be used to take improper advantage of others. Coming then to specific acts by which the corporations can win the favor of the public, the president mentioned four. Of these he placed publicity first, because publicity not only prevents wrong

action but disarms suspicion that anything improper is being planned. Second, he placed the rendering of a full equivalent in service for the return received. The third was conscience in business, or acting according to the standards of those whose good opinion we respect and desire, and the fourth was the spirit of service, or the pride of doing a thing as it ought to be done. The address was a strong plea for confidence in the fair attitude and intentions of the public toward the corporations. It was a fitting conclusion to a convention devoted to the plea of the corporations, as expressed in the code of principles, for confidence in their fair attitude and intentions toward the public. It is satisfactory to hear these expressions from the chief executive of the nation. Let us hope that they will assist in a better understanding of the problems of the railways by the public. If all other authorities should adopt the views of the president as given in his Washington speech, it is all the railways can ask and all they desire.

THE ANTHONY N. BRADY MEDALS

At the mid-year meeting of the American Electric Railway Association a significant event was the awarding of the Anthony N. Brady memorial medals to the Boston Elevated Railway, to its general attorney and to a mechanic in its employ. Our congratulations are extended to the recipients with the hope that the encouragement thus afforded will still further assist the officials of the company in reducing accidents and removing any dangers to health that may remain. The founding of these medals is indicative of a spirit of the times and it appropriately comes when the safety movement is at its height. The foundation takes its place among a constantly growing number of gifts which have been made for the purpose of commemorating achievement in efforts for the public welfare. To our mind the function of such awards is commemorative rather than directly stimulating. The possibility of securing a medal cannot be an impelling motive in the safety movement and, if it could be, the motive would not be a worthy one. Experience has shown that unless conditions are such as to stimulate a development without an award the prospect of an award will not furnish the impetus. A medal and the honor that goes with it are not things to be earned, they only indicate the accomplishment of what they stand for. The word "competition" often used in connection with medals and prizes is unfortunate, it is undignified. In the present case American electric railways were invited to state what they had done to safeguard human life, as this was the only way in which the information could be obtained. A number of companies gave the information desired, many did



not. It is to be hoped that an even better response to the request for information will be made next year, so that the committee may have a full perspective view of the safety movement. As a central clearing house for safety information the medal committee should be invaluable, entirely aside from its primary function. It is valuable also for the companies periodically to marshal their safety facts, for their own information if for no other purpose.

PRACTICING PUBLIC RELATIONS

While R. M. Howard's paper in this week's issue on "Experience with the One-Man Electric Car in a Small City" will attract deserved attention for the economies achieved, emphasis should be placed upon what Mr. Howard has to say about public relations in practice. There was no doubt in the mind of the Wisconsin Railway, Light & Power Company's management that the modern one-man car would do for the conditions in a town like Winona, Minn.; but it also knew that the best car might prove a failure if imposed upon the public without due explanation. The company, therefore, took the local City Council and commercial body into its confidence to an unusual degree. First it submitted its earnings to show that they were too small to justify new two-men cars; second, it offered to install new one-man cars if the citizens were satisfied with the type proposed and with the changes in operation that their use would involve. The frankness of the company has evidently been appreciated, for not only did the bodies mentioned approve the company's plan at the time, but since then the public at large has also shown its satisfaction with the new service. The success of this experiment in public relations in practice is all the more noteworthy since nothing is more likely to get a public service corporation in hot water than any step which calls for a big cut in the number of employees.

THE ENGINEER'S PLACE IN BUSINESS At the recent Philadelphia meeting of the American Association for the Advancement of Science, Martin Schreiber, engineer of maintenance of way Public Service Railway, presented a paper epitomizing his experience with "the engineer out in the world." That the engineer plays an important part in the electric railway "game" is evident from the activities of our Engineering Association, of which Mr. Schreiber is a past president. His conclusions, therefore, should be of interest to a large proportion of the readers of the *ELECTRIC RAILWAY JOURNAL*, particularly as they may be extended to include many effective men who had not been fortunate enough to have had a technical education thrust upon them. He believes that we must get away from the notion of an engineer as one who merely designs, builds and operates plants of one kind or another. Administrative positions demand the application of the same principles to management, and many men who have come up through the engineering ranks now occupy such positions. But engineers should not be limited to cor-

porations or private industry, for there is a big field in public life. They should take a prominent place in regulative bodies, for there is urgent need of first-hand technical information in rightly performing the regulative function. It is up to the engineer himself to change his status. Mr. Schreiber believes that the best way in which the individual can prepare himself for broad responsibilities is by becoming an expert in some particular line. The theory is that one who can master one subject can master more, and that success in a specialty inspires confidence in the ability of the expert to handle larger propositions. We agree with Mr. Schreiber in the fundamental principle which we understand him to have in mind. Engineering training is primarily to give facility and assurance in solving problems. The engineer is trained on technical problems because they are the most tangible and interesting. Their place in the technical schools is analogous to that of manual training in the secondary schools. But he must not confine himself entirely to these problems through life, or he misses the larger opportunities for which he has been ostensibly prepared.

THE CODE OF PRINCIPLES

The paper by Colonel Williams on the code of principles, presented at the mid-year meeting yesterday, was a clear exposition of the need for the code and the purposes which underlay its preparation. The fundamental spirit of the code is that of the mutual obligations existing between all public utilities and the public, whom they serve. These obligations, while expressed in the code in ten principles, can be reduced in essence to two, as follows: The public utility should provide the best service possible for the fare charged and should adopt a frank, open policy in all of its affairs so that the public will know that it is doing the best it can. The second principle is similar to the first except that it expresses the duty of the public. The public should co-operate in securing good service by authorizing efficient operating conditions and should permit the company a fair return on a fair capitalization. On these two laws hang the entire ten principles of the code. They are so self-evident that they should commend themselves to all who give any thought to the reciprocal relations between public utilities and the public. They are essential if private ownership is to continue for public utilities. The only alternative is municipal ownership and operation, which is generally admitted by those who have studied the subject to be out of harmony with our political system of government and to be of great potential danger to the community.

As Colonel Williams says, the most important thing about the code is the spirit behind it. Railway companies and all who believe in the private ownership of public utilities are not obligated to accept its exact phraseology. There is nothing sacrosanct about the wording. Its chief purpose, so far as the railway companies are concerned, is to emphasize the idea that their first duty is to deserve support and then to remove prejudice. There is no greater fundamental truth

than that the interest of the public utility and of the community which it serves are one. If either forgets this principle, both suffer. The growth and prosperity of the community is dependent to a large extent upon the fair treatment by it of the public utility, just as the growth and prosperity of the public utility is largely dependent upon fair treatment by it of the community. Independent of all other considerations, unless new capital can be secured a railway company will find it impossible to extend its lines into the new sections of a city when these lines are needed. Railway managers understand the reasons for the present lack of investment in electric railway enterprises better than do the public. It is their duty to explain the facts so that there shall be no misapprehension on the subject.

OPERATING COSTS ON THE NEW HAVEN

In a paper read at a joint meeting of technical societies in Philadelphia last week W. S. Murray gave interesting and valuable data of operating costs on the New Haven electrified section. This paper is the third of a series presented to the American Institute of Electrical Engineers by Mr. Murray during the past eight years for the purpose of giving the facts regarding this pioneer electrification. The choice of the a.c. system for New Haven conditions has been widely criticised, largely, he thinks, on account of ignorance of the facts. Mr. Murray explained that these costs had not been given earlier because, in the first place, only a part of a whole division was electrified and an extremely expensive interchange of steam and electric operation had to be maintained; second, the first construction costs were excessively high, and, third, the motive-power equipment was handicapped in having to operate on both direct and alternating currents. All of these factors combined to produce high operating costs. The speaker stated frankly that of the \$15,000,000 invested in electrification more than a third could be saved if the work were to be done again, this \$5,000,000 being the contribution of the New Haven to the development of the industry.

The primary purpose of the paper was not to give cost data but to emphasize one phase of electrification which Mr. Murray believes to have been inadequately considered, namely, administration. It would seem to be obvious that when a new form of motive power is adopted, the characteristics of the novel equipment should be studied and every effort should be made to adapt the best methods of operation to them. The electric motor is inherently different from the steam engine which it replaces in this field, as it was different from the horse which it replaced in the street railway. The organization of the steam railroad is, by the process of natural selection, highly developed to utilize the steam locomotive to the limit. The shops, the round-houses, the enginemen, the firemen, in fact everything and everybody in the operating department, revolve about the locomotive. When radically new and different equipment is injected into this smoothly-working maintenance machine a process of adaptation must take

place. This requires adaptability, time and co-operation, otherwise the savings possible through electrification will be negative in character and electrification will be a disappointment. This is the principal point brought out by Mr. Murray, outside of the valuable figures on cost of construction and operation presented.

PUBLIC SERVICE AND PUBLICITY

The exhaustive paper on this subject by N. C. Kingsbury, vice-president American Telephone & Telegraph Company, read at the mid-year meeting and published in abstract elsewhere in this issue, is one of the most enlightening ever presented at a meeting of the American Electric Railway Association. Mr. Kingsbury's thesis is briefly that in all countries public opinion is irresistible and that the utilities should spare no efforts to supply the data which the public needs to be intelligently informed on utility matters. Mr. Kingsbury speaks with authority because his company, on account of its national extent and the intimate character of its service which enters the homes of so many citizens, has been obliged to meet this situation more extensively than perhaps any other company or union of interests. In consequence of this condition its executive officers have made a very thorough study of the subject and the success of their efforts is notable.

In his paper Mr. Kingsbury speaks frankly of the methods of financing the early public utility companies, but while he recognizes the fact that many of these enterprises would not have been begun except for the large rewards which the promoters hoped to gain, he believes that the period of the promoter and of abnormal profits has passed and that a fair return on the investment is all that should be earned or promised. If this view is accepted, what is the proper course to pursue? To this there is but one answer—full and frank publicity as enjoined by the tenth principle in the code. This policy should not be followed as a last resort because of fear. Instead, it should be adopted as a frank acceptance of conditions as they are and as an effort to prove the honesty of intentions and a real desire to serve. When viewed in this light the problem is a simple one, although its execution requires tact as well as sincerity of purpose.

Mr. Kingsbury emphasizes the possibilities of enlisting the interest in the work of improving public relations of both the stockholders and the employees, both of whom should be valuable allies. He also shows that the problem discussed is not only common to all public utilities but that their interests are closely inter-related, because any unfair action on the part of one utility will react in the minds of the public upon all. We are especially glad to see this point mentioned and hope that its statement by Mr. Kingsbury will lead to beneficial results. It certainly emphasizes the importance of the action of the committee on public relations this week in appointing a sub-committee to investigate the subject of co-operation on public relations between the American Electric Railway Association and similar associations of public service companies of other classes.

President Wilson Addresses Association

OUTLINES HIS VIEWS ON BUSINESS AND PUBLIC UTILITY POLICIES

Other Speakers Discuss the Code of Principles, the Reserve Banking Law and the Relations Between the Utility Corporations and the Public—The Meeting Closes with a Brilliant Banquet

The seventh annual mid-year meeting of the American Electric Railway Association was held in Washington, D. C., on Jan. 29, preceded by a meeting of the executive committee on Jan. 28. The sessions were held in the ballroom of the New Willard Hotel. The meeting was unique in that President Woodrow Wilson was one of the speakers. The conference was devoted to discussion of public relations, with particular reference to the code of principles. The list of speakers at conference and banquet included, besides well-known railway men, Senator J. W. Weeks and Representatives Swagar Sherley and A. J. Montague. The meeting closed with a splendid joint banquet of the American and Manufacturers' Associations.

MORNING SESSION

The morning session was opened at 10:20 o'clock with the announcement by President Allen that W. Caryl Ely, E. W. Rice and Guy E. Tripp had been appointed as a reception committee to escort President Wilson to the afternoon session. The next order of business was a paper entitled "The Code of Principles," which had been prepared by Colonel T. S. Williams, president Brooklyn Rapid Transit System. In the unavoidable absence of Colonel Williams the paper was read by S. W. Huff, vice-president Brooklyn Rapid Transit System. It appears on page 220. Abstracts of discussions by Guy E. Tripp, chairman Westinghouse Electric & Manufacturing Company, and M. C. Brush, vice-president Boston Elevated Railway, follow:

DISCUSSION BY GUY E. TRIPP

I find it exceedingly difficult further to illuminate a subject which has been so thoroughly and admirably covered by the address of Colonel Williams.

At the outset I wish to express my entire assent to the proposition that the adoption of the code of principles places the men in charge of the street railway industry in a position to do exactly what Colonel Williams points out, viz., "to nail their flag high and to defend it." I have for a number of years had the feeling that there was nothing to which a flag could be nailed, and that attempts at defense for the very want of a platform were too often construed by the public to be nothing but the selfishness or obstinacy of local interests. For the lack of a platform this association, as such, has made but little impression upon public opinion, and the individual efforts of local companies, however vigorous and wisely conducted, have had an essentially local effect and have been exerted with little reference to furthering the aims and influence of this association.

The code of principles is not simply a statement of what the association believes to be sound economics but it furnishes the opportunity for centralization, organization and most of all for the establishment of something akin to discipline in the defense of sound economics as applied to street railway work. The success which will attend the effort of the association in forwarding a better understanding and sane ideas on public utility ownership and operation will depend a great deal upon

how frequently and how conspicuously the code of principles is carried to the front by the member companies. Therefore, every local company ought to use it as much as possible in its dealings with the public, and endeavor so far as possible to concentrate discussion upon the principles themselves to the end that the progress of the great question of government versus private ownership may tend to be directed along broad lines and the vital issues not be obscured by the details of local conditions.

As Colonel Williams has stated, it is quite possible that the code might have been differently expressed, and perhaps improvements might be made, and, after due time has elapsed, there may be no objection to amending them in essential particulars but for the time being they should be accepted as they are and the best use possible made of them. Each one of the ten principles has received a great deal of consideration and great care was exercised in the use of language in order to avoid embarrassments which might arise under possible constructions which may be placed upon it by hostile critics.

For example, under Section 5, it was found very difficult to express the idea that a street railway is entitled to a fair return on a fair investment and provide for the application of that axiom to a new community which demands service, ahead of its time, with the same accuracy that it would apply to a populous center which already has a proved earning capacity. That is to say, a fair return is of course one that will cause capital to flow into the business, but, as it varies with time and locality, it cannot be permanently fixed, and a new community, with the risks that future growth and prosperity may not come, must pay more for its capital on account of these risks. It might be necessary to sell securities for 50 cents on the dollar in order to obtain the capital, and the code says the other 50 cents is fair capitalization under these conditions. This is only an example to illustrate that any suggestions of changes should be carefully weighed before being adopted.

I have been a non-combatant in the matter of relations between public utilities and the public because I recognize the futility of antagonizing the public. I have believed and now believe in co-operation with the public; but, with Colonel Williams, I am in favor of a vigorous militant defense of the principles upon which the business should be conducted, because, unless the business can be conducted substantially in accordance thereto, the only alternative seems to be municipal ownership.

The decreasing purchasing power of the nickel on the one hand and increasing wages, taxes, heavy rolling stock and non-paying extensions on the other, tend to bring about conditions under which only the public can own and operate street railways. The government is the only agency that can successfully deny the applications of a community for improvements in facilities, the demands of labor for higher wages, avoid the payment of taxes and obtain capital without reference to net earnings. Even a non-combatant must fight the propagandists who are trying to teach the public in effect

that shares of stock or bonds of a public utility or any other corporation, for that matter, may on occasions be treated as mere "scraps of paper."

A dollar invested in a municipal or government bond is considered property to be jealously safeguarded, and notwithstanding any disclosures of waste, graft or corruption, the investment liquidates eventually at par, and, in the meantime the interest is paid. But a dollar invested in a corporation appears to be an entirely different dollar in spite of the probability that it is working more efficiently for the public than the other. It not only has no protection (of which no complaint is made), but upon suspicion it is often legislated, taxed, regulated and theorized to 50 cents, and upon disclosures of waste, graft or corruption often absolutely obliterated.

So much for the dollar actually invested. But how about the share of stock or that part of it representing the so-called unearned increment of value? In the first place there is much less of it than is popularly believed, particularly in the street railway business, for bonus stock that was issued to the pioneers in the business has since been paid up by these same men, who with courage, faith and energy have stood by their properties through thick and thin with time and money; and where they did not stand by but sold out to the public the result has been more often than not bankruptcy for the abandoned concern, and thus the pioneers, by the loss of their investments, have paid back the bonus. But for the sake of argument suppose it still exists. It was legally issued at a time when public opinion did not deny that the increase in value of a railway line was just as sound wealth as the increase in the value of real estate along the line. And since there is no fundamental right of property ownership, but all rights proceed from the laws and customs of organized society, destruction or reduction in street railway security values, for the purpose of taking back this unearned increment, is repudiation.

The limit of time allowed me will not permit, and it is not necessary before this audience, to enlarge upon the proposition that those companies which have heretofore capitalized the future to an extent which is out of proportion to the growth of value in the average investment in its community will not be able to collect.

As to the future, the code itself proposes a square deal which is in harmony with all sound advanced thought, and it will support all arguments for a demand that the rights of a street railway and all other corporations to the peaceful possession and enjoyment of their property be considered as binding upon society as the right of individuals, subject, of course, only to such restrictions as will protect the liberties of the people and secure just dealings.

I am pleased to have this opportunity to say a word in support of the code, and from which I hope much, and to enlist under Colonel Williams' banner of honesty and militancy.

DISCUSSION BY M. C. BRUSH

Colonel Williams has presented a most interesting and instructive discussion and explanation of the code of principles. There are probably few, if any, electric railway men, either officers or stockholders, but who would agree with the code as adopted and with his discussion and conclusions. As to whether or not others whose opinions and actions vitally affect the electric railway industry would also concur in these principles there is considerable question.

Colonel Williams states "What we have done is merely to nail our flag high and indicate that we intend to defend it." There can be little question but that, with

the advocacy of such a code of principles, we shall have ample opportunity to exercise our defensive powers.

I believe that the public as a whole is fair and willing that capital honestly invested in public service corporations should receive a reasonable return. The difficulty, however, lies in a measure in the company's representatives themselves having failed in the past to persevere in a well-defined and perpetual campaign to acquaint the great majority of the public with the facts.

The tenth "principle" reads "Full and frank publicity should be the policy of all transportation companies, to the end that proper information may be available to the investor and the public." This without question is wise and proper and the most sensible thing to do from the standpoint of properly conserving the interests entrusted to street railway companies. I think, however, that all railway officers should first be sure that they honestly agree with the code of principles. This ought not to be difficult. Next, however, they should be sincere in their determination to practice what they believe.

Those empowered with the administration of affairs of electric railways have failed to avail themselves of a power which they possess and which, if they carried out the code of principles in its entirety and with entire sincerity, would be automatically placed at their disposal. I refer to the great army of men and women directly or indirectly vitally affected by the success or failure of the electric railway industry. In other words, if all of the directors, all of the stockholders, all of the associates of the stockholders, all of those who have confidence in the integrity and honesty of one or more stockholders, and all of those who are dependent in whole or in part upon the success, financially or otherwise, of any stockholders, were not only thoroughly informed about the present actual conditions prevailing on street railway properties as a whole, but were also made to realize how essential the right attitude of critics, legislators, commissioners, and others is to the success of the industry, there would be set in motion machinery which in its far-reaching power would be beyond anyone's present comprehension.

While it may be difficult for an overtaxed executive to prepare statements, data and information with a view to enlightening the stockholders of public service corporations on the general question of the relation of their company to the community, is it not feasible and is it not one of the duties of the association to see that a well-organized campaign is carried out with a view to disseminating such information to all stockholders of electric railways in the United States?

We all appreciate what has been accomplished by co-operation in the "safety first" campaigns throughout the country. Now I believe that if all public utilities should unite in a similar campaign of financial education much would be accomplished. It is an art to prepare brief data in attractive phrases to capture the public's attention, but it does seem as if a concrete effort could be successfully made when we consider the enormous amounts of money involved in the large number of corporations whose interests would be promoted by such an action.

We talk a great deal about educating the public. Do you not think that if we deliberately and systematically educated each of our stockholders, they in turn would do more towards proper education of the public than we could accomplish by any other means? Could they not impress upon their associates in business and in organizations, upon their neighbors, friends and acquaintances, the fact that the electric railway to-day is a co-operative institution in which the inter-

ests of their friends and themselves, that is, of the public and the stockholders, or the public and the company, are substantially identical, and that the attitude of antagonism towards a street railway, merely because it happens to be a public service corporation, is suicidal to the community served by such company?

We meet together from time to time, a large body of men all interested in this industry, many of us with no asset whatever other than that which lies in the industry, the return to ourselves being governed entirely by the success or failure of the industry. But do we practice fully what we preach by our code of principles, that is, frank publicity?

Is it not a fact that with the present method of conducting public service corporations, with the present supervision by public service commissions, and with the present comparatively low rate of return upon street railway investments, we are extremely unwise in not deliberately and systematically living up to our tenth principle which advocates full, frank publicity to the end that proper information may be available to the investor and the public? It does us but little good to have a code of principles if we hang copies of it upon the walls of our own offices but fail to promulgate it through the many channels open to our use.

Is it possible that each member of the association, whether an individual member, or connected with a company member, has, since the day when this code of principles was printed and circulated, done all in his power to see that it was printed and distributed broadcast in his community, and has he in all cases done all in his power to see that the community served by his company is particularly informed of what his company means to do in regard to such code of principles?

Do we at all times endeavor to meet and eliminate from the minds of those who are misinformed the thought that an electric railway is a great secret monopoly with dishonest officers and insincere principles? There is a play being produced in this country to-day which is meeting with tremendous success. The theme throughout is based upon the story of a rich old gentleman who was president of a railway company and was trying to spend \$200,000 to bribe the mayor of the city to get a franchise for him. Here is a play that is probably seen by several hundred thousand people in the course of a year, and it is fair to presume that by far the larger part of the audiences are at least unconsciously carrying away with them a thought which emphasizes, either at the moment or at some future time, the imagined rottenness and dishonesty of electric railway management.

If we are going to live up to our code of principles is it not the duty of our association or of its members, either individually or collectively, to endeavor to persuade either the author or the producer of such a play that he probably could accomplish the same result with his drama with some other theme than the dishonesty of street railway administrations?

One of the elements which it is extremely essential that the officers, stockholders and their friends, associates and dependents reach and educate in carrying out these principles is the legislative body. The practice of prescribing the prices at which public utility securities shall be sold is absolutely wrong. Prices cannot be legislated unless the rate of return also be legislated, and this can be done only if at the same moment are legislated conditions, revenues, etc., which will guarantee the legislated return.

The practice is in vogue in some states of prohibiting the issuing of securities by public service corporations other than at prices specified by the commission, which is the creature of the legislature. In the case, however, where the state itself issues securities, the rate of re-

turn is specified but the prices at which the securities are sold are governed entirely by the one real governing feature of price, that is the law of supply and demand. The securities thus sold bring such prices as the public desire to pay at public auction.

This, too, is a field for the operation of the code of principles, for does it not say "that the rate of fare should be sufficient to permit the companies to meet the reasonable demands of patrons and to yield a fair return on a fair capitalization"?

Is it not time, therefore, that the executives who are directing the policies and administering the affairs of the electric railways of this country should make it their business to create an army of backers by properly informing their stockholders and then to go out frankly in the open and with plenty of backbone and with an absolute knowledge that their business is being conducted in a particularly fair, frank and honest manner, to defend their properties? Should they not insist that those sitting in the legislatures, commissioners' rooms, editors' chairs and critics' homes should give to the individual who has happened to buy a share of street railway stock, or a bond of some public utility, the same fair chance and opportunity for a proper return on his investment as is given to his neighbor who has bought a state or municipal bond?

PUBLIC SERVICE AND PUBLICITY

The second paper of the morning was that on "Public Service and Publicity," prepared and read by N. C. Kingsbury, vice-president American Telephone & Telegraph Company, New York. This paper is published in abstract on another page.

DISCUSSION BY W. CARYL ELY

The discussion on Mr. Kingsbury's paper was opened by Mr. Ely, who first touched briefly on the chaotic state of mind that seemed to be affecting the whole world at this time. The declaration of the code of principles was most important at this juncture when nothing should be hidden. It was a declaration, as he put it, for "a square deal from us to the public and a square deal from the public to us." To get that square deal depended much upon what the railways would do. He agreed with Mr. Kingsbury that all the public utility interests should get together to the end of giving full publicity about their business, reaching not only those transacting the business but the people outside upon whom the welfare of the public utilities depended. There were two branches of publicity—within and without. The publicity without was that which related to the public, and the publicity within was that which related to the publicity between the railways themselves. He recalled that as long ago as the convention of 1906 ideas similar to those expressed in the code of principles had been advanced by different members of the association. But the difference to-day was that the thoughts on the subject had been collated and publicly declared to be the doctrines of the organization. At last the atmosphere was clarified, and the men who had believed for years in these principles were no longer obliged to hold them back for fear of offending other and more powerful individuals or interests. If this code had been adopted ten years ago, he felt that conditions would have been much better. Now the railway men should be as quick to adopt full and frank publicity as they had been slow before.

In conclusion Mr. Ely said that the mere fact that Mr. Kingsbury's corporation had permitted him at this time, in this place and under these circumstances, to promulgate the declarations contained in his able address was a very significant event. It indicated that every one of the public utility corporations should be willing

to court and invite investigation and discussion and to submit to every one all the evidence in their possession relative to their business.

DISCUSSION BY E. G. CONNETTE

The second speaker to discuss Mr. Kingsbury's paper was E. G. Connette, president International Railway, Buffalo, N. Y. Mr. Connette said that a few years ago what almost amounted to an indignation meeting occurred at one of the sessions of the association because a number of the members thought that the public was treading on the toes and rights of people who directed corporate interests. He had not been in accord with that sentiment and had left it behind years ago. As early as 1890 he had taken charge of a broken-down property in bad grace with the public. Eventually the red figures were converted to black, and this result was achieved largely by applying the remedy of publicity. He had taken the newspaper representatives into his confidence, and they in their turn had educated the public. Within a year or two the company which had formerly been oppressed was considered a public benefit.

In more recent days after he had left the service of the Public Service Commission of the First District of New York, to take care of the International Railway at Buffalo, he found a strong antagonism against the company and that representatives of the Public Service Commission of the Second District had been on the ground for three months making investigations of the service. On his arrival in the city he was invited by the Men's Brotherhood Clubs of the churches and by many civic associations to address them on railway service conditions. He accepted every invitation, although this required him to speak about twice a week for about five months. At these meetings he made many acquaintances whom he tried to convert into friends by explaining what problems the company had to meet and how it could be helped by them in many ways. Newspaper men were always present at these meetings and published his remarks the next morning. He found that he reached the populace better in that way than could be done in any other way. As yet scarcely any money has been spent in the newspapers for electric railway publicity. Mr. Connette stated that he had strong faith in newspaper advertising, believing that it paid to spend substantial amounts since the investment brought good returns in two ways, namely, it made patrons of the public and it was helpful to people in suggesting where they could ride for pleasure, especially during the summer months. Newspaper advertising was, therefore, one of the remedies for poor public relations.

Continuing, Mr. Connette said that codes of principles could be formulated forever but they were a good deal like catechisms learned in Sunday schools which were repeated rather than observed, as "we are all sinners."

He stated that he had been connected with a public service commission for two years and believed that such commissions were a benefit. The condition of the public mind was such that there must be a brake upon the wheels, first that the public may be protected and second that the interests that the public is attempting to attack will not be destroyed. The commissions were not only an aid to the public but they protected the companies, particularly against the municipal attacks which had been so serious in the past, and also against attack by individuals or associations. So far as rates were concerned, it was the duty of commissions under the law to grant to companies such rates as would yield an income sufficient to take care of operating costs, taxation, gradual reproduction and a reasonable return on the investment. The great difficulty which commissions have had to meet in rate cases has been that

of over-capitalization. When commissions attempt to appraise property for rate adjustments they do not find the property there. Even by stretching their consciences by adding large percentages for indefinite things they find it difficult in some cases to arrive at a value equal to the capitalization. This question has brought more condemnation on commissions than anything else. The fundamental principle of regulation was right. A few years ago the association had not believed that it was right, but to-day it was on the right track and going in the right direction.

In conclusion Mr. Connette said that the code of principles should be lived up to and that any money spent to take the public into the confidence of the railway was well invested.

AFTERNOON SESSION

The afternoon session was opened at 2:15 p. m. with an address entitled "Financial Legislation as Affecting Public Utilities" by Hon. John W. Weeks, United States Senator from Massachusetts. An abstract of Senator Weeks' address is printed elsewhere in this issue. His address was discussed in a written communication by J. H. Mortimer, president North American Company. This communication was read by F. W. Doolittle and appears on another page.

ADDRESS BY PRESIDENT WILSON

Amid great enthusiasm Woodrow Wilson, President of the United States, was introduced to the convention.

President Wilson said he knew how important the interests represented by the association were, for they represented some of the chief channels through which the vigor of the nation flowed. He was very glad to have the delegates look at some portion, at any rate, of the Government of the United States. Many things were supposed about that Government, and it was worth while to see it for themselves. In his experience the only way to know people was to meet them. If he believed everything he read in the newspapers he would not understand anybody for he had found on meeting people that the horns they were supposed to have dropped away.

A fine thing about the United States was its large number of get-together associations, but it was a great mistake to confine such associations to groups of individuals in the same business. The important thing was for people in different enterprises to understand one another in order to comprehend our life as a nation.

President Wilson said that he firmly believed that we were now on the brink of a new era of prosperity. For twenty years enterprises in this country had been checked because men were moving amongst a mass of interrogation points. They did not know what was going to happen to them. All sorts of regulations had been proposed, and they were uncertain which of them were going to be adopted. Yet, in spite of this, men knew that most business men are honest and public-spirited citizens, but the many were made afraid because a few did not do right. It had been necessary to agree on the main things that ought not to be done, and then to put our laws in such a state as to correspond with that general judgment. This was a necessary preliminary not only to a common understanding but also to a universal co-operation. Except upon a basis of thorough understanding of law and propriety of conduct it was impossible to pull together. The great majority of the American people believed in doing what was fair and honorable, but a method of control by law of the small recalcitrant minority was a thing difficult to determine upon. What those laws should be was a very great burden to fall upon a particular Ad-

ministration. The business of final definition had been attempted by the present Congress. It was simply attempting to define something for which the country had already been trying to get ready for half a generation. Of course it would take time to determine what changes may be found desirable in the laws, but no one disputed that such laws were necessary.

Electric railway men whose business it was to join community to community were surely in a better position than others to understand how communities constitute units; that what was hurtful to one part was detrimental to all. One could not demoralize some of the forces of a community without putting in danger of demoralization all the forces of a community.

In this connection, President Wilson said that he realized that the interests of the electric railway companies were not in the congestion of life but in the release of life; not in isolation but in union—the union of parts of this great country so that every energy in those parts will flow freely and with full force from county to county throughout the whole nation.

Continuing, President Wilson said that while he would not dare to make any predictions he would venture some prognostications. The thought of no single man could comprehend the life of a nation like ours, yet men in public life were burdened with a certain degree of guidance, and they must attempt to comprehend as much of the nation's life as they can. Their strength must lie in common counsel with the men in each field in which they have to deal, but a time must come when they are obliged to make some kind of prognosis. He felt that the mists and miasmic airs of suspicion that the commercial world had felt have been blown away and that we had come into an era of confidence. This confidence in enterprise meant that no one was going to be suspicious of any business merely because it was big. If his judgment had been correct, no one ever had been suspicious of business because of its bigness but because people felt that bigness was being used to take unfair advantage. It was easier for a big man to take unfair advantage than a little one. That was why the big fellow was watched. Now that a bond had been given for the behavior of the big fellow to keep the peace we could sleep o' nights provided always that there would be fair dealing and real service.

The characteristic of modern business was this: Most men do not do business on their own private capital but with other people's money. In the case of a stock company the partners are constantly changing. Hence as the managers are using the money of everybody their responsibility is to everybody. Their business is a public business and the public must be taken into the confidence of the managers. The oxygen that the lungs of modern business must take in is the oxygen of public confidence. If it did not business was essentially paralyzed and asphyxiated.

A common understanding was the only stable basis of business. What we want for business hereafter, he said, was the same kind of liberty that we want for the individual. The liberty of the individual was sharply defined by the limits where he comes into contact with the rights of the community in which he lives. Business must not ask for more liberty than the individual. To use an expression from the world of sport the motto should be "A free field and no favor." There had been times when favors had been granted to friends at court, when some had been allowed to travel on the inside track and when others had been granted positions which would block the other runners. The race might have looked all right from the grandstand, but there were many who were never allowed to reach the track. He did not mean that the corporations were going to be penalized for bigness, but they were going to be made

to observe the rules of the track. If they won it would be because they possessed more vigor and skill.

When we get to understand that we are all sports and that we are not going to ask nor even going to condescend to take advantage of what does not belong to us the atmosphere will clear and the spirit of true sportsmanship will get into everything. Men who squeal when beaten under such conditions will not deserve our pity.

President Wilson said that he appreciated that there were different degrees of capacity in the world, and that some men had heads that were not particularly well furnished. To illustrate his point, he told of a conversation where two men in speaking of a third referred to him as one whose head was simply a knot which the Almighty had put on him to keep him from raveling out. Liberty did not mean putting men of that type at the front and making others travel the same pace, but no matter how feather-headed the other man was no one must arbitrarily interfere with him.

One of his rules was: Don't do anything under cover. Many businesses had fallen under suspicion for secretiveness where there was nothing to secrete. The same publicity which is required in sport was required in business: The questions were: How do you run the game, and are you giving a full equivalent in service for the money that you receive? The operators should try to make the profits proportional to the service they give. If the service to the people was satisfactory the people would not grudge them any profit because they were getting a quid pro quo.

Again, business was a game that also required a certain kind of conscience—a certain feeling that we are in this world to make good according to the standards of the people we live with. He did not fear to pass a penitentiary, but he did fear to look into the eyes of an honest friend if he had done anything that his conscience did not approve. We are sustained, he said, by the moral judgment of honorable men; nothing else in this world was worth while. Honors achieved dishonorably were as arrows in a man's heart. Therefore conscience in business was the motive spring of the whole thing—the pride of doing a thing as it ought to be done.

All of us were employees of the public in so far as the money we get comes from the public. A clean conscience toward our employers is the basis of our success.

Last was the spirit of service. By this he did not mean a sentiment or state of mind but something very concrete, namely, that the thing we get money for from the public is the best thing of the kind that can be done.

Government was an endeavor to represent the public conscience. If it went too fast it would have to be pulled up. If it went too slow it would have to be whipped up. He thought he understood what his audience was after, and he hoped that his audience understood what he was after. If anything was being done that ought not to be done the fault in it should be conclusively pointed out and the way to correct the mistake should be conclusively shown. There was a homely old rule: "Put up or shut up." The way in use was the best way until some one could show a better one. In saying this he did not mean any disrespect to the ideas of others. The market for ideas was a highly competitive market. In this country men who have ideas were invited to the platform, and nothing better had been found for trying out ideas than exposure to the atmosphere. If enough people heard the idea expounded often enough it would reach its proper level. He believed in free speech—he got plenty of it himself. The President's office seemed a clearing house for ideas. Sometimes the ideas did not register on him, but if the railway men had ideas to submit his register was entirely at their service.

After a standing ovation to the President the meeting was adjourned.

The Banquet

Co-operation Between Men in Public Life and in Business was the Keynote

The banquet which was held on Friday evening in the beautifully decorated dining room of the New Willard was notable both for the high quality of the addresses and for the number of distinguished public men who attended as guests of the association. Music was furnished by the United States Marine Band Orchestra.

MR. PEIRCE'S REMARKS

The first speaker was C. C. Peirce, vice-president American Electric Railway Manufacturers' Association, who spoke for President E. H. Baker, as the health of the latter did not permit him to exert his voice. Mr. Peirce mentioned with enthusiasm the new functions which the Manufacturers' Association have added to its work, such as a bureau of information on foreign trade and on the increased facilities of the home offices in New York. Even a system of consular reports was contemplated. He hoped that some day Washington would erect a permanent convention hall to give the electric railway industry a chance to bring to the attention of the law-makers its needs and its good works. Referring to the great question before the industry he said that the fundamental trouble of many electric railway properties was one of not following the rules for good merchandising. They have been selling goods below cost and had not been as profitable as had been expected because of the continued demands of and concessions to the public.

CONGRESSMAN SHERLEY'S REMARKS

The next speaker was Hon. Swager Sherley, representative in Congress, Fifth District of Kentucky, who thought there were plenty of grounds for optimism in the business outlook. First of all, he was sure that the people of America believed in the intelligence, courage and honesty of their business men. Second, there were still great national resources of the United States open for development. Third, a comparison of conditions in the United States and Europe to-day certainly should inspire optimism. Our competitors were now mortgaging their future for many generations. Out of this was bound to come a wonderful opportunity for America. One difficulty in America to-day was that the men in business did not understand those in public life and vice versa. Change, and consequently new laws from time to time, was inevitable, but he hoped that such new laws would always be tempered by justice. Congress was judged too often by what some individual member says rather than by what Congress itself does. Congressmen may say foolish things, but Congress usually does wise things. Naturally the press plays up the unusual features and not the everyday but more important happenings. The growth of great corporations had made it necessary for the government to step in as the only factor of sufficient size to deal with gigantic aggregations of capital. But the "thou shalt not" period was approaching its close. Punitive laws had helped to make the situation clear and now the government was entering the era of helpful legislation of which the trade commission act and the federal reserve act were illustrations. The government was not sitting up nights to worry and punish business. In conclusion, Mr. Sherley said that the political representatives of the people would never have the necessary knowledge to make satisfactory laws unless they received help in full candor from the business men affected by the laws.

ARTHUR WILLIAMS' REMARKS

Arthur Williams, president American Museum of Safety, then announced the winner of the Anthony N.

Brady medal as detailed elsewhere in this issue. Mr. Williams described the origin of safety medals in other lines of industry and in conclusion expressed his thanks to James H. McGraw, president McGraw Publishing Company and a member of the committee on award, for his kindness in printing a report of the medal committee and for other services to the electric railway and lighting industry.

CONGRESSMAN MONTAGUE'S REMARKS

The next speaker was Hon. A. J. Montague, former governor of Virginia and representative in Congress from the third district of Virginia. He had no particular subject for the guests, he said, but would talk "by and large" and allow them to fill up the interstices. Referring to Congress as a mirror of the American people he said that if the mirror seemed dirty it was up to the American people to wash their faces. He was proud that he came from Richmond which had been the first city to operate electric railways with commercial success. Of course, he admitted, some other cities had electric railways before Richmond but only to see if they would operate. He was doubtful as to how far the United States could succeed in competition with China and Japan because those countries underlive us, but much might be done in South America, for that part of the world was the most expensive place to live in that he had ever heard of. This country should send its best men not to Great Britain or Germany, but to Brazil and Argentina. They should not only know the language of the country but should be men of such unquestioned character at home that they would command respect and homage abroad. In seeking the trade of South America we cannot tell them what we think they ought to have but give them what they think they want.

MR. HENRY'S REMARKS

The last speaker was C. L. Henry, president Indianapolis & Cincinnati Traction Company. He said that as representatives of two great closely-allied industries they had been permitted to confer at first hand with representatives of both the law-making and executive branches of the government. He hoped that their coming to Washington would not only give them a clearer view of their relations with the government but also tend to a better understanding by the executive and legislative departments of the government of the place filled by the manufacturing and transportation industries represented. Mr. Henry then discussed the international balance of trade for the last twenty-six months, showing that up to the beginning of the war the United States had immensely increased its purchases abroad, while at the same time its sales abroad had fallen off hundreds of millions of dollars. Since then the raising of emergency currency and heavy purchases from the warring nations have brought about a change for the better in the financial situation, and it would not be strange if in the near future England would have to commence shipping gold to the United States. If the war continued but one result would follow, namely, that the United States would have ample money and be so favorably affected that employment could be given to every willing hand and prosperity would be abroad in the land. The important question was to make this temporary, or more properly feverish, financial and industrial improvement a permanent one. Let Americans produce from the farm and factory everything that Americans need, and, in addition, export what they can find a market for in foreign countries. In conclusion, Mr. Henry spoke of the unnecessary public regulations which had occasioned heavy expense to electric railways and had been injurious to the service in so many instances that the word "regulation" had been transformed into "strangulation."

The Code of Principles*

The Keynote of the Code Is Responsibility, Frankness and Fair Dealing, and the Utilities Should Insist on Equally Fair Treatment to Themselves in the Interests of Humanity, Business and Future Civic Developments

BY COLONEL T. S. WILLIAMS, PRESIDENT BROOKLYN RAPID TRANSIT SYSTEM

The subject upon which I have been asked to address you is not so dull as its title, without explanatory preface, might imply. It embodies, in fact, an attitude and a determination full of business significance and human interest. The workers in an industry employing 282,461 persons and representing \$4,596,563,292 of invested capital have not merely formulated a declaration of the principles which shall animate their purposes and guide the conduct of their business—they have asserted and propose to defend a sound and honest basis of business opportunity. More than any other public utility, the street railways of the country stand in close relationship with both people and government. The opportunity of their development is, unfortunately, public privilege. The continuous performance of their functions is a public necessity, and the manner of that performance is, of all public services, the most intimately associated with the time, the comfort and the welfare of the people. Wide-reaching then, and of universal interest, is the standard of obligation assumed by such an industry and the conception of fair play which it contends for.

I regard as perhaps the most important and timely work ever undertaken by the American Electric Railway Association the effort which has culminated, during the past year, in committing the association to earnest and intelligent propaganda for encouraging among its member companies the recognition of a high standard of business obligation, and for disseminating among the people clear and sound ideas of that mutual relationship which must prevail if street railways, under private ownership and operation, are properly to perform their functions. Necessarily preliminary to such propaganda was the attempt to formulate certain underlying principles of belief and action—called, perhaps too comprehensively, our Code of Principles. From these were to radiate illustrative studies based upon all the information which is furnished by our industry. The association was to be not merely a storehouse of facts, figures and experiences but a ready disseminator of these, both among our members and throughout that great collateral constituency with which our activities are so intimately related. We became by this undertaking an alert and aggressive force, combining varied and expansive experiences under concentrated leadership, for efficient methods and broad ideas. I am sure I voice the unanimous feeling of the committee which, at the direction of the association, outlined the scope of this large educational program, when I pay tribute to the sincere co-operation which the committee received in its work from the members of the association, and if the earnestness of spirit which characterized the strong men in the organization toward our undertaking be typical, as I believe it is, of the general attitude, a new and useful era is before us.

IN SPIRIT OF HONESTY AND MILITANCY

What we have done is merely to nail our flag high and indicate that we intend to defend it. We do not

ask you to indorse the precise language in which our principles have been phrased. You may like all of them or you may question some of them. You might phrase them differently. We believe them to be generally sound, and the association has approved them. But the important thing is the spirit behind them. And you will all agree that this spirit is an honest one and a militant one. This is their note of triumph and courage. This is their significance in these days of mollycoddling in business, politics and economics.

Because public privilege in the shape of franchises has usually been incident to the existence and growth of street railways, evils have arisen for which we perhaps, equally with official representatives of the public, are responsible. History will determine the relative measure of that responsibility. Whether blackmail or theft, involves merely the definition of the crime. I have no apologies to present for those instances of corrupt alliance between franchise-giver and franchise-taker, which have brought discredit both upon business and upon politics, nor for those dishonest and reckless financial manipulations which have beclouded some railroad operations and covered some reputations with scandal.

Nor would I urge that we should forget and forgive these deplorable incidents as the products of a lower moral standard and not likely to recur. The remembrance of them is a wholesome deterrent. But it must be borne in mind that no business, large or small, has been free from similar evils, and we have a right to insist that public service corporations should not be the special victims of public prejudice excited by such misdoings.

The street railway corporation is under specially severe restrictions in the development of its business. Its obligation is to serve the public with transportation, but it cannot occupy a foot of public street without express official consent. The difficulties of procuring such consents have, in many of our cities, become almost insuperable—and they exist largely because of prejudice and suspicion generated easily by demagogues who still thrive on some possible wrongs of the past. This same antagonistic spirit, too prevalent against all manifestations of enterprise, seeks to impose all kinds of exacting burdens as well as to prevent expansion, with the result of withholding from the people those facilities which ought to be theirs even without the asking.

It is this fact of dependence upon privilege, with the concurrent atmosphere of suspicion and envy of possible rewards, which makes all public service activities a doubtful business—doubtful in permanency of private control, doubtful in opportunity of profit, doubtful in assurance of fair play—and we may well feel at times that the inexorable logic of conditions (not of results) points inevitably to government control and government operation.

The public service most difficult of all to render in our large cities is transportation, and because the railroads are brought into such constant association with the people and are expected to furnish facilities which they are not always allowed to furnish, they are

*Paper presented at mid-year meeting of American Electric Railway Association, Washington, D. C., Jan. 29, 1915.

likely to be among the first victims of public prejudice or political demagoguery.

NO SECURITY FOR UTILITIES

The situation which confronts the street railway business is thus a peculiar one. There is in the first place no free field of effort. There is no assurance against competition. There is little security in rates. There are incessant and increasing demands for improvement in the character and frequency of service. There is the frequent deadlock which springs from the irreconcilable conflict of demand and inability to comply. There is the daily prejudice of ignorance and of unreasonable dissatisfaction. And there is, from the viewpoint of public concern, the constantly menacing evil of government railroading, with its certain train of extravagance and inefficiency. The situation is further complicated by the existence of some perpetual franchises which have proved profitable, and in eagerness to attack these is forgotten the almost invariable sequence that, for every dollar of profit to street railway owners, the people of a community, its business and its real estate, its growth and its social environment, have received many fold in diverse dividends.

Confronted by these conditions, the American Electric Railway Association has taken the manly and intelligent course. It seeks first to remove prejudice and then to deserve support. Frankly avowing the sense of public obligation inherent in the transportation business, it makes the recognition of that obligation the fundamental precept of its platform. The keynote of its code is responsibility, frankness and fair play. Mark the courageous tone of its first paragraph:

"The first obligation of the public utilities engaged in transportation is service to the public. The first essential of service is safety. Quality of service must primarily depend upon the money received in fares. For this reason it is necessary that the rate of fare should be sufficient to permit the companies to meet the reasonable demands of patrons and to yield a fair return on a fair capitalization."

THE PLATFORM EPITOMIZED

Here is the whole platform in one paragraph. But the association has properly realized that in its own councils and in the contact of its members with the public an expression of opinion and attitude is called for upon many questions which involve the life of street railway corporations and the correct settlement of which determines the scope of their usefulness. The association's code meets these with equal straightforwardness. It holds that regulated private ownership and operation of electric railways are more conducive to good service and the public welfare than government ownership and operation, because the latter are incompatible with administrative initiative, economy and efficiency and with the proper development of cities through the extension of transportation lines; that in the interest of the public and good local service transportation should be a monopoly and should be subject to regulation and protection by state, rather than by local, authorities; that short-term franchises are detrimental to civic welfare and growth because they ultimately check the extension of facilities and discourage good service; that in order to render good service, fair return must be allowed on a fair capitalization, and the issuance and sale of securities representing such capitalization should be legally authorized on such terms as will produce the requisite funds; that securities lawfully issued should be regarded as valid obligations; that the relation of adequate wages to efficient operation should always be recognized, but electric railways, being public servants

regulated by public authorities, should be protected against excessive demands of labor and strikes; that the principle of holding companies is economically sound for the reason that the securities of local companies have protection against the varying business conditions of a single locality or company, and because money for construction and improvements can thus be more readily obtained; that in the appraisal of an electric railway for the purpose of determining reasonable rates all methods of valuation should have due consideration; and, finally, that full and frank publicity should be the policy of all transportation companies, to the end that proper information may be available to the investor and the public.

MUTUAL RESPONSIBILITY

There is thus presented in this code of principles a two-sided obligation—the obligation of the carrier to the public, and the obligation of the public towards the carrier. The mutual responsibility is so self-evident that argument would seem to be unnecessary, but the real evils from which our corporations in common with others are suffering to-day arise from the failure to appreciate this mutual responsibility. The obligation of the railways to the public is forced home upon them in many ways, but the obligation of the public towards the railways is not only not recognized but is often contemptuously repudiated. I speak now not of obligation in the sense of debt, for I appreciate that people dislike to be regarded as debtors and particularly to corporations of their own creation, and I make no mention of those great participations in town and country up-building which have followed the courageous lead of transportation—achievements often due exclusively to the nerve and determination of railroad pioneers who are, in this sense, indeed public benefactors. But I speak of obligation which involves only justice and fair play. I call attention, particularly in municipal transportation, to that close relationship to which I have before referred, as being so essential between city and corporation—first, that the city may get the transportation which it wants, and, second, that the corporation may give it. People forget or overlook the interdependence of this relationship. So long as our municipal policy is to employ private agencies to furnish and conduct its transportation, so long must there be two parties to the contract, so long two contributors to the results. If you expect your street railways to furnish facilities of transportation, you must give them the power; if you give them the power, you must see that they properly exercise it, and if they do properly exercise it and succeed by their effort, do not penalize them or attempt to strip them of their just reward.

Our association aims, as I understand it, to impress upon its own members a full sense of our own obligation towards those whom we serve, and also to drive home to the people a few plain economic truths which must be self-evident to sensible men but which unfortunately are not always the basis of popular action, although they involve merely a recognition of reciprocal honesty. Transportation is a commodity. It resembles other commodities in that it is bought and sold. The city is the buyer, bartering its privileges for the benefit of its people. The railroad company is the seller, furnishing the facilities of transportation in such streets and places as the buyer determines and under such restrictions and conditions as the buyer dictates. Self-interest on each side, to the extent reconcilable, inspires and formulates the bargain. Once made, it is supposed to be carried out. The results may be disappointing to one side or to the other or to both, but there must be absolutely good faith between buyer and seller. Long is

the list of enterprises in street railways where investors have lost, but the railroads have continued their operations; they have kept the faith, while the city, the other party to the contract, and its people, have received all the benefits. The experience of the comparatively few successful enterprises has not always shown that they have been allowed their full reward, however. Their success, even when accompanied by vastly greater compensations to city and people, has too often meant the exaction of new concessions, the imposition of new burdens or the creation of competing lines.

CONTRACTS SHOULD BE SACRED

We stand on unassailable ground when we insist upon the sacredness of contract and upon honest and fair dealing. In order to demand it of others, we require that we should respect it ourselves. We therefore favor "full and frank publicity." We propose to take the people into our confidence and give them the facts and figures of our business, not alone the official periodic reports which they have generally had under the direction of law, but the live information which helps the public promptly to form accurate judgments. We admit the desirability of regulation, but we believe that regulation, too, should have a moral code—that it should be honest, fair and intelligent, not an official instrumentality for oppression, punishment, unreasonable exaction or political baiting. We insist upon the square deal, whether it relate to capitalization, to rate making, to franchise burdens or to taxation. We recognize the increasing demands for both the quality and quantity of electric transportation, but we urge with insistence that should not be necessary the dual interest of expanding facilities, and that no extensions and improvements can be permanently forthcoming without a sound basis of credit.

Such a basis for expansion implies an equitable margin of profit—compensatory returns for both labor and capital. I am often impressed with the fact that we have become the victims of our own liberality and optimism. Electric power has so improved and cheapened transportation that we have deceived both ourselves and the public as to its possibilities. Too careless accounting and too many official impositions have been extravagant accompaniments of lower fares, longer hauls and generous free transfers. The nickel is called upon to do too much. Having learned by the difficulty of enlisting new capital in traction ventures of the narrowing margin of profit and of the lessening ability for expansions and even for the maintenance of high physical standards, we owe it to the public, as well as to ourselves, that the truth should be emphasized. Our patrons are equally interested with us that fares should be adequate and that operating and fixed charge costs should be proportionate. This is not an academic proposition. It affects vital interests. Our invested hopes and dollars are only a small factor. Our past optimism and prodigality may now seem to have been ill-advised, but they have built up great communities, scattered urban homes over long distances, choked the only avenues of distribution permitted to us, and in our large cities have brought about a situation which cries aloud for relief, in the interest of humanity, of business and of future civic progress. To the real and important sufferers from this situation every fact bearing upon the explanation and the remedy should be pressed home, if we are to be the instrumentalities of their relief.

WHAT THE CODE HAS DONE

What our association has done by its code of principles and its proposed propaganda is merely to take a virile, aggressive stand for honest business and co-operative development. We have been taught to respect the

dignity of labor, and although modern business is the enlarged definition of labor, it has stood in recent years timid, supine and cowering before the attacks of demagogues and politicians. The structure of industry has tottered because those who should be its defenders have been either conscience-stricken or invertebrate. Business everywhere may need honesty, but it also needs backbone. Methods must be clean and straightforward, but business men must have the courage of convictions and the militant spirit to fight for them. There is little danger of injustice in our country if facts are known and rights are defended. Why should politicians have it in their power by invective, legislation and official mandate to frighten capital, restrict commerce and drive willing labor out of employment? Why should these same influences in our cities be able to excite popular prejudice against the agencies which give them public service? Clearly, such a situation cannot prevail if, in the first place, business is honest and efficient, and in the second place, if it is frank with the people and aggressive in the defense of its rights. Politicians would then quickly run to cover, or they would be overwhelmed with the assertion of popular common sense.

The American Electric Railway Association has properly recognized the necessity for aggressive, concerted action in behalf of honest methods and fair play.

The Federal Reserve System*

BY SENATOR JOHN W. WEEKS

The principal functions of the federal reserve system, which went into operation Nov. 16, 1914, are as follows: (1) The United States is divided into twelve districts, each one having a Federal Reserve Bank. (2) Through these Federal Reserve Banks the government will hereafter conduct all of its financial operations. (3) All banks belonging to the system will hereafter keep with the Federal Reserve Banks all of their reserves which the law does not require them to keep in their own vaults. (4) A general rediscount system is provided, limited by law, enabling member banks to rediscount qualified paper and to add the rediscount to their reserves or obtain circulation for it, as their needs require. (5) A system of bank-accepted bills is provided according to the practice which has been common in European countries for many years. (6) The system enables a concerted action in the future to control the national gold supply. Heretofore no such power has existed and the country has frequently lost gold when, with a proper system, it could have paid its debts in other ways. (7) It provides for a foreign banking system, or rather for foreign branch banks, which are needed in the development of foreign commerce. (8) It provides new national currency by authorizing the issuing of treasury notes, and loaning them to the banks under conditions provided in the act. (9) It enables the use of the combined resources of the country to aid a business community wherever and whenever such assistance becomes imperative.

When in full operation, the system should affect every class of corporation and business enterprise through adding stability to business. If there is one mistake in the new banking system, it is that there is too much government and too little scientific banking control in its conduct. Electric railway officials could take no wiser course than to discourage every step which is now being taken or may be taken to put the government into competition with private capital and private operation, and to discourage every attempt at legislation which is going to put unreasonable restriction and burdens upon their operations.

*Abstract of paper presented at mid-year meeting of American Electric Railway Association, Washington, D. C., Jan. 29, 1915.

Public Service and Publicity^{*}

Public Opinion Is Irresistible and the Public Utilities Should Recognize This Fact and Govern Themselves Accordingly—The Author Outlines His Suggestions

BY N. C. KINGSBURY, VICE-PRESIDENT AMERICAN TELEPHONE & TELEGRAPH COMPANY.

The President of the United States has advised business men to be confident of the future, and so we should be. Money is here looking for investment. We have an improved and, we think, a scientific currency system. The railroads have recently been granted the long-needed increase in rates. Our abundant crops are finding a world-wide market. We owe Europe less and less. New foreign markets are opening up to us. Public relations are improving. Progress is in the air, and we must grasp the opportunity.

No line of business endeavor has shown greater initiative or assumed greater business risks in the settlement and development of the United States than the so-called public utility companies. Nearly one-fifth of the total wealth of the United States is invested in the business of furnishing transportation, light, heat, power, water, gas and telephone service. This is an investment well worth conserving. Indeed, if the public service corporations of this country are not to be successful, if the twenty-eight billions of dollars representing the investment in this line of business does not have a real, definite, permanent earning power, it is absolutely certain that the earning power of the rest of the investments and wealth of the United States will be greatly impaired and general good times in business impossible.

It is my belief that there has been a great change in the attitude of these corporations toward the public during the past few years, and one of the great problems, if not the greatest, of the business is to bring about a corresponding change in the attitude of the public.

It is easy to understand some of the reasons for the feeling of distrust and suspicion with respect to public service corporations which we often encounter in the public mind. It naturally arose at the very inception of the business. The great majority of these corporations were started by men of broad vision. Indeed, many of them had visions so extremely broad that we might call them visionary, and in many instances they capitalized their hopes, then sold out and moved on to conquer other fields. These men left some hard situations to work out. Now, I do not mean to condemn the promoters, the pioneers, in these various lines of public service. In fact, I have never been able to figure out how the great majority of these institutions so beneficial to the public could have been started in any other way. But the time of the promoter has passed. Public utilities should not in these days be placed on a speculative basis, in my opinion. A fair return on the investment is all that should be earned or promised. Stability of investment, constant earning powers, sufficient to return a fair margin of profit and thus attract necessary new capital, we should have, and the only way to attain this is to abandon all speculative methods. It is only very recently that we have come to a complete realization that the operation of a street railway is charged with such a public interest that it is not a private business at all.

All companies have not accepted this new theory of

obligation to the public in all matters concerning it as fully and as quickly as the public and public authority have required them to do and this has caused a good deal of friction. There has been a tendency to resist any improvement in the laws concerning the business. The lobbyist of the public service corporation was long a familiar figure in legislative halls, and a great deal of permanent harm resulted in the obstructive tactics that some of the companies followed whenever any progressive legislation was attempted.

I remember very well, as many of you doubtless do, that the passage of laws requiring street railway companies to equip their cars with vestibules in the winter time was strenuously resisted. The officials of the companies bombarded the legislators with pages of reasons against such laws, and they even got their motormen, in some instances, to declare that the vestibules would be dangerous to their health, as well as making it difficult to operate the cars. From what little I know of the electric railway business, I should say that such laws would not be strenuously resisted at this time. Other laws, rulings of commissions and city ordinances, which, in the main, have been for the benefit of the public or the employees of the companies, or of the companies themselves, have often met with such opposition as to fill the public mind with distrust and suspicion.

I appreciate the fact that in many cases demands have been made for refinements and improvements which, while in themselves reasonable, were far in advance of the financial ability of the companies and therefore unreasonable. In all such instances, my opinion is that a frank statement to the public and the lawmakers of the exact financial conditions will receive just consideration and that the old method of blind opposition and intrigue was a mistake.

These are but a few of the many causes which have combined to bring about a relation between the public and the companies serving the public which we all deplore, and which we all earnestly desire to improve. How can we do it? That is the question. A great many different things have been suggested. Time permits of a discussion of very few of them this morning.

I am by no means overlooking the first great obligation of every public utility company to give the very best service possible. That is the one reason for the existence of the business. I am assuming that this paramount duty has been recognized and met. Argument here is not necessary along that line.

FEASIBLE CO-OPERATION BY PUBLIC UTILITIES

In the first place, I think the public service corporations should all get together. In all matters which have to do with relations between the corporations and the public there should be the fullest and most cordial co-operation. We have a common cause. The electric railway, in the very nature of things, when it adopts a policy which pleases the public, helps the telephone company operating in the same territory, and when the telephone company offends the public, and thereby injures its own public relations, it also injures the public relations of the street railway company. The public

^{*}Abstract of paper presented at mid-year meeting of American Electric Railway Association, Washington, D. C., Jan. 29, 1915.

does not clearly discriminate between the different public service corporations, but in its attitude almost invariably puts them all in the same class.

I do not feel that the public service corporations have been well enough acquainted with each other in the past, and I think it is high time we all recognize a common danger, a common purpose and a common interest. I am glad to say that recently a common danger brought about a joint consideration of the mutual use of outside plant facilities rather than the continuation of building up of conflicting and duplicate transmission lines, and a remarkable result has been obtained in decreasing the number of accidents to employees and to the public.

We are all interested in the orders and decisions of the various public service commissions throughout the country. In many of such orders and decisions the underlying principles apply equally to the various types of public service corporations, and there should be a full and frank discussion between the corporations in regard to all cases and complaints in which such mutual interests exist. Of course, a public service corporation is often in grave doubt because of conflicting rulings of various commissions, state and national. By working together, in my opinion, the corporations can do much to eliminate many of the uncertainties arising from the multiplicity of regulating bodies.

We are all mutually interested in the effort which is now being made to induce the government to enter realms of business heretofore occupied by private interests. The attitude of the corporation which I have the honor to represent is not to oppose violently any such proposition, as we recognize the supreme right of the American people to make the decision as to what the government shall do or shall not do; but we do think it our duty to advise the public as to what is involved in such a decision.

PUBLICITY AND THE FORCE OF PUBLIC OPINION

Many other opportunities for co-operation could be mentioned, but I wish to call your attention to what, in my mind, is the most important method of securing and maintaining proper relations with the public.

I refer to the tenth section of your admirable code of principles, which has been discussed here this morning. Questions will doubtless arise in many minds as to certain policies involved in some sections of the code of principles; but I believe that we will all agree that the time has come for making known to the public freely and frankly everything which the public wishes to know concerning our business.

The one great purpose and end of our modern publicity is the formation and control of public opinion. The world to-day is ruled by public opinion. Almost without exception the governments of the world are governed by public opinion. The aggregate of private opinion gives us public opinion, which in nations finds expression in the form of government, the selection of officials and the adoption of codes of manners, morals and laws.

No greater example of the power of publicity to mold public opinion could be drawn from human affairs since the world began than the efforts which the various warring nations in Europe have set forth in the last few months to convince their own people and the rest of the world and God Almighty that their cause was the just and righteous one.

It has been interesting to note, ever since the war started, how anxious the different governments involved have been to convince the people of this country as to the righteousness of the individual national causes. And how has this been attempted? By exactly the

same means employed by the Ivory soap people to convince the American public that Ivory soap is a good thing to buy. Newspaper advertisements, magazine articles, news clips sent to individuals, newspapers devoted exclusively to setting forth one side or the other; all these ordinary forms of publicity are now being employed.

Could there be a more striking example of the use of publicity? All these governments realize, of course, that the die has been cast, the war is on, and after men are through killing and destroying there must be a settlement. The recourse to arms cannot settle everything. In fact, it is probably true that the most the war can do is to force the nations into an attitude where they must get together and arrange for a settlement; where, in short, they must negotiate; they must give and take. And in such a conference justice, right and wrong are carefully weighed and are considered no less than the actual results of campaigns. And so it becomes of paramount importance that the world shall know as fully as possible the reasons for the war and the immediate events leading up to it. No government on earth, no matter how autocratic its head, would dare to enter upon war without first being sure there existed public opinion supporting it.

What is true in governmental affairs, what is so apparent in the publicity campaigns of these great governments, is equally true in business. More and more must we appeal to the people, and the people must answer the appeal and assume the responsibility to a greater extent than ever before in the conduct of business.

In comparatively recent times even political power was considered as a private possession. The doctrine of the divine right of kings recognized no obligation of accountability to the people. We all know what happened to that doctrine; it was swept away by an irresistible flood of public opinion, and public officers now do account to the people.

But our business interests in general have been entirely too slow to appreciate the necessity for publicity and its influence on public opinion, and I believe that fact is responsible for much of the distrust and suspicion which has arisen in the past with respect to business affairs. Many business institutions have doubtless suffered from hostile publicity, from sensationalism. In most of such instances the fault, in my opinion, has been with the secret methods employed and the constant suspicion and danger of misrepresentation.

The crisis has been fast approaching, and it seems to me the only way to avoid disastrous consequences is to seek continually to enlighten the public by various methods of publicity as to just what our business means in all its relations to the public. I do not believe that publicity in any case should be the result of fear, envy or avarice, but the honest urging of intrinsic worth and honest methods born of a real desire to serve.

The idea which has existed for so long a time on both sides of this controversy that the other side is all wrong and that our side is all right must be eliminated. It is a dangerous attitude, and one which stops all progress in arriving at a mutual understanding. As a matter of fact the time has come when there can be few, if any, secrets in a public service corporation. The reports required by the various commissions are searching and should reveal the exact condition of the public service corporation from almost every possible angle.

I recognize, of course, the fact that in many cases the public service corporation finds itself in a most embarrassing position. There is the continual need for new capital, which the public does not adequately understand or realize. The physical property of a public service corporation is not like a building, which requires

a certain amount of money to complete it. A public service corporation never completes its plant. New capital for extensions and improvements is constantly needed. But suppose the company is not making money. Suppose the return upon the investment is inadequate. Where is the new capital coming from? The public will not invest in the securities of a company which has proved to be a losing venture, or which does not earn an adequate rate of return upon the investment, and with such a company there is, of course, a tremendous temptation, when additional capital is required, not to reveal the exact present state of affairs, often with the hope that the new capital will result in better earnings and adequate return. But even in such cases it is better to make the facts known. In fact, in most states the public service commissions require a full statement as to financial condition before the issuance of new capital is allowed.

THE VALUE OF ADVERTISING

I am a firm believer in that form of publicity which we call advertising. But the advertising of a public service corporation must be the embodiment of truth. There was a time not far back when advertising consisted for the most part of blatant and highly-colored statements. It was largely the hawking of goods in the market place. But more recently it has developed into a very fine art with real moral purpose and apt expression.

It is comparatively easy to secure the attention of the public by printing some great, startling piece of news, but to further a great idea with aptness and power requires intellect and art of the highest order. And it seems to me that the time has now come when the public service corporations of our country must face this proposition. Their aims must be honest and true, and their aims must be made known candidly and fully to the public.

I am so impressed with the protective value of publicity that I make bold to say that had the railway interests of this country taken the public fully into confidence much of the railway legislation of the past few years might have been tempered and formulated to consider with more sympathy the interests of the great business of transportation.

RAILWAY REGULATION

Doubtless the doctrine of public control with respect to railways has been pushed beyond proper limits. The railway managers have been content to allow the politician and the radical to cry out against them, in many instances solely for political purposes. One of the surest ways of perpetuating a man in office in recent years has been to bait the railways. I believe now that the railways have learned the lesson and are willing to give the fullest publicity to all their affairs, and that the effect of publicity so given will result in a betterment of their condition. As an evidence of this attitude on the part of the railways you all remember that only a few weeks ago the President of the United States was requested by the railroads to publish broadcast throughout the country his ideas of what was due this great business of transportation—a stroke of publicity which seems to have marked the turning point of the attitude of the general public with respect to the railways.

There may be, there doubtless is, grave danger that this doctrine of public control may be pushed beyond proper limits. The pendulum may swing too far in that direction; but let us hope not. Initiative must not be chased from the industrial field. Capital must not be frightened into hiding. The leaders in business will not work out the great problems of production, dis-

tribution and communication without definite hopes of reward. To much control would soon lead to socialism, or something worse.

It is doubtless true that in the past the great leaders of corporations did not possess a proper feeling of accountability to the public they were serving. But are we not also in danger of going to such an extent in the direction of state and federal regulation that the commissions will feel their accountability to the radical politicians, rather than to the public and private interests which they are presumed impartially to serve? I sincerely hope this may not prove true. I really do not believe it will prove true; in fact, I believe that the great majority of men serving on our public service commissions are earnestly striving to do the right thing, both by the public and by the corporations.

SECURITY HOLDERS AND EMPLOYEES

The public service corporations have a great audience to address in their own security holders. It has been estimated that a million or more of voters own securities of public service corporations. These investors are always listening for announcements concerning the affairs of the corporations. But in order to reach and influence such a scattered clientele, the corporations must at all times be right in their statements and in a position to make known their innermost affairs.

In my opinion, it is incumbent upon public service corporations to confide absolutely in their employees the true conditions relating to the operation and financial conditions of their companies. If you will look into this question I think you will be surprised when you find out how little your employees really know about the business in which, with you, they are engaged. Every employee should be close to the balance sheet. A man connected with one of our telephone companies has been doing some excellent work right along this line. He has gone out into the country and given talks and illustrated lectures before meetings of our employees, and he has tried to make clear to them by examples which they would easily understand just what the company is doing. In one of his illustrations he compared the investment of the telephone company for which they were working with an investment of \$1,000 in the chicken business. He then assumed that the revenue on this investment of \$1,000 would be in the same proportion as was the gross revenue of the telephone company upon its investment and that the expenses of operation would be in the same proportion in both, and when he got down to the net revenue applicable to dividends, the men were greatly surprised to understand that the net result of the investment of \$1,000 in the chicken business was a profit of slightly more than \$60 for the year.

Our employees should know just what the company is doing, so that they may realize the result of their own endeavors and be in a position to discuss intelligently statements which are continually made to them by patrons who are not fully informed.

I wish I could adequately express the importance of the attitude of every employee in his contact with the public. He can enhance the value of your means of publicity many times each day and, likewise, he can destroy that value. And this applies to every employee. There should be no specialization in this effort. From the president of the corporation down to the humblest employee the constant endeavor should be to reflect a sincere desire to serve and to please; and the attainment of the desired result is so difficult that it is absolutely impossible unless the desire to serve and please is an honest, sincere desire. No mere lip service nor mere civility will answer. A great governing policy which

all understand and in which all have been carefully trained must really exist.

Many of our companies are carrying on an extensive campaign of education by means of lectures, often illustrated with stereopticon views. We have found in many places that the children in the public schools are eager to know all about our affairs, and we are, of course, glad to tell them. We have had recourse to the moving picture films, showing various operations connected with our business, and these films have been received with enthusiasm all over the country.

OTHER CONSIDERATIONS

There should be nothing to conceal in the business of any public service corporation. It should be a legitimate enterprise, conducted under the sanction of the nation's laws; and if there is some policy or practice in the affairs of a public service corporation which the officials hesitate to make known to the public, the best thing those officials can do is to abandon that policy and give up that practice. I firmly believe that until we reach the time when we are willing to do just those two things we shall not be successful in acquiring proper relations with the public, nor in the handling of our business as a whole. No utility can ignore the rights of the public as to service or information without great injury to its own affairs, and also to the affairs of other public utilities. In our relations to the public we do not and cannot stand alone. In such experience as I have had I am glad to say I have found the American public is generally inclined to fair play, and if the public can be made to understand the problems which public service corporations are continually called upon to solve, the great factors in fostering hostility, the factors of ignorance, of suspicion are eliminated.

Another thing we should do is to make it known that we are not adverse to the local ownership of our securities. If the people of a community believe that a great amount of money is being made by the public service corporations, a good way to dispel the idea that a corporation is making too much money is to offer the securities of that corporation to local investors. You may be sure, before the investor puts up his money, he will investigate carefully the financial returns of the corporation, and if the returns are good and there is profit in holding the securities so much the better.

There is an idea prevalent in this country that these public service corporations belong to the very rich and that their ownership is controlled by a comparatively small coterie of men. This is not true. The securities are widely disseminated throughout the length and breadth of the land. We have something like 60,000 stockholders, the majority of whom are women, and I dare say many of your companies are similarly owned. The savings banks, the insurance companies, trust funds, large and small, are heavy owners in the securities of public service corporations, and these facts should be made known to the public.

This is an enormous business in which we are interested, but mere size, bigness is not a crime. Size breaks no law, human or divine. Our country is large. Our government departments are large. Our business institutions which cater to the needs and well-being of this great people are necessarily large. If we furnish service to this great country, if we cover the territory, we cannot escape size, even if it were a good thing to do.

In Europe there is a great clash of arms between warring nations, nations with different languages, with different ideals, with different rulers. In America we are at peace, with one language, one set of ideals, one ruler—the Public. And I firmly believe that the public service corporations have had much to do with the beneficial conditions under which we live and that had

Europe been settled at a time when public utilities were developing and if those utilities had kept pace with settlement or had gone ahead of settlement and development as they did in this country, there would have been a homogeneous country in Europe.

The people of this country ride on railways, steam and electric, about 31,000,000 times every day; they talk together over the telephone about 50,000,000 times every day; and so long as there is this tremendous intermingling of the people made possible by transportation and this universal interchange of ideas by the people made possible by intercommunication, so long, I believe, we shall continue to be a homogeneous people. We should be proud, we who are connected with public utilities, because in truth and in fact we have made a community of this continent.

Mr. Mortimer on Electric Railway Finances

A written discussion on electric railway finances by J. D. Mortimer, president North American Company, was read at the mid-year meeting of the American Electric Railway Association at Washington yesterday as part of the discussion on Senator Weeks' paper on that subject.

He said that the dangers of government participation in business activities were certainly not less than those referred to by Senator Weeks. He also mentioned tax extravagance as a fault common to practically all of the divisions of our government. The electric railway business is beginning to experience the effects of increased taxes, which effects, when augmented by other burdens imposed under the guise of governmental authority, have brought electric railway development to a standstill and harmed the character of electric railway investment.

Mr. Mortimer emphasized the fact that in the long run the public pays in the price of a ride. Legislators, by the imposition of special tax burdens, may apparently change the incidence of such taxation, but eventually it will rest on the street railway patrons. Taxes thus often fall upon those least able to pay, while the citizens upon whom the tax should properly fall, escape this burden. An instance like this, but more indirect in its effect, is that of the federal income tax. This tax in the electric railway industry is imposed on both the corporation and the income derived from securities. It directly affects the cost of production through the normal tax on the corporation and indirectly increases the cost of production through the normal and super-tax on the income of individual investors, by raising the cost of capital. The securities issued by a corporation owning a regulated monopoly might properly be freed from the income tax if the lowest costs of production are to be obtained. Were such the case, the annual cost of money for regulated public utilities would be lowered and tend to approach the interest yield on municipal and state bonds now free from income tax.

As regards the Federal Reserve System, Mr. Mortimer felt that it would not have any material influence on public utilities, different from that which it exerted on all other classes of business. If it resulted in a reduction in interest rates for long time investments, it would prove beneficial to public utilities and other enterprises. If it resulted in an inflation of currency as some have alleged, it would in time affect electric railways differently. During times of inflation, the value of money decreases when compared with the value of articles of commerce. In such event, the price of an electric railway ride would remain at, say, 5 cents, in accordance with franchise requirements and custom, while the cost of all things making up electric railway operating costs would necessarily increase.

Fireproof Carhouse at Vancouver, B. C.

A Reinforced Concrete, Sprinklered Carhouse Two Stories High, with Indirect Heating from Oil Fuel for Working Quarters and Direct Steam for Trainmen's and Other Rooms

Work is being completed on the construction of a carhouse for the British Columbia Electric Railway at Vancouver, B. C. The estimated cost of the structure is \$350,000.

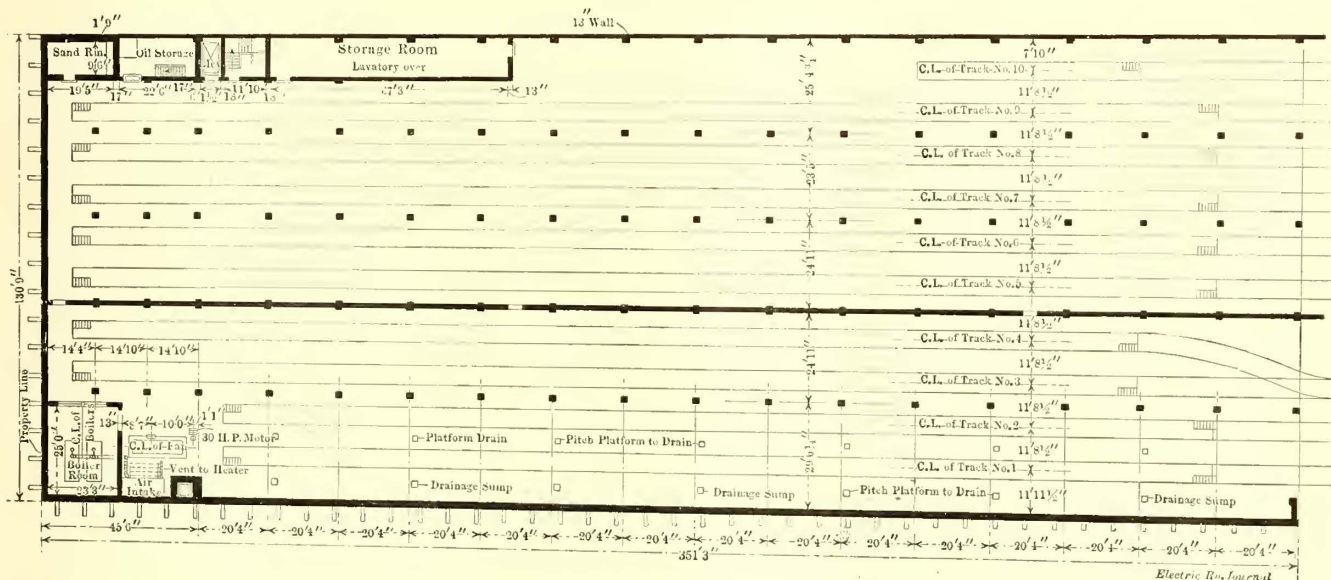
Some years ago the company purchased an entire city block in the Mount Pleasant district with the idea of utilizing the block for carhouse purposes. The block fronts on Main Street, one of the principal car line streets in the district, and extends to Quebec Street, the other boundary streets being Thirteenth and Fourteenth Avenues. Several years ago the company erected on the north half of the block two carhouses of galvanized iron construction, capable of housing sixty cars.

The new building is on the south end of this block and adjoins the old structure. It is two stories high on Main Street and one story high on Quebec Street, the difference in grade between the two streets making

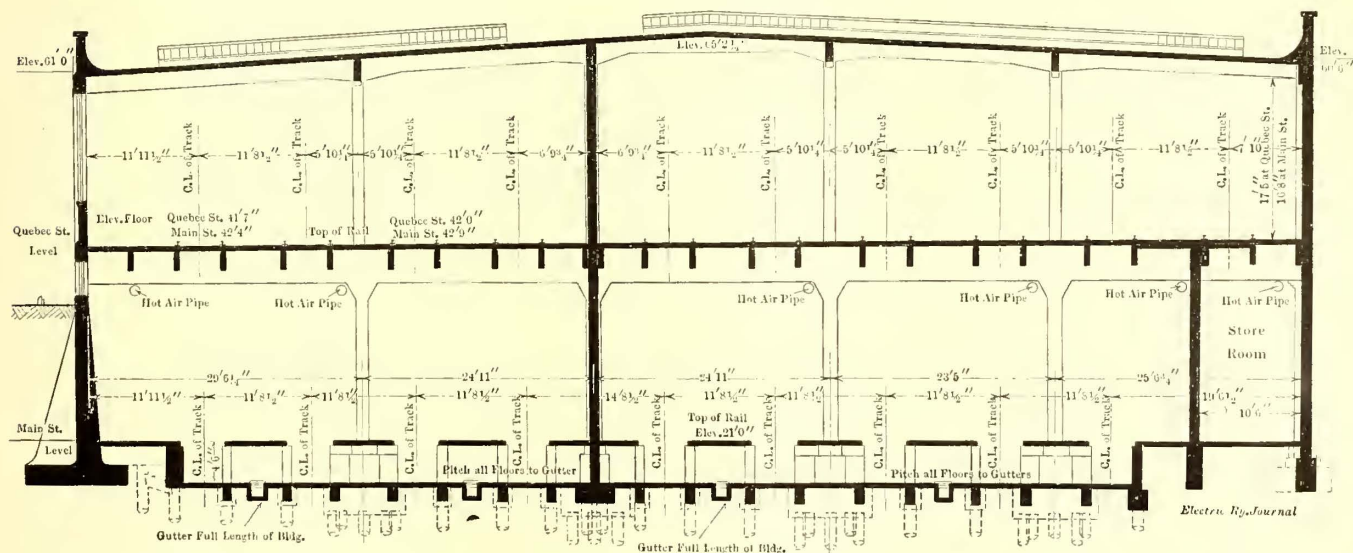
this plan possible. The dimensions are about 350 ft. x 130 ft., the height of each story being approximately 20 ft. On the ground floor the entire area is available for the housing of cars, the ten tracks making provision for sixty-two cars. The Quebec Street frontage of the second story is placed 45 ft. back from the street line, thus giving a floor area of 302 ft. x 130 ft., sufficient to accommodate fifty-eight cars. This makes the total capacity of the new building 120 cars. The total capacity of all structures on the block is 180 cars.

CONSTRUCTION

The block naturally lies low, and after investigation of the soil the engineers decided that a pile foundation was advisable for the new building. The average length of the piles driven is 20 ft. The building is so designed that the entire load is carried on the piles, no allowance



VANCOUVER CARHOUSE—FIRST FLOOR PLAN, SHOWING TRACK LAYOUT, LOCATION OF INDIRECT HEATING PLANT AND THE UTILITY ROOMS



VANCOUVER CARHOUSE—CROSS-SECTION, SHOWING TWO-FLOOR CONSTRUCTION, OPEN PITS AND INDIRECT HEATING

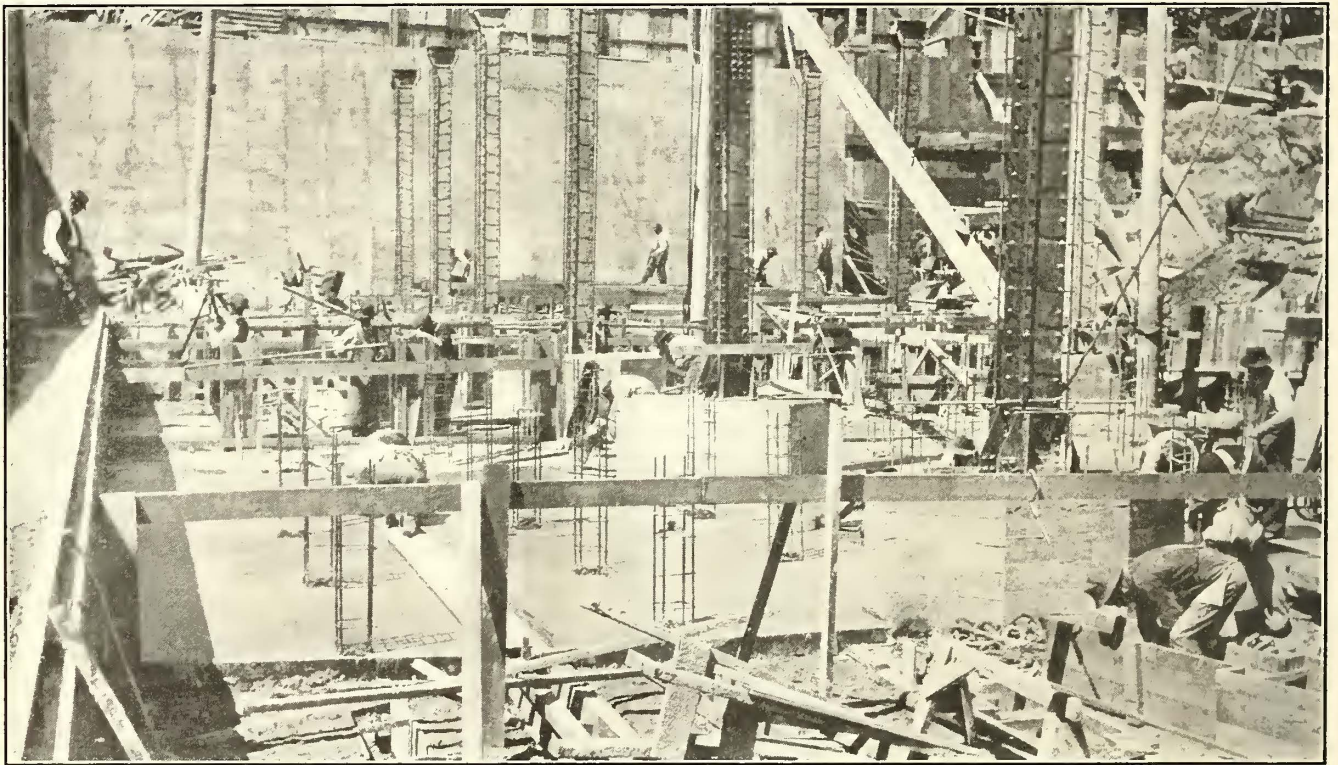
being made for any carriage by the soil. The general type of construction throughout the entire building is reinforced concrete skeleton, with the exception of the columns between the first and second floors where steel is used to save floor space. The building is finished with 13-in. brick walls on the outside. In these walls are fixed steel sash glazed with $\frac{1}{4}$ -in. wired glass and chain-operated steel doors of the rolling type. Practically all the tracks on the first floor are provided with inspection pits.

The floor consists of 5-in. reinforced concrete slabs between the rails, these being supported on 12-in. square concrete piers, placed at about 7 ft. centers, extending from the pit floor. The pit floor is $4\frac{1}{2}$ ft. below the level of the carhouse floor and is formed of 6-in. concrete with piles under each of the track pedestals and building columns. The floor is graded to drain into four channels 10 in. wide, which run the whole length of the building and are covered with iron gratings.

through ducts running through the building by a 130-in. fan. For the rooms set apart for the use of house employees and car men a direct steam heating system is employed. In accordance with the requirements of the fire underwriters a steel tower carrying a water tank with a capacity of 35,000 gal. was installed above the second story. This is connected with a sprinkler system which provides 2450 roof and aisle sprinkler heads throughout the building. Both floors are divided into two sections by a 13-in. brick fire wall.

One track on each floor is arranged for the washing and painting of cars. On the lower floor provision is made for a room for sand drying and the storage of oil. On this floor also is located a shop for carrying out minor repair jobs, a freight elevator 5 ft. x 8 ft. in size connecting the shop with the second floor.

The cars enter the first floor direct from Main Street. The company has also constructed a track from Main Street along Thirteenth Avenue and Quebec Street



VANCOUVER CARHOUSE—FIRST FLOOR OF BUILDING DURING THE CONSTRUCTION PERIOD AND BEFORE INSTALLATION OF PITS

The second floor will be used merely for storage purposes, no provision being made for inspection pits, etc. It includes 5-in. reinforced concrete slab construction, with reinforced concrete girders 8 in. x 24 in. placed under the rails. The second story is supported on concrete-covered steel columns placed between each pair of tracks, the centers varying from 23 ft. 5 in. to 29 ft. 6 $\frac{1}{4}$ in. and the lengthwise spacing being about 20 ft. 4 in. The cross-girders between the columns are 3 ft. 10 in. deep. The roof of the building is 3 $\frac{1}{2}$ -in. reinforced concrete slab, carried on cross concrete beams 18 in. deep. For the construction of the building it was necessary to excavate about 12,000 cu. ft. of earth. The approximate amount of concrete was 5500 cu. yd. and the construction plans called for the use of about 400 tons of steel.

The building is heated by an indirect heating system, oil fuel being used. This installation consists of two 70-hp boilers, the heated air being driven

to reach the second-story entrance. The plans provide for the continuation of the façade of the new carhouse along the entire Quebec Street frontage of the block.

The new building is designed to accommodate the cars of the company operating in the eastern section of Vancouver as well as its South Vancouver lines. For the accommodation of its cars operating in the western section of the city the company in 1913 constructed a large carhouse in the Kitsilano district, as described in the *ELECTRIC RAILWAY JOURNAL* for Dec. 27, 1913.

The record of passenger train performances on the steam railroads of the State of New York for the month of September, just issued, shows that during the month the number of trains run was 64,215. Of the number of trains run 81 per cent were on time at the division terminals. The average delay for each late train was 22.7 minutes and the average delay for each train run was 4.3 minutes.

New Haven Operating Results

W. S. Murray, at a Recent Meeting in Philadelphia, Gave Construction and Operating Costs for the Electrified Division of the New Haven Railroad and Discussed the General Principles of Successful Steam Railroad Electrification

Under the title "Conditions Affecting the Success of Main-Line Electrification" William S. Murray, consulting engineer of the New York, New Haven & Hartford Railroad, delivered a paper in Philadelphia on Jan. 20 before a joint meeting of the Franklin Institute and the Philadelphia section of the American Institute of Electrical Engineers. The meeting was held in the Franklin Institute lecture hall, 15 South Seventh Street. The paper was heard by a large audience and was discussed by several prominent steam railroad officials. The full text of the paper will appear in due course in the publications of the two institutes. The following abstract gives in substance some of the most striking statements made by the speaker.

Mr. Murray first outlined the history of main-line electrification development, commenting particularly upon the pause in the demand for electrification, which has permitted a careful study of the subject. He then gave statistics of the New Haven electrification and explained the reasons for the choice of the system used and how it was developed to meet operating conditions. Upon this basis he outlined the principles of successful electrification of steam roads, comparing the electric locomotive with the steam locomotive. He then gave data of actual construction and operating costs of the New Haven electrical equipment, mostly in tabular form. Summing up the results of actual experience with electrifications, he urged in this connection a conservative attitude on the part of the public.

A few years ago a movement was started by the public to require the railroads to electrify, the demand being directed particularly toward roads of large size with regard to their city yards and terminals. This demand was unjust because at that time there was little information available regarding the details of electrification and the financial situation was such that the railroads could not possibly carry the necessary increased financial obligations. The result was that there came a pause in the demand, which gave the railroads an opportunity to learn many things in regard to electrification. To-day there are many places where conditions are such as to insure successful electrification, but the change of motive power might not be warranted because, for roads sufficiently large to consider it, the economies effected would be small in comparison to the existing capital investment. A proper relation must first be established between capital already invested and the return upon it before further charges against capital account are made, no matter how attractive the return on the proposed betterment may be.

SOME FACTS REGARDING THE NEW HAVEN ELECTRIFICATION

During 1913 on the electrified section of the New York, New Haven & Hartford Railroad 2,182,000 electric passenger locomotive-miles were recorded, representing 600,000,000 ton-miles. The route mileage electrified is 73, of which 61 is four-track and 12 is six-track, the total main-line mileage in single-track equivalent being 316. There are 184 miles of yards, sidings and spurs, making a total of 500 miles of single track. One electrified yard contains 35 miles, another 25 miles. The present electric power supply is taken from a single station

at Cos Cob, but it will shortly be supplemented at the east and west ends of the electrified zone. There are 100 passenger, freight and switching electric locomotives and sixty-nine multiple-unit cars, all of which are maintained at one main electrical shop with facilities for inspection at various points. The electrification has cost more than \$15,000,000, although against this should be credited the value of 150 steam locomotives transferred to other parts of the system, the steel bodies of the multiple-unit cars which would have been purchased even had not the electrification been undertaken, and other items of this sort.

The winter time-table now in effect, excluding Sundays, calls for sixty-eight trains per day into Grand Central Terminal, two through trains originating in Harlem River Station, and the same number of trains out of both stations, a total of 140 trains per day. The Harlem River Branch service includes nineteen trains each way per day, except Sundays, between New Rochelle and Harlem River. On the New Canaan Branch sixteen trains are operated each way between Stamford and New Canaan. Additional trains in and out of Grand Central Terminal are operated on Saturdays, and extra trains are also run on the Harlem River Branch on Sundays. Of the seventy through trains per day, thirty-six are electrically operated the entire distance, steam locomotives being used between New Haven and Stamford on the remaining thirty-four trains. Of the 210 daily trains, 114 are handled by electric locomotives, multiple-unit equipment being used on the remaining ninety-six. Forty-eight a.c.-d.c. locomotives are used in passenger service and the multiple-unit equipment at present comprises four a.c. motor cars, twenty-one a.c.-d.c. motor cars, and forty-six trailers. The average number of electric train-miles per day is about 6600, of which 1400 are made by multiple-unit equipment. The passenger locomotives make an average of 6200 miles per day, some of the individual mileages being as high as 450 to 500. The multiple-unit motor cars make an average of 2100 miles per day, the proportion of trailers to motor cars for a.c.-d.c. equipment being two to one, except on the New Canaan Branch, where the proportion is one to one, and on the Harlem River Branch where one-half of the trains have two trailers per motor car, the remaining trains consisting of one motor car and one trailer.

New flash boilers have recently been installed on many of the locomotives to provide for steam heating of through passenger trains between New York and New Haven.

ECONOMICS OF ELECTRIFICATION

After outlining the general principles as above, Mr. Murray took up the underlying conditions of success of main-line electrification from a combined public and railroad standpoint. He stated that success is entirely dependent upon density of traffic. Economy can be secured by electrification in saving in fuel, saving in motive power maintenance and repairs and saving in train-miles. There may be also assets created by electrification through, for example, reclamation of city terminal property after the removal of gas and smoke.

Experience has shown that a pound of coal burned under the boilers of a central electric power station and

transmitted to an electrical engine will develop twice the drawbar pull at the same speed as if burned in the firebox of a steam locomotive. The maintenance and repair costs on electric locomotives of the straight a.c. type are about one-half of those of steam locomotives of equal weight on drivers.

The problem of electrification then depends upon the density of traffic in which these economies can be practiced. If the schedule of train movements for all roads were the same, then, based upon the number of tons translated, it would be a simple matter to plot a chart which would show two intersecting curves, one representing the savings per annum to be effected by the substitution of electricity for steam, and the other the summation of the costs per annum of interest, depreciation, maintenance, insurance and taxes on electric power plants, inclusive of power house, lines, locomotives and shops, necessary to affect these savings. The analysis, however, is not as simple as this, for while a number of roads might translate equal tonnages over equal distances, the local conditions might require a wide variation as to schedule, etc.

ADMINISTRATION IN ELECTRICAL OPERATION

One of the essentially real conditions affecting the success of main-line electrification is administration. Electricity as an agent of power development is essentially different from steam. The electric locomotive is increasing in ruggedness, but it can never be the great mechanical brute that the steam locomotive is to-day. On the other hand, the steam locomotive can never reach into the zones of usefulness which are open to the electric engine.

It is possible to keep the maintenance and repairs of the electric locomotive down to one-half those of the steam locomotive under the most favorable conditions of steam maintenance, and in many cases below this figure. Due, however, to the peculiar nature of the electric engine this can only be done by the most rigorous and careful inspection and conformity to rules of operation. If electric engines be treated as has been the custom of treating steam locomotives, then their repairs instead of costing less will cost far more than those of steam engines. The electric engine, like an overwilling horse will, if permitted, work itself to destruction. The days are passing when the steam operating man points with pride to the electric locomotive as having been able to perform twice the duty for which it was designed and the next day wonders why it "blew up" on half load. Successful electrification, therefore, requires that there be in the administrative forces men trained to the necessity of a different viewpoint from

that which has been developed in eighty years of steam service.

An inheritance by the New Haven Railroad of the old steam locomotive engineers for the operation of their electric engines is a case where the "tail of the dog wags the body." While it is a good argument that these men understand the roadbed and signals better than anyone else, this argument fails when engineers without electrical experience or training can bid in the electric runs, depending upon their seniority and records of service. It is a long time before the steam locomotive engineer divorces himself from the fact that he is not operating a steam locomotive. Electrically-trained men are therefore necessary, and one of the successes of electrification depends upon this feature.

NEW HAVEN OPERATING STATISTICS

Mr. Murray gave a number of tables showing the operating statistics of the electrical equipment. He called attention to the fact that the electrical plant had from its inception been handicapped, both from the construction and the operating point of view. The conditions applying to the New Haven electrification re-

CONDENSED TABLE OF ENERGY DATA

	November		October	
	Total	Per Kw-hr.	Total	Per Kw-hr.
Coal consumed.....	12,439 tons	2.78 lb.	12,281 tons	2.75 lb.
Water consumed (gallons)	38,778,000	4.33	35,835,000	4.01
Cost of coal.....	\$34,084	0.381 cent	\$33,527	0.375 cent
Cost of water.....	\$1,582	0.017 cent	\$5,016	0.057 cent
Cost of other supplies	\$317	0.004 cent	\$656	0.007 cent
Maintenance of power plant and machinery	\$3,655	0.041 cent	\$3,434	0.038 cent
Wages and salaries.....	\$6,057	0.068 cent	\$6,704	0.075 cent
Total cost, maintenance and operation	\$45,695	0.511 cent	\$49,337	0.552 cent
Fixed charges (interest, taxes and insurance)	\$16,107	0.180 cent	\$16,107	0.180 cent
Total cost	\$61,802	0.691 cent	\$65,444	0.732 cent
Energy consumption (kw-hr.)				
Passenger service (electric locomotives)	2,894,465	.....	3,072,145	.....
Passenger service (multiple unit cars)	630,039	.....	499,367	.....
Freight service.....	1,508,306	.....	1,494,052	.....
Switching service.....	984,255	.....	848,613	.....
Non-revenue service.....	10,340	.....	6,191	.....
Total used by electric locomotives and motor cars	6,027,405	.....	5,920,398	.....
Signals	107,465	.....	117,445	.....
Other company purposes	389,652	.....	399,401	.....
Line loss	543,235	.....	617,804	.....
Total used for company purposes	7,067,757	.....	7,055,048	.....
New York, Westchester & Boston Railway	676,144	.....	636,058	.....
Other companies	1,205,699	.....	1,255,139	.....
Total energy used	8,949,600	.....	8,946,245	.....
Maximum daily output	343,300 kw-hr. Tuesday, Nov. 24	.....	316,630 kw-hr. Friday, Oct. 30	.....
Maximum swing.....	30,000 kw Tuesday, Nov. 3	.....	29,800 kw Sunday, Oct. 18	.....
Minimum daily output	249,800 kw-hr.	.....	256,155 kw-hr.	.....
Average daily output	301,902 kw-hr.	.....	288,589 kw-hr.	.....
Energy Purchased from New York Central:				
Energy purchased (kw-hr.)	1,244,021	.....	1,306,017	.....
Cost of power.....	\$16,097.67	.....	\$16,348.47	.....
Cost per kw-hr. (cents)	1.294	.....	1.252	.....
Total Energy consumed (kw-hr.)	10,193,621	.....	10,252,262	.....
Total cost of power (including fixed charges)	\$77,899.87	.....	\$81,792.32	.....
Cost per kw-hr. (cent), including fixed charges.....	0.764	.....	0.798	.....

TABLE OF EQUIPMENT FAILURES

	Classes of Service				Multiple			
	Passenger		Freight		Switch		Multiple	
	Nov.	Oct.	Nov.	Oct.	Nov.	Oct.	Nov.	Oct.
Heated parts.....	1	4	1	2	.....	.....	3	.....
Broken parts.....	2	1	1	2	.....	.....	2	1
Grounds	20	25	3	2	.....	.....	2	.....
Miscellaneous	12	6	.....	1	.....	.....	11	11
Total failures.....	35	36	5	7	.....	.....	18	12
Miles per failure	7,071	7,328	13,183	9,506	40,964	39,624	3,554	4,331
Minutes detention per failure	11	13	56	60	.....	.....	18	7

TABLE OF LINE AND EQUIPMENT FAILURES

	November		October	
	No. of Failures	Total Delay, Min.	No. of Failures	Total Delay, Min.
Type of failure:				
Catenary insulator	3	22	1	14
Dead end	3	.....	1	.....
Other line failures.....	7	61	10	62
Equipment	10	169	7	166
Signal	1	15	1	.....
Outside interference	4	.....	3	.....
Employee	1	.....	.....	.....
Totals	29	267	23	242

quired that its motive power be designed to operate on both alternating and direct current. Further, on account of past inadequate shop facilities, heavy repairs have been necessary throughout the entire electric motive-power equipment since the new shops were completed. Last October the repairs to electric passenger locomotives cost 8.56 cents per locomotive-mile, while for November they were increased to 10.61 cents. This fact is explained by the condition that all of the passenger engines had been undergoing general repairs, and invoices for material were passed in greater amount for November than for October. Many of the electric locomotives had not received a general overhauling since 1907, and during this time some of them have made more than 350,000 miles.

Taking the first ten locomotives of the a.c.-d.c. type to be overhauled, their records show an average cost of less than 5 cents per locomotive-mile. The first one overhauled has now operated 93,140 miles at an average cost of 3.6 cents per locomotive-mile. The general table of passenger engine operating costs (printed herewith) shows a larger cost of maintenance than this and emphasizes the lack of maintenance to which the electric locomotives were subjected in the early days of their operation. Had conditions permitted the electric passenger engines to be of the straight a.c. type, in Mr. Murray's opinion their average maintenance would not have exceeded 4 cents per locomotive-mile.

ton, straight a.c. electric passenger locomotive, capable of handling a 250-ton trailing load in normal, large-city suburban service, should cost \$40,000. A steam locomotive to do the same work would probably cost about \$15,000. For every electric engine purchased the railroad would be justified in making a capital investment of \$40,000 to cover the cost of electric power houses and transmission equipment necessary to supply the electric engine with current.

The costs per mile for six-track catenary construction of the compound type, that is with an auxiliary messenger wire, with 300-ft. spans, are as follows: Tangent track, \$38,760 and curved track from \$43,000 under 1 deg. curvature to \$59,230 up to 4 deg. curvature. The costs for four-track construction are \$25,490, and from \$27,550 to \$40,940 respectively. The corresponding figures for two-track catenary are \$19,190 and \$21,610 to \$24,960, while the cost for two-track construction with curvature greater than 4 deg., requiring a pull-off pole, is \$34,450. The cost for two-track, single catenary is \$13,720, for tangent track and curves up to 2½ deg.; \$15,110 to 3½ deg. and 260 ft. span; \$19,385 up to 4½ deg. with 200 ft. span, and \$28,850 above 4½ deg. with pull-off pole and 200 ft. span.

The total cost of an anchor and sectionalizing bridge including steel, concrete, floor on upper deck of bridge, control apparatus and connections, and sectionalizing are as follows: Compound catenary, six-track, \$14,000;

TABLE OF PASSENGER AND FREIGHT OPERATING COSTS

	Locomotive repairs		Power		Locomotive supplies		Engine house expenses		Enginemen		Trainmen		Total	
	Novem-ber	Octo-ber	Novem-ber	Octo-ber	Novem-ber	Octo-ber	Novem-ber	Octo-ber	Novem-ber	Octo-ber	Novem-ber	Octo-ber	Novem-ber	Octo-ber
Passenger trains hauled by locomotives:														
Cost per train-mile (cents).....	17.15	13.80	19.33	19.89	2.23	1.53	0.57	0.54	8.81	8.37	9.51	9.55	57.60	53.68
Cost per locomotive-mile (cents).....	10.61	8.56	11.96	12.29	1.39	0.95	0.38	0.34	5.41	5.20	5.88	5.91	35.63	33.25
Cost per car-mile (cents).....	2.45	1.93	2.76	2.79	0.32	0.21	0.08	0.08	1.26	1.17	1.36	1.34	8.23	7.52
Multiple unit trains:														
Cost per train-mile (cents).....	15.27	11.83	11.39	11.42	0.24	0.16	0.91	0.78	5.17	5.20	8.84	7.53	41.82	36.92
Cost per motor-car-mile (cents).....	10.51	7.98	7.84	7.70	0.17	0.11	0.62	0.53	3.56	3.51	6.08	5.08	28.78	24.91
Cost per car-mile (cents).....	4.32	3.12	3.22	3.01	0.07	0.04	0.25	0.21	1.46	1.37	2.52	1.98	11.84	9.73
Freight trains hauled by locomotives:														
Cost per train-mile (cents).....	15.51	15.98	28.51	27.90	0.54	0.63	0.48	0.58	10.66	10.44	17.83	17.46	73.53	72.99
Cost per locomotive-mile (cents).....	9.69	10.19	17.82	17.79	0.34	0.40	0.30	0.37	6.67	6.66	11.14	11.13	45.96	46.54
Cost per 1000-ton-mile (cents).....	9.95	10.16	18.30	17.73	0.35	0.40	0.31	0.37	6.84	6.63	11.45	11.09	47.20	46.38

Mr. Murray gave statistics of electric energy consumption in the different classes of service as follows, the values for eastbound service being given first in each case: New Haven express trains, 31.4 watt-hours per ton-mile, 32; Stamford express, 34.2, 40.3; Stamford local, 59, 63.7; Port Chester trains, 66.7, 77.3; New Rochelle trains, 90.2 (westbound not given). The average for eastbound passenger trains was 42.2 watt-hours per ton-mile and for westbound trains, 47.4. The average values for freight trains were: eastbound, 32.8, westbound, 33. The differences in the "power rate" constants for passenger service are due to the relative numbers of stops per mile. In the freight service allowance for the weight of the electric engine reduces the rate to 26 watt-hours per ton-mile, and it may be said that 30 watt-hours is a reliable figure to cover electric freight operation on level track in a combination of fast and slow service.

CONSTRUCTION COSTS

Mr. Murray gave detailed construction costs of the different features of the New Haven electrification. He stated that the cost of electric locomotives of approximately 100 tons weight will, under present conditions of costs of labor and materials, vary between 18 cents and 20 cents per pound. This figure is practically irrespective of speed torque characteristics, a high-speed passenger locomotive and a low-speed switcher not varying greatly in cost upon a pound basis. Multiple-unit cars, now usually built of steel, do not vary greatly from these figures, but, if anything, would be slightly higher in cost per pound. A first-class, high-speed, 100-

four-track, \$9,730; two-track, \$6,660, and for single catenary, four-track, \$9,020; two-track, \$6,120.

CONCLUSIONS

In conclusion Mr. Murray made a plea for a conservative point of view on the part of the public with respect to electrification. While the savings to be effected under certain conditions of electrification may be considerable, on the other hand the construction investment necessary for these savings may be very great. Only a healthy condition of finance throughout the country will warrant the consideration of electrification. Partial electrification, such as that applying to yards only and no main lines, might prove a serious and unfair burden for a railroad to carry. The electrification of great railroad terminals in particular presents conditions in which the maximum cost is combined with a minimum direct return upon the invested capital, and without some reasonable assurance of adequate return it will be more difficult to secure the necessary capital for such improvements.

A meeting is to be held in Pittsburgh in the near future by committees from New York, Pennsylvania and Ohio to co-operate in the establishment of standard rules and laws governing safety and sanitation. The idea is said to have originated with the Industrial Commission of Ohio in its efforts to reduce the number of accidents in industrial plants, but the co-operative effort of the three states is due in a large measure to suggestions of large manufacturing concerns which have plants in all three states.

Proceedings of the Wisconsin Electrical Association

One-Man Car Operation as Successfully Introduced into a Town of 20,000 Population After Approval by the Local Public, Public Utility Financing Under Legislative Restrictions, the Cost of Workmen's Compensation Insurance in Wisconsin With Results in Improved Safety Conditions, and Other Topics of Interest Were Discussed at this Convention

The seventh annual convention of the Wisconsin Electrical Association and the fourteenth annual convention of the Wisconsin Gas Association were held jointly at Milwaukee on Jan. 20 to 22 inclusive. President Korst, in his annual address, stated that during the past year public utilities in the state of Wisconsin had not been seriously affected by the general business depression.

In his paper on "Financing of Public Utility Properties" Andrew Cooke said that extensions to Wisconsin utility properties were stagnated, paralyzed and helplessly crippled by unwise legislation and commission rulings. Money cannot be obtained for extending utility services if the commission and the courts allow a return of only 7 per cent upon the investment. The channels of investment open to municipal bonds are closed to utility bonds bearing the same rate of return because of the greater risk incurred in the purchase of utility securities. Mr. Cooke suggested a campaign of publicity to change public sentiment in favor of better rates of return for Wisconsin utilities. The discussion of the paper by Edwin Gruhl, assistant to the president, Watertown Gas & Electric Company, Watertown, Wis., entitled "Increased Taxation in Wisconsin and Its Effect on Public Service Companies" brought out the fact that some of the public utilities were paying as much as 10 per cent of their gross revenue in taxes. A paper by Carl Muskat on "Practical Effect of the Workmen's Compensation Act" was also presented and briefly discussed. Abstracts of the papers by Messrs. Gruhl and Muskat are presented on page 234.

In the discussion following R. M. Howard's paper on "One-Man Electric Car Operation in a Small City," abstracted on page 233, F. W. Walker, general manager, Milwaukee Northern Railway, Cedarburg, inquired regarding the safety of operating one-man cars over steam railroad crossings. He stated that his company had a test case in the State Supreme Court in which a street railway company was endeavoring to force the distribution of the cost of protection and crossing installation. He requested that until this case was decided all street and electric railway companies in the State of Wisconsin refuse to pay the entire cost of crossing installations voluntarily, so as not to embarrass his company's contention in the court.

Mr. Walker added that his attorneys had made a very careful study of the Wisconsin law and that in presenting their case they questioned whether any of the cost of installation belonged to the electric road occupying the street. The basis for this contention was on the fact that the extraordinary danger was created by the steam road on the private right-of-way, the operation of street cars and interurban cars on city streets was nothing more nor less than a form of conveyance which rightfully belonged there. Mr. Walker also stated that a decision in this case would determine the power to divide the expense as affected by past contracts. His legal advisors were of the opinion that, since these crossing contracts affect rates, they came under the jurisdiction of the railroad commission and could be an-

nulled in making rate adjustments. In these test cases Mr. Walker stated that his company was endeavoring to clarify the crossing situation for future investors in electric railway projects, and to force a cost distribution where both his road and the steam road occupied private right-of-way.

Another point which was brought out in Mr. Walker's discussion of railroad crossings was that, where safety devices were necessary, it had been the custom to place the derails in the electric line to be operated either by the motorman or from a tower, while the steam road tracks were not equipped with similar protective devices. Since the steam road produced the hazard, Mr. Walker contended that there was nothing in the law to prevent electric lines from forcing the steam roads also to provide protection at the electric crossing. The derail on the electric line only served as a protection for the steam road cars against the electric, when it was just as important that the electric cars be similarly protected against high-speed steam trains.

In response to an inquiry by a delegate Mr. Howard stated that the steam railroad crossings on his property were located where traffic was light, and that he permitted his cars to run closer to the actual track crossing than has been the custom heretofore. He also stated that he had found that steam roads would permit their flagmen to flag street cars over a crossing, if the electric line would pay a portion of the cost. Mr. Howard advised that since he had installed the one-man cars on his road he had ceased selling tickets on the cars.

The paper by Professor D. W. Mead, of the University of Wisconsin, entitled "Latent Water Powers and Difficulties of Development Under the New Wisconsin Water-Power Law" was discussed by M. C. Ewing, general manager of the Wausau Street Railroad, Wausau, Wis. He emphasized the fact that the Wisconsin State laws governing the construction and operation of hydro-electric power plants had worked a great hardship on both the public and the owners. He stated that under the existing act it was absolutely impossible to obtain money to develop water powers. Other papers of interest to electric railways presented and briefly discussed included "Practical Suggestions for Increasing the Efficiency of Small Steam-Electric Power Plants," by W. F. Lathrop.

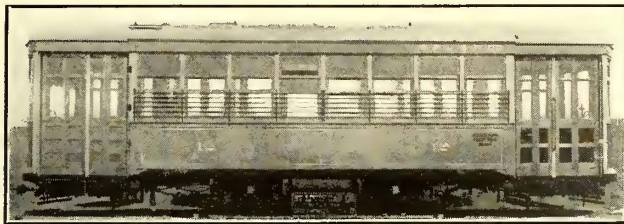
Immediately following the close of the regular program the following officers were elected: President, M. C. Ewing, treasurer and general manager Wausau Street Railroad, Wausau, Wis.; first vice-president, W. E. Haseltine, secretary and treasurer Ripon Light & Water Company, Ripon, Wis.; second vice-president, B. F. Lyons, vice-president and general manager Beloit Water, Gas & Electric Company, Beloit, Wis.; third vice-president, A. E. Peirce, general manager Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., and secretary and treasurer, George Allison, comptroller Clement C. Smith properties, who was re-elected to office.

EXPERIENCE WITH THE ONE-MAN ELECTRIC CAR IN A SMALL CITY

BY R. M. HOWARD, GENERAL MANAGER MINNESOTA DIVISION, WISCONSIN RAILWAY, LIGHT & POWER COMPANY, WINONA, MINN.

The operation of the Winona Railway from its electrification in 1891 to 1911 did not yield sufficient revenue to take care even of the operating expenses. In August, 1911, the property changed hands, and as the result of a number of improvements the gross earnings increased more than 40 per cent with only a temporary rise in operating expenses. The service was then as good as could be reasonably expected in a town of 20,000. Careful study showed that no further opportunities for important reductions in operating expense were available except by the adoption of one-man near-side cars.

The company realized, however, that the co-operation of both the public and employees would be necessary before such a system could be introduced successfully. The matter of buying one-man cars was therefore laid before the local City Council and commercial association, and the economies to be effected were frankly admitted. Photographs of the proposed cars and a description of their equipment and operation were submitted, upon which the proposition of the company was approved and it was urged to go ahead. An order



WINONA ONE-MAN CAR—VIEW OF CAR

was then placed with the St. Louis Car Company for four new cars and for door-operating mechanisms to equip the old cars retained for one-man service. In all, eight cars are now operated on regular schedule.

The new cars are of double-end type, 34 ft. 10½ in. over the bumpers, with 6-ft. 3-in. vestibules and an opening 5 ft. wide at the entrance and exit sides. They have steel underframes, steel sides and arch roof, are mounted on St. Louis No. 46 trucks of 8-ft. wheelbase, and are heated with Smith No. 3 hot-air heaters. The controller and brake staff are mounted to the left of the usual location to place the motorman out of the way of entering passengers. The register cord is also located to permit the motorman to ring up fares without moving from his operating position. The entrance and exit vestibule steps of folding type are operated from levers placed between the controller and brake rigging. The electrical equipment consists of two GE-54 motors with K-10 controllers. The old cars measure 29 ft. over all, but have vestibules only 4 ft. 6 in. long with entrance and exit door openings of 26 in. These cars were remodelled for the one-man operation, including the addition of push-buttons and the removal of the bulkhead doors.

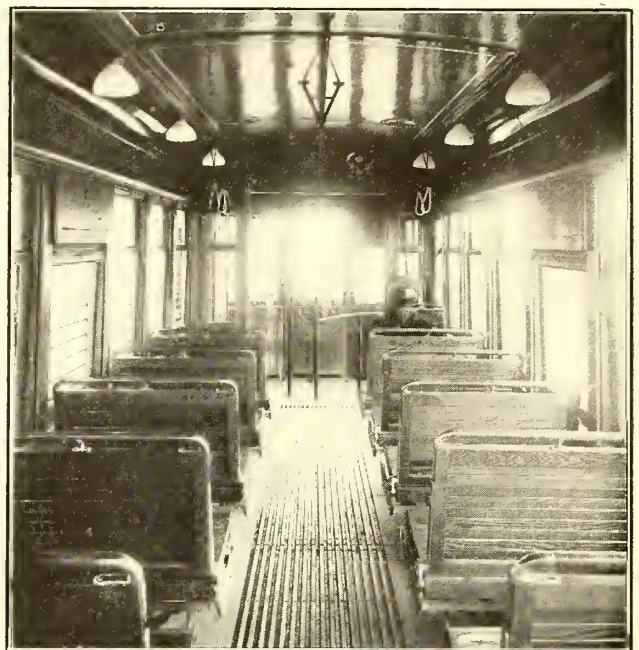
For ten days prior to inaugurating the new system the company displayed in the daily papers and also distributed on the cars in dodger form an advertisement which explained the reason for the adoption of the new system, including a frank statement that the earnings did not justify new two-man equipment. Each trainman also received typewritten instructions covering the operation of the new cars, including the registration of fares, issuance of transfers, etc. Fares must be paid be-

fore the passengers enter the car, but transfers are issued to passengers as they leave the car.

One-man operation began on May 3, 1914. As the public was well informed regarding the change, the new system went into operation without a hitch. No difficulty has arisen in maintaining the average schedule of 9 m.p.h., but if loops for turning cars at the ends, air brakes and air-operated doors were used an operator could doubtless make faster schedules if traffic conditions so demanded.

PERFORMANCE WITH ONE-MAN CARS

After one and a half months the company saw what one-man cars could do for heavy traffic. The earnings on July 15, 1914, were the largest in its history, exceeding the previous record by 90 per cent. The average earnings for that day were 41 cents per car-mile, the largest number of fares on a single trip 126 and the turn-in from one man, \$70.50. Operation on this day was a little slow because all fares had to be collected before the cars were started, but not a step accident oc-



WINONA ONE-MAN CAR—INTERIOR VIEW

curred. In any event such heavy days form too small a percentage of the yearly operating period to offset the expense of conductors. Railroad crossings are flagged by the motorman in the usual manner, but the saving in the wages of conductors would warrant the maintenance of flagmen on one or two crossings if local conditions made this necessary.

ADVANTAGES AND SAVINGS.

The operation of both the new and remodeled cars has produced the usual operating advantages of eliminating step accidents, because the doors are not opened or closed while the car is in motion; of avoiding arguments regarding payment of fare and of easier checking by inspectors because fares are registered as passengers enter. Further the one-man system has greatly decreased the extra list. The percentage of trainmen's wages has also decreased from 29 per cent to 19 per cent of the gross revenue, so that an increase in wages would not affect so materially the ratio of operating expenses to gross income. The apparent discrepancy in the percentages quoted is explained by the fact that the conductors did not work to the end of the line but turned back at the last switches. Hence their hours did not equal those of the motormen.

The total expense of rebuilding old cars and purchasing new cars was \$11,893.55. During the first seven months' operation a saving of \$3,549.02 was effected. On the basis of equal mileage for the corresponding period of 1913 and 1914, the difference in the ratio of operating expenses, insurance and taxes to gross earnings is 10.52 per cent in favor of one-man operation. If the two-man system had been retained the net earnings would have been 38.67 per cent less. The savings effected during the first twenty-six months will amortize the entire investment. Only the investment in car bodies and trucks has been considered in the amortization statement because a company which operates old motors can amortize the investment for new motors by applying the saving in motor maintenance cost to the purchase of new motors.

The company's experience has led it to the conclusion that it would be a mistake to remodel small short platform cars and attempt to put the one-man system into operation with such equipment only. At least part of the equipment should be modern with long platforms especially designed for one-man prepayment operation. When all is said and done, the public is the final arbiter and the question is too important to risk the chance of failure due to the lack of proper equipment. If platforms are long enough and the motorman attentive and courteous, the system is bound to be satisfactory from every standpoint. Few street railways can afford to spend anything more than is absolutely necessary, and the one-man car will often place the balance on the right side of the ledger.

INCREASED TAXATION IN WISCONSIN AND ITS EFFECT UPON PUBLIC SERVICE COMPANIES

BY EDWIN GRUHL, ASSISTANT TO THE PRESIDENT, WATERTOWN GAS AND ELECTRIC COMPANY, WATERTOWN, WIS.

The increases in taxes of public service corporations during the last few years have been proportionately greater than the general increase in taxes. The increases have, moreover, far exceeded the rate of growth of the business, whether measured in terms of new capital or in terms of gross or net earnings.

The summarized reports of the several utilities to the Railroad Commission show that during the period 1910 to 1914 taxes paid by gas utilities increased 44.72 per cent as compared with an increase in operating revenues of 24.79 per cent and an increase in gross income before deducting taxes of 14.97 per cent. Where in 1910 gas companies paid 6.07 per cent of their operating revenues in taxes this ratio has increased steadily to 7.04 per cent of their operating revenues for the fiscal year 1914. The percentage of taxes to gross income before deducting taxes shows a similar increase from 21.26 per cent to 26.76 per cent. An examination of the returns of all electric utilities to the Railroad Commission discloses the same tendency to increase. Where during this five year period operating revenues increased 80.33 per cent and gross income before deducting taxes increased 35.83 per cent, taxes paid increased 112.74 per cent. Where electric utilities in 1910 paid 4.45 per cent of their operating revenues as taxes this ratio increased to 5.25 per cent in 1914, while the proportion of gross income available for taxes and return upon the investment which has been paid in taxes increased from 10.17 per cent to 15.92 per cent. Electric railway operating revenues during the five years increased 19.30 per cent, and gross income available for taxes and return upon the investment decreased 10.37 per cent, while taxes continued to increase 15.82 per cent.

Much of the reason for increased assessment of pub-

lic service corporations rests on the theory that the intangible values of such corporations are peculiar in themselves and are entitled to special classifications and special treatment. These intangibles are frequently referred to in statutes as "rights," "privileges," "franchises" or "corporate excess." Before the advent of commission regulation there was greater reason why unregulated monopolies should be taxed in excess of the amounts contributed by competitive businesses or other classes of property, but such taxes are not levied upon the theory that they were a proper and fair contribution of the corporation to the conduct of government but as a compulsory form of profit-sharing.

While these general descriptive titles may have had their use in the past as a justification for placing larger tax burdens upon public service corporations, the conditions justifying their use have largely disappeared. Under regulation both the commission and the public are demanding that service should be furnished at cost to the utility plus a fair return upon the investment, and in Wisconsin more than in any other state the element of cost has been the controlling factor in the regulation of rates of service. Special taxes, whether in the form of large assessed valuations attributed to franchises or as other public burdens, merely increase the cost and are ultimately shifted upon the customer. It is a mistaken notion, prevalent in many quarters, that this is merely taking money from one pocket to put it in another.

Were even a part of the \$1,315,000 contributed by gas companies in taxes last year, the \$2,642,000 contributed by electric companies and the \$2,412,000 contributed by traction companies applied to finance additional miles of gas mains, electric lines and new tracks, there would be less of criticism that there has been no expansion of the utility business in Wisconsin. Considering that taxes paid in 1914 amount on an average to 7 cents of the cost of gas per 1000 cu. ft. to $\frac{1}{2}$ cent on the cost of electrical energy, to \$4 on the annual cost of an arc lamp, and to nearly $\frac{1}{2}$ cent on the cost of carrying a passenger, it is very apparent that the imposition of such indirect taxes has a far-reaching effect upon the average customer's use of the service.

WISCONSIN'S COMPENSATION LAW

BY CARL MUSKAT, MILWAUKEE

Mr. Muskat first mentioned the wide adoption of compensation acts and quoted a large number of judicial opinions concerning their constitutionality and justness. The present Wisconsin act now covers about 250,000 employees and about 600 employers. He noted that public service corporations, unlike others, could not pass the cost of compensation on to the ultimate consumer because they are permitted to charge only a fixed rate for their product.

As to the actual cost of compensation, Mr. Muskat said that the Wisconsin law had already been amended by increasing the maximum payment for permanent total disability to six times the average annual earnings instead of four times. The aggregate compensation payable in Wisconsin also exceeds that of twenty of the twenty-three states with such acts. In Oregon the entire cost does not fall upon the employer. The latter deducts 0.5 per cent of the employee's monthly earnings, not less, however, than 25 cents per month, and himself contributes six times this amount. The state itself contributes one-half of the amount paid by both classes. Compared with this practice and the similar one of Germany, the Wisconsin schedule was certainly very liberal to the employee and should not be increased.

According to the reports of the Wisconsin Industrial

Commission the cost of compensation to the employer, if he carries his own insurance or is insured in a mutual company, is hardly, if at all, greater than under the old common law liability. Like the commission, Mr. Muskat had found that those who insured in the so-called bureau or conference rate of the old-line companies paid much more than those who were self-insured. In any event, he had learned from inquiries directed to some seventy-five industries that the cost of compensation under the new law was greater than under common-law liability regardless of the character of insurance. Thus The Milwaukee Electric Railway & Light Company, which employs 3000 to 4000 men, found an increase of 90 per cent when comparing the averages of the three-year periods just before and after the compensation act became effective. This company carries its own risk at about 94 cents per \$100 of payroll, whereas the old-line rate is \$4.41 per \$100 of payroll for urban street railway workers, \$7.28 for electric light and power workers and \$14.57 for interurban railway workers. In spite of various adjustments, the old-line rates still appeared to be too high. For example, in 1913 two-thirds of the premiums collected by the bureau insurance companies were used for expenses and profits, only one-third going for indemnities and medical aid. To-day the rates of the bureau companies are six times the cost of self-insurance. Mr. Muskat also pointed out several inconsistencies in the rates of the bureau which placed Wisconsin employers at a disadvantage when compared with other states. The Industrial Commission had determined that if the New York rates were adequate the Wisconsin rates of the bureau should be reduced by at least 40 per cent; and if the Massachusetts rates were adequate, the Wisconsin rates should be reduced at least 35 per cent. The commission had further stated that if the old-line companies would not grant equitable rates, mutual insurance or state insurance would have to solve the problem. A further remedy, Mr. Muskat said, is suggested by the decision of the United States Supreme Court in the case of the German Alliance Insurance Company vs. Kansas 233 U. S. 389, wherein it is held that the State has the constitutional power to pass laws regulating and fixing insurance rates the same as the rate of the railroad and other public utilities.

EFFECT OF THE SAFETY MOVEMENT

Referring to the effect of safety education and equipment Mr. Muskat said that the Industrial Commission had reported that one-third of the reduction in accidents had been accomplished by means of safety devices while two-thirds had been accomplished by the education, inspection and co-operation of the workmen. The commission had shown commendable zeal and ability especially in organizing a volunteer committee of experts from laboring, employing and municipal bodies to organize safety committees, suggest safety equipment and distribute safety literature. As a result some companies had decreased their accidents as much as 70 per cent. One of the most useful bulletins issued by the committee was one on shop lighting. In one plant improved lighting had increased the output more than 10 per cent, and this better lighting also promoted safer operation.

In conclusion Mr. Muskat made the following points:

The Wisconsin commission has administered the law fairly and efficiently and has done much to promote co-

operation between employer and employee, but it is undoubtedly true that the commission desires to obtain a favorable reception of the law and will not report and publish facts that tend to bring the law into disrepute, since it seeks to establish the law as a permanent institution.

Compensation has been certain, prompt and reasonable, if not liberal.

The cost of compensation is greater under the act than it was under the common-law system. In this respect the law has placed a greater burden upon the employer than heretofore.

Because of the abolition of all defenses, it is cheaper to come in under the law than remain outside. The employee in the aggregate has been benefited.

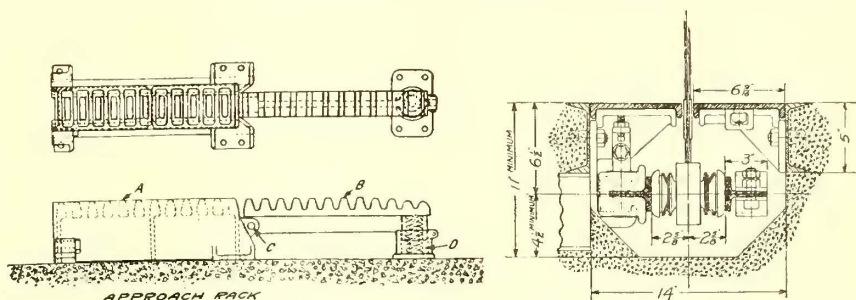
There should be no increase in the amount of compensation.

Experience will demonstrate what changes are needed in the present law.

Electric Towing at Panama

Vessels Prohibited from Using Own Power to Pass Through Locks—Rack-Rail Locomotives Used for Propulsion

When the various plans proposed for the construction of a canal across the Isthmus of Panama were under consideration, the possibility of a grave disaster caused by a great ocean steamship breaking through the gates of an upper lock and plunging down through those below made it evident that vessels should not be passed through the locks under their own power. The various systems in vogue in dry docks, generally, are based on the principle that the operator sees the result of his

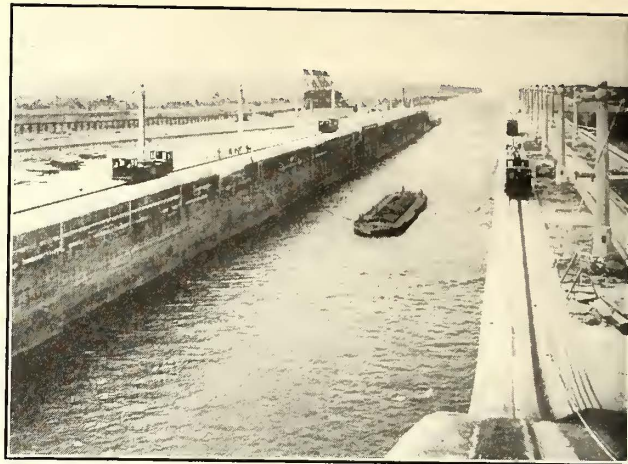
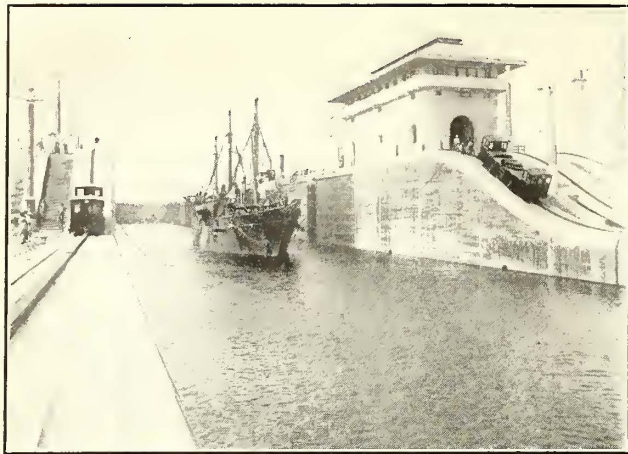


ELECTRIC TOWING AT PANAMA—RACK-RAIL APPROACH AND CROSS-SECTION OF CONTACT RAILS AND PLOW

action, and the employment of winches, or capstans, has been looked upon with a great deal of favor. These do not, however, possess the flexibility and reliability required for the operation of the locks of the Panama Canal, neither can they eliminate the breaking of the lines at critical moments. This is regarded as one of the essential requirements in the successful handling of ships in canal locks, and, in consequence, a towing system with electric locomotives was adopted.

A vessel that passes through the Panama Canal from the Atlantic to the Pacific enters the approach channel in Limon Bay, which extends to Gatun, a distance of about 7 miles. At Gatun it enters a series of three locks in flight and is raised 85 ft. to the level of Gatun Lake. It may then steam at full speed through the channel in this lake, for a distance of 24 miles, to Bas Obispo, where it enters the Culebra Cut, which has a length of 9 miles. At Pedro Miguel it enters a lock and is lowered 30 ft., and then passes through Miraflores Lake for a distance of 1½ miles until it reaches Miraflores, where it will be lowered 55 ft. through two locks, to the sea level, finally passing out into the Pacific through an 8½-mile channel.

In all of the locks there are two ship channels, one for traffic in each direction. The channels are sepa-



ELECTRIC TOWING AT PANAMA—LOCOMOTIVES IN OPERATION

rated by a center wall. There are two systems of tracks, one for towing and the other for the return of idle locomotives. The towing tracks are naturally placed next to the channel side, and the system of towing utilizes normally not less than four locomotives running along the lock walls. Two of them are opposite each other in advance of the vessel, and two run opposite each other behind it. The number of locomotives is, however, increased when the tonnage of the ship demands it.

Cables extending from the locomotives connect with the bow and quarters of the vessel, the lengths of the four cables being adjusted by a special winding drum on each locomotive so as to place the vessel substantially in mid-channel. The leading locomotives tow the vessel, followed by the trailing locomotives, which keep all the cables taut, guide the vessel and stop it when necessary. Therefore, the vessel is always under complete control quite independent of its own power, and the danger of injury to the lock walls and gates is very greatly lessened.

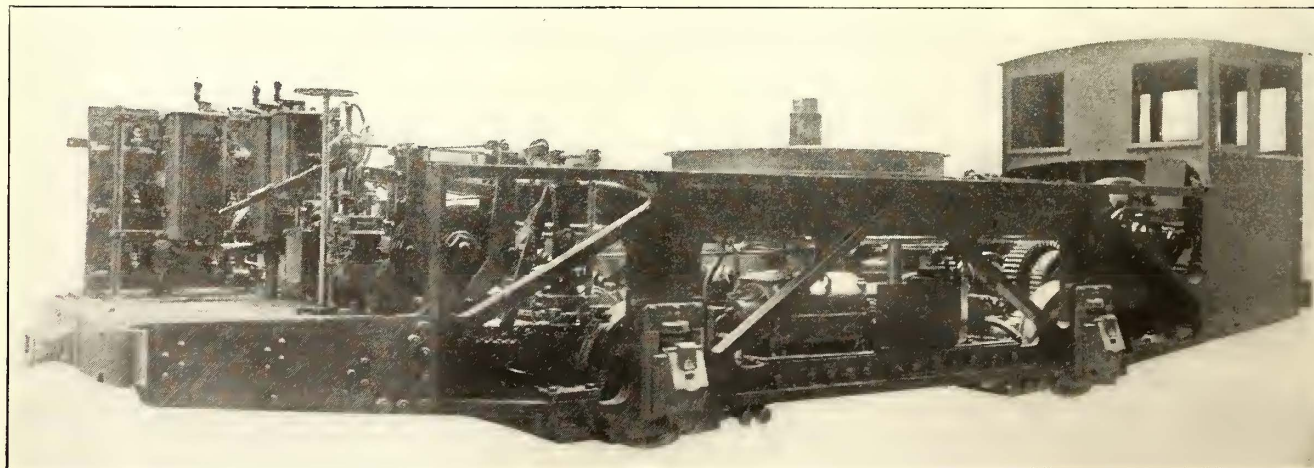
The towing tracks have a specially designed rack-rail extending the entire length of the track and located centrally with respect to the running rails. Through this the locomotive exerts the traction necessary for propelling large ships and climbing the steep inclines, but when running light the traction motors are disconnected from the gear by means of a clutch and drive the locomotive through the axles and wheels.

A rack-rail is also provided on short portions of the return track so as to lower the locomotives safely from one level to the next, the steepest slope being 26 deg. or 44 per cent. The rack-rail is of the shrouded type, and

each tooth space has a drain hole cast in the bottom so as to carry off water and other accumulations to suitable drain pipes or ducts set in the concrete of the walls. A further feature of the rack-rail is the projecting edges, which permit thrust wheels attached to the locomotive to run along the under side and prevent overturning of the locomotive in case some unforeseen operating condition should produce an excessive pull on the towline. These thrust wheels serve to counteract the lateral component of the towline pull and the flanges act for emergency only, as the weight of the locomotive is sufficient to prevent overturning with a normal pull of 25,000 lb. on the towline.

Three-phase, twenty-five-cycle, 220-volt alternating current is used for operating the locomotives, and this is supplied through an underground contact system. The collecting device is adjacent to the running rail on the side remote from the lock. It has T-rails which form two legs of the three-phase circuit, the third leg being formed by the main track rails. A specially designed contact plow slides between the two T-rails and transmits the current to the locomotive, to which it is flexibly connected.

The locomotives, which were described in the *ELECTRIC RAILWAY JOURNAL* for April 11, 1914, are equipped each with two 75-hp slip ring induction motors. Each of these, with all its gearing and clutches, is mounted upon the wheels independent of the frame of the locomotive, to which it is connected only by the springs. In connection with each motor a powerful brake is installed; and, as the motors are at all times geared either to the axles or to the cog wheels, the truck wheels are not provided with any brake rigging. The brake



ELECTRIC TOWING AT PANAMA—VIEW OF LOCOMOTIVE WITH CAB AND SIDE HOUSING REMOVED

is operated through a solenoid which is in circuit with the controller of the motors, so that when the current is turned on to energize the motor windings the solenoid will lift its core and thereby release the brakes. The first point of the controller raises the brakes without applying power to the motors, thereby providing a coasting point. But should the motor current be shut off, either intentionally or accidentally, the core will instantly drop by gravity, and its weight will exert a heavy pressure upon the brake levers to stop the motor and the locomotive.

During the first three months of commercial operation of the Canal, from Aug. 15 to Nov. 15, the cargo towed through the locks by the locomotives amounted to 1,079,521 tons. During the fiscal year ending June 30, 1914, the Panama Railroad had carried 643,178 tons of through freight between the two seaboard, and in the preceding fiscal year 594,040 tons. From this it is seen that between six times and seven times as much cargo is passing over the Isthmus now as passed over this route when goods were transhipped by rail.

American Wood Preservers' Convention Proceedings

Some Modifications Were Made in Committees' Recommendations as Published Last Week—
New Officers Were Elected

The American Wood Preservers' Association held its eleventh annual convention at the Congress Hotel in Chicago, Jan. 19-21, at which time reports from the numerous standing committees were presented. These were given in abstract in last week's issue. In some instances the recommendations of the committees were modified. In the report of the committee on plant operation, under the topic of the proper amount of zinc-chloride to be injected, the specified minimum was $\frac{1}{2}$ lb. of dry chloride of zinc per cubic foot of timber. This was questioned, and it was stated that the quantity would vary from $\frac{1}{4}$ lb. to $1\frac{1}{4}$ lb. per cubic foot. The amount used should be varied to protect against the most adverse condition, depending both upon the character of the wood and the service it was to perform. This committee report was adopted as information to be considered again by the committee for 1914.

The committee on miscellaneous subjects, which reported on the treatment of red-oak ties, stated that red-oak ties should be air seasoned for at least one year before attempting to treat them, and that it was practically impossible to season a red-oak tie so as to render it dry throughout, but that they may be treated satisfactorily with any standard process. In the report of the committee on specifications for the purchase and preservation of treatable timber the summary of fundamental principles was approved for publication in the manual, but it was decided to eliminate the recommendation that the minimum duration of treatment, except with easily penetrated woods, should be equivalent to one hour for every radial inch on the sticks treated. Another important change in this committee's report included the reduction from 30 per cent to 20 per cent in the amount of refined coal tar that should be used to adulterate creosote. This is the same figure as that which will be adopted by the American Railway Engineering Association at its next annual meeting.

In the discussion on creosote specifications it appeared that the members of the association in closest touch with this situation believe that there is no reason for apprehension on the part of treated-timber users that the shortage in imported creosote is going to compel the use of untreated timber. Another interesting point

brought out was that decayed timber created an additional fire hazard, since it burned more readily than sound timber, the object of this discussion being to present to the wood preservers information which would lead them to consider more thoroughly the application of preserved timber in building construction.

At the closing business session of the convention a committee on constitution and by-laws reported a number of revisions which were made necessary by the rapid growth of the association and which would permit the acceptance of applications of members who were not eligible under the old constitution and by-laws. The following new officers were elected for the ensuing year: President, J. H. Waterman, superintendent of timber preservation C. B. & Q. Railroad, Galesburg, Ill.; first vice-president, H. S. Loud, chief engineer U. S. Wood Preserving Company, New York City; second vice-president, Lowry Smith, superintendent tie plant Northern Pacific Railroad, Brainerd, Minn.; third vice-president, F. D. Beal, superintendent St. Helens Creosoting Company, Portland, Ore., and secretary and treasurer, F. J. Angier, superintendent timber preservation B. & O. Railroad, Baltimore, Md. The next annual meeting of the association will again be held in Chicago.

The Engineering Foundation

As announced in last week's issue the "Engineering Foundation" was inaugurated formally on Jan. 27. This is a fund to be "devoted to the advancement of the engineering arts and sciences in all their branches, to the greatest good of the engineering profession and to the benefit of mankind." The initial gift of \$200,000 to the foundation has been made by Ambrose Swasey, a member of the well-known firm of Warner & Swasey, of Cleveland, Ohio, manufacturers of astronomical instruments, and machine tools. Mr. Swasey has contributed largely to many other enterprises for the public good.

The foundation was accepted by the United Engineering Society, comprising the American Institute of Mining Engineers, the American Society of Mechanical Engineers and the American Institute of Electrical Engineers. The American Society of Civil Engineers has promised co-operation and will have equal representation with each of the other societies on the board of directors. The dedication exercises were well attended and impressive addresses were made by Gano Dunn, Henry S. Pritchett, Ambrose Swasey, Robert W. Hunt and Alexander C. Humphreys. No definite plans for administering the income of the fund have been announced as yet, further than that it is to be used in engineering research.

Increase in Revenue for New York State Railways in 1914

The Public Service Commission of the Second District of New York, in its annual report, states that electric railroads show a substantial increase over 1913 in the matter of net revenue, despite increases in expenses, and the astonishing growth of 66 per cent over 1907. The figures for electric roads do not include freight traffic, as this is insignificant compared to the passenger business of such lines.

Operating revenues increased 6.6 per cent over 1913 and 66.2 per cent over 1907; the increase in expenses was correspondingly 7.2 per cent and 66.3 per cent, and net revenues increased 3.6 per cent during the year. Electric roads in this State paid dividends of \$3,662,433 in 1914 as compared with \$4,298,982 in 1913. But dividends were almost the same as those paid in 1912 and very much larger than for any year previous to that.

COMMUNICATIONS

Calculations of Starting Resistances for Railway Motors

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
EAST PITTSBURGH, PA., Jan. 25, 1915.

To the Editors:

Recently there appeared in the *ELECTRIC RAILWAY JOURNAL* an interesting article on a graphical method of calculating ohmic values of starting resistors for railway equipment. A general scheme employing a simple graphical method for determining the ohmic value of grid resistors for the proper acceleration of cars and locomotive equipments has long been desired.

If, in designing resistors, it were possible to choose the ideal number of notches for a given equipment and to demand a certain average current for all acceleration with no restrictions as to present standards, weights, etc., the general problem of designing resistors would be comparatively simple. However, there are many features which must be considered in a large percentage of the cases, some of which are as follows:

Motor equipment—Number of motors; motor characteristic curves; nominal, or one-hour rating; continuous rating; total resistance of each motor (including brush resistance); resistance of car wiring. Gear ratio. Diameter of wheels. Total weight of car or locomotive. Line voltage (maximum and average). Class of service—Passenger car; freight car used as hauling locomotive; passenger, freight and switching locomotives. Type of control—Number of running notches, in series, in series-parallel, in parallel; shunt or "K" type; bridging, open-circuit, or "L" types. Lag of torque in motors—Desirability of employing resistor elements which are interchangeable with existing equipment; special features such as very heavy grades, emergency accelerations, method of emergency braking, etc.

As a rule, data on the entire motor equipment, including motor ratings, characteristic curves, wheel diameter, weight of equipment, voltage conditions, class of service and type of control, are all known quantities at the time the starting resistor is designed, and having all of these elements fixed, the problem usually resolves itself into the designing of a resistor suitable for a particular arrangement of control steps and given weight of equipment, and a predetermined motor characteristic.

For a simple case, such as a double equipment of motors for, say, a K-36-J controller, which is arranged for shunt transition with four notches in series and four notches in parallel, it is a comparatively easy matter to lay out the ohmic values of a resistor that will give equal increments of tractive effort per notch, if it is assumed that resistor elements of any convenient ohmic value and current-carrying capacity are available. However, as it is of the utmost importance that all resistors be made up of a predetermined line of standard elements, it is practically always necessary to employ a "cut and try" method before making a commercial application.

Another fact in this connection, which it appears is not generally appreciated, is that the calculation of resistance should be based, not solely on Ohm's law, but should also take into consideration the element of time required for the building up of torque or tractive effort. The tractive effort at any instant is proportional to the product of current and strength of magnetic field in the motors. On the first notch of the controller the current does not immediately reach its maximum value, but lags somewhat because of the counter emf of self-induction.

Furthermore, the motor fields lag somewhat in building up, due to the damping action of the eddy currents produced in the magnetic circuit. Because of this lag of current and field strength the resistance to be used on the first notch should be somewhat less than would be the case if the current and field flux were assumed to reach the final values immediately. Thus the logical procedure in calculating the total external resistance is, first, to find from the motor characteristic curve the value of current required to give the desired tractive effort; second, to calculate the resistance which would give this current according to Ohm's law, and finally to use a total resistance varying from 60 per cent to 90 per cent of this calculated resistance. If the lag in torque, or tractive effort, is not taken into consideration in the calculation of resistors the initial tractive effort may be considerably less than desired.

In addition to the ohmic value an important consideration in the design of resistors is that of capacity. Under the general heading of capacity, two essentials must be considered: first, thermal capacity; second, continuous capacity. As thermal capacity is a function of mass, any attempt to reduce the weight of the active material reduces the capacity for heat absorption, and consequently it is false economy to reduce equipment weights by the use of insufficient capacity.

As the continuous rating of resistors varies with the working temperature and the radiating surface, it is of the utmost importance that the individual elements shall withstand high temperatures and be provided with comparatively large radiating surfaces.

Since the design of railway resistors involves the consideration of numerous variables, it is not at all surprising that we are without simple graphic methods covering the many possible conditions encountered.

KARL A. SIMMON,

Engineer Railway Engineering Department.

NEW YORK STATE RAILWAYS

ROCHESTER, N. Y., Jan. 22, 1915.

To the Editors:

The article by F. Castiglioni, on "Calculations of Starting Resistances for Railway Motors," published in the issue of the *ELECTRIC RAILWAY JOURNAL* for Dec. 26, 1914, is very interesting. The method described is ingenious and should prove of great value in original design work.

It appears to the writer, however, that it is not a method which would be adopted, to any great extent, by superintendents of equipment in checking up cars which are in service. The first thing to do in solving problems of this kind is to calculate the starting current and its limits of variation. Mr. Castiglioni has very lucidly explained the method of doing this.

The investigation from this point can be made by a series of tests. If the current values have been determined and the voltage is known, a simple application of Ohm's law will show the total amount of starting resistance required. When the total resistance for an existing equipment has been checked and corrected, if it is found necessary to do so, the next step is to determine whether the connections are such as to cut out the proper amount of resistance at each point on the controller so as to provide a smooth and uniform acceleration of the car. In this case the number of resistance steps is fixed by the design of the controller installed in the car. By careful feeding of the controller, the incorrect steps can be determined and corrected so as to eliminate the "jerks." This is a quick method which may be classed as "cut and try."

Incorrect resistances, however, often cause a waste of power. The "cut and try" method may not give the values which would prove most efficient as regards

power consumption. In order to make the check complete so as to obtain smooth acceleration and maximum power saving, another practical method presents itself, viz., the use of a graphic ammeter. It is interesting to note, in the letter by John W. Corning published in the issue of your paper for Jan. 9, 1915, a description of the practical application of this instrument in the investigation of resistance problems.

Very often a variation from theoretical values of resistance is made in order to use standard grids and standard combinations. Since current-carrying capacity has to be considered in making up all car resistances, it also affects the combinations so that, in practice, a slight variation from theoretical figures is usually found. The use of the ammeter affords an excellent means of checking current capacity required as well as the proper resistance values.

It is not my intention to criticise the article mentioned in any way, but to point out the difference between the problem as it affects the designer and the operating man. The operating man has the opportunity to solve his problem by practical tests. These tests can be easily and quickly made by him. I believe that in most cases he will prefer to use such methods.

G. M. CAMERON, Master Mechanic.

Baling Waste Paper, Shavings and Excelsior

PITTSBURGH RAILWAYS COMPANY

PITTSBURGH, PA., Jan. 19, 1915.

To the Editors:

The practice of collecting, baling and selling waste paper it seems, from accounts printed in various publications recently, is quite generally recognized as a saving, and many companies are doing it, realizing that, under normal circumstances, it costs less to bale than to burn it, while the proceeds from the sale amount to a considerable sum each year. The fire risk to buildings is considerably reduced; in fact, in most of the larger cities ordinances forbid the burning of paper or anything else within the city limits unless in an incinerator.

It may be of some interest to know that this company has carried the idea a step farther. Our carpenter shops produce a considerable volume of shavings. The practice had been to allow the neighboring grocers, transfer companies and others maintaining stables to come to the shops, load and haul away the daily accumulation free of charge. The shavings are used for horse bedding. It had been impossible for us to handle them in bulk because our stables are at a considerable distance from the shops.

Our balers worked so well with the waste paper that we immediately sought one capable of greater pressure, which is necessary in baling shavings so the bales will withstand repeated handling. We now have a portable baler located conveniently to the planing machine, the shavings being baled and removed from the shops before the end of each day.

The supply is sufficient for bedding all our horses, for which purpose we had previously purchased baled straw at \$16 per ton. In addition we sell at the current market price the excess, which nets an amount sufficient to pay for baling the entire output.

We also have a baler on the receiving floor at the general store, which acts as a waste receptacle, where we bale the excelsior that is found in the boxes of material received. This reduces the fire risk. Baled excelsior is saleable at a price per ton somewhat more than the current price for scrap iron.

The wrappings from our bales of waste, soiled wiping cloths, cement sacks too badly torn, etc., are collected,

baled and sold also. Without the baler the cost of handling such low-grade salvage would be prohibitive. The total net saving is at least \$1,000 per year.

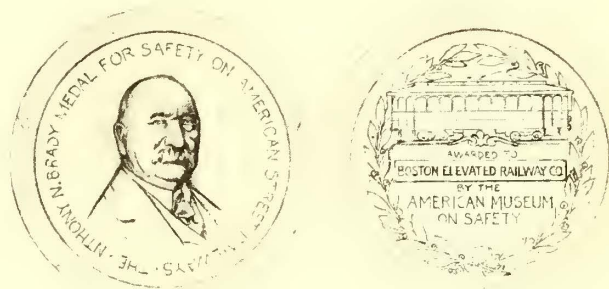
The collection, baling and sale is handled entirely by the stores department, which also handles all scrap copper, iron and other salvage.

B. J. YUNGBLUTH, General Storekeeper.

The Brady Medal Award

At the mid-year meeting of the American Electric Railway Association, Arthur Williams, president of the American Museum of Safety, announced the award of the Anthony N. Brady memorial medals as follows: The gold medal to the Boston Elevated Railway; the replica in silver to Hon. Russell Adams Sears, general attorney of the company, and the replica in bronze to Henry Vinton Neal, a mechanic in the employ of the company. Honorable mention was awarded to the Public Service Railway of New Jersey, and special favorable mention to the Northern Ohio Traction & Light Company.

In connection with the announcement of the awards a special bulletin of the Museum of Safety, giving full information regarding them, was distributed. This contained a brief historical statement of the medals, a copy of the letter transmitting the findings of the award committee, an outline of the terms of the award and the methods used in evaluating the reports, and summaries of the features of the safety work of the three railways affected by the awards.



THE ANTHONY N. BRADY SAFETY MEDAL

The Anthony N. Brady memorial medals were founded about a year ago by the family of the late Mr. Brady for the purpose of stimulating and promoting interest in safety and health in the electric railway industry. The details of administering the awards have been largely in the hands of the American Electric Railway Association, with the active co-operation of Arthur Williams, general inspector New York Edison Company, and Dr. W. H. Tolman, respectively president and director of the American Museum of Safety. The terms of award were specified by a committee consisting of Arthur W. Brady, president Union Traction Company of Indiana, chairman; Frank Hedley, vice-president and general manager Interborough Rapid Transit Company, and C. S. Sergeant, vice-president Boston Elevated Railway. This committee reported through Chairman Brady at the Atlantic City convention in October, 1914, its work, however, having been completed in the spring. The awards were made by a committee appointed by the American Museum of Safety, comprising Bion J. Arnold, chairman, Board of Supervising Engineers Chicago Traction, chairman; Will J. French, industrial accident commissioner, San Francisco, Cal.; James H. McGraw, president McGraw Publishing Company, Inc.; Frank J. Sprague, consulting engineer, and George F. Swain, professor of civil engineering Harvard University.

American Association News

Meeting of Executive Committee in Washington—Sub-Committees Appointed by Committee on Public Relations
—Activity of Various Other Committees—Coming Committee Meeting

AMERICAN ASSOCIATION EXECUTIVE COMMITTEE

The executive committee met in Washington on Jan. 28 with the following in attendance: C. Loomis Allen, Syracuse, N. Y., president; C. L. Henry, Indianapolis, Ind., first vice-president; L. P. Crecelius, Cleveland, Ohio, president Engineering Association; William Tichenor, Indianapolis, Ind., president Claims Association; M. C. Brush, Boston, Mass., president Transportation & Traffic Association; C. S. Sergeant, Boston, Mass., past-president; W. Caryl Ely, Buffalo, N. Y., past-president, and E. B. Burritt, New York, N. Y., secretary.

The secretary reported for the 1915 convention committee, outlining in full the work done up to the present time and stating that an informal conference with such local chairmen of transportation committees as were in Washington would be held the following day, when further plans would be discussed.

The World's Insurance Congress to be held in San Francisco this year was considered and the appointment of a local representative was authorized.

The secretary reported that data sheets calling for information regarding wages had been sent to member companies and that good returns were expected.

The committee voted to increase the circulation of *Aera* among the member companies.

The secretary reported that the following companies had become members since Oct. 1: Berlin & Northern Street Railway Company, Bristol & Plainville Traction Company, Charleston & Dunbar Traction Company, Cleveland & Eastern Traction Company, Port Arthur Traction Company, Slate Belt Street Railway Company, Steubenville & East Liverpool Railway & Light Company, and Steubenville, Wellsburg & Winton Railway Company.

Reports from American Association committees and from the presidents of affiliated associations covering the work of their committees were read. They showed satisfactory progress to date, although in many cases there had not as yet been sufficient time to accomplish much definite work. A large part of the committee work is well under way with sub-committees engaged on their respective assignments. The work of these committees has been covered from week to week on the "Association News" pages of the *ELECTRIC RAILWAY JOURNAL*.

Among the many activities of the committees but a few typical ones can be mentioned. The committee on valuation is collecting data preliminary to outlining a comprehensive plan. The committee appointed to represent the association at the American Road Congress did so and covered its meetings systematically, reporting the proceedings to President Allen. The committee on taxation will conduct a canvass for data and will include a bibliography with this year's report. The committee on relations with state and sectional associations is collecting data and studying the manner in which other associations have handled the matter. The committee on company sections and individual membership is preparing a booklet for general circulation to increase the membership. Each member will endeavor to interest one company in forming a section. The committee on compensation for carrying United States mail has been active in bringing the attention of the congressional committee to the facts and has, with the

co-operation of the bureau of fare research prepared a bill embodying the results of recent studies. The committee on cost of transportation service explained the activities of the above bureau and stated that it will furnish information in convenient form through a series of popular articles. The educational committee explained the operation of the correspondence courses now in actual use with a growing enrollment. The committee on federal relations has kept in touch with the Stevens, Cresser and other bills.

The committees of the Engineering Association have in general assigned detail work to subcommittees which are investigating them. In the case of the committee on equipment this was done by letter, and some subcommittees have already formulated recommendations. The committee on power generation will endeavor to crystallize the work of former committees and writers of papers in the form of recommendations. The committee on standards will study the extent of the use of the association standards and the practice of other associations. The committee on block signals has made considerable progress and is planning a meeting in March to gather together the results of the winter's work.

The Transportation & Traffic Association committee on express and freight traffic is preparing a data sheet covering a wide range of subjects, while that on passenger traffic will also make recommendations on the effect of automobiles on city passenger traffic. The committee on training of transportation employees is studying public service commission rules or city ordinances affecting street railway employment, methods of improving employees' courtesy, and of discipline, and watch inspection methods. The committee on block signals is a joint one with the Engineering Association and is mentioned above.

COMMITTEE ON PUBLIC RELATIONS

A meeting of the committee on public relations of the American Electric Railway Association occurred in New York Jan. 25. It was held at the University Club, where Thomas N. McCarter, chairman of the committee, entertained the members. The members of the committee present, in addition to Mr. McCarter, were C. Loomis Allen, S. M. Curwen, F. R. Ford, James H. McGraw, James D. Mortimer, J. H. Pardee, E. W. Rice, Jr., Guy E. Tripp and T. S. Williams. Others present were J. R. Lilienthal, H. H. Vreeland, T. S. Wheelwright, R. M. Searle, C. C. Peirce, H. C. Clark, H. C. Donecker, E. B. Burritt and H. W. Blake.

Mr. McCarter explained that during the last year the committee had drafted a code of principles which had been indorsed at the October convention and had also suggested a program for publicity, to be conducted by a bureau with a director under the general supervision of the committee on public relations. The program included five general methods of publicity, namely: (1) The dissemination of literature, (2) co-operation with similar committees of other public service associations, (3) lectures on the Chautauqua circuits and elsewhere, (4) preparation of popular articles for publication in magazines and periodicals, and (5) newspaper advertising.

President Allen then said that he had been in consultation with Mr. McCarter on the work which should

be taken up during the coming year and they had come to the conclusion that it would be desirable to give attention to the first three methods mentioned above. These could be taken up this year without great expense to the association if railway men themselves would volunteer to do the work. The final two parts of the program could be postponed until later. This plan met the approval of all. President Allen then moved that three committees of three members each should be appointed by the chairman of the committee to undertake these three lines of work. The motion was carried.

Mr. McCarter, after consultation with President Allen, then announced the appointment of the following committees: For the dissemination of literature, Messrs. Tripp, Rice and Williams; for co-operation with other public service associations, Messrs. Pardee, Ford and Vreeland; for the lectures, Messrs. Mortimer, Brady and McGraw. A committee of ways and means was also appointed, consisting of Messrs. McCarter, Rice, Tripp, Brady and Wheelwright. Harlow C. Clark was appointed director of the bureau.

ENGINEERING ASSOCIATION EQUIPMENT COMMITTEE

A meeting of this committee was held in New York on Jan. 27. Those in attendance were: W. G. Gove, Brooklyn, N. Y., chairman; R. H. Dolgleish, Washington, D. C.; F. W. Garrett, Boston, Mass.; R. N. Hemming, Anderson, Ind., and W. E. Johnson, Brooklyn, N. Y. The outline of work of this committee and the personnel of the sub-committees were printed in the issue of the *ELECTRIC RAILWAY JOURNAL* for Dec. 26, 1914, page 1393. Most of these reported progress on their assignments.

In regard to the present specifications for heat-treated axles it was felt that the title should be revised to cover specifically quenched and tempered materials. The sub-committee is to prepare a tentative revision of the specifications for submission to the association this year. The manner of specifying ductility requirements is left to the sub-committee for recommendation. Certain recommendations of the sub-committee relative to improvements in phraseology in the specifications for tensile and cold-bend test and heat treatment were approved. The sub-committee is to collect data preparatory to suggesting recommended practice on proof tests. On the subject of re-treating it was the sense of the committee that the specification should be made to limit re-treating to three times. Further investigation is also to be made as to the practice of leaving rough-forged collars on axles.

Operating data are to be secured from companies on the results obtained from present grades of gearing with a view to preparing tentative specifications, as recommended practice which can be used in obtaining competitive bids.

A design for a deep M. C. B. journal brass that could be used on present type of journal box to replace the present brass was considered. It was considered desirable to have two designs, one for new equipment in which better advantage could be taken of the deep brass principle and another carrying out the principle as far as possible with present equipment.

Members of the committee are to make trials of the tentative air-brake hose specification by purchasing small quantities of hose under them and also obtaining for trial similar hose with oil-resisting inner tubing. The latter is felt to be desirable, and changes in the specifications to include it may be recommended.

The C. E. R. A. limit-of-wear gage was considered and the sub-committee on this subject will consider its adoption as far as the limit is concerned. The turn-

ing-gage feature, however, was not included as the committee felt that the turning point is governed largely by local conditions. The matter is to be investigated farther.

The design of steel wheels is to be extended to include sizes down to 21 in. Tentative designs have been prepared and the inclusion of a limit-of-wear groove is under consideration.

COMMITTEE ON POWER GENERATION.

A meeting of the Engineering Association committee on power generation was held on Jan. 22 at the Hotel Statler, Cleveland, Ohio. Those present were J. W. Welsh, Pittsburgh, Pa., chairman; L. P. Crecelius, Cleveland, Ohio, president; E. H. Scofield, Minneapolis, Minn.; G. H. Kelsay, Anderson, Ind.; R. J. S. Piggott, New York, N. Y.; W. H. Roberts, Akron, Ohio; A. B. Stitzer, New York, N. Y., and Fay Woodmansee, Chicago, Ill.

The morning session was taken up with a consideration of the reports from the various sub-committees. As a result of the preliminary study which had been given the subjects originally assigned by the executive committee, a number of changes and additions were agreed upon. The principal task before the committee this year is to crystallize the work of former committees. The aim is to secure definite standards and recommended practices for reference to the committee on standards, with the ultimate purpose of publishing them in the "Engineering Manual." In former years the committee work has consisted largely in the presentation of papers without specific recommendations. The committee proposes this year to bring all of the previous work together in the definite form indicated. The afternoon session was taken up with a discussion by the whole committee of each of the sub-committee subjects and in the preparation of an outline covering the method of treatment and principal subdivisions of each subject.

ENGINEERING ASSOCIATION COMMITTEE ON STANDARDS

This committee has now been completed and the personnel is as follows: H. H. Adams, Chicago, Ill., chairman; C. F. Bedwell, Newark, N. J.; C. H. Clark, Cleveland, Ohio; W. G. Gove, Brooklyn, N. Y.; J. H. Hanna, Washington, D. C.; E. R. Hill, New York, N. Y.; E. B. Katté, New York, N. Y.; C. S. Kimball, Washington, D. C.; F. R. Phillips, Pittsburgh, Pa.; A. S. Richey, Worcester, Mass.; W. H. Sawyer, New York, N. Y.; Martin Schreiber, Newark, N. J., and J. W. Welsh, Pittsburgh, Pa.

AMERICAN ASSOCIATION COMMITTEE ON SUBJECTS

This committee met informally on Jan. 28 in Washington to consider the San Francisco program. Those present were: C. L. Henry, Indianapolis, Ind., chairman; M. C. Brush, Boston, Mass.; H. C. Clark, New York, N. Y.; L. P. Crecelius, Cleveland, Ohio, and William Tichenor, Indianapolis, Ind., of the committee, and E. B. Burritt, New York, N. Y., and J. H. Hanna, Washington, D. C. A tentative outline of the program was made covering four topics of general interest which, however, cannot be announced yet as they are subject to modification.

COMING COMMITTEE MEETING

Feb. 11, New York, 10 a. m., standards committee of the Transportation & Traffic Association, L. H. Palmer, Harrison Williams Company, New York, chairman.

Equipment and Its Maintenance

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

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

Rail-Laying Outfit on the Kankakee & Urbana Traction Line

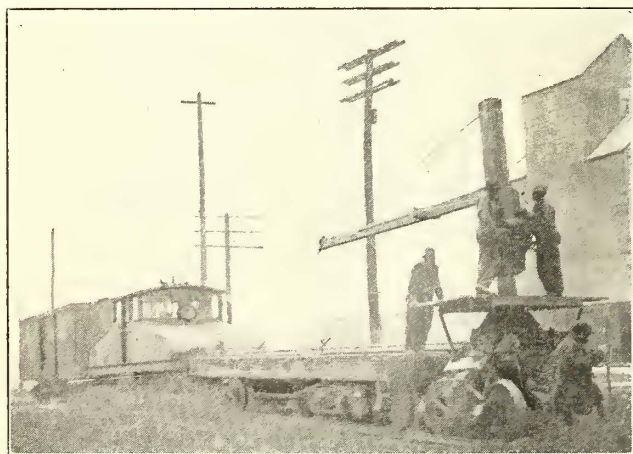
BY T. W. SHELTON, GENERAL SUPERINTENDENT KANKAKEE & URBANA TRACTION COMPANY, KANKAKEE, ILL.

A device for laying rails, which has been invented and built by the writer, consists of an ordinary freight-car truck, on which is mounted a movable crane and jib. This jib extends a length of 20 ft., which permits



SIDE VIEW OF RAIL-HANDLING MACHINE

a 33-ft. rail to be lifted out of an ordinary gondola car, to be swung around and to be laid in place on the ties. A brake on the crab attached to the mast of the crane permits the rail to be lowered at will. The device can be used for loading, unloading or relaying rails and, with four men, will unload one rail per minute or about a carload an hour. The rail-handling machine



RAIL-HANDLING MACHINE AND PART OF SUPPLY TRAIN

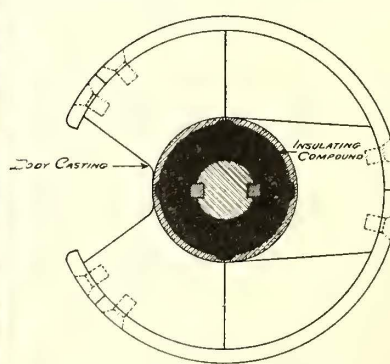
The construction train is composed of the rail-handling device, one loaded rail car, an electric locomotive, a box-car for carrying rail joints, bolts, spikes and all necessary track tools, and one, two or three cars loaded with ties. The accompanying illustrations show the track-laying outfit and part of the train.

The weight of a rail is about 800 lb. which, hanging on the end of a 20-ft. jib, requires a counterweight on the truck of about 5 tons to hold it on the track. This counterweight is obtained by loading the truck with pig iron. The tie-carrying cars are not shown in the views. They are left a short distance back of the train and are unloaded from the cars to wagons, hauled ahead of the track-laying gang and placed on the grade.

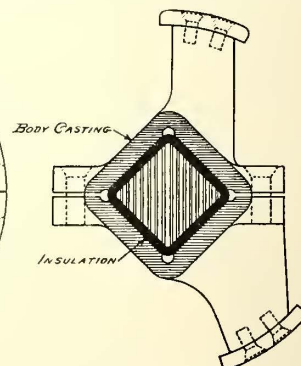
Equipment Defects—Controller Drums, Shafts and Handles—III

BY C. W. SQUIER, E. E.

The general construction of main controller drums consists of body castings of either cast-iron or brass upon which the copper contact segments are fastened with screws. These body castings are insulated from the drum shaft, and the principal differences of drum construction are the result of different methods of insulating these body castings. One of the first constructions used in railway controllers and still generally employed was designed by the General Electric Company and is shown in an accompanying illustration. This makes use of a round shaft with fiber or steel keys, and the body castings are insulated from this by an insulating compound. Bushings of this compound are placed between the shaft and the inside of the body castings,



CONTROLLER DRUM WITH
BODY CASTINGS INSU-
LATED FROM SHAFT BY
INSULATING COMPOUND



CONTROLLER DRUM WITH
BODY CASTINGS
CLAMPED TO A SQUARE
INSULATED SHAFT

is coupled to the rail car in the ordinary way and is readily moved with it.

For laying $\frac{1}{2}$ mile to $\frac{3}{4}$ mile of track a day two men are required at the crab, two men inside the car, one man to handle the line that swings the jib, two bolters, four spikers, two nippers, four end men for placing rail on ties and one foreman, a total of eighteen men. For laying the same amount of track in the old way forty to fifty men were needed. The machine therefore saves the cost of twenty-five to thirty men.

and by applying heat these are softened to form one compact mass.

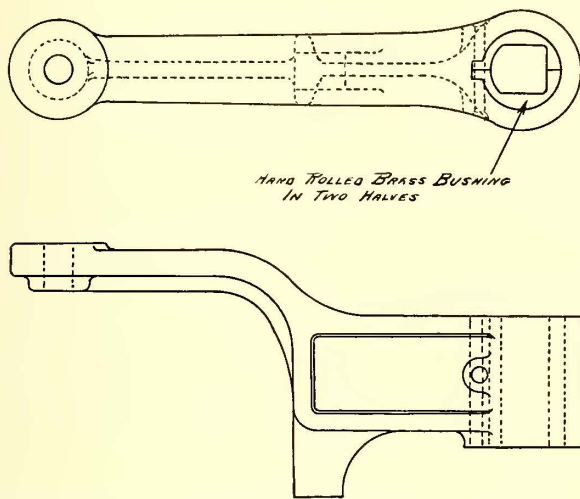
The principal trouble experienced with this form of insulation is due to the loosening of the body castings in the compound or the loosening of the compound from the shaft. The first designs employed but one fiber key in the shaft. These were afterward increased to two and the material was changed to steel to try to overcome the troubles due to loosening. The inside of the body castings was also changed from a smooth surface

to a corrugated surface, and holes were made to give the compound a firmer grip on the castings. These changes were an improvement over the first construction, but controller drums still require insulation due to loose body castings long before the shafts show excessive wear. Other controller manufacturers have used a square shaft where it passes through the body castings and have made the inside of the body castings square also to give the compound a firmer supporting surface. Hard rubber bushings are also used to insulate the body castings from the shaft, and the bottom of the shaft is provided with a steel clamping nut to secure the bushings in place.

Another form of insulation, which was first brought out by the Westinghouse Electric & Manufacturing Company, is shown in a second illustration. This makes use of a square shaft insulated with mica or pressed asbestos, and on this the body castings are clamped. Some trouble was experienced with this type of construction due to the shrinkage of the insulation as it

designs had no provision for renewal of the wearing surfaces. As a result, it was necessary to scrap the handles and shafts when they had worn too far. The first handles were also made with too short a bearing on the shafts, so that their life was correspondingly short. Operating companies have discovered the need for renewable wearing surfaces, with the result that several types of handles have been developed by different makers. An accompanying illustration shows one method of bushing the standard K-6 and K-28 controller handles. The bushing used consists of either hard-rolled brass or phosphor bronze and is made in two parts. After insertion in the handle the bushing is held in place by a small pin. Other designs of handles have called for a babbitted center instead of a bushing, but of the two types the brass bushing gives the better service.

An effort has also been made to provide for renewal of the wearing surface of the shafts. Steel tubing $\frac{1}{8}$ -in. thick drawn to the necessary shape for fitting the



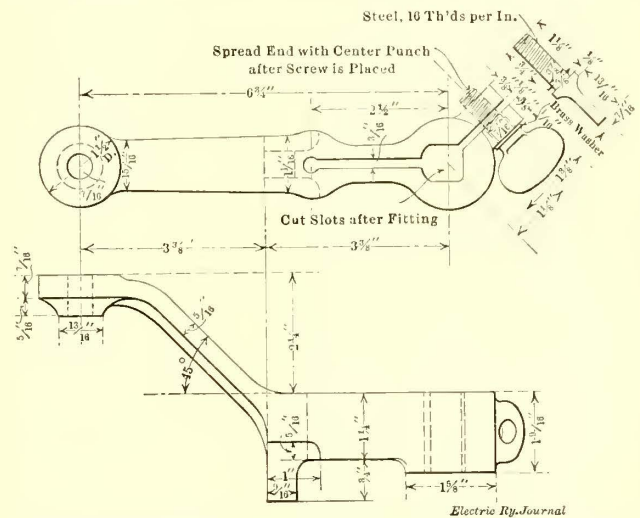
HANDLE FOR K-6 AND K-28 CONTROLLERS WITH RENEWABLE BUSHING

aged, thus permitting the lengthwise shifting of the body castings on the shaft. This trouble was overcome, however, by using spacing bushings between the different body castings. Another advantage of this type of construction is the ease with which body castings can be replaced without the use of special tools or assembling jigs should they become broken or damaged from burning or short-circuits. The labor required to make repairs with this type of construction is very much reduced, and no trouble arises from loose castings if the clamping screws are carefully tightened and prevented from unscrewing by prick-punching the heads.

The General Electric Company has also adopted a similar type of insulation in its recent controllers. This consists of a shaft of hexagonal section wrapped with several thicknesses of thin sheet insulation cemented together. The body castings fit over this insulation and are held in place by steel keys which are the width of one of the hexagonal faces. The body castings are prevented from sliding by set screws which pass through bosses in the castings and bear against the steel keys. This construction permits easy renewal of the body castings and also forms a more rigid connection between the shaft and the castings than the molded compound used with other types of controllers.

CONTROLLER SHAFTS AND HANDLES

The principal troubles experienced with shafts and handles are due to wear between these parts. The first



K-11 CONTROLLER HANDLE FURNISHED WITH CLAMPING SCREW

broached portion of the handles has been developed. This tubing is fitted to the shafts by turning down the worn portion.

Other types of handles have been designed to take up the lost motion caused by worn shafts or wear in the handles themselves. A fourth illustration shows such a handle, for K-11 controllers, which is provided with a clamping screw. The handle is split at the corner of the broached portion, and this can be successfully clamped to a shaft that is quite badly worn. Such a handle is liable to produce excessive wear on the shafts, however, as motormen frequently operate without clamping the handles firmly, and it is the movement of the handle about the shaft that causes wear. This type can be used on shafts that are worn to such an extent that a plain broached handle could not be considered. The principal objection against its use is that if it is not tightly clamped to the shaft nothing is gained, and the fact that the adjustment is left to the motorman permits operation with handles so loose as to be dangerous. There is also no definite means of determining when handles or shafts are worn to such a degree that they should be replaced.

The matter of checking handles and shafts for excessive wear is important but rather difficult to cover satisfactorily. The greatest wear of the handles and shafts occurs at the corners, very little taking place on the sides. Plug or snap gages have not proved satisfactory for condemning handles or excessively worn

shafts. The reason is that handles often wear in such a way that they can be turned through a large arc before producing any movement of the controller drum, and yet a gage only a few thousandths of an inch larger than the broached portion cannot be inserted because the wear at the sides is so small. A better way of checking excessive wear is to provide a test board with shafts of standard dimensions for checking the wear of handles by the arc through which they can be moved. If a handle moves to the condemning limits provided it should be taken out of service. A similar method of checking heavily-worn shafts can be used by trying handles of standard dimensions on them and determining the allowable limits of movement.

Location of Trolley Wire on Curves—V (Concluded)

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

Distance Between Ears on Curves—In building an overhead trolley wire curve the more ears or points of "pull off" there are, the smoother the curve will be. On the other hand, it will be more expensive for construction and maintenance, and the extra overhead wires will be a greater provocation for adverse criticism from an esthetic point of view.

It is the usual practice to allow about 9 ft. as a good practical distance between cars on a curve of 50-ft. radius, giving an external angle of $5\frac{3}{4}$ deg. Some engineers go as low as $3\frac{1}{2}$ deg. on this angle, while others give "from 5 deg. to 8 deg." and "not more than 10 deg." From this 9-ft. standard it can readily be determined how to space the ears on curves of other radii so that the scraping of the sides of the trolley wheels against the wire will be the same on all curves of the system as from this standard spacing on the 50-ft. radius curve.

Referring to Fig. 8, which represents an arc of an imaginary circle between two ears of a trolley curve of 50-ft. radius and 9 ft. between the ears, we have

$$V.S. = R - D = R - \sqrt{R^2 - \left(\frac{c}{2}\right)^2} = 0.203 \text{ ft.} = 2.436 \text{ inches as the allowable versed sine.} \quad (19)$$

Substituting this 0.203 in the formula

$$V.S. = R - \sqrt{R^2 - \left(\frac{c}{2}\right)^2} \text{ we get}$$

$$0.203 = R - \sqrt{R^2 - \left(\frac{c}{2}\right)^2} \text{ or}$$

$$c \text{ (the distance between ears on curves)}$$

$$= \sqrt{1.624R - 0.1648} \quad (20)$$

The constant quantity under the radical—0.1648—is so small that it can be dropped without affecting the result appreciably and we have

$$\text{Distance between ears on a trolley wire curve} = \sqrt{1.624 \text{ radius}} \quad (21)$$

From this formula the table at the top of the next column has been constructed. Similar tables can be constructed in like manner where from local conditions it seems best to use a different external angle than $5\frac{3}{4}$ deg.

The trolley wire is located exactly at the ears, according to the calculations already explained, and is allowed to depart from exactness of location between

DISTANCE BETWEEN EARS ON TROLLEY CURVES WHEN USING TROLLEY WHEELS WITH RIGID HARPS (EXTERNAL ANGLE AT EAR 5 DEG. 44 MIN.)

Radius	Distance Apart	Radius	Distance Apart	Curvature	Radius	Distance Apart
35 ft...	7½ ft.	150 ft...	15½ ft.	5½ deg.	1000 ft...	40 ft.
40 ft...	8 ft.	160 ft...	16 ft.	5 deg.	1042 ft...	41 ft.
45 ft...	8½ ft.	180 ft...	17 ft.	4½ deg.	1146 ft...	43 ft.
50 ft...	9 ft.	200 ft...	18 ft.	4 deg.	1274 ft...	45½ ft.
55 ft...	9½ ft.	250 ft...	20 ft.	3½ deg.	1433 ft...	48 ft.
60 ft...	10 ft.	300 ft...	22 ft.	3 deg.	1637 ft...	51½ ft.
70 ft...	10½ ft.	350 ft...	24 ft.	2½ deg.	1910 ft...	58 ft.
80 ft...	11½ ft.	400 ft...	25½ ft.	2 deg.	2292 ft...	61 ft.
90 ft...	12 ft.	500 ft...	28½ ft.	1½ deg.	2865 ft...	68 ft.
100 ft...	13 ft.	600 ft...	31 ft.	1 deg.	3820 ft...	79 ft.
120 ft...	14 ft.	700 ft...	34 ft.		5730 ft...	96½ ft.
140 ft...	15 ft.	800 ft...	36 ft.			

successive ears because the trolley wire on curve work as on straight line work is found to wear out faster at the ears than between the ears. Therefore, the wire should be favored as much as possible at the ears.

DEGREE OF CURVATURE

Civil engineers, on steam and interurban track location, use the word "degree" in describing curvatures more often than they do the word "radius" and a few words will show their connection.

The word "degree" as used by locating engineers, means a curvature whose angle subtends a chord of 100 ft. *Example:* A 4-deg. curve is a curve, of which 4 deg. at the center of the circle from which the curve can be imagined to have been struck, will cut out of the circumference of this circle an arc whose chord is exactly 100 ft.

The "radius" can be obtained from the "degrees" by several formulas of varying precision, as follows:

I—Radius = $\frac{5730}{D}$ where D = degrees. This is the simplest but is not quite exact.

Example: Radius of a 4-deg. curve = $\frac{5730}{4} = 1432.5$ ft.

II—Radius = $\frac{50}{\sin \frac{D}{2}}$. This one is more accurate.

Example: Radius of a 4-deg. curve = $\frac{50}{\sin 2 \text{ deg.}} = 1432.664$ ft.

III—Radius = $\frac{100 \cos \frac{D}{2}}{\sin D}$. This is most accurate.

Example: Radius of a 4-deg. curve = $\frac{100 \cos 2 \text{ deg.}}{\sin 4 \text{ deg.}} = 1432.611$ ft.

NOTE:—The radius of a 4-deg. curve is usually given as 1433 ft.

A few of these "degrees" and corresponding radii are given in following table.

Curvature	Radius	Curvature	Radius
1 deg.....	5730.0 ft.	11 deg.....	521.7 ft.
2 deg.....	2865.0 ft.	12 deg.....	478.3 ft.
3 deg.....	1910.0 ft.	13 deg.....	441.7 ft.
4 deg.....	1433.0 ft.	14 deg.....	410.3 ft.
5 deg.....	1146.0 ft.	15 deg.....	383.1 ft.
6 deg.....	955.3 ft.	16 deg.....	359.3 ft.
7 deg.....	819.0 ft.	17 deg.....	338.3 ft.
8 deg.....	716.8 ft.	18 deg.....	319.6 ft.
9 deg.....	637.3 ft.	19 deg.....	302.9 ft.
10 deg.....	573.7 ft.	20 deg.....	287.9 ft.

The motorman's gong, mounted as it is under the platform, is not only subject to rust but a perfect catch-all for the soilure of the streets. Under these conditions the sound of the gong soon becomes dull and little better than a click. At the Wolf Street shops of the New York State Railways, Syracuse Lines, such gongs were formerly restored to their original tone only after a good deal of scraping, but it has since been discovered that an ordinary sandblasting outfit is by far the quickest and most effective cleanser.

Handling and Sale of Car Wheels, Rails and Scrap Iron

BY J. P. ALEXANDER

The minimum carload shipments of car wheels, rails and scrap iron on railroads east of the Mississippi River and north of the Ohio River is as follows:

Car wheels (scrap).....	44,800 lb.
Rails (old)	56,000 lb.
Mixed railway scrap.....	44,800 lb.

On the other hand the fully-loaded cars run in the case of scrap:

Car wheels—car loaded is 30 per cent under capacity.
Old rails—car loaded is 10 per cent to 20 per cent under capacity.
Frogs and crossings—car loaded is 40 per cent under capacity.
Mixed railway scrap—car loaded is 30 per cent to 40 per cent under capacity.

Unless a company selling scrap materials has its own scales, it is compelled as a rule to take railroad weights, and it is usually good practice to inquire as to the condition of railroad scales and as to who does the weighing. If possible, have a representative watch the weighing to insure the company against loss through collusion.

The loading of heavy scrap is hard work. Where it is carried on by hand the workmen and foreman should be cautioned and protected against accidents, for the falling of a single heavy piece may produce a permanent cripple for the claim agent to deal with. Overhead or boom cranes or hoists with portable electromagnets should be used if power is available.

Where much loose material is thrown into a car it should go in first, and the heavier material should be placed on top. Then the car is less likely to be robbed in transit, and is more readily unloaded at destination.

It hardly ever pays to sort mixed scrap unless it contains an unusual amount of steel castings or broken parts. Steel axles should always be piled separately, as the advanced price of scrap steel axles would justify their removal from scrap piles, even if the cost ran as high as \$1 per ton of scrap moved.

In shipping to concerns of unquestionable standing, a straight bill of lading could be used, and the material regularly billed on reported weights. It is a good practice and much more satisfactory, however, to sell f.o.b. cars shipping point, and ship on order, bill of lading attached to draft, insuring immediate settlement, and saving any controversy over market changes or delays in transit.

At one time the writer had six cars of rails caught in an embargo declared on iron shipments. The railroad company was told not to accept shipments for a certain mill, after a stated date. The cars loaded and on the way were stopped and sidetracked. It took some time to get the material accepted and delivered at a sacrifice and the demurrage waived. Due time should be specified in sale contracts for loading, transit and possible stoppages, in order that such losses as this cannot occur.

When the management backs up the purchasing agent who sells the scrap by giving the help necessary for rapid loading and shipment according to contract, buyers will subsequently offer better prices, knowing that rapid shipments will be made when promised. This point is often overlooked with consequent loss to sellers.

The most common error in shipments is inversion of figures by the clerks who handle the weights. If the difference in weight reported is divisible by 9, the mistake is usually an inversion, and can be looked for in the car weights reported by the railroad and the original scale weights.

Demurrage rules, except for loading, and unloading time which should be doubled, are not objected to by a shipper if the proper notifications are given, for

it forces the movement of cars and makes the securing of empties much easier, where cars for loading are desired. Flat-bottomed gondolas of 60,000, 80,000 and 100,000 lb. capacity are best for iron shipments and rails. They should be inspected before acceptance for loading, for if discovered in bad condition after loading, the steam railroad may refuse to reload into another car or accept shipment without charge and delay, and material may have to be sacrificed because the terms of delivery of sale are broken by such delay. Gondolas set in for loading should not have drop bottoms, as poorly-maintained bottoms may drop down and cause a wreck, making the shippers partly, or in whole, liable for damages.

In dealing, order bill of lading attached to draft. When distant parties offer particularly good terms for materials, it is a good plan to have in correspondence in the same locality a second or third possible customer who will take the material if the first party refuses it. It is an old trick of iron brokers and some mills to refuse or condemn incoming shipments and try to buy them at lower figures, knowing that the accumulated freight and demurrage and the cost of returning material to starting point is a dead loss to the shipper. Many traction companies have had experiences of this kind that should cause them to hold such cars in their own railroad yards until the drafts are lifted. This insures a small demurrage, perhaps, but not necessarily more than loading cost and switching charge.

The ruled sheet reproduced has been found by the writer to be useful in keeping track of outgoing shipments.

While rails are bought in short tons of 2000 lb., old rails are usually sold in long tons of 2240 lb., called gross tons, the following being average prices (Chicago, Ill.):

	F. o. b. cars shipping point, per gross ton
Old rails	\$11.50
Frogs, switches and guards.....	9.00
Mixed scrap iron	9.00
Old car wheels	10.25
Cast scrap	10.00
Steel scrap	9.00
Malleable scrap	7.50
Car wheels	10.25

The sales agreement recommended by the writer is of the following general form, subject to the "OK" of the legal adviser of the sellers:

CHICAGO, ILL., Dec. 24, 1914.

(Two copies, original and duplicate)

The undersigned hereby agree that party of the first part, the Blank Traction Company (sellers), will sell to the parties of the second part, A. B. C. & Company (buyers), the approximate gross tonnage stated below, in least minimum carloads of clean material, at the prices, f. o. b. cars shipping points named, with the understanding that the buyer is to have an inspector on hand to watch the satisfactory loading and weighing, shipment of car without protest on his part to constitute acceptance of car at weight and classification given by shipper. All shipments to be order bill of lading attached to draft, and railroad weights to be accepted.

Tonnage	Material	Located at	Price per gross ton	To be shipped to
2000 tons	Old rails	Alton, Ill.	\$16.00	Chicago, Ill.
200 tons	Old car wheels	Alton, Ill.	15.00	Chicago, Ill.
1000 tons	Mixed scrap	Alton, Ill.	14.00	Chicago, Ill.

Routing of cars desired, their capacity and kind, to be given on or before.....1915, by the buyer, and shipments to proceed commencing.....1915, cars to be loaded and shipped in accordance with such instructions from the buyer at the rate of at least two days' loading time per car, all shipments to be completed on or before.....1915. Memorandums of shipments and routing to be sent to buyer immediately on shipment, the sellers not to be liable for delays arising from accidents, wrecks or car shortages beyond their control, and affecting loading. Shipper's liability for rapid delivery of material to cease after delivery of shipment to the railroad company.

All payments made by the shipper in settlement for bill of lading without draft to be in cash or equivalent, a memorandum of exact weight and amount being furnished by the seller. Any further details to be agreed upon in writing by signers.

I agree to the above terms:

Buyer.	Seller.
Date.....	Date.....

The accompanying record sheet form will be found useful for inserting weights and amounts, while the dis-

tribution of the credits on the credit sheet shown brings up the fact that the clause of the contract, "any further details to be agreed upon in writing by signers," takes care of allowances to buyers for dirt or reduction in selling price, delays in shipping, etc., where consequent losses ensue. The writer believes that some of the points mentioned may be of interest to those who intend

MEMORANDUM OF CREDITS—SCRAP SALE—1915											
Material	Amts.	Credits Allowed Buyer	Final Amt.	CREDITS					Totals		
				Stock Ac-count	Track No. 2	Shop No. 32	Blank St. Re-con.	Main St. Re-con.			
Wheels....	\$514 99	\$45 52	\$169 47	\$469 47					\$469 47		
Rails....	3257 34		3257 34		\$318 39 *	913 87	\$1120 13	\$934 95	3257 34		
Frogs....	1017 30	35 83	981 47		200 09		781 47		981 47		
R. R. scrap	1223 95				238 29	985 66			1223 95		

* Entire cost of loading.

At such conferences, such questions as the collection, classification and safe storage of all kinds of scrap should be considered and arrangements should be made to prevent the labor cost of rehandling as far as possible in future.

New Cars of the Niagara, St. Catharines & Toronto Railway

The Niagara, St. Catharines & Toronto Railway has recently purchased six 45-ft. pay-as-you-enter cars for city service and six 55-ft. 6-in. semi-steel and wooden cars for interurban service, all from the Preston Car & Coach Company. The following is a description of the interurban cars:

The cars are 55 ft. 6 in. over all, 13 ft. high from the rail to the top of the car and 10 ft. wide over all. The underframing and sides are of solid steel. The exterior painting consists of two colors of steel gray with black trimming. The interior finish of the car is in mission. The seats are high-backed. In three of the cars the up-

SCRAP SALE RECORD, CHICAGO, ILL.—1915 SHIPMENTS COMPLETE—6-7-1915.																				
CARS			Car Initials	Car Numbers	Loaded With	Car Capacity	Car, Light Wt.	Car, Gr. Wt.	Tare	Net Wt.	Gross Tons			Price per Gr. Ton	B L Rec'd	Amt.	Totals	Shipping Point	Destina- tion	Consignee
Set	Loaded	Shipped																		
1915										Reported 6-4				Rec'd						
6-1	6-2	6-3	PRR	62323	Wheels	10,000	48,700	110,800	38,700	72,100	32	187	\$16	00	6-4	\$514	99	Switch at "B" Barn	S. Chicago	A. B. C. Steel Co.
6-2	6-3	6-4	C&NW	147196	Rails	8,000	31,000	96,600	30,800	65,800	29	375	16	00	Rec'd 6-5	470	00	Switch at "C" Barn	S. Chicago	A. B. C. Steel Co.
6-5	6-6	6-7	C&NW	37752	rails	10,000	46,000	133,540	46,040	6-10 87,500	39	162	16	00	Rec'd 6-7	624	99	Switch at "D" Barn	S. Chicago	A. B. C. Steel Co.

shortly to move any old rails or other scrap materials.

The following credit sheet mentioned above has figures chosen at random for illustration purposes only. The bookkeeping or auditing department should have a proposed form submitted to it, in order that such changes can be made as will give the officials of the department every chance to secure all data they might later desire.

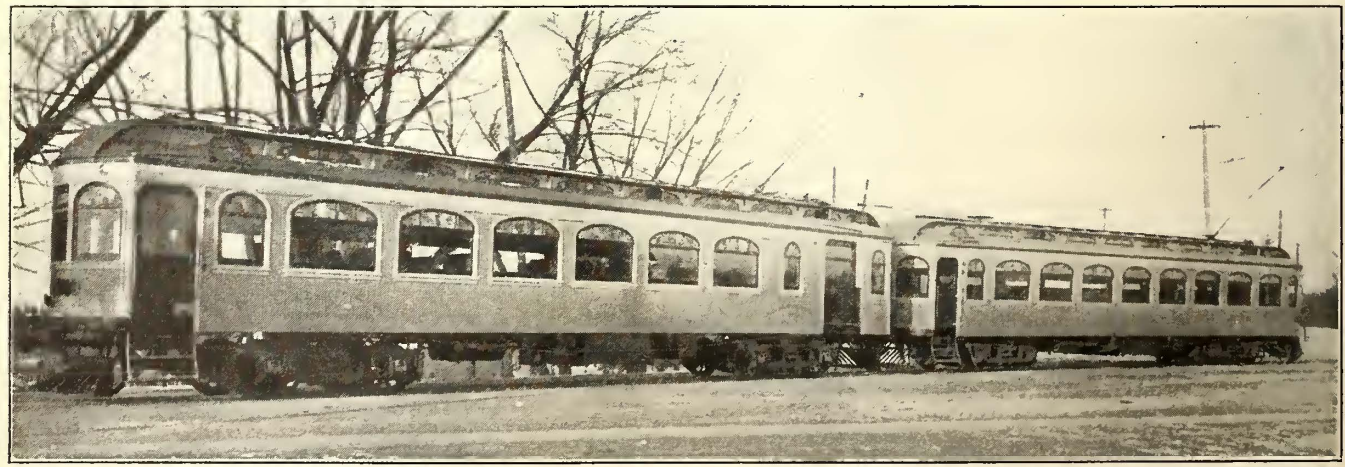
A general conference of department heads should be held at times as to the distribution of credits derived from a sale, and details as to the records to be taken for crediting particular accounts, or jobs, co-operation of the several mechanical departments, and utilization of loading facilities, crews, or cars to attain the lowest cost of handling and shipping scrap.

holstering is leather, while the other three have green plush.

These cars are built for two-car train operation, one car of the train containing a baggage compartment and the other a smoking compartment. The seating capacity per car is sixty-seven. The weight of each of these interurban cars is 75,400 lb.

The electrical equipment per car consists of four GE-219 75-hp motors with multiple unit control for train operation.

The air equipment is A.M.M. Westinghouse. The cars are equipped with electric markers and clas-sification lights and with the latest type of Peter Smith electric heater with forced draft and thermostat control.



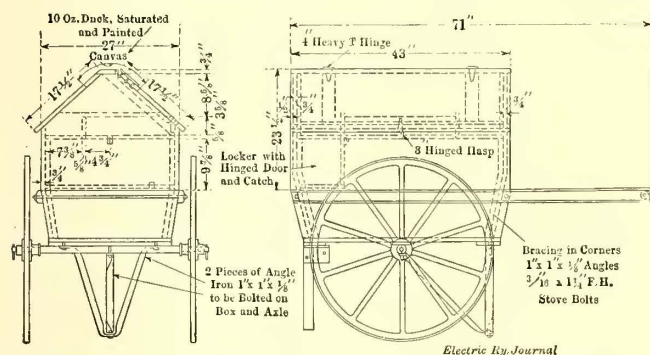
TWO-CAR TRAINS OF SEMI-STEEL, ALL-MOTOR CARS FOR THE NIAGARA, ST. CATHARINES & TORONTO RAILWAY

Syracuse Step Lighting at the Step

The New York State Railways, Syracuse Lines, has equipped a number of its cars with step lamps at the front exit, the lamp being located to throw the light directly on the step. Other users of step lamps generally have placed the lamp over the doorway, but this can hardly be considered the best position as the lamp is too far from the step. The Syracuse lines have therefore installed the step lamp just where it will do the most good. The favored position is behind the bumper. However, on those cars where no bumper room is available, the lamp is installed behind the step. In either case the light is much closer to the tread and pavement than before.

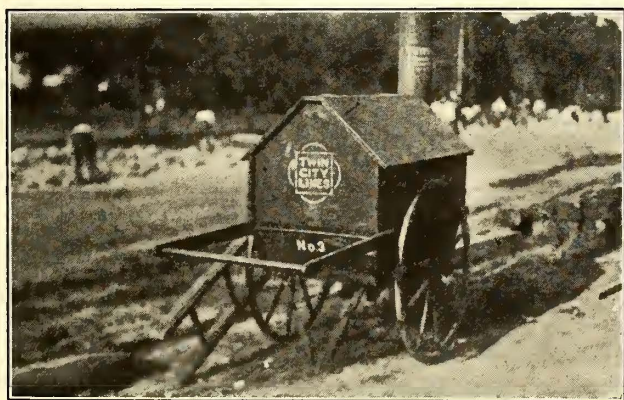
Cable Splicer's Portable Tool Box Used in the Twin Cities

To facilitate the movement of a cable splicer's tools in his daily travels about the city, a compact, substantially-built portable tool box has been furnished to him



CONSTRUCTION DETAILS OF THE TWIN CITY CABLE SPLICER'S TOOL CART

by the electrical department of the Twin City Lines, Minneapolis, Minn. This box is arranged with shelves and bins and is large enough to receive a complete kit of cable splicer's tools. In addition to the tools generally used in this class of work, this box is fitted with a Globe kerosene-oil furnace with a reservoir sufficiently large for a two days' run, a Pyrene extinguisher, a



TWIN CITY CABLE SPLICER'S TOOL CART IN USE

bank of lamps, rubber gloves and a first-aid outfit consisting principally of supplies for the treatment of burns. As shown in the accompanying illustrations, the tool box is in the form of a hand push cart. The box was built of 3/4-in. hard pine reinforced with 1-in. x 1-in. x 1/8-in. angles and mounted on an axle with 36-in. wheels. The principal dimensions and materials are also shown clearly in one of the accompanying illustrations.

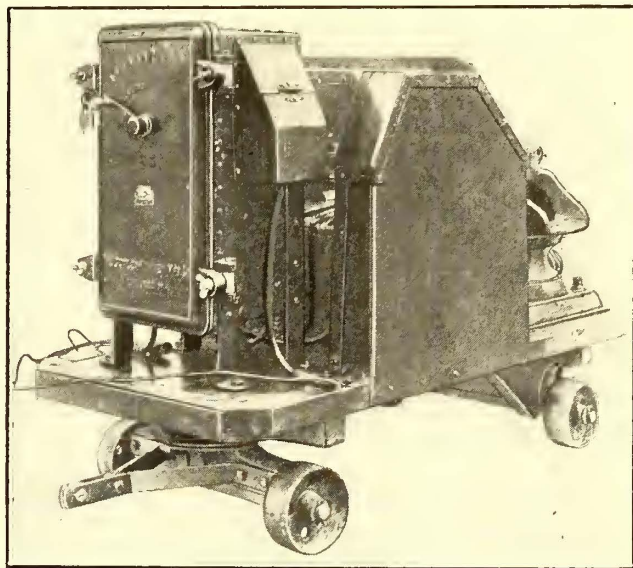
Power-Driven Drainage Pump for Manholes

BY "CONDUIT"

For about a year past the Brooklyn Rapid Transit System has been using a portable motor-driven outfit for draining manholes, which outfit was assembled at the company's shops.

The apparatus, which is mounted under cover as shown in the accompanying illustration, comprises a No. 3 Edson frictionless, non-chokable, side-suction pump, a 550-volt Northern Electric motor and a Cutler-Hammer type "C" water-tight non-reversible, panel type starter.

The pump operates at from forty-five strokes to fifty strokes per minute, and its capacity is 1 gal. per stroke.



POWER-DRIVEN DRAINAGE PUMP MOUNTED FOR TRANSPORT

when pumping from a height of 8 ft. above the water in a manhole. This capacity is about five times that of the hand pump formerly used.

The maximum current consumption of the pump at 550-volts is about 2 amp. The cost of this outfit was about \$200. It requires no special means of conveyance, as it is placed on the small jigger wagon usually employed by the manhole cleaning gang.

Rochester Water-Power Plant

A hydroelectric generating station with very low cost per kilovolt-ampere has recently been put in operation by the Rochester Railway & Light Company. The total cost of the station, the capacity of which is 4500 kva, was \$176,000, making a cost per kilovolt-ampere of \$39.10.

The total cost included the preliminary investigation reports, cost of building, intake and fore-bay construction, head works, penstock, tailrace, and 3000 ft. of underground lead cable for tying this plant to two other generating stations, as well as the initial and installation cost of the hydraulic and electrical apparatus. This figure, however, does not include any items covering water rights or real estate. During the eight months since the plant was put in service on March 15, 1914, it has generated 12,000,000 kw-hr., operating at a load factor of approximately 46 per cent. The possible winter output is larger on account of the larger amount of water available.

The building, which is located on the Genesee river in the heart of the city, is a one-story structure of rein-

forced concrete, inside dimensions 38 ft x 96 ft. The generating equipment consists of one 3000-kva Westinghouse waterwheel generator, 11,000 volts, three-phase, twenty-five-cycles, direct connected to a 5000-hp Wellman-Seaver-Morgan horizontal turbine and one 1500-kva, Westinghouse waterwheel generator of the same voltage and frequency, direct-connected to a 2500-hp horizontal turbine furnished by the Camden Waterwheel Works. The station is operated in parallel with a 15,000-kva, twenty-five-cycle steam plant and the hydraulic plant of the Niagara, Lockport & Ontario Power Company at Niagara Falls, 100 miles distant, which supplies energy to the Rochester Railway & Light Company at 60,000 volts.

New General Electric Apparatus

A review of the work in design of electrical apparatus by the General Electric Company during the past year discloses the development of much machinery applicable to electric railway operation. Among other equipment the company has built a 30,000-kw, 6600-volt, twenty-five-cycle horizontal steam turbo-generator set for the New York Edison Company put in operation in November, 1914. This turbine operates at 1500 r.p.m. and normally under 185-lb. steam pressure. The overall dimensions are: length, 57 ft. 4 in.; width, 19 ft. 8 in., and height, 14 ft. 3 in. A number of similar machines ranging in capacity from 20,000 kw to 35,000 kw are on order and several of these have been shipped. The inherent simplicity and relatively compact arrangement of these large turbo-generators has made it possible to effect installation in a remarkably brief time. As an example, a 12,500-kw set was completely installed for the Toledo Railway & Light Company and placed in commercial service within fourteen days after its arrival in Toledo. The company has also recently constructed a number of d.c. generators of exceptional capacity designed for water-wheel drive. At present work is nearing completion on a lot of eleven horizontal-shaft d.c. machines of this type, each having a rated output of 5200 kw, 520-volts at 170 r.p.m. These exceed in size any generators of their type previously built.

Improvements have also been made in gas-engine driven generators. There are now in the Schenectady Works three units of 1390-kva capacity, 2300-volts, sixty cycles, arranged for operation at 116 r.p.m. They will be utilized by the Monongahela Traction Company, Fairmont, W. Va., and are said to be the largest sixty-cycle generators designed for gas-engine drive. Other and larger units, but for twenty-five-cycle operation, have been constructed in prior years for the Bethlehem Steel Company, being of 3125 kva. An equitable basis of guarantee for the parallel operation of both gas-engine and steam-engine driven generators has been developed by the General Electric Company, which should prove of value to the builders of engines and generators and to the operator.

Another piece of apparatus installed during the last year for railway service is a frequency changer set used to inter-connect the Boston Edison and Boston Elevated Systems. This is a horizontal shaft set, the sixty-cycle unit being rated at 9500 kva, 13,800-volts, and the twenty-five-cycle unit rated at 9000 kva, 13,200-volts. The set operates at 300 r.p.m. and is reversible. It is totally inclosed and provided with inlets for an external air supply which discharges into the station. This is the largest frequency changer set produced by the General Electric Company and is said to be the largest machine of this type in service to-day.

Prior to 1914 the largest core type transformers produced by the General Electric Company did not exceed

2000 kva in rated capacity, but during the year the maximum rating was carried up to 7500 kva. Improvements in design have also greatly reduced the interruption to service in transformers as they are now capable of withstanding momentary short-circuits under sustained primary voltage without injury to the coils. This has been accomplished largely through changes in the grouping of the coils and working to higher inherent reactance. A combination transformer, which may be operated either self-cooled or water-cooled, has also been developed during the year. When self-cooled it may be operated safely at 50 per cent of normal load, and when provided with the necessary cooling coils can be used efficiently at 50 per cent above the normal capacity. Improvements in reactances have also been developed for the protection of feeder lines.

The improvements in motors, especially those for higher voltages, have been described in detail in these columns in the past year. Among the most conspicuous are the motors for the Chicago, Milwaukee & St. Paul Railway, those for the locomotives for the Bethlehem & Chile Mines Company, the 2400-volt motors for the Michigan Railway Company and the Canadian Northern Railway, 1500-volt motors for a number of lines, and the GE-247 motor designed for 24-in. wheel, low-floor city cars.

Fiber Bushing for Signal Cord Fixtures

Martin A. Pahler, a carhouse foreman of the Third Avenue Railway System, New York, has recently patented a signal cord bushing which is made preferably of fiber but which can be manufactured of other suitable material. The object of the invention is to reduce the rate of wear of the cords by furnishing smooth rounded surfaces for bearing them, and also to transfer the wear from the bracket openings to the bushings. While the use of bushings for purposes of this kind is not new, the merit of this particular invention lies in the care given to secure non-cutting and non-abrasive surfaces and in the simple means for replacing the bushing when necessary. Mr. Pahler has made arrangements with the Hard Fibre Sales Company, New York, to manufacture the bushings mentioned.

The Tatra 1650-Volt D. C. Railway

The Tatra Railway, located in the central Carpathians of northern Hungary, was built four years ago as a meter-gage, 550-volt d.c. line, chiefly for tourist travel. It has since been lengthened from 8.4 miles to 22.5 miles and supplied with 1650-volt d.c. equipment by the Hungarian Siemens-Schuckert Works.

The overhead line is of simple catenary type with hangers placed about 13 ft. apart for safety against breaks in trolley wire. Energy is supplied from 220-kw motor-generator sets. The a.c. end of a set is a motor taking 3300-volt energy which has been stepped down from 15,000 volts, forty-two cycles; the d.c. end consists of two 825-volt generators permanently connected in series. A storage battery of 794 cells with Pirani equipment is also used.

Part of the rolling stock is made up of converted 550-volt equipment, but this is used only on days of heavy traffic. Each new car carries four 44-kw (60-hp) 750-volt motors of commutating-pole type, each pair being permanently connected in series. The speed of a new car on a 6 per cent grade is 12.4 m.p.h. and on level grades 24.8 m.p.h. The contactors for the control system are operated with current from a motor-generator set. The old cars have only two motors, also of commutating-pole type, and these are operated directly from the ordinary controller.

News of Electric Railways

BROOKLYN CONSTRUCTION PROGRESS

Summary of Work Completed by Brooklyn Rapid Transit Company Under Dual Contracts

The New York Municipal Railway Corporation (Brooklyn Rapid Transit) has issued its progress report on new construction work to the end of December. The work of reconstructing the Lutheran Cemetery line, hitherto involving the operation of elevated trains on the surface from Palmetto Street to Metropolitan Avenue, is practically complete, only the details of station finish and the installation of a few sections of track and third-rail remaining, along with the erection of a temporary connection between the new steel structure and the existing structure at Myrtle Avenue. Jan. 31 has been tentatively fixed as the date of commencement of through operation on the new Lutheran Cemetery line.

Reconstruction on the Sea Beach line is rapidly approaching completion. The excavation has been completed throughout the length of the Sea Beach reconstruction. The erection of steel is 85 per cent completed. During December an additional 2 miles of track was ballasted on the Sea Beach route, 2 miles of third-rail was installed, 30 per cent additional track bonded and about 20 per cent additional conduit installed for station lighting.

The new substation at Sixty-fourth Street on the Sea Beach line and the enlargement of the substation at New Utrecht Avenue are approaching completion, and the installation of additional electrical equipment is under way.

The contract for station buildings on the Sea Beach line has been approved by the Public Service Commission and invitations for bids have been sent out to contractors.

The trucks and bodies of the new subway cars for the New York Municipal Railway have been arriving at intervals at the Thirty-ninth Street shops of the company and are being set up and fitted out with electrical equipment, seating and lighting facilities, etc. Fifty of the new cars are now being assembled in the shops, and, as fast as completed, they are being tested out under actual service conditions on lines adjacent to the Thirty-ninth Street shops. Two hundred of the new cars are contracted for and 600 will ultimately be obtained.

During December the diversion of West End and Culver line trains from the line of construction work was completed, which materially facilitated construction progress.

In the third tracking of the Fulton Street elevated line, in the section where construction work is going on, between Nostrand Avenue and Manhattan Junction, the reinforcing of column foundations has been completed; 560 tons of old structural steel has been withdrawn and replaced with new girders, and steel in excess of 3000 tons has been delivered for use in strengthening the structure to accommodate the third track. The temporary station at Utica Avenue has been completed, and plans and specifications have been prepared for the construction of permanent stations, which plans have been approved by the Public Service Commission and invitations have been sent to contractors to bid upon them.

With respect to the Broadway third tracking, the fabrication of steel, assembling of plant and organization for erection of steel on a section of the Broadway elevated line from Havemeyer Street to Myrtle Avenue have continued satisfactorily; work has commenced on the reinforcing of column foundations, and plans and specifications have been submitted to the Public Service Commission covering the third tracking of the Broadway line between Myrtle Avenue and East New York.

In the Center Street Loop, which will ultimately connect the Broadway and Fulton Street elevated lines, work continued during December on the block signaling and interlocking plants, upon the lighting and ventilation of the tunnel and station and platform lighting.

The Liberty Avenue elevated line at the end of December was within 33 per cent of completion. The contract has been awarded for the erection of stations, and work on the station structures will begin as soon as weather conditions

allow. Satisfactory progress has been made in the installation of track and third-rail.

Plans and specifications have been approved by the Public Service Commission for section No. 1 of the Jamaica Avenue line from Crescent Street, the terminus of the present Cypress Hills elevated in the Borough of Brooklyn, to the junction of Myrtle Avenue and Jamaica Avenue in the Borough of Queens.

TORONTO MUNICIPAL RAILWAY EXTENSIONS

On Jan. 1 the ratepayers of Toronto, Ont., approved the extension of the present civic railway system and the acquirement of the Kingston road line of the Toronto & York Radial Railway from Queen Street to the city's limits. Asked as to the policy of the city in regard to the running of this latest branch, Works Commissioner Harris said it had not been settled whether the city or the company was to operate the line. The Kingston road line will not come into the city's hands until the City Council passes the by-law appropriating the necessary \$6,021. The ratepayers sanctioned a \$425,000 expenditure for the extension of the civic railway system, and as a result a line will be built on Lansdowne Avenue southerly from St. Clair Street to the tracks of the Canadian Pacific Railway. The new North Toronto line will be built as soon as the road through Mount Pleasant Cemetery is completed. The Lansdowne Avenue line will cost \$105,000 and the North Toronto line \$320,000.

THE INDIANA LEGISLATURE

The Indiana Legislature convened on Jan. 11. The following bills have been introduced in the House: A bill requiring steam and electric roads to install, at all public crossings where the view of approaching trains is obstructed and the obstruction cannot be removed, an automatic gong or bell, or a flagman, to warn the public of an approaching car or train; a bill making it unlawful for any steam or electric road to permit any car or train to remain standing across any street or highway while discharging passengers, except that if the train is longer than the distance between two streets or highways crossing the track, the train may discharge passengers while standing across one only of such highways; a bill providing that in case a city causes any street in which electric street railroad tracks are laid to be paved with any kind of material, the space between the rails and tracks and a certain distance outside the rails shall be paved at the same time and with the same material; a bill making it unlawful to procure copies of pending bills except by permit from the presiding officers of the House and Senate, requiring all persons or corporations to register their attorneys or agents with the Secretary of State, paying a fee therefore, and filing statements of all salaries and expenses paid such agents; a bill giving the boards of public works of cities the right to condemn land, or open or close streets and alleys for railroad purposes; a bill providing that employees in power houses and substations, switchboard operators, attendants controlling or reporting train movements of passenger or freight trains or cars of interurban railroads shall not be permitted or required to work more than nine hours in one day or more than sixty hours in any week; a bill providing penalties for persons tampering with or interfering with any safety device used by any common carrier on its cars, or with any telephone or signal wires or devices; a bill requiring employers to pay within seventy-two hours all wages due any employee who is discharged or who quits service, also giving a letter setting forth correctly the facts relating to the service and cause of termination of same; a bill providing that all common carriers shall afford reasonable and proper facilities for interchange of freight traffic between their respective lines at junction points, a junction point being defined as a point served by two or more railroads, either by main line or switches, an actual physical crossing not being considered necessary to constitute a junction. This act applies to both steam and interurban railroads.

The following bills have been introduced in the Senate:

A bill making it unlawful for any public utility, when an order for examination has been made by the Public Service Commission, to divert or pay out any funds from its treasury for the purpose of concealing its income or assets; a workmen's compensation and employer's liability bill, supported by the State Federation of Labor.

No definite action had been taken on any of the above bills up to Jan. 23.

PRESIDENT LILIENTHAL'S REPLY

He States Attitude of His Company Toward the Municipal Railway

Jesse W. Lilienthal, president of the United Railroads, San Francisco, Cal., has replied specifically to the seven questions put to the company in the resolution passed by the Board of Supervisors calling upon the company to state its policy regarding extensions and improvements. The reply is concluded as follows:

"The United Railroads is financially able to meet all of its obligations to this community and will gladly do so. In fact, notwithstanding the dullness of the times and the constantly increasing competition, the company has seen its way to increase the wages of the employees; to insure their lives for the benefit of their families, irrespective of their physical condition and without cost to them; to establish a system by which any saving of costs by the reduction of accidents will inure to the benefit of the employees; and to make numerous loans to them to take or keep them out of the hands of loan sharks.

"It is certainly not the policy of this company to obstruct in any way the extension of the municipal lines. We believe that the city engineer will bear us out in the statement that we have rendered every assistance in connection with furnishing specifications or information to his office, in connection with the construction of the city lines, both as to track and roadway and rolling stock, and this same policy will be pursued in the future. We have also furnished the city with our shop facilities to make repairs to their equipment and have only charged the city for such services at their actual cost.

"It is the policy of this company to concede to the city every request which it might make of the company, but, just as your Honorable Board are trustees for the public, the directors of the company are trustees for its creditors and stockholders and must obtain for every concession some reasonable equivalent. Approaching every negotiation, as we mean to do, in the right public spirit, it ought to be possible for us to avoid all friction, and we shall certainly co-operate to that end.

"Finally, we beg leave to say that the public is entitled to adequate transportation facilities, and, to the extent that private capital cannot or will not build the necessary extensions, it is not alone the right but the duty of the city to furnish the same, and we would not, if we could, do anything to obstruct the fulfilment of that duty."

PLAN FOR PUBLICATION OF UTILITY COMMISSION DECISIONS

The Utilities Publication Committee of New York has sent to public utility companies in the United States an announcement in regard to the scope and character of the plan for publication of "Public Utilities Reports Annotated." This plan was described in the issue of Dec. 5, 1914. The reports are to be published by the Lawyers' Co-operative Publishing Company of Rochester, N. Y., beginning as of Jan. 1, 1915. The enterprise is indorsed by the American Electric Railway Association, National Electric Light Association and American Gas Institute.

The committee says that the amount of material issued by the public service commissions in the country is so voluminous and a large part of it is necessarily of so temporary a character as to make the publication in its entirety commercially impractical. All material of general interest and permanent value, however, will be contained in the reports. The committee adds: "In order that such a set of reports may be a success it is obvious that the public service companies in the country must very largely sub-

scribe therefor. In order to insure the success of the undertaking assurances have been given the publishers of substantial support from the public service corporations."

In order that these assurances may be carried out, a committee has been formed, of which E. W. Burdett, counsel of the National Electric Light Association, is chairman. The circular is sent in behalf of the committee, the other members of which are as follows: Randal Morgan, United Gas Improvement Company; J. W. Lieb, Jr., New York Edison Company; Anton G. Hodenpyl, Hodenpyl, Hardy & Company; Owen D. Young, counsel General Electric Company; O. B. Willcox, William P. Bonbright & Company, New York; Bernard Flexner, counsel Middle West Utilities Company; Charles F. Mathewson, counsel Consolidated Gas Company of New York; L. D. H. Gilmour, counsel Public Service Corporation of New Jersey, and Z. K. Graham, secretary.

TRANSIT MATTERS IN CINCINNATI

At a meeting of the City Council at Cincinnati, Ohio, on Jan. 19, City Solicitor Walter Schoenle was granted the right to examine the books of the Cincinnati Traction Company and the Cincinnati Street Railway in order to secure data needed in the readjustment of fares in 1916.

Director of Public Service Fosdick has informed Mayor Spiegel that service has been improved by reducing the schedule two minutes on a number of local lines. Additional cars will be put on to meet the Cincinnati, Milford & Loveland cars morning and evening.

At a meeting of the Business Men's Club on Jan. 20 George W. Harris, president of the Sinking Fund Commission, expressed the belief that the Cincinnati Traction Company would be willing to finance the proposed rapid transit belt. W. Kesley Schoepf, president of the Cincinnati Traction Company, refused to comment on the matter until he had given it further thought.

In a talk before the Advertisers' Club at the Hotel Metropole on the same day, John E. Bleekman, vice-president of the Cincinnati Union Depot & Terminal Company, said he believed that an elevated road would be better than the belt line that has been planned for the city. His company will offer either a privately-owned or publicly-owned proposition.

REPORT OF RHODE ISLAND COMMISSION

The Public Utilities Commission of Rhode Island said in part in its third annual report to the Legislature of that State:

"The matter of providing for a suitable inspection of the several utilities was urged in the last report to the Governor. Whatever work of this nature has been done during the year has necessarily been done by the members and employees of the commission at such times as they have had occasion to make use of utilities. Naturally the best result cannot be obtained with this method of supervision, and for that reason the adoption of suitable legislation providing for the employment of inspectors properly qualified to inspect and supervise such utilities, particularly railroads and railways, is suggested.

"In relation to the matter of requiring every public utility to keep and render to the commission uniform accounts of all business transacted, attention was called in the last report to the apparently unintentional repeal of certain sections of chapter 215 of the general laws, one of which provided that annual returns should be made to the railroad commissioner. At the request of the commission the railroad and railway companies have continued to make such returns, but, in the commission's opinion, the law should be amended in such manner as to require all utilities to file such annual return.

"The railroad and railway companies, in common with other business, suffered from the general depression during the year. Whatever the cause of the shrinkage in the net incomes of these companies it is obvious that some time must elapse before the New York, New Haven & Hartford Railroad and the Rhode Island Company, which are the two principal operating companies of these two classes, can obtain the results which might properly be anticipated from the natural increase in business."

CLEVELAND CONSTRUCTION

J. J. Stanley, president of the Cleveland (Ohio) Railway, conferred with the Council of East Cleveland on Jan. 21 in an effort to secure an agreement for an extension of the franchises on Euclid and Hayden Avenues in return for the expenditure of \$200,000 for moving the tracks and repaving on Euclid Avenue, where the city expects to build a new sewer the coming summer. The Hayden Avenue franchise expires in 1917 and the Euclid Avenue franchise expires in 1921.

Talk of the establishment of combined steam and inter-urban railway terminals on a tract of land bounded by Ontario Street, West Third Street and Prospect Avenue has been revived. It is said that the Baltimore & Ohio, Wheeling & Lake Erie and the Erie Railroads have practically agreed to the plan, while the Big Four and Nickel Plate have it under advisement. The Cleveland & Youngstown Railway, which will build an electric railway through Kingsbury Run, will bring in a number of interurban lines, it is said.

Delay in building a sewer in East Thirtieth Street will in all probability postpone the construction of the proposed crosstown line on that thoroughfare until 1916. Plans had been made to complete the work the coming summer, but the company refuses to lay the track until the sewer is built.

NEW CONSTRUCTION IN BUFFALO

Edward G. Connette, president of the International Railway, Buffalo, N. Y., has notified the Public Service Commission of the Second District of New York that the company proposes to spend \$1,732,516 on improvements this year and that authorization of a bond issue will be required. The company expects to start constructing its new suburban passenger terminal and office building on the Garden Theater site in Pearl Street this year. The statement to the commission shows the company proposes to spend \$808,309 for paving in Buffalo and \$250,289 for paving outside of Buffalo. For replacing worn-out tracks and roadbed with new heavy type rails and concrete roadbed, the sum of \$373,358 is to be appropriated. For new track extension, \$40,876 will be spent. Other improvements the company desires to make this year are grade crossing improvements, \$57,310; overhead line work, \$29,722; power stations and substations, \$144,040; shops, \$1,200; bridge and building department, \$27,410.

Last year the company spent \$1,231,076 for improvements, most of it in laying new roadbed and tracks within the city limits.

THE KANSAS CITY BOARD OF CONTROL

Following the opinion of Judge Hook of the federal court that the board of control of the street railway property in Kansas City, which board was provided for the management of certain features of the service by the franchise not yet operative, should exercise its powers pending compliance with the franchise terms, subject to the receivers, the following statement was issued by Ford F. Harvey, one of the receivers:

"The receivers, desiring fully to meet complaints as to service, have agreed with Mayor Jost that the members of the board of control, as their employees, shall forthwith assume entire control of the routing and scheduling of cars, including the number, character and condition thereof, and the regulation of transfers. As the board is to assume full responsibility, its orders should and will, in the absence of specific personal contrary directions of the receivers, be promptly carried out. It is not the intention to give any such contrary directions unless there arises some radical difference in policy, of which difference the public will be promptly advised.

"To systematize the work and prevent disorganization of a large working force, it is imperative to have the orders go to the general manager, as the head of the system, with instructions to see that they are absolutely and in good faith promptly carried out. There is not and has not been the slightest difference between Mr. Dunham and myself upon the subject; I feel implications to the contrary should be corrected."

SUGGESTED SUBWAY CHANGES

Chief Engineer and Electrical Engineer of New York Commission Make Suggestions Regarding Subway

Alfred Craven, chief engineer of the Public Service Commission for the First District of New York, has reported to the commission in regard to the investigation which he is making of the subway with the view of preventing accidents from short-circuits, fires, etc. While not ready to make final recommendations, he stated that his staff was inquiring into the advisability of complete separation of telephone and emergency alarm cables from all other cables in the subway, and also for an independent outside telephone system; the complete separation of the lighting circuit from all other cables, and an emergency service from the New York Edison Company; the supply of power for ventilating fans from substations, with an independent connection from outside sources; the walling up of all manholes and splicing chambers so there will be no connection with the subway, and an increase in the capacity of the emergency and ventilating chambers.

Clifton W. Wilder, electrical engineer of the commission, has recommended that the Interborough Rapid Transit Company be required to change the storage-battery light system in the subway cars, so that the batteries will be automatically charged and kept at full capacity at all times of normal operation. These batteries supply emergency lighting in case the power is cut off. They were installed by order of the commission, which requires batteries strong enough to operate two lamps of not less than 12 cp. each in every car for at least three hours. The present system makes necessary the removal of the batteries from the cars in order to charge them.

TORONTO RAILWAY MATTERS

The Board of Control of Toronto, Ont., on Jan. 18 gave considerable attention to the transportation problem, and after Mayor Church had elaborated the suggestions made in his inaugural address for solving this question, decided to apply to the Ontario Legislature for powers to compel the Toronto Railway to build extensions and otherwise improve its system. The Mayor contended that under the terms of the agreement of 1891 the railway was obliged to make such extensions as were ordered from time to time by the city, whether such extensions related to streets within the city limits as they existed in 1891 or at the present time, and the application to the Legislature is practically to overrule the decision of the Privy Council that the city's rights regarding improvement apply only to the railway system within the limits of the city as defined in 1891. The board could not agree as to the advisability of applying for power to purchase and operate a system of motor buses, so the matter was sent on to the Council without a recommendation.

Corporation Counsel Geary of Toronto has reported to the Board of Control that John Mackay has no legal claim against the city for services rendered in connection with the valuation of the property of the Toronto Railway and Toronto Electric Light Company. Mr. Geary states that Mr. Mackay did not receive a proper retainer and the city has no legal liability whatever. Mr. Mackay was retained in 1913 by Mayor Hocken. His bill was for \$42,545.

TOLEDO CONTEMPT CASES

Judge J. M. Killits of the Federal Court at Toledo, Ohio, announced his decision in the contempt cases against the Toledo *News-Bee* and its editor, Negley D. Cochran, on Jan. 23. The *News-Bee* was fined \$7,500 and Mr. Cochran \$200. The court held the paper guilty on three counts.

The cases grew out of an injunction against the city of Toledo sought by the Toledo Railways & Light Company to prevent the enforcement of a 3-cent fare ordinance. The newspaper commented upon the decision in a way considered offensive by the court, and Judge Killits cited both the owner of the paper and its editor to appear and explain the purpose of such publication. The defendants contended that the articles were published in what it considered to be the best interests of the public.

Under a resolution introduced in Council on Jan. 25, the various electric railways using the Cherry Street bridge

will be charged rental for the tracks, which belong to the city. Director of Public Service Boardman has been directed to furnish an estimate of the cost of the track as a basis for fixing the rentals.

Maine Bill.—A bill has been introduced in the Maine Legislature to make it compulsory for electric railways to install toilets on cars used on lines more than 10 miles in length.

Public Utilities Bill in Utah.—Senator Frank Evans has introduced a bill into the Legislature of Utah creating a public utilities commission. The measure has been referred to the judiciary committee.

Unemployment in Transit.—The committee on unemployment appointed by Mayor Mitchel of New York, has made public its second report. Replies from thirty-one large transportation and public utility companies in the greater city, covering a total of 57,000 persons, show only 1 per cent increased unemployment over that of 1913.

In the Ohio Legislature.—A bill has been introduced in the House to permit trainmen on steam and interurban lines to carry concealed weapons and exercise police powers. Representative Holl has introduced a bill to allow street, suburban and interurban railway companies, using power other than steam, and companies furnishing current for light, heat and power, to appropriate property for use in placing wires and poles.

Steel Car Report.—Clifton W. Wilder, electrical engineer of the Public Service Commission for the First District of New York, has reported to the commission that it was possible to build an all-steel car for service on the elevated railroad which would not weigh any more than the heaviest wooden car now used. In this report George Gibbs, consulting engineer, concurred. The heaviest wooden car body now used on the elevated weighs about 24,000 lb.

Electrical Section of Western Society of Engineers.—At a joint meeting of the Chicago Section of the American Institute of Electrical Engineers and the Electrical Section of the Western Society of Engineers on Jan. 25, the annual election of the executive committee resulted as follows: H. M. Wheeler, Chicago Railways; C. A. Keller, Commonwealth Edison Company; F. J. Postel, consulting engineer; G. T. Seely, Chicago Elevated Railways, and E. W. Allen, General Electric Company.

Additional Tunnels for Baltimore.—The Pennsylvania Railroad has outlined the plans by which it seeks to relieve the congestion of its traffic facilities in Baltimore so as to get a more direct and convenient outlet for the movement of its trains through the city, both north and south. The primary point in the letter is that the company proposes to resort to additional tunnels under the city streets for its relief, paralleling the two existing tunnels, and in this way secure four tracks through the city.

The Richmond Franchise.—The hearing on the proposed new blanket franchise sought by the Virginia Railway & Power Company, Richmond, Va., has been postponed indefinitely by the street committee of the Council. The committee had asked for a compilation of the franchises and grants under which the company now operates. General Counsel Henry W. Anderson says that the company found it impossible to make the compilation in the given time. The franchise was accordingly laid on table.

Removal of Coroner Asked.—Theodore P. Shonts, president of the Interborough Rapid Transit Company, New York, N. Y., has filed a complaint with Governor Whitman, in which he asked for the removal of Coroner Patrick D. Riordan of New York City. Mr. Shonts based his demand upon the actions of the coroner at the inquest on Jan. 12, when the officials were held for culpable negligence by the coroner's jury in connection with the death of two persons in an accident on the Ninth Avenue elevated railway on Dec. 9.

Philadelphia Electrification Equipment.—Eight cars intended for use on the electrified line of the Pennsylvania Railroad between Philadelphia and Paoli have been received at the West Philadelphia yards of the company. It is announced that work on the rest of the ninety cars to be used on the main-line electrification will be completed by April 1. The work of stringing wires and erecting poles is more than 65 per cent completed, and under favorable con-

ditions it is expected that electric service will be started in June.

Almanac Features Traction.—The Brooklyn *Daily Eagle* has added to its almanac for 1915 a table covering the electric railways of all the states, giving a statistical record of the growth of the traction industry in each part of the United States and indicating the extent to which the bulk of the nation's people have come to utilize the street railways for transportation. The *Eagle* says that, in studying the figures, the reader should keep in mind the fact that thirty-five years ago "there was no such thing as a traction industry in the United States."

The Stevens Bill.—The Stevens bill to promote the safety of employees and passengers on railroads engaged in interstate and foreign commerce was introduced into the House of Representatives at Washington by Mr. Stevens of New Hampshire on May 27, 1914. It was referred to the committee on interstate and foreign commerce and ordered to be printed. On Dec. 23, 1914, the bill was reported with amendment, referred to the House, and ordered to be printed. In its final form the bill excludes electric street railways and electric interurban railways from its provisions.

Memorandum of Workmen's Compensation Suggestions.—The Workmen's Compensation Department of the National Civic Federation has issued a memorandum of suggestions for uniform State legislation upon workmen's compensation. The report covers the general principles that should be followed in such legislation rather than any details for particular States, and is recommended to legislatures convening in 1915. The compilation was made by a committee whose members were appointed by State industrial accident boards, compensation commissions and governors of States not having compensation laws.

Electrification Suggested.—Suggestions which may lead to the electrification of the Missouri, Oklahoma & Gulf Railroad have been made. The property is now in the hands of a receiver. If the proposed plan is worked out, Joplin, which is now the northern terminus of the line, will become the junction of that system and the electric line northward to Pittsburg, and ultimately a link would be built to connect the lines with those running out of Kansas City. Connections would be made on the south at Denison, Tex., bringing the Dallas-Ft. Worth line into the system.

Franchise Election Question in Cincinnati.—A committee representing the business interests of Cincinnati, Ohio, filed notice with the city auditor on Jan. 21 to the effect that it will circulate petitions for a referendum vote at a special election on the franchise recently granted the Cincinnati, Newport & Covington Street Railway. On the following day an advertisement from the company appeared in the daily papers asking that the petitions being circulated by this committee be signed. The Federated Improvement Association and the People's Power League will circulate petitions for a referendum vote at the regular election this fall.

Chicago Traction Fund Drained Dry.—The Chicago *Examiner* says: "Henry A. Blair, president of the Chicago Railways, made the statement that the city's traction fund of \$13,000,000 has been drained dry. He declared that all that remains to represent the \$13,000,000 are I. O. U.'s of various city departments. The last \$900, he said, was drawn a few days ago to pay city salaries. 'How the money is ever to be forced back into the traction fund,' Mr. Blair told D. H. Morris, a broker, representing 200 of the Chicago Railway Company's participation certificates holders, 'is a matter of speculation.' Mr. Blair said the company was in no position at present to pay dividends because of the hostile attitude of the city toward the company."

Valuation of Omaha Properties.—In connection with the act of the Omaha & Council Bluffs Street Railway, Omaha, Neb., in securing an injunction attacking the ordinance to require it to sell seven tickets for a quarter, District Judge Sears at Omaha has directed the company to furnish a valuation of its property to the court. The company is also required to furnish the court the following additional information: Gross revenue for each of the last three years and the amount of fares received in Omaha

for the same period, salaries of all officers and employees for the last three years, receipts and expenses for the same time, amount of bonded indebtedness and interest charges, any other indebtedness and rates of interest, taxes, dividends, sums set aside for reserve and depreciation, if any, and amount of revenue after demands have been met.

Utility Legislation in Michigan.—That Mayor Marx and the city administration in Detroit will contest any attempt on the part of the Michigan Legislature to pass a public utilities bill voiding any of the authority now held by the city was intimated in the Mayor's message to the Common Council at the beginning of his second term. The Mayor frankly stated that he considered the city could look after its own public utility affairs better than a State commission with wide powers. The proposed bill, which is to be prepared by Lawton T. Hemans, chairman of the State Railroad Commission, has not yet been placed in the hands of the Legislature, but Mr. Hemans has intimated that he favors perpetual franchises under the control of the State commission with power to raise or lower rates as circumstances dictate and with ample provision for municipalization.

California Home Rule Bill Up.—Max Thelen, president of the State Railroad Commission of California, has prepared and taken to Sacramento for presentation to the Legislature a bill making effective the constitutional amendment adopted by the people of that State last November giving the Railroad Commission power to regulate public utilities operating within cities. Immediately following the passage of this bill by the Legislature the State Railroad Commission will be invested with the power of making and fixing rates for all public utilities operating within the State. In Los Angeles hereafter the City Council will have no power to fix rates to be charged for gas, electricity, telephones or street railway fares. Water rates will not be affected, for the reason that the water system is publicly owned and the constitutional amendment is applicable only to private corporations, individuals or associations of individuals owning or operating public utilities.

Bills in New York Legislature.—Bills have been introduced in the Legislature of New York to amend the public service commissions law, in relation to conferring on the public service commissions jurisdiction with respect to the number of men constituting crews on trains, and repealing section 54-a of the railroad law, relating to such crews; to amend the railroad law, in relation to grade crossings; to amend the railroad law, in relation to the construction of certain railroads where the property of the company has been sold under foreclosure proceedings; to amend the railroad law, in relation to imposing on railroad corporations the duty of placing upon cars the name of the operating company; to amend the railroad law, in relation to the operation of certain railroads in the city of New York, and providing a penalty for violation; to amend the public service commissions law, in relation to common carriers by water; to amend the railroad law, in relation to grade crossings; to regulate street railway fares in all cities.

Divergent Views of Ohio Valuation.—Speaking before a district meeting of the Ohio Independent Telephone Association at Columbus, Charles E. Marshall, a member of the Ohio Public Utilities Commission, said that the requirement of the new utilities law that makes an appraisal of the 1500 or more service companies in the State necessary will result in an economic waste that is entirely unnecessary and in many cases will be of no benefit to anyone. Some companies that will never have a rate controversy were compelled to pay out large sums of money for appraisements that will be of no value to them. Specific cases could be handled under the old law and those companies not involved in investigations would have saved the money they are compelled to pay out under the new one. E. W. Doty, another member of the commission, said that the appraisements will be valuable in bringing to light conditions that were unknown before. He urged the utility men to make their valuations complete in the itemized form provided by the commission. Mr. Doty complimented the committee of Ohio utility companies which established forms for appraising property, especially the portion pertaining to depreciation, and said that the report disposed of every other theory that had been advanced.

Financial and Corporate

BUSINESS PROSPECTS BRIGHTER

Vice-President Pratt of Stone & Webster Management Association Sees Fairer Day for Business and Financial Institutions

In a recent interview Frederick F. Pratt, vice-president Stone & Webster Management Association, Boston, and chairman of the board of directors of the Puget Sound Traction, Light & Power Company, Seattle, Wash., takes a fairly optimistic view of the future of general business and financial conditions. Mr. Pratt believes that while short-time money will continue to be held at low rates, money which might flow into permanent investments will accumulate in the United States because of the reluctance of investors to engage in new undertakings unless assured of protection. The ultimate effect of the present war will be to make money rates higher. When the war is ended, money may be secured for existing industries and public service corporations, but only at the "going" rates.

In connection with the cause of the present business depression, Mr. Pratt says:

"Notwithstanding last year's wonderful crops and prices, we are in a period of depression and financial disturbance worse than anything which has occurred within the last twenty years or more. This depression cannot be laid to the crops, and it was well under way before the European War broke out. Hence the best thought of this country attributes the present conditions largely to the fettering of business. The attacks on business have made investors fearful of embarking on new enterprises under existing unpropitious conditions. Without a more square deal to business it will be next to impossible to entice capital to make further investments. Such a situation would bring about a most serious condition, with unemployment and decreasing wages, which in time would mean a decrease in purchasing ability. Just now there are very encouraging signs that the general public is beginning to come out of its trance, and it is daily becoming more difficult for self-seeking demagogues and high-minded theorists alike to carry out their program of destruction. The time is fast approaching when a man who pulls down the business structure will lose his following, but he who helps to build up such a structure will be placed in a high position in public confidence. The people are now beginning to see that they, by imposing burdens and restrictions, have been destroying property values, and to realize that the regulation of intricate business affairs must be done with the utmost care and moderation."

DECREASE IN ST. LOUIS EARNINGS

According to a statement issued by Richard McCulloch, vice-president of the United Railways, St. Louis, Mo., the business of the company was fairly good during the first half of 1914. The gross receipts up to July 1 were 1.55 per cent greater than in the corresponding period of 1913. After July 1, however, the receipts of each month kept diminishing. In further describing this situation, Mr. McCulloch said:

"Conditions became so serious that it was necessary to curtail the service to some extent. This has been done, but the diminution in service is not at all proportionate to the diminution in receipts. In curtailing the service we took into account the welfare of the trainmen, as well as the convenience of the public. Although it was necessary in some cases to readjust the runs, no conductor or motorman has been discharged on this account.

"During the last three months of 1914 the passenger receipts were \$3,005,336, as compared to \$3,248,203 during the last three months of 1913, a decrease of \$242,867, or 7.48 per cent. During December, 1914, the number of passengers carried was 29,734,022, as compared to 32,176,129 in December, 1913, a decrease of 2,442,107, or 7.59 per cent. For these two months the total number of car-miles was 3,556,077 as compared to 3,686,340, a decrease in 1914 of 130,263, or 3.53 per cent. The decrease in gross receipts was 9.54 per cent, but the decrease in car-miles was only 3.53 per cent."

ANNUAL REPORT

Massachusetts Electric Companies

The statement of income, profit and loss of the Massachusetts Electric Companies for the year ended Sept. 30, 1914, follows:

Dividends on stocks owned.....	\$1,077,291
Interest on notes and bank balances.....	77,551
Total income	\$1,154,842
Expenses	22,692
Net income	\$1,132,150
Interest on coupon notes.....	155,000
Net divisible income.....	\$977,150
Dividends—4 per cent.....	968,256
Surplus for the year.....	\$8,894
Surplus, Sept. 30, 1913.....	2,746,998
Total	\$2,755,892
Credit:	
Federal income tax 1910 refunded.....	881
	\$2,756,774
Debit:	
Proportion federal income tax to Sept. 30, 1913.....	7,191
Surplus Sept. 30, 1914.....	\$2,749,583

The statement of the subsidiary Bay State Street Railway for the year ended June 30, 1914, follows:

Gross income	\$9,695,249
Operating expenses	6,363,969
Gross income less operating expenses.....	\$3,331,280
Interest, rentals, taxes, etc.....	2,006,984
Net divisible income.....	\$1,324,296
Dividends:	
First preferred stock.....	\$164,916
Common stock	1,077,153
Total dividends	\$1,242,069
Surplus for the year.....	\$82,227
Surplus, June 30, 1913.....	212,850
Total	\$295,077
Credits:	
Sinking fund—coupon notes.....	\$25,000
Accumulated profit on sales of scrap.....	3,524
Tickets sold and not used.....	3,462
Adjustment of accounts.....	3,391
Total credits	\$35,377
	\$330,454
Debits:	
Reconstruction	\$100,000
Net losses by fire, etc.....	10,478
Premium on bonds called for redemption.....	1,865
Settlement with Boston Elevated Railway for certain rental charges covering a number of years.....	4,579
Total debits	\$116,922
Surplus, June 30, 1914.....	\$213,532

The report states that the last year has been one of decreasing business activity in the territory served by the Bay State Street Railway, and has been marked by an increase in expense on most of the transportation companies operating in the New England States. As a result, while the gross income of the company showed an increase of \$233,000 (of which \$102,625 came from the increase in the freight and express business and only \$121,654 from an increase in its passenger income) the net divisible income decreased \$113,542.

During the year \$290,000 of bonds were issued and sold under the mortgage of the Boston & Northern Street Railway, and \$769,000 of bonds under the mortgage of the Old Colony Street Railway. Of this, a total of \$619,000 was issued to refund maturing bonds, the balance being issued on account of completed improvements. No new capital stock was issued during the year by either the Massachusetts Electric Companies or the Bay State Street Railway.

The company spent during the year for new property or reconstruction a sum of \$1,574,807. New track to the extent of 5.75 miles was constructed; 4.4 miles of track were relined, resurfaced and paved, and 15.71 miles were reconstructed. Fifty semi-convertible cars with four-motor equipments were put into service about Jan. 1, 1914, and seven new express cars and two new service cars were purchased and put into service during the year. Twenty-seven sets of new trucks and 100 new motors were also purchased, besides additional feeder and power equipment.

Birmingham Railway, Light & Power Company, Birmingham, Ala.—At a meeting on Jan. 14 S. J. Dill, New York, was elected a director of the Birmingham Railway, Light & Power Company to succeed D. M. Drennan, deceased.

Carbon Transit Company, Mauch Chunk, Pa.—A. R. Jarard has been elected a director of the Carbon Transit Company, to succeed John M. Wolff, deceased. H. A. Butler has also been chosen a director, to succeed William Dods, who has been elected president of the company.

Cities Service Company, New York, N. Y.—At a recent meeting of the board of directors the capital stock of the Cities Service Company was reduced by \$2,200,000. At the time of the purchase of the common stock of the St. Joseph Railway, Light, Heat & Power Company, the Cities Service Company issued \$1,200,000 of preferred and \$1,000,000 of common stock to finance this transaction. These securities, however, were not sold, and recently the financing of the balance of the purchase price was accomplished through the sale of \$1,118,000 of trust certificates secured by the deposit of the St. Joseph stock, these certificates to be retired from a monthly sinking fund within two and a half years. The Cities Service Company stock issues originally authorized for this financing have now been returned to the treasury, reducing the outstanding preferred stock from \$27,368,426 to \$26,168,426 and the outstanding common stock from \$15,718,380 to \$14,718,380.

Holyoke (Mass.) Street Railway.—At the recent annual meeting of the Holyoke Street Railway, L. D. Pellissier was elected president and general manager of the Holyoke Street Railway and president of its leased line, the Mt. Tom Railroad, in each instance to succeed W. S. Loomis. Charles E. Mackintosh was added to the directorate of the street railway and I. E. Sawyer to that of the Mt. Tom Railroad.

Humboldt Transit Company, Eureka, Cal.—The Humboldt Transit Company has filed an application with the California Railroad Commission requesting authority to pledge eighteen of its first mortgage 5 per cent thirty-year gold bonds to the Pacific Coast Casualty Company, as surety in a \$7,000 damage case which the company proposes to carry on appeal to the Supreme Court.

Jacksonville (Fla.) Traction Company.—The Jacksonville Traction Company has passed its usual Feb. 1 dividend on its \$1,000,000 of common stock. From May, 1911, to November, 1914, 1½ per cent was paid quarterly. Inasmuch, however, as there was an ample margin over the preferred stock dividend requirements, the directors declared the regular quarterly dividend of 1½ per cent on the preferred stock payable on Feb. 1. Jacksonville, being essentially a commercial city with a large export business, has felt the business depression and lack of shipping facilities to a greater extent than have other Southern centers. The company made an effort to meet decreased earnings by cutting operating expenses as much as possible and by stopping all new construction except work required by the city. The directors feel confident that with a return to normal business conditions the earnings will show a corresponding improvement.

London (Ont.) Street Railway.—Thirty-five 5 per cent first mortgage bonds of the London Street Railway have been drawn for redemption at par on the maturity date, March 8, at the office of the Canadian Bank of Commerce, Toronto.

New York, New Haven & Hartford Railroad, New Haven, Conn.—Chairman Howard Elliott and General Counsel Buckland of the New York, New Haven & Hartford Railroad have been authorized by the board of directors to seek the legislation necessary in Massachusetts, Rhode Island and Connecticut to allow the placing of a blanket \$400,000,000 mortgage on the property. Under this mortgage bonds would be issued from time to time as needed. The railroad on Jan. 20 petitioned the Legislature for a change in its charter which would entitle it to sell, pledge or dispose of any shares of capital stock of steam railroads or street railways now held by it.

New York (N. Y.) Railways.—Judge Lacombe has denied the application of the New York Railways for repayment of judgment recovered by the city of New York against the Broadway & Seventh Avenue Railroad and the Ninth Avenue Railroad for repavement of parts of streets. The lines were leased to the Metropolitan Street Railway, and after the sale of the latter at foreclosure the New York Railways

as purchasers assumed the leases. Judge Lacombe says that obligations to repave the street were personal from the lessees to the city, the terms of the leases requiring the lessees to do such work or to respond for failure to do so.

New York State Railways, Rochester, N. Y.—J. P. Morgan & Company have purchased \$3,000,000 of first consolidated mortgage 4½ per cent bonds of the New York State Railways. It is reported that Harris, Forbes & Company and other investment houses will be associated with J. P. Morgan & Company in the public offering of these bonds.

North Alabama Traction Company, New Decatur, Ala.—The North Alabama Traction Company has authorized an issue of \$75,000 of 6 per cent income bonds to pay its floating debts and to reduce its capital stock to \$75,000.

Northern Ohio Traction & Light Company, Akron, Ohio.—An amount of \$300,000 of Northern Ohio Traction Company (the predecessor of the Northern Ohio Traction & Light Company) consolidated mortgage 5 per cent bonds held in escrow to retire \$300,000 of Akron, Bedford & Cleveland first mortgage 5 per cent bonds due on March 1 has been sold to the Citizens' Saving & Trust Company, Cleveland. This makes the entire \$3,000,000 of such bonds outstanding a first mortgage issue.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—The Oakland, Antioch & Eastern Railway on Jan. 13 filed an application with the California Railroad Commission requesting the approval of two notes amounting to \$68,000. These notes are dated Jan. 29, 1913, and Jan. 14, 1913, and extend for a period of three years thereafter.

Omaha & Council Bluffs Street Railway, Omaha, Neb.—Redmond & Company, New York, are offering for sale at 96½ and interest, to yield 5.35 per cent, first consolidated and now first mortgage 5 per cent bonds, due 1928, of the Omaha & Council Bluffs Street Railway.

Pacific Gas & Electric Company, San Francisco, Cal.—Announcement is made that the \$4,000,000 of Pacific Gas & Electric Company 5 per cent one-year collateral trust notes recently offered at private sale by Bond & Goodwin and William A. Reid & Company, jointly, have all been sold and are now quoted at a premium. The notes were offered at 99¾ and interest. They are dated Dec. 16, 1914, but are subject to prior redemption before Dec. 16, 1915, all or in part (by lot) at 100¼ and interest on fifteen days' notice.

Reading (Pa.) City Passenger Railway.—At the annual meeting of the Reading City Passenger Railway on Jan. 12, George A. Rick was elected a director of the company to succeed William R. McIlvain, deceased.

Rhode Island Company, Providence, R. I.—The trustees of the Rhode Island Company named by the Federal Department of Justice were on Jan. 20 elected directors of the Providence & Danielson Railway, which is leased by the former company. The new directors are Rathbone Gardner, John O. Ames, T. F. Green, J. P. Farnsworth and C. C. Mumford, succeeding D. F. Sherman, J. E. Thielson, C. A. Potter, V. W. Mason and F. A. Smith, Jr. The new directors elected C. C. Mumford president of the company in place of D. F. Sherman.

Riverside, Rialto & Pacific Railroad, Riverside, Cal.—The Crescent City Railway has been incorporated into a stock company under the name of the Riverside, Rialto & Pacific Railroad, commencing business as of Jan. 1, 1915. The Crescent City Railway was under the sole ownership of William C. Henshaw and had no bonds or shares of stock outstanding. Although it was considered a steam railroad and freight was handled by steam, all passenger service was performed by the Pacific Electric Railway under contract. According to a valuation recently completed by the California Railroad Commission, the original cost of the line is not ascertainable, but the reproduction cost, as determined by the commission, is \$457,886, as compared to the carrier's estimate of \$538,868. The carrier's estimate of present value as of June 30, 1914, was \$491,642, but the commission placed this amount at \$430,052.

San Diego (Cal.) Electric Railway.—A notice was recently issued by the California Railroad Commission stating that it intended to conduct on its own initiative an investigation into the property value of the San Diego Electric Railway. A public hearing has been set for Feb. 20.

Seattle (Wash.) Municipal Railway.—The utilities committee of the City Council of Seattle, Wash., on Jan. 19 voted to recommend to the Council the extension of Division "A," of the Seattle Municipal Railway, into Ballard, notwithstanding Mayor Gill's veto. The Division "A" extension bill, which seeks to transfer \$80,000 from the street railway bond issue, voted two years ago, to an extension fund to build into Ballard through Fremont and by way of Leary Avenue, was expected to come to the Council for final vote on Jan. 25. If it carries it will go on the ballot at the March general municipal election. The votes necessary to carry the bill over the Mayor's veto are said to be assured.

Shreveport (La.) Traction Company.—Redmond & Company, New York, are offering at a price to yield 5¼ per cent first mortgage 5 per cent serial gold bonds of the Shreveport Traction Company. These bonds mature annually July 1, 1918, to 1944, inclusive.

South Carolina Light, Power & Railway Company, Spartanburg, S. C.—A. B. Leach & Company, New York, are offering at 95 a small block of the 6 per cent cumulative preferred stock of the South Carolina Light, Power & Railway Company. This stock is redeemable at any time at 115 and dividends. Of an authorized amount of \$1,500,000, there is now outstanding \$700,000, which includes \$200,000 recently issued for improvements.

Third Avenue Railway, New York, N. Y.—A semi-annual payment of 2½ per cent has been declared on the \$22,536,000 of 5 per cent income bonds of the Third Avenue Railway, payable on April 1, from the earnings for the six months ended Sept. 31, 1914. This is the same payment as was made in October and April, 1914, and October, 1913. In April, 1913, an initial payment of 1¼ per cent was made. Frederick W. Whitridge, president, says that the combined transportation revenues of all the street railway, subway and elevated lines in New York for December sustained a loss of \$200,000 on account of business conditions. According to Mr. Whitridge, the special committee appointed to look into the affairs of the Third Avenue Railway has not yet submitted its report. The appointment of this committee was noted in the *ELECTRIC RAILWAY JOURNAL* of Nov. 21.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio.—The directors of the Toledo, Bowling Green & Southern Traction Company have passed the usual quarterly dividend paid on Feb. 1 on the company's \$750,000 of non-cumulative preferred stock. No dividend was disbursed last November, but from August, 1910, to August, 1914, 1¼ per cent was paid quarterly.

Toledo Railways & Light Company, Toledo, Ohio.—At the annual meeting of the Toledo Railways & Light Company on Jan. 22, the membership of the board of directors was reduced from twenty-one to nine. The following men were elected to serve for the ensuing year: Henry L. Doherty, New York, chairman; Frank W. Frueauff, M. R. Bump and C. E. Murray, New York; E. H. Close, S. D. Carr, Thomas H. Tracy, Frank R. Coates and Rathbun Fuller, Toledo.

United Railroads, San Francisco, Cal.—The California Railroad Commission on Jan. 12 sent a reply to a recent letter from Jesse W. Lilienthal, president United Railroads, in regard to the plan which he and creditors of the Solano Irrigated Farms project were considering as a means of rehabilitating this property. Previous reference to this plan was made in the *ELECTRIC RAILWAY JOURNAL* of Jan. 16. The commission took the stand that additional funds of the United Railroads should not be invested in the Solano enterprise. In its opinion the revenues of the railway should be saved for the purchase of new cars, for the improvement and extension of its service in San Francisco and for the payment of its outstanding obligations.

Western New York & Pennsylvania Traction Company, Olean, N. Y.—J. B. Olmsted, Buffalo, N. Y., chairman of the committee representing bondholders and stockholders of the Buffalo & Susquehanna Railroad, has confirmed a report that the Western New York & Pennsylvania Traction Company has been investigating the abandoned Buffalo & Susquehanna section between Buffalo and Wellsville, with the idea of purchase and electrification. According to Mr. Olmsted, however, the investigation is still in progress and no offer has been received from the traction line.

Youngstown & Southern Railway, Youngstown, Ohio.—In compliance with a petition filed by F. D. Wilkerson, Judge C. M. Wilkins of the Common Pleas Court at Youngstown on Jan. 21 appointed a receiver for the Youngstown & Southern Railway. David Tod, secretary and treasurer of the company, was appointed to execute the trust. The company operates 19 miles of line between Youngstown and Leetonia. There are \$948,000 of bonds and \$1,520,000 of stock outstanding.

DIVIDENDS DECLARED

American Railways, Philadelphia, Pa., quarterly, 1¾ per cent, preferred.

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

Brazilian Traction, Light & Power Company, Ltd., Toronto, Ont., quarterly, 1½ per cent, common.

Bristol & Plainville Tramway, Bristol, Conn., quarterly, 2 per cent.

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

Cumberland County Power & Light Company, Portland, Maine, quarterly, 1½ per cent, preferred.

Grand Rapids (Mich.) Railway, quarterly, 1¼ per cent, preferred.

International Traction Company, Buffalo, N. Y., 2 per cent, preferred.

Jacksonville (Fla.) Traction Company, quarterly, 1½ per cent, preferred.

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

Monongahela Valley Traction Company, Fairmont, W. Va., 2½ per cent, preferred.

Northern Texas Electric Company, Fort Worth, Tex., 3 per cent, preferred; 1¾ per cent, common.

United Power & Transportation Company, Camden, N. J., \$1.54.

ELECTRIC RAILWAY MONTHLY EARNINGS

COLUMBUS (GA.) ELECTRIC COMPANY

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14		\$63,274	*\$28,850	\$34,424	\$28,781	\$5,633
1 " " '13		58,858	*23,933	34,925	24,957	9,967
12 " " '14		678,572	*290,177	388,395	320,944	67,451
12 " " '13		600,009	*296,515	303,494	266,980	†79,226

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

1m., Nov., '14		\$195,389	*\$103,121	\$92,268	\$36,751	\$55,517
1 " " '13		211,612	*122,129	89,483	36,565	52,918
12 " " '14		2,435,544	*1,323,974	1,111,570	441,464	670,106
12 " " '13		2,352,895	*1,345,232	1,007,663	418,386	589,277

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

1m., Nov., '14		\$19,590	*\$13,901	\$5,689	\$5,603	\$86
1 " " '13		21,701	*15,261	6,440	5,670	800
12 " " '14		279,980	*180,484	99,496	67,068	32,428
12 " " '13		298,441	*180,771	117,670	67,721	49,949

JACKSONVILLE (FLA.) TRACTION COMPANY

1m., Nov., '14		\$52,880	*\$37,229	\$15,651	\$13,052	\$2,599
1 " " '13		58,234	*36,226	22,008	13,225	8,783
12 " " '14		723,598	*477,286	246,312	152,325	93,987
12 " " '13		663,761	*424,067	239,694	141,608	98,086

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

1m., Nov., '14		\$157,568	*\$83,848	\$73,720	\$26,807	\$46,913
1 " " '13		197,719	*109,037	88,682	24,052	64,630
12 " " '14		2,093,413	*1,166,265	927,148	312,857	614,291
12 " " '13		2,118,256	*1,167,127	951,129	287,527	663,602

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

1m., Nov., '14		\$24,838	*\$15,044	\$9,794	\$7,542	\$2,252
1 " " '13		26,659	*16,281	10,378	7,626	2,752
12 " " '14		303,576	*194,186	109,390	91,438	17,952
12 " " '13		294,920	*194,093	100,827	89,592	11,235

PENSACOLA (FLA.) ELECTRIC COMPANY

1m., Nov., '14		\$18,860	*\$12,251	\$6,609	\$7,353	†\$744
1 " " '13		22,695	*14,560	8,135	7,255	880
12 " " '14		271,024	*172,204	98,820	86,537	12,283
12 " " '13		283,303	*181,900	101,403	80,357	21,046

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

1m., Nov., '14		\$686,819	*\$401,883	\$284,936	\$177,757	\$107,179
1 " " '13		753,982	*\$423,479	329,503	174,419	155,084
12 " " '14		8,523,730	*5,026,359	3,497,371	2,115,522	1,381,849
12 " " '13		8,548,934	*4,989,954	3,558,980	2,061,589	1,497,391

*Includes taxes. †Includes other income. ‡Deficit.

Traffic and Transportation

THE "JITNEY" BUS

Developments Are Recorded in Connection with the Bus in California and Washington—2375 Buses in Operation in Five Cities

The police department of San Francisco has been issuing licenses to "jitney" bus drivers recently at an average rate of fifteen to twenty per day. The men engaged in this traffic have organized the San Francisco "Jitney" Bus Association, which has promised exposition officials that 2000 automobiles will be put in service to handle crowds expeditiously to and from the exposition gates throughout the season. Books of tickets are to be sold, good on any of the association's buses. These automobiles are expected to handle 20,000 passengers per hour.

Supervisor Vogelsang, of San Francisco, chairman of the public utilities committee, has drafted a recommendation for a municipal "jitney" bus line along Ocean Boulevard, with "jitney" transfers to the Municipal Railway on Geary Street.

On the other hand, at a hearing on Jan. 19 before the State Legislature, presentations were made to show that the "jitney" bus is endangering the street railways. Opposing the "jitneys" at the hearing were Paul Shoup, representing the Pacific Electric Railway, the Stockton Electric Railway, the San José Railway and the Peninsular Railway; C. N. Black, for the United Railroads, San Francisco; R. S. Dilworth, for the San Diego Electric Railway; H. F. Jackson, for the Monterey & Pacific Grove Railway; A. G. Wishon, on behalf of the Bakersfield & Kern Electric Railway; G. K. Weeks, for the Key Route and the Oakland Traction Company; A. Bearce, for the Tidewater & Southern Railway; G. F. Herr, of the Central California Traction Company; F. W. Webster, of the Fresno Traction Company; J. C. McPherson, of the Oakland lines of the Southern Pacific Company; E. L. Lewis, of the Los Angeles Railway Corporation; W. V. Hill, of the Pacific Electric Railway, and James Irvine, of the San Francisco, Napa & Calistoga Railway.

The "jitney" bus associations were represented by W. R. Covington and H. V. MacMeans, San Francisco, and Mr. Higgings, Los Angeles. Mr. MacMeans said that the rolling stock of the concerns in San Francisco is worth more than \$500,000 and that this would be doubled in a short time. He pointed out that the "jitney" buses are now subject to five different taxes, namely, city license tax, State license tax, chauffeurs' State tax, chauffeurs' city tax and property tax. The associations invited regulation, he said, but were opposed to increased taxation because they were already paying at a higher rate than the corporations.

The San Francisco-Oakland Terminal Railways have been losing \$500 per day in passenger fares, according to W. R. Alberger, general manager of the company, on account of the traffic diverted to the auto bus lines now operating in that city. Subsequent to Mr. Alberger's analysis of the situation, the city of Oakland on Jan. 20 passed an ordinance, the salient features of which are that each bus shall be covered by a \$10,000 indemnity bond; pay a \$60 annual license fee; ply only on routes approved by the City Council; be driven only by drivers who have passed rigid examinations and carry identification papers, and be subject to special police regulation.

San Francisco has under consideration a similar ordinance and a tentative draft of this, given out on Jan. 20, included the following provisions: Each "jitney" owner must have on file with the police commission a \$10,000 bond. The police commission will have absolute control of "jitney" buses, which may operate only along the route provided by the commission. The licenses will be, five passengers, \$40; more than five and less than eight, \$60; more than seven and less than sixteen, \$80; more than fifteen, \$100. The "jitney" bus men will confer with the members of the public utilities committee to discuss the proposed license fees and other features of the ordinance. The supervisors have explained that they computed the license fees on the basis of 2 per cent of the gross earnings of the "jitney" buses. The bus men claim that the receipts of their cars

average \$1 per hour and that the cars in operation on the Pacific Coast are as follows: San Francisco, 300; Bay Cities, 450; Los Angeles, 1050; Portland, 75; Seattle, 500. If these figures are correct their total receipts for an eight-hour day in these cities would be \$19,000.

The report of the public utilities committee of the Council of Los Angeles, which has been considering the matter of "jitney" bus legislation, says:

"We are convinced that this mode of conveyance is not temporary in character, as some believe, but that it has come to stay as a permanent feature as transportation convenience.

"We hold it as a sound economic principle that every mode of transportation in operation prior to the advent of the motor bus should sustain its appeal to popular favor and profit-making upon its intrinsic merit and not upon protective legislation.

"The motor bus must be received in all fairness and be encouraged to develop along natural lines, leaving the experience of time to demonstrate whether it will develop as an aid to established methods, or whether it will work a complete revolution as an urban passenger common carrier.

"As this development proceeds, certain uniformity of procedure, known as regulation, should be laid down, and while this must be first to the advantage of the passenger public, it must also work to the advantage of the operator and owner."

The committee says that in its judgment an ordinance should be enacted providing that the present license fee remain unchanged for the present; that every operator and owner register his name, description, state number and make of car to be operated and number of driver's license; that licenses be issued only for definite routes, including designated terminals, such routes to be selected by the applicant and not dictated by the city; that non-skid tires be applied to the rear wheels of all buses with tire chains in wet weather; that every operator be required to understand the traffic rules and demonstrate his ability properly to drive his car; that signs be provided which name the route, terminals, license number and fare; that the front seat accommodate not more than one passenger or one passenger with child in arms, and that the supervising power in the city be assigned to the board of public utilities.

The committee of the whole of the Council of Los Angeles has agreed to instruct the city attorney to draft an ordinance incorporating the regulations for "jitney" buses recommended by the utilities committee. The regulations have been approved by the Autobus Owners' and Operators' Association.

In commenting on the regulations suggested by the public utilities committee of the Council of Los Angeles, one of the local papers said that "leading business men were not slow to express their disgust with the City Council's weak-kneed, half-hearted plan of dealing with the serious 'jitney' bus problem."

J. W. M. Pherson, manager of the Glendale & Montrose Railway, Glendale, Cal., issued a statement recently which he concluded as follows:

"I respectfully submit that in view of the serious financial injury caused this company by the operation of the buses in Glendale some action should be taken which will enable both transportation concerns to live, each being compelled to operate in its proper field and in the territory best suited to its respective equipment. In this way the stage line and the railway can work harmoniously and with profit to each and with no loss to the Glendale public or to the inhabitants of the La Crescenta and Monte Vista Valleys. In that event this corporation will gladly continue to co-operate with you in the advancement of the welfare of the city, maintain its present efficient service and constantly try to improve the same. Are not such results better for all parties than to have our present properties deteriorate and again become the butt and ridicule of the community."

About Jan. 1 the first "jitney" bus made its appearance in Seattle. On Jan. 22 not less than 650 buses were operating on the main streets of the city. The City Council, some time ago, passed a bill to regulate those who drive automobiles for hire. Drivers must be twenty-one years of age, or more, must submit to a physical examination to

prove their ability to handle a car, must file sworn testimonials of at least two citizens, with the city, before obtaining a license, must submit two photographs of themselves, one to be filed in the comptroller's office and the second to be attached to the license, and must pay a fee of \$4 per year for each license to operate, with an additional fee of 50 cents for driver's badge.

State regulation of the "jitney" bus in Washington is proposed in a bill by Senator Wilburn Fairchild and Senator Sutton. This measure provides that bus drivers must give bonds, making themselves responsible for accidents. General regulation of routes and fares is proposed, and a tax on the bus, to assist in the maintenance of streets. I. M. Howell, Secretary of State, is having a bill prepared for regulation of public carrying automobiles, for submission to House members.

Ruling that the Washington State Public Service Commission has the legal right to regulate "jitney" buses, Charles A. Reynolds, chairman of the Public Service Commission, has directed T. E. Phipps, chief engineer for the commission, to instruct his assistants to gather all possible data regarding bus operation. Mr. Reynolds says that the "jitney" bus is a common carrier, under the act creating the commission, and as such falls within the jurisdiction of the commission. The section of the Washington statute defining common carriers follows:

"The term 'common carrier,' when used in this act, includes all railroads, railroad companies, street railroads, street railroad companies, steamboat companies, express companies, car companies, sleeping car companies, freight companies, freight line companies, and every corporation, company, association, joint stock association, partnership and person, their lessees, trustees, or receivers appointed by any court whatsoever, and every city or town owning, operating, managing and controlling any such agency for public use, in the conveyance of persons or property for hire within the State."

The act defines the transportation of persons as follows:

"The term 'transportation of persons,' when used in this act, includes any service in connection with the receiving, carriage and delivery of the person transported and his baggage and all facilities used or necessary to be used in connection with the safety, comfort and convenience of the person transported."

The powers of the commission to regulate the "jitney" buses are outlined in the following section of State law:

"Whenever the commission shall, after a hearing had upon its own motion, or upon complaint, find that additional tracks, switches, terminals, terminal facilities, stations, motive power or any other property, apparatus or equipment, facilities or device for use by any common carrier in or in connection with the transportation of persons, or property, ought reasonably to be provided, in order to secure adequate service or facilities for the transportation of passengers or property, the commission may, after a hearing, either on its own motion, or after complaint, make and serve an order directing such repairs, improvements, changes or additions to be made."

At the present time, there are no "jitney" tariffs on file with the board, and if Mr. Reynolds sustains his ruling, as given out, it is expected that the owners and drivers of buses will flood the commission's office with their tariffs and schedules.

Discussing the matter recently, Mayor H. C. Gill of Seattle said:

"The situation to-day is abnormal. Motor-propelled vehicles are as logically the successors to the electric cars, as the electric cars were the logical successors to the horse-drawn vehicles. Regulations by ordinance, except as provided in the new ordinance requiring registration, is impossible under the present State laws. Any ordinance looking toward general regulation will conflict with State statutes and will be restrictive rather than regulatory. Such a law would be unconstitutional, and would fall before the first test case. Seattle's hope of regulation lies in the passage of a State law covering the operation for hire of all motor-driven vehicles within the State. In the first place, prosecution under a State law always is more effective than under a city ordinance. Buses should not be permitted to be overcrowded; the drivers should be bonded to protect their passengers in case of accident, and the

strictest police supervision should be maintained, that human life and property may be protected."

More than 600 owners and drivers of "jitney" buses in Seattle have decided on a permanent organization, to be known as the Seattle Auto Transit Association; its incorporation under State laws, as a non-profitable concern, with a president, vice-president, secretary and treasurer; a business office downtown, and an assessment against every member of \$2 per month, to defray the expenses of maintaining the organization.

A. L. Kempster, manager of the Puget Sound Traction, Light & Power Company, advises that the heads of the local corporation have held several conferences for the purpose of discussing the situation, but that it is felt the "jitney" bus has not interfered with their business sufficiently to warrant drastic action being taken at the present time. Other officials of the company intimate that the matter of building and operating a number of buses in direct competition with the privately-owned buses is not improbable. The company has not laid off any men or curtailed its service.

An address in regard to the "jitney" bus in Portland, Ore., was made on Jan. 15 before the Transportation Club in that city by Franklin T. Griffiths, president of the Portland Railway, Light & Power Company. Mr. Griffiths said in conclusion:

"I trust that I have made clear not only the unfair nature of this competition to the existing company, but also that the best interests of the people of Portland would be subserved by placing automobile or auto bus transportation in its proper field as supplementing existing transportation only in those districts where there is or may hereafter exist an inadequacy of street railway service and then subjecting them to a burden for the benefit of the public commensurate with that assumed and discharged by the existing company. Either similar burdens should be imposed upon the new transportation system or the existing company should be relieved of further obligations in the matter of such charges and reimbursed for what it has heretofore expended for the benefit of the public. I trust that in the interests of the public as well as the company a fair and equitable solution of this problem will speedily be found."

The City Council of Portland has taken no steps to regulate or curb the operations of the buses. Commissioner Daly, of the Department of Public Utilities, terms the buses a "fly-by-night" fad. He asserted, however, that should they survive for five or six months they must be made subject to the same regulations as the electric railways and forced to make the long hauls as well as the short.

MASSACHUSETTS BILL TO REGULATE "JITNEY" BUS

As announced briefly in the *ELECTRIC RAILWAY JOURNAL* of Jan. 23 the Massachusetts Street Railway Association has filed a bill with the Legislature setting forth the conditions under which bus business may be carried on in that State and providing for responsibility in case of damages caused by such bus lines. The bill provides that five or more persons may associate themselves by written agreement with the intention of forming a corporation for the transportation of passengers in automobiles, having a seating capacity for eight or more passengers. The agreement of association is required to be in such form as the Public Service Commission shall require, including the names of the cities and towns in which it is proposed to operate. The capital stock of the corporation is to be not less than \$10,000 for each of the total number of passengers capable of accommodation in the largest vehicle operated or proposed for service by the corporation, and is to be fixed at such larger amount and may be increased at the order of the board from time to time, in view of the volume of business, speed of vehicles, danger of injury, or loss of life of passengers or other users of the highways through which such vehicles are operated, and of other conditions deemed pertinent by the board.

The bill provides that the municipal authorities of any city or town named in the agreement of association may issue, after public notice and hearing, a license designating the streets and highways upon which the vehicles are to be operated, the terms and conditions as to rate of speed, com-

pensation for wear and tear of highways and bridges, manner of operating such vehicles, and adoption of proper safeguards under which the business shall be conducted, but no license is to be valid until it has been approved as consistent with the public interests by the Public Service Commission, which may modify any provisions as it deems necessary for the protection and convenience of passengers and the public. If such a license includes any portion of a state highway it is not to be valid until the Massachusetts Highway Commission has determined the amount of annual payment to be made by the corporation to the latter commission to be by it applied in the maintenance of such State highway, and this annual payment, to be made on or before Jan. 1, is to constitute a condition precedent to the right of the corporation to operate its vehicles over the State highway. The amount of the payment can be changed from time to time at the order of the Highway Commission. A fee of \$50 must be paid by the corporation for its license. All the provisions of the general electric railroad law (Chap. 463, part 3, Acts of 1906) relative to the issue of securities are to apply to the bus corporation.

The Public Service Commission is to have as full power over fares, service and operation as it exercises over electric railways, and bus corporations are required by the bill to file annual returns with the board. A sworn return of the weight and seating capacity of every motor vehicle seating more than eight passengers and transporting persons for hire is to be made annually to the Highway Commission, duplicates being filed with the Tax and the Public Service Commissioners. No owner, except such corporations, of such a motor vehicle, shall permit its operation for the carriage of passengers until he shall have deposited a bond with the Highway Commission in the amount to be obtained by multiplying \$5,000 by the number of persons for whom there is seating capacity in the motor vehicle, to provide security for damages which may be recoverable by any passenger on such motor vehicle, or by any person not a passenger, against the owner or operator of the motor vehicle. Every such individual owner is required by the bill to pay an annual tax to the State at the rate of \$10 for every 100 pounds of weight of the vehicle in excess of 4500 lb., the tax to be expended by the Highway Commission as provided by law.

THE "JITNEY" BUS ELSEWHERE

The Real Estate Exchange of Fort Worth, Tex., and other business organizations are protesting against the operation of the "jitney buses," and the exchange has on its own initiative drafted a proposed ordinance covering their operation. This ordinance calls for a higher license on all automobiles operating for hire. It would eliminate the solicitation of passengers on streets over which street cars are run and would provide a regular schedule under which the buses must operate. The ordinance further provides that the "jitney" buses should pay both personal and occupation taxes and carry free all city employees.

Meanwhile the city commissioners of the city of Fort Worth have authorized the police commissioner to approve applications made by "jitney" bus owners and send them to the tax office without the applicants having to wait for the entire commission formally to approve the application. Every applicant is questioned about the condition of his machine, and in some cases the commissioner insists on inspecting the machine before approving the application. The commissioner expressed himself to the effect that he did not intend to have "a lot of 'ratty' and unsafe automobiles running around the city with big loads of people." He has assigned a motorcycle officer to ride around with applicants for "jitney" bus licenses to test their efficiency as chauffeurs. He cautions every driver to whom a license is issued about the traffic regulations and tells him to keep his running board clear and never allow more than one person on the front seat. He has announced that he will revoke the licenses of all who fail to comply with these instructions. On Jan. 15 there were fifty-four "jitney" automobiles in operation in Fort Worth. It was then figured that more than 100 other cars would be in service by Feb. 1.

David Daly, manager of the Houston Electric Company, is quoted by the *Houston Post* as follows in regard to the "jitney" bus:

"We estimate that the 'jitney bus' lines, if they continue to increase as at present, will decrease the earnings of the Houston Electric Company under those of 1914 by at least \$250,000. If such a decrease does come about, it will be absolutely impossible to finance new improvements and go on with the work of double-tracking and the expenditures for paving and other items amounting during the twelve months ended July 1, 1914, to \$750,000."

Regarding the menace of the "jitney" bus in Texas L. C. Bradley, manager for Stone & Webster in Texas, is quoted as follows by the *Dallas Times-Herald*:

"If the cities of Texas do not take some steps to put these automobiles under the control of the municipalities in which they operate and have fixed rules of service to all points and see that they pay a permit tax for the streets they use it means a revolution of the street car business of this section. We cannot begin to maintain adequate service if our business is shot to pieces by a business which pays nothing to the city's tax office. We are waiting for the city governments to recognize the situation which faces them and us."

As an immediate means of obtaining motor bus service for the city of Chicago, Mayor Harrison has announced that the field is open for private capital to step in and operate "jitney" buses. In explaining his position the Mayor stated that the thoroughfares were not under park jurisdiction, therefore no franchise was needed to operate bus lines over them. He held that the streets were as free for private motor buses as for any other commercial vehicles.

The operation of about sixty automobiles, including a few adapted trucks, in "jitney" service mornings and evenings, on the streets of Kansas City, has elicited the question by Mayor Jost as to licenses and taxation. The first "jitney" went into service in Kansas City on Jan. 18.

EXPOSITION TRAFFIC

Preparation Being Made for Handling Exposition Crowds at San Francisco

Until recently there has been some apprehension in San Francisco as to the possibility of handling exposition crowds with the transportation facilities now planned, and after a record attendance at the grounds on Jan. 10 a careful compilation of data was made. On that date 45,000 people were admitted to the exposition grounds, this being the last day the grounds were open to the public prior to the official opening on Feb. 20, and although practically all the heavy traffic was handled both ways on a short afternoon, there was no undue delay or inconvenience. Within another month the transportation facilities for handling exposition visitors will, it is estimated, have a total capacity of 52,600 per hour.

A review of transportation facilities to be available by the opening date next month, gave the following results: Municipal Railroads, 18,100 passengers per hour; United Railroads, 16,000; Hyde Street line, 3000; Double-deck buses, 3500; "jitney" buses, 5000; independent buses, 500; Key Route (direct to fair grounds), 5000; Northwestern Pacific, 2000; total, 52,600.

It is estimated by Mr. Mortensen that the average daily attendance will be 40,000 to 50,000. He points out that the 15,000 privately-owned automobiles in the city will convey a large number of people to and from the grounds, and that 40 per cent of the city's population live within walking distance of the exposition gates.

C. N. Black, vice-president and general manager of the United Railroads, said recently:

"The United Railroads wants to make two changes before the opening day. The first of these is under way in Fillmore Street—on the line coming down the hill. We are having cars reconstructed for this line so that they can be emptied and filled much more rapidly than the regular cars. There will be two doors on each side, and when the passengers are going out on one side they will be entering on the other. These cars will be run in trains of two, with a two-minute headway. A new cable is being made and will be put in. I am confident that we can handle 6000 an hour on this line. We shall ask for a temporary permit on Francisco Street between Polk and Van Ness, and if we get it we shall load and unload cars both on this spur and on

Polk Street north of Francisco. That will give us double facilities to turn the cars, and with this permit we can run on about a forty-five-second headway on Polk Street. I know that there are estimates that a thirty-second headway can be maintained, and it could were the regular traffic on Polk Street not so heavy, and if the team drivers could be persuaded to keep off the car tracks. These objections will make it impossible to try to run a car more frequently than forty-five seconds. We have the equipment and expect to handle 10,000 people an hour on this line."

ADVICE ABOUT SNOW

Director of Public Service Fosdick of Cincinnati issued the following statement on Jan. 23:

"People riding on street cars will naturally understand that weather conditions of the past few days have greatly contributed to causing delays in the car service.

"The unusual fall of snow and the alternate freezing and thawing tend to more difficult operation of cars. Even with the best attention that can be given to cleaning the streets of snow it is impossible to cover the whole city at once.

"The fact that the electric railway operates its snow plows continuously when the snow comes means that the tracks are clearer of snow than the sides of the streets and that teams and vehicles of all kinds hunt the tracks in preference to the sides of the streets. As the sides are cleaned, however, this condition is materially relieved, and I think it is advisable to request teamsters and drivers of all kinds of vehicles to keep out of the street-car tracks as far as possible so that delays to street cars by fallen horses and broken or stalled wagons will be reduced to a minimum.

"Frequently drivers stay in the car tracks in spite of the ringing of gongs and dragging of the cars behind them. They ought to turn out at once. The street cars are to accommodate so many people that the first consideration should be given to those desiring to get to their destinations in this way. Accidents happening in the car tracks mean the tying up of lines, consequent delays and impairment of the car service. All drivers are earnestly requested to follow the above suggestions."

GRADE CROSSING ACCIDENTS

The report of highway railroad grade crossing accidents for 1914, issued by the National Highways Protective Society, shows that, in New York State, during 1914, 199 persons were killed, as compared with 124 in 1913 and 107 in 1912, not including trespassers. One hundred and thirty-three persons were seriously injured. Of those fatally injured more than 66 per cent were pedestrians. The fatalities in which the victim was an occupant of a motor car decreased from thirty-eight in 1913 to thirty-five in 1914. There were no fatal collisions between trolley cars and trains, but thirty-one occupants of wagons met their deaths by collisions with trains, as compared with thirty in 1913 and forty in 1912. The report holds that the immunity from fatal accidents to trolley passengers at highway railroad grade crossings during 1913 and 1914 is due largely to the law now in force in New York State which compels the motormen of trolley cars to stop their cars at each crossing and assure themselves that the way is clear before proceeding. It is suggested that if a similar law had been enacted to apply to drivers of automobiles and wagons, sixty-six persons would not have been killed last year while attempting to cross a railroad at grade.

CHICAGO TRACTION FUND FOR EMPLOYEES' PENSIONS

Mayor Harrison has suggested to the City Council of Chicago that a portion of the city's traction fund be contributed hereafter to a pension fund for street railway employees. In the letter to the City Council the Mayor asked that the matter be referred to the local transportation committee for investigation and that the corporation counsel be asked to render an opinion as to the legality of an ordinance applying a percentage of the city's future receipts from the street railways to a pension fund. The Mayor sets forth as his reason for making such a suggestion that the working agreement between the employees and the railway companies will expire

during the coming summer, and no doubt an increase in wages will be demanded. Since the granting of an increase would reduce the city's share of the net receipts, it might be good policy to inaugurate such a plan as a means of forestalling serious difficulties which, he stated, were sure to arise when negotiations were under way for another working agreement.

EMPLOYEES' MAGAZINE IN ST. LOUIS

The first number of the *United Railways Bulletin*, a monthly published by the United Railways, St. Louis, Mo., in the interests of its employees, has been issued. The front page is devoted to an explanation of the purpose of the *Bulletin*, by Richard McCulloch, vice-president and general manager, who says: "It is intended to be a medium for the interchange of ideas between the men who constitute the brains, the bone and the sinews of the United Railways."

The "leader" in the magazine is an article devoted to the United Railways new pension system. The organization of a building and loan association for employees of the company is told of in an article by Robert J. Richardson. Pope Y. White, formerly with the *St. Louis Times*, is editor of the monthly.

Children's Tickets in St. Louis.—The transportation department of the United Railways, St. Louis, Mo., has inaugurated a new system of handling children's tickets. Heretofore conductors have been required to buy tickets good for children and to keep supplied with a certain number of them. In the future the company will furnish \$2 worth of tickets to each conductor each morning, for which he will sign receipt the same as he does for change money, turning in the tickets he has left at night and paying for those he has sold.

Stay Granted in Albany Service Order.—Officials of the United Traction Company, Albany, N. Y., have been granted a temporary stay from the order of the Public Service Commission of the Second District of New York requiring certain improvements to be made in its equipment and service. The application was made before Supreme Court Justice A. V. S. Cochrane at Hudson for a writ of certiorari and a stay to the order of the commission. It is believed that the case will go to the Appellate Division, which will convene in Albany in March and then to the Court of Appeals.

The St. Joseph Fare Case.—On Jan. 22 three United States District judges—John E. Garland, A. S. Van Valkenburgh and D. P. Dyer—heard arguments on the application of the Kansas City, Clay County & St. Joseph Railway for an injunction against the enforcement of the Missouri Public Service Commission's order as to commutation rates. The commission has been allowed thirty days to file a brief. The company will then have five days to make answer, and the hearing then will be by one of the judges. The new rates are suspended by a temporary order pending the hearing of the case on its merits.

Southern Pacific Rate Case Up Again.—The entire peninsula rate case against the Southern Pacific Company and its electric subsidiary, the Peninsula Electric Company, has again been brought up before the State Railroad Commission of California on complaint of San Mateo and Palo Alto people. All rates of the Southern Pacific Company and its electric subsidiary are attacked, including the monthly commutation, trip and regular fares. The peninsula people complain that they are discriminated against by the railroad in favor of Alameda County and trans-bay passengers who are getting lower rates.

Subway Service Order.—On the recommendations of Commissioner Maltbie, the Public Service Commission of the First District of New York has ordered the Interborough Rapid Transit Company to furnish a seat for every passenger in the subway cars between the Atlantic Avenue station, Brooklyn, and Manhattan, during the non-rush hours. The company may obey the order either by operating the maximum of ten-car trains during the hours mentioned, or run a sufficient number of cars to provide seats equal to the number of passengers carried during a period of every twenty minutes.

Steam-Electric Freight Service Discontinued.—The present freight service operated over the Iowa & Illinois Railway from Davenport, Ia., to Clinton, and from that point over the Northwestern steam railroad, will be discontinued after March 15. This means the withdrawal of all steam cars on the Iowa & Illinois Railway. A local electric service in carload lots and less will be continued on both the Iowa & Illinois Railway and the Davenport-Muscatine line. The steam-electric freight service on the Iowa & Illinois Railway was inaugurated on April 1, 1912. It is stated that the service has been unprofitable and that it has interfered with the passenger business.

Traffic Decreases in Buffalo.—The records of the International Railway, Buffalo, N. Y., show that it is carrying fewer passengers now than it did two years ago and that there was a decrease in passenger traffic in 1914 compared with 1913. Edward G. Connette, president of the company, says that the increased number and use of automobiles have injured the business of the company. To obtain concrete information on the subject he had a check made of the number of passengers riding in automobiles on Delaware Avenue, the Fifth Avenue of Buffalo, and from the figures thus obtained it was found that the automobile traffic on that thoroughfare was sufficient to justify a double track railway with cars running on a headway of two and one-half minutes.

New Schedule at Manila.—A new schedule was put into force on Nov. 17 by the Manila Electric Railroad & Light Company, Manila, P. I., because of changed traffic conditions caused largely by the temporary closing of the Bridge of Spain. In answer to some adverse comments in the daily papers on the changes in schedule, C. N. Duffy, vice-president of the company, published a statement on Dec. 3, giving in detail the reasons for the changes in the schedule. He also presented a statement of the revenue passengers carried during the first eleven months of 1914, as compared with 1913. These figures showed an increase of about 2 per cent during the first six months of the year, compared with 1913, but during the last five months of the year there was a decrease of approximately 17 per cent, or a decrease of approximately 7 per cent for the eleven months.

Talks to the Men in Houston.—David Daly, manager of the Houston (Tex.) Electric Company, has begun the publication of *The Organization*. The first issue was dated Jan. 2, 1915. Mr. Daly describes the publication as a pamphlet issued now and then from the manager's office for the promotion of thrift, economy and service. The idea is to make the publication a means by which Mr. Daly can have heart-to-heart talks with his men. His appeal to the men is to read carefully everything that he has to say in the talks and think it over. The talks are not meant for the public. Mr. Daly says that to meet the decreased revenues due to the prevailing dull business and incidentally to the "jitney" lines, the company must decrease its expenses without hurting the service and if possible without reducing the payroll. He desires co-operation towards cutting down waste of materials, of time, money and human life.

Lower Car Steps in New Hampshire.—The order of the Public Service Commission of New Hampshire requiring lower car steps, previously referred to in the *ELECTRIC RAILWAY JOURNAL*, requires that all cars hereafter placed in service on any of the roads in the State shall be equipped with steps none of which shall be more than 15 in. high. With reference to several of the lines, the commission says that they are small roads and that none of them pay dividends upon their stock or have not done so for the last ten years, except in the case of the Keene and Berlin roads. The steps on the cars on these lines do not vary greatly from the standard fixed by the proposed order, and the commission says that upon these roads the management ought to provide an extra set of steps for the open cars at some reasonably early date. At the present time the commission will make no order as to any reconstruction of existing equipment upon any of this group of roads. The commission states that 93 per cent of the total street railway traffic is upon lines the cars of which now conform, or will by the proposed order be brought to conform, to the standard fixed by the commission.

Personal Mention

Mr. Herbert Clay, counsel of the Atlanta Northern Railway, Atlanta, Ga., has resigned from that company.

Mr. J. H. Hornung has resigned as general manager and purchasing agent of the San Francisco, Napa & Calistoga Railway, Napa, Cal.

Mr. Arthur B. Fuller has been appointed superintendent of equipment of the Union Street Railway, New Bedford, Mass., to succeed the late Richard H. Bennett.

Mr. Samuel Riddle, superintendent of transportation of the Louisville (Ky.) Railway and allied lines, has been elected vice-president of the Louisville Engineers' & Architects' Club.

Mr. Carl D. Jackson, Oshkosh, Wis., former district attorney of Winnebago County, has been appointed a member of the Wisconsin Railroad Commission to succeed Mr. John H. Roemer, resigned.

Mr. P. H. Worman was elected treasurer of the Dayton (Ohio) Street Railway at the recent annual meeting of the company to succeed Mr. E. W. Hanley, who resigned several months ago. Mr. Worman is also secretary of the company.

Mr. Robert E. Williams has resigned as manager of the steam heat department of the Birmingham Railway, Light & Power Company, Birmingham, Ala., to become connected with the Little Rock Railway & Electric Company, Little Rock, Ark.

Mr. Edward M. Graham, who has been connected with the Frank Ridlon Company, Boston, Mass., for the last year, has resigned to resume his former position as assistant to Mr. John R. Graham, president of the Bangor Railway & Electric Company, Bangor, Maine.

Mr. Frank W. Webster, general manager of the Fresno (Cal.) Traction Company and the Stockton Electric Railroad, has also been appointed general manager of the Central California Traction Company, Stockton, to succeed Mr. C. H. Robertson.

Mr. William S. Hamel has been appointed chief clerk to Mr. C. V. Wood, vice-president of the New England Investment & Security Company, Springfield, Mass., to succeed Mr. Robert E. Cosgrove, whose appointment to the position of passenger and freight agent of the company is referred to elsewhere in this column.

Mr. John Hall Rider is about to join the firm of Preece, Cardew & Snell, London, England. Mr. Rider retires shortly from the position of consulting electrical and mechanical engineer to the Central Mining & Investment Corporation, Ltd., and Rand Mines, Ltd., Johannesburg. Previous to going to South Africa in 1910, Mr. Rider was for nine years electrical engineer to the London County Council Tramways, London, England.

Mr. George M. Cox, vice-president and general manager of the Boston Suburban Electric Companies, Boston, Mass., was presented with a diamond ring and a traveling bag recently by the employees of the company as a token of their esteem and to commemorate his election as vice-president of the company. More than 200 members and guests were present at the annual dinner of the Suburban Railway Club, at which the presentation was made. Included in the gathering were many officers of the towns and cities through which the lines of the company are operated.

Mr. Robert E. Cosgrove, chief clerk to Mr. C. V. Wood, vice-president of the New England Investment & Security Company, Springfield, Mass., has been appointed to the position of passenger and freight agent of the lines operated by the company. He will be in charge of traffic over the Springfield Street Railway, the Worcester Consolidated Street Railway, the Milford, Attleboro & Woonsocket Street Railway, the Interstate Street Railway and the Attleboro Branch Railroad. The new position was created as a separate department, the work having been done previously by Mr. Cosgrove as chief clerk. Mr. Cosgrove is a native of Winchester and entered the service of the company in its Boston office as a stenographer. He was associated

there with Mr. Wood, and when the offices were moved to Springfield in 1908 he was appointed to the local office in that city.

Mr. W. H. McGrath, who succeeded Mr. A. W. Leonard recently as manager of the Puget Sound Traction, Light & Power Company, Seattle, Wash., and subsidiary companies



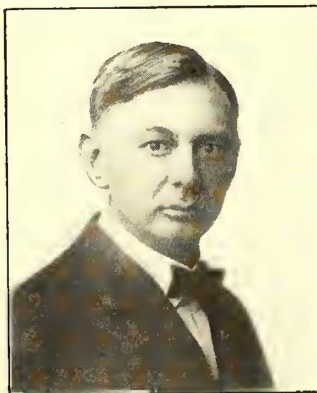
W. H. M'GRATH

on the election of the latter to the position of president, has been connected with public service properties for the last fourteen years. After graduating from Harvard in 1901 with an engineering degree, Mr. McGrath went with Stone & Webster and gained experience in every department of the Boston office work. In 1902 he was appointed electrical engineer for the company at Houghton, Mich., and became superintendent of the Houghton County Electric Light Company about 1903. In 1905 Mr.

McGrath was made manager of Houghton County Traction Company and Houghton County Electric Light Company, both Stone & Webster properties. He served in this position until 1909, when he was transferred to Minneapolis as assistant to Mr. A. W. Leonard, at that time vice-president and manager of the Minneapolis General Electric Company. During some of the trying times of this company and until 1912, when Stone & Webster sold the property, which then was very successful, he held the position of assistant general manager at Minneapolis. In June, 1912, Mr. McGrath returned to Boston and took up expert work for Stone & Webster in connection with the examination, analysis and organization of new properties and for other interests, bankers, etc. In November, 1913, he was appointed assistant to the vice-president of the Puget Sound Traction, Light & Power Company, Seattle, which position he held until Mr. Leonard's election to the office of president to succeed the late Jacob Furth.

Mr. M. C. Ewing, general manager of the Wausau (Wis.) Street Railroad, was elected president of the Wisconsin Electrical Association at the seventh annual convention of

the association, held in Milwaukee on Jan. 22, 1915. Mr. Ewing was born in Cleveland, Ohio, in 1869 and entered public utility service at Wausau in 1906, when he aided in the promotion and construction of the Wausau Street Railroad. In 1908 the electric service and street railway properties in Wausau were merged, and Mr. Ewing was made general manager of the combined properties. He also aided in the promotion and construction of the street railway system in Grand Rapids, Wis. He has been active in the



M. C. EWING

work of the Wisconsin Electrical Association for a number of years. The company at Wausau, of which Mr. Ewing is general manager, operates 9 miles of line and furnishes current for light and power purposes in the cities and towns of Wausau, Schofield and Rothschild.

OBITUARY

Harry Glazier, formerly superintendent of the Trenton, Bristol & Philadelphia Street Railway, Bristol, Pa., is dead. Mr. Glazier assumed the position of superintendent of the company in 1906 and severed his connection with the company in 1908. He then became associated with the Frankford, Tacony & Holmesburg Street Railway and was connected with that company at the time of his death.

Construction News

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

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

FRANCHISES

Buffalo, N. Y.—The Council of the city of Buffalo has referred to a committee of nine the Sullivan resolution to permit the Frontier Electric Railway to cross various streets between Kenmore and Main Streets, Buffalo. The Frontier Electric Railway proposes to build between Niagara Falls and Buffalo. [E. R. J., Oct. 12, '14.]

Birmingham, Ala.—The City Commission of Birmingham has been notified that H. J. Milner, president of the Milner Land Company, will apply for a franchise to build an electric railway from the end of the South Highlands line of the Birmingham Railway, Light & Power Company at Twentieth Street and South Fifteenth Avenue to Milner Heights.

Santa Barbara, Cal.—Application has been made to the Council of the city of Santa Barbara for the granting of a franchise to Richard Hamilton Gaud for the construction of a single or double-track street railway upon certain streets of the city of Santa Barbara under the provisions of the general law of the State of California for a period ending March 15, 1957. Competitive bids will be received by the Council until Feb. 18.

Baltimore, Md.—The Pennsylvania Railroad, in a letter to Mayor Preston, has asked that Baltimore grant a franchise to the company to construct two more tunnels under the city, one paralleling the tunnel from Fulton station to the North Avenue Bridge and the other paralleling the line from Greenmount Avenue to Broadway.

Syracuse, N. Y.—The New York State Railways has applied for a franchise for permission to lay a single track in Elm Street, Syracuse, from Shuart Avenue to Burnet Avenue, which will give it a double track on the East Syracuse line within the city limits and enable it to improve its service on that line. By this plan the company proposes to run out-bound cars through Oak, Hawley and Elm, while the in-bound cars will be operated by way of Elm Street and Burnet avenue. At present the East Side cars are operated in both directions by way of Oak, Hawley and Elm.

TRACK AND ROADWAY

Birmingham-Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala.—Two cars have been received by this company preparatory to establishing service on the company's line in Tuscaloosa on Feb. 1.

Gadsden, Ala.—It is expected that the construction of the proposed interurban electric railway from Gadsden to Center at an estimated cost of \$250,000 will be begun in the spring. Louis Hart, Gadsden, is said to have received assurances to this effect. [E. R. J., Nov. 7, '14.]

Fort Smith Light & Traction Company, Fort Smith, Ark.—The Fort Smith-Van Buren Bridge Commission has tabled the offer of the Fort Smith Light & Traction Company for a twenty-year franchise to use the Fort Smith-Van Buren Bridge.

Fraser Valley & Southern Railway, Vancouver, B. C.—An inquiry to this company by the ELECTRIC RAILWAY JOURNAL in regard to the prospect for carrying out the construction of the company's proposed line has resulted in a communication from Frank Harris of the British Columbia Electric Railway, Ltd., Vancouver, to the effect that at the present time no development operations are contemplated by the company.

Los Angeles, Cal.—The Board of Public Works is advertising a hearing by the City Council for Feb. 24 on the granting of a right for a spur track franchise in Los Angeles.

Pacific Electric Railway, Los Angeles, Cal.—So rapid has been the construction of the extension of the line of this company from Harrison Street, Arlington, to Corona that it is announced the line will probably be finished and ready for operation by Feb. 15.

Marion County Electric Railway, Mill Valley, Cal.—This company has filed a supplemental application with the Railroad Commission of California requesting authority to commence construction work upon its Cascade branch in accordance with an offer of the Hicks-Folte Corporation to accept in payment, stock, notes of stock purchases and installment stock subscriptions. [E. R. J., Dec. 12, '14.]

San Francisco (Cal.) Municipal Railway.—The Board of Supervisors of San Francisco on Jan. 21 adopted a modification of what is known as Plan No. 9 for overcoming the obstacles to extending the municipal railway by a line on Church Street hill. The plan approved provides for a detour through Mission Park and around the Church Street hill from Nineteenth to Twenty-second Streets over a private right-of-way for double track 28 ft. in width, to be purchased by the city. The grade will be between 9 per cent and 10 per cent. The cost of the detour alone will be \$200,000, as estimated by the city engineer. Since the amount of funds available for the construction of the Church Street line from Van Ness Avenue to Thirtieth Street is estimated at \$450,000, this would leave but \$250,000 for the rest of the construction, which is estimated to cost approximately \$325,000. The question of financing the new line is yet to be settled.

Ukiah, Cal.—T. J. Weldon, Ukiah, writes that no company has as yet been formed to construct the proposed electric railway from Ukiah to Lake County via Potter Valley. The whole matter is in the preliminary state. [E. R. J., Dec. 26, '14.]

Vallejo-Benicia Electric Railway, Vallejo, Cal.—Estimates made of the cost of construction of this proposed electric railway include the following: Grading, \$12,000; ties, poles, etc., \$1,500; rails, etc., \$2,800; track laying and surfacing, \$3,000; pipe, \$500; overhead and bonding, \$6,000; two cars, \$7,000; city construction, \$10,000; engineering, \$5,000; total, \$86,500. Joseph J. Henry, president.

Kankakee, Ill.—Right-of-way for the proposed electric railway between Kankakee and Lafayette has been secured from Lafayette to Rensselaer. Some grading has been done near Lafayette. The proposed line will be 80 miles long and from Lafayette will run through Beaverville, St. Anne, Wichert and Waldron and connect with the Chicago & Southern Interurban Railway at Kankakee. O. J. Brown, general manager.

Union Traction Company, Coffeyville, Kan.—This company has installed service on the Nowata extension of its line. The extension is 23 miles long, and gives the company a continuous line from Nowata, Okla., to Parsons, Kan., by way of Coffeyville, Independent and Cherryvale.

United Railways, St. Louis, Mo.—This company favors the extension of its Fourth Street line through the Lafayette Park district. Richard McCulloch, general manager.

South West Missouri Railroad, Webb City, Mo.—It is stated unofficially that this company contemplates extending its line from Galina to Commerce.

New York Municipal Railway Corporation, Brooklyn, N. Y.—The New York Municipal Railway Corporation, affiliated with the Brooklyn Rapid Transit Company, has advertised for bids for the construction of the elevated railroad from the Cypress Hills terminal of its present elevated lines through Jamaica Avenue to Myrtle Avenue, Richmond Hill, about 2 miles. This is the first section of the line which when complete will extend all the way from Crescent Street, Cypress Hills, to Grand Street, Jamaica. This will be a two-track line with provision for the installation of an additional track in the future. It is expected that the entire line will be completed by July, 1916.

Cleveland, Akron & Canton Terminal Railway, Cleveland, Ohio.—At an organization meeting on Jan. 26, O. C. Barber, Barberton, Ohio, was chosen president of this company, formed to build a subway under East Fifty-fifth Street between the lake front and the upper Cuyahoga Valley. William Greif was chosen vice-president; F. D. Lawrence, treasurer, and E. F. Hutches, secretary. The Osborn Engineering Company has been employed to make the preliminary surveys.

Lake Erie & Youngstown Railroad, Youngstown, Ohio.—This company has filed its first account with the Public

Utilities Commission of Ohio on Jan. 18. It appears, according to this, that more than \$200,000 in bonds has been issued to the Caldwell Construction Company. The commission gave the company thirty days in which to decide whether it will proceed with the work of constructing the road or abandon it. [E. R. J., June 27, '14.]

Cleveland (Ohio) Railway.—John J. Stanley, president of the Cleveland Railway, has submitted to the West Madison Avenue Civic Association the plans under which his company would be willing to construct a line on West Madison Avenue, Lakewood, from West 117th Street to Rocky River.

Berks & Lancaster Railway, Lancaster, Pa.—This company has been granted permission to construct its proposed electric railway across the property of the Orphans' Home at Womelsdorf. [E. R. J., Oct. 12, '14.]

Charleston Consolidated Railway & Light Company, Charleston, S. C.—This company has begun the construction of its new interurban lines between Charleston and North Charleston. The work is being done under the direction of L. Y. Dawson, roadmaster of the company.

Carolina, Greenville & Northern Railroad, Greenville, Tenn.—Headquarters of the company organized to build an electric railway from Kingsport, via Greenville to Newport, have been established in the Hill & Rankin Building, Depot Street, Greenville, and it is said that construction work will begin in the spring. The power would come from the hydro-electric plant on the Nalachuckey River. [E. R. J., Jan. 2, '15.]

Brenham, Tex.—The construction of the proposed electric railway from Brenham to Independence and Old Washington and points in the Brazos Bottoms has been referred to a committee composed of D. C. Giddings, H. F. Hohlt, president of the First National Bank, Brenham, and F. H. Bosse, president of the Washington County State Bank. [E. R. J., Jan. 23, '15.]

Dallas (Tex.) Electric Company.—L. C. Bradley, assistant district manager for Stone & Webster in Texas, said in a recent interview that the firm was committed to build the Terrell Interurban Railway and that it intended to do so, but as to when the line would be built he could not say.

Northern Texas Traction Company, Fort Worth, Tex.—This company has begun the installation of an automatic block signal system on its line between Fort Worth and Dallas.

Princeton (W. Va.) Power Company.—During 1915 this company plans to build 13 miles of new track.

Morgantown & Wheeling Railway, Wheeling, W. Va.—This company contemplates testing, on one of its local lines, a straight gasoline motor car made by the Roberts Gasoline Engine & Car Company. The inventor of the motor used in the Roberts car is Amos Harold, Marion, Ohio.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—This company has opened its new depot at El Segundo, Cal. The building is 58 ft. x 38 ft. and consists of an indoor and an out-of-door waiting room, an express office, express and freight rooms, and a platform for freight loading on one side of the station.

United Railroads, San Francisco, Cal.—This company has leased the block bounded by Van Ness Avenue and Polk, Francisco and Bay Streets, and on it will erect a terminal for the use of cars during the Panama-Pacific Exposition. Application has been made to the Board of Works and the Supervisors for permission to put in the necessary track connections.

Slate Belt Electric Street Railway, Pen Argyl, Pa.—This company will move its carhouse and shops from Pen Argyl to Wind Gap in order to be more advantageously situated when the projected line from Wind Gap to Saylor's Lake is completed.

POWER HOUSES AND SUBSTATIONS

Texas Light & Power Company, Dallas, Tex.—The new plant of this company is said to be ready for operation. The Texas Light & Power Company is affiliated with the Texas Traction Company and the Southern Traction Company.

Manufactures and Supplies

ROLLING STOCK

Princeton (W. Va.) Power Company will purchase four interurban cars during 1915.

Arkansas Valley Interurban Railway, Wichita, Kan., will purchase one 40-ft. express trailer during 1915.

Sioux City, Crystal Lake & Homer Electric Railway, Sioux City, Ia., will purchase one open motor or trail car during 1915.

Metropolitan Street Railway, Kansas City, Mo., is receiving bids from car-builders on twenty-five new single-end cars.

Niagara, St. Catharines & Toronto Railway, St. Catharines, Ont., has received four 55-ft. suburban cars from the Preston Car & Coach Company. The cars are geared for a maximum speed of 60 m.p.h. The electrical equipment consists of 4 GE-214 motors with type MK simplified control, the master controller having dead man's release handle. The cars are divided into two compartments, the smoker at one end being separated by a partition which allows a passage-way on one side of the car, enabling passengers to go into the other compartment without having to pass through the smoker. The framing is steel with wood lining.

Oklahoma (Okla.) Railway, noted in the ELECTRIC RAILWAY JOURNAL of Jan. 9, 1915, as having ordered eight double-truck T-post prepayment city cars from the St. Louis Car Company, has specified the following details for this equipment:

Date of delivery.....	April	Body	semi-steel
Seating capacity.....	44	Interior trim.....	bronze
Weight of car-body,		Headlining	Agasote
	17,000 lb.	Roof	arch
Length of body.....	29 ft.	Underframe	steel
Length over vestibule..	40 ft.		

The specialties of old car-bodies and old trucks will be used for the new equipment.

TRADE NOTES

Hugo Burgheim Company, Cincinnati, Ohio, dealer in iron and steel scrap and equipment and specializer in relaying rails, has moved its Cincinnati offices to larger quarters in Suite No. 601, Mercantile Library Building.

David A. Wright, who for several years has been connected with the Yale & Towne Manufacturing Company, New York, as district manager in the West, has opened an office for himself as manufacturers' agent at 140 South Dearborn Street, Chicago, Ill. Mr. Wright is specializing on labor-saving and pneumatic machinery, cranes, hoists and trolley systems.

ADVERTISING LITERATURE

Pittsburgh Transformer Company, Pittsburgh, Pa., has issued a reprint of a paper by D. W. Roper read before the American Institute of Electrical Engineers on May 29, 1914, which presents an analysis of transformer operation for one year on a system having nearly 15,000 transformers installed.

H. M. Bylesby & Company, Chicago and New York, have issued an attractive booklet describing the various securities which they are offering to the public. The securities described have been issued by various electric lighting companies under the engineering and commercial management of the management company.

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has organized a bronze department for the production of a general line of brass and bronze castings in addition to certain specialties developed and patented by this company. The department will be under the management of William M. Corse, until recently works manager of the Lumen Bearing Company, Buffalo, N. Y. Hugh R. Corse, who will be located at 912 Ford Building, Detroit, Mich., will be sales representative. This company is specializing in aluminum bronzes. The titanium aluminum bronze has a tensile strength of 70,000 lb. per square inch, elongation 20 per cent, specific gravity 7½.

Dayton Fare Recorder Company, Dayton, Ohio, has issued a catalog which gives particular attention to the new stand-

ard D. B. registering fare box which this company is now putting on the market and to its standard types of computing fare recorders for urban and interurban railways. The catalog contains illustrations of the fare box and full-size photographic reproductions of a trip-card record, showing register readings taken from a recorder adjustment used in combination with the fare box. By this system of fare collecting and accounting every fare is classified and indicated as paid, is registered, computed and recorded as indicated and is as effectually checked and verified by the double system of recording as money paid in a bank.

General Electric Company, Schenectady, N. Y., has issued Bulletin No. 44004, which forms an ordering catalog devoted to railway line material for direct suspension. This publication covers practically everything in line material for this method of suspension, save poles and wire. The parts are illustrated and each illustration is accompanied by the proper catalog numbers. The prices are not included. The bulletin contains also miscellaneous data relative to construction, overhead material per mile, general data on the use of solid copper wire and copper cable, dimensions of grooved trolley wire sections, etc. Bulletin No. 49901, just issued, describes an oil-testing set, by means of which the dielectric strength of oil can be easily determined. The proper use of this set insures the successful operation of high-tension oil insulated apparatus. The set consists of a 30,000-volt testing transformer with an induction regulator for voltage control and an oil spark gap, all of which are assembled as a unit. The set can be furnished for either twenty-five cycles or sixty cycles. A special portable voltmeter has been built for use with this set.

NEW PUBLICATIONS

Experiments. By Philip E. Edelman; P. E. Edelman, Minneapolis, Minn.; 256 pages; cloth, \$1.50; leather, \$3.

This book is a comprehensive account of experimental work in science, invention, the industries and the amateur field, containing practical instructions and working directions, and illustrated with tables, plates, engravings and halftones. It comprises two distinct sections, the first of which deal with selected and graded experiments, including some of the most brilliant demonstrations in chemistry, physics, electricity, wireless telegraphy and mechanics. The second part gives a carefully made and interesting classification of the principles of original experimenting, and illustrates these by giving examples of their application in testing and commercial experiments. The book is clear and simple enough for beginners, and it should prove useful to both experienced and inexperienced workers along the lines covered.

Ocean Traffic and Trade. By B. Olney Hough, La Salle Extension University, Chicago; 430 pages; cloth, \$3.

This work from the pen of Mr. Hough, editor of *The American Exporter*, is a complete economic study of a subject now occupying a prominent place in the minds of American manufacturers—i.e., exporting and importing. Yet it should not be understood that the work is theoretical in character, for its chief merit, besides its comprehensiveness and authoritativeness, is the practicability of the treatment afforded the discussion of ocean and foreign shipments. The treatise contains a large number of photographs and actual forms portraying the various phases of the subject. Particular stress is laid upon the manner of handling foreign freight, and many practical suggestions are offered as to ways and means of developing export trade. Some of the chapter heads will serve to indicate the range of the book. "Ocean Carriers," "Shipping Agreements," "Ocean Shipping Routes and Service," "Seaports and Terminal Facilities," "Getting Export Trade," "Developing Export Trade," "Foreign Credits and Collections," "Foreign Trade Opportunities," "Marine Insurance and Merchant Marine." A large insert map of trade routes is included.

Why the Dollar Is Shrinking. By Irving Fisher. The Macmillan Company, New York; 223 pages. Cloth, \$1.25.

This book states the general principles that fix the scale of prices and shows the manner in which these apply to the high cost of living. The level of prices, according to the author, depends on five definite factors: (1) the volume of money in circulation; (2) its velocity of circulation; (3) the volume of bank deposits subject to check; (4) its

velocity; and (5) the volume of trade. These factors have continued to shrink the dollar to about two-thirds of its value in 1896. As for the future, Professor Fisher concludes that 2 per cent is a fairly safe minimum estimate for the average annual expansion of the scale of prices, and that therefore the general trend of world prices for the next two decades will be upward.

Professor Fisher points out in a postscript that the effect of the present European war is most likely to be an acceleration of the rise in commodity prices already in progress. After the war credit will expand faster than tradé, which will cause a further rise in prices. This assertion is borne out by charts showing the course of prices during great modern wars. "Why the Dollar Is Shrinking" should be read by every investor and by any one who desires to understand how the value of money enters into commodity prices.

Applied Theory of Accounts. By Paul-Joseph Esquerré. The Ronald Press Company, New York. 400 pages. Cloth, \$3; half leather, \$3.50.

It is almost axiomatic that the man who has mastered the theory of accounts is the one who is best suited to be trusted with the transactions relating to the finances of a business. This means that the practicing accountant, no matter in what line he may be located, should be conversant with the theory of accounts as it may be applied to all forms of commercial enterprise. To those who wish to gain such a general knowledge, this book by Mr. Esquerré can be recommended. In brief, it presents a comprehensive and not too technical review of accounting theory. Beginning with the fundamental principles of business organizations and the various forms of bookkeeping, the writer progresses by easy stages to the most intricate points of accounting science. At times, it is true, it seems as if he were straining his points in order to present his subject in a slightly different way from that in which preceding accounting writers had treated it. On the whole, however, the book is logical, clear cut and practical. Probably its most valuable sections are those presenting a detailed analysis of all the balance sheet accounts. Every electric railway accountant who follows Mr. Esquerré in his exposition of the theory of such accounts and his constructive description of financial statements that may be used under various conditions, will beyond all doubt have his accounting vision considerably widened.

Concrete Pile Standards. By Hunley Abbott; copyrighted and published by Hunley Abbott, 11 Pine Street, New York, N. Y.; fifty-nine pages; cardboard, fifty cents.

The novel contribution of this treatise to the widely-spreading field of concrete engineering in formulating and presenting for the first time a proposed standard design for reinforced-concrete pile caps renders the suggestions and specifications contained therein of especial value to the engineer and architect. The writer's work during the last six years has included the making of detailed plans for concrete-pile foundations for a large number and variety of structures. It was with the needs of himself and his company, the MacArthur Concrete Pile & Foundation Company, that he first drew up the standards which appear in the book. Having established a unit maximum safe-bearing load per pile from many recommendations based on wide experience, the author proceeds to work out and illustrate, by means of drawings, standard specifications for the dimensions of structures requiring from one to twenty-five piles. The advantages claimed under standardization are stated as follows: (1) Consideration of the economic advantages of concrete piles would not be discounted by an unnecessarily expensive capping design; (2) standardization facilitates the making of concrete-pile plans and reduces the labor and cost of making such plans; (3) standardization lowers the cost to the contractor and owner. Design of wall and column footings along building lines receives special attention. There is a thorough discussion of the advantages of concrete over wooden-pile construction as regards permanence, reliability, shorter time of construction and other advantages which compensate for the greater first cost of construction of concrete piles. At the end of the book is described a method of testing a concrete pile, and also tables on the safe bearing power or various kinds of soils.