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First Beeler Unit Report Mutually Acceptable

THE announcement that both the Public Utilities Commission of the District of Columbia and the Capital Traction Company have found acceptable every one of the ten recommendations made by John A. Beeler in his first unit report on Washington traffic augurs well for the reception of later units. This report, as noted in the issue of Feb. 2, recommended for the congested district in Fifteenth Street, between Pennsylvania and New York Avenues, a one-half reduction in stopping places, double berthing, safety zones, front-end fare collectors, one-way traffic streets and other means of relief. Mr. Beeler is certainly to be commended for his constructive aid. Traffic reports suggesting such concrete practicable remedies for congestion are invaluable.

Just as the mouth of a river imperceptibly but surely fills up with silt until navigation is impossible, so is the traffic flow of a railway imperceptibly but inevitably impaired by increasing the number of stops here and there, allowing automobiles to park at new locations, ignoring the day-by-day growth of other vehicular traffic and so on. And as navigation can be restored to the river only by the radical use of a dredge, so can circulation be restored to an electric railway only by radically reducing the elements that impede car movement.

A municipality and its railway system are so intertwined that one cannot be highly efficient without the co-operation of the other. Washington is fortunate in having pointed out to it so clearly the points on which its co-operation is needed in order to insure more efficient transportation service. All it needs to do is to help.

Regulation in New York Has Not Broken Down

HAVE the Public Service Commissions in New York State outlived their usefulness? An answer seems unnecessary. But Senator George F. Thompson thinks that they have, and he, as public utility men know, is a fearless, eagle-eyed investigator of regulatory conditions! His choice of evidence, however, is not always happy. For instance, his remark in Albany last week that each commission is paid practically as much as the State Senate costs might lead some one to observe, without of course having any particular senator in mind, that the comparative salaries would often be a good indication of relative values.

What legislators in Albany seem prone to forget is the fact that the work of the commissions has been hampered sometimes by the appointment of men who gave only part-time to the work, or by the delay of the Governor in filling vacancies or the Senate in confirming

appointments. According to Mr. Van Santvoord, who has just retired from the chairmanship of the Second District Commission, such delays have resulted in a serious piling up of cases. He suggests that the law should be modified to compel the Governor to send nominations to the Senate at least thirty days before the expiration of the terms of the outgoing commissioners. This would place the burden fairly on the Senate and would in general tend to promote continuity and dispatch in regulation.

The Senate might try to play politics and delay confirmation. Its record is not altogether commendable on this point. But if the Governor's appointments are wisely made, most of the work is done. Technical training is desirable for the members of a commission, along engineering, legal, financial and accounting lines, but we do not believe that a commissioner should be appointed solely for his technical ability. He must primarily have a judicial mind, fairness and competency as an investigator, fearlessness and honesty.

Good men are doubtless hard to secure, but it is part of the Governor's job to find them. They may be his political friends; they may be unknown to the politicians or to the public at large. These points are often raised by carping critics, but they are not vital. The only important question is—have the men under consideration the desired training and character? If so, they deserve appointment; if not, they don't.

The Old Order Changeth, Giving Place to the New

PERHAPS the steam railroad problem, so pressing at this moment, can be solved by the application to it of the principle underlying the partnership agreement between New York City and its rapid transit lines. This suggestion, made by Theodore P. Shonts before the Detroit Board of Commerce on Feb. 5, is of vital importance to the electric railway industry as well as the steam carriers. If the partnership idea is worth extending to the national transportation lines, it is worth applying in a much wider way to electric railways.

Mr. Shonts, from his intimate acquaintanceship with the dual contracts in New York City, speaks as an authority when he says that these embody principles that are capable of extension. Under the partnership idea utilities are able to secure the private capital which they need and the community to enjoy the benefits from any unusual profits. Maximum efficiency, without the evils of political management and operation, is what is meant by private operation and public participation in financing.

The partnership idea is spreading in the electric railway industry. In some cases, as in Dallas, the community has shown its financial responsibility by au-

thorizing a flexible fare under a service-at-cost plan. Such a plan is now proposed for all of Massachusetts. In other cases, under a more elaborate partnership plan, the community has gone farther and furnished money for new rapid transit construction. A flexible fare and city money are both featured in the Philadelphia lease just adopted. Now the question is pending in another form in Boston, where the Massachusetts Public Service Commission has recommended a public guarantee of the return, public control and a fare increase for rehabilitation, in addition to the present private operation of city-owned rapid transit lines. Between these agreements and between these and older ones, details differ, but the fundamental idea is there—a community of city and railway interest in transportation development.

Progress, however, should be more rapid. The men who originated the partnership idea had vision. If, as Mr. Shonts suggests, we should hope for a similar vision in connection with the steam railroads, how much more should we hope for it in the electric railway industry! The day of rapid construction by private capital has passed, but the day of economic reconstruction with public co-operation is here.

Transportation and the War Construction Plants

A SUDDEN and very heavy demand has been made upon electric railways in several parts of the country for the transportation of workers to and from plants engaged in constructing ships or manufacturing munitions and other war supplies. For many reasons the present is not a very propitious time for railways to extend their facilities, but, worse yet, the traffic which the kind of transportation just mentioned produces is not of a variety which can be handled profitably under ordinary operating conditions.

The time is unfortunate for the electric railways because a succession of untoward events, all too familiar to the readers of this paper, have combined to make it difficult to give good service even to regular patrons. Shortage of men and materials, reasonable and unreasonable demands from labor for higher wages under stress of increased cost of living, automobile and jitney competition, growing street traffic congestion, etc., combined with reluctance on the part of the public to allow increases in rates of fare, have operated to prevent amelioration of the present situation.

As regards the second point, the traffic is not desirable because it is largely of the peak-load variety, which is notoriously expensive to handle. For economic reasons the war plants must be individually very large, thus concentrating the workers in groups of enormous size. Furthermore, they must be located primarily with respect to convenience in securing materials and power, shipping products and protection of equipment from malicious damage. In general, sites meeting these requirements are some distance from present residence centers. Hence, either the workmen must be transported to and from their work or they must be housed near it. In the former case there is a severe tax on the local railway facilities.

Again, the tendency in all manufacturing centers is to follow established custom as to hours of starting or

stopping work. Hence thousands of workers may require transportation at one time and are seriously inconvenienced if they do not get it. But to furnish it requires new track, and more cars, line wire, men, coal—all scarce as hens' teeth these days. Moreover, the service factor of the equipment which would be used to carry such workers to and from their work is low, so that it is used ineffectively; and ineffective use of men, money or material is inexcusable, if it can be avoided, in war time.

By the above we do not mean that the electric railways cannot and will not do their share of the transportation of workers to war plants, but the situation is outlined merely to indicate why this work is not easy or profitable. At many points they are loyally trying to do their part, usually under intense fire of criticism. More and better work in this line can undoubtedly be done even with existing equipment, but co-operation on the part of government, federal and municipal, and contractors will be required.

How the War Workers Can Be Cared For

THE best over-all solution of this special transportation problem will come through the application of the following principles: First, the workers should be housed as near their work as possible, preferably without walking distance. By walking they can save manpower on the cars, reduce the consumption of their own time in transit, and minimize the demand on the track facilities, thus releasing track for freight service. There is some tendency to locate housing centers at a distance from plants to permit the use of large tracts which can be laid out on a grand scale. Such a plan is undesirable from a transportation standpoint and should not be followed unless necessary for healthfulness or some other paramount consideration.

If we assume that housing centers are properly located, next comes an equitable division of transportation duty among railroads, electric railways, waterways and motor buses, particularly the two first named. For the purpose of insuring good freight facilities the war plants are necessarily located on or near steam railroads, and in some cases waterways also. There is thus usually the possibility of furnishing passenger steam railroad service for the workmen, although some slight modification of freight service may be necessary for this purpose. Electric railway service is so attractive and apparently so flexible that government officials are apt to feel that the steam roads should not be asked to discommode themselves as to freight handling in order to run the few trains necessary to get men to and from their work. Economically, however, steam trains should be used for this service when possible, as they utilize track and cars already existing, and also conserve men and materials. Thus, as compared with single-car electric units, a steam train can be operated with possibly 80 or 85 per cent fewer men. That is to say, a steam train of reasonable length can transport a rush-hour crowd of, say, 1500 men economically and with very little use of the track, whereas this would be a tremendous tax on the man-power of an ordinary electric railway.

So much for what the steam roads can and ought to

do. Now for the electric railways. They are primarily in the passenger business and have a much more flexible equipment and organization than the steam roads. They must do their part, and we may assume that a considerable share will be allotted to them, but they need active co-operation. One essential is that the demand upon them should be distributed over as long periods as possible. Different establishments and groups in each establishment can be scheduled to begin and finish work at different times, thus widening and flattening the peak. Second, the electric railways can be helped in financing extensions of track and equipment. In addition there should be a clear understanding on the part of both the munition workers and their employees, of the difficulties which electric railways experience when they try to carry large bodies of men in rush hours. It would be desirable also if riding during rush hours on lines leading to war plants was restricted to actual workers, who could be provided with special tickets to identify them. Permission could also be given for the more efficient use of existing track, such for example as the belt line in Buffalo.

Nothing has been said regarding waterways and motor buses, which have their obvious place when available. The principal point is to realize that there are many factors involved in these special war transportation problems. The electric railways are endeavoring loyally to do their share in solving these problems, but they cannot do it all. The "powers that be," above all must be reasonable in their demands.

Loading at Large Industrial Points Calls for Special Provisions

METHODS of loading electric cars at large industrial plants constitute as important a problem, in its way, as that of staggered hours. If no plan is followed except that of "first come, first served," the results are most unsatisfactory from every viewpoint, while the dispatching of cars is delayed. The wide interest which attaches to this subject is shown by a number of letters which we have received in regard to an article which we published in our issue of Jan. 12, describing the methods followed at the Ford plant in Detroit.

Here, from 30,000 to 40,000 employees are handled in a period of an hour and a quarter, at one terminal, where a starter dispatches cars at intervals of about thirty seconds. These employees are formed in two lines and enter the cars in turn. The difficulty of keeping the men in line was overcome when the Ford Company discharged some of the most obstreperous. This is the feature of co-operation with the company which makes the scheme most efficient.

With the development of large industries supplying war material in many parts of the country, the conditions at Detroit might be duplicated elsewhere to advantage. It should not be difficult to get employers interested to the extent that they will exercise control over the behavior of their employees while loading at such points. This is but a fair return for special service and is in the interest of the passengers who are to be benefited. Another feature of the system at the Ford plant terminal is the practice of dispatching cars with less than a full load—thus allowing crews to pick up other passengers on the trip. This removes

the criticism that special facilities are given in the interest of a few large employers. The lessons learned at Detroit before the war had caused congestion at many construction centers in this country ought to prove invaluable at the present critical juncture.

Special Freight Service Merits Equitable Rates

ONE difficulty which all companies meet in making a convincing presentation of a claim for higher freight rates is in determining and proving just what the service costs. Undoubtedly freight business has in many cases been built up as a side line and rates have been made on the basis of the increment in total cost caused by the increment in business. This, however, is fair neither to the passenger business nor to the freight business. The former has to bear the freight "overhead" as well as its own; the latter is not on its own feet, and the apparent profit which it produces may be largely fictitious. The freight business should pay its own way and the charges which are permitted to be made should be sufficient for this purpose.

An essential factor in determining costs and therefore legitimate charges is classification. As far as the transportation company is concerned it matters little what a package contains so long as it occupies a given car space, is roughly of standard form and is not excessive in value. It seems illogical, therefore, to charge different rates for packages in the same car when they are within the range suggested above. This is a point for which the Connecticut Company has contended, and successfully contended, as indicated in the decision recently handed down by the Connecticut Public Utilities Commission.

In its ruling the commission permitted the Connecticut Company to make a single classification for package freight, with suitable excess charges to cover extra risk of damage or extra value. The case has been fully covered from the news standpoint in these columns, but knowing that our readers would appreciate the company's point of view in the matter we have asked V. S. Curtis, secretary and general traffic agent of the Connecticut Company, to state this briefly. The result is an article printed this week. The ruling is attracting considerable interest, as is illustrated by the fact that the New England Electric Freight Association devoted its entire January meeting to discussing it and will continue the discussion at the February meeting.

As evidenced by the ruling referred to the company was not entirely successful in convincing the commission that it is giving a special service for which a considerably increased compensation should be allowed. Undoubtedly such conviction will come to the commission in due course. In the meantime the company is able to handle its business with less clerical routine than if the standard freight classification was required, and some financial relief has been provided also. As in other cases where there has to be a change in its customs, the public must be educated, and the process takes more or less time. Yet, in the end, the fact will stand out clearly that an electric railway can give a certain class of freight service which no other agency can furnish.

Bonus Plan Reduces Coal Consumption at Manila

By Dividing the Saving Effected with Power Plant Employees "Meralco" Is Able to Increase Wages of Eighty Men More or Less by About \$700 per Month

By B. H. BLAISDELL

Chief Engineer of Power Plant, Manila (P. I.) Electric Railway & Light Corporation

DURING the early part of the year 1915 the management of this company had under consideration the inauguration of a bonus system of wages for the employees of the power plant, for the purpose of creating in them more enthusiastic interest in fuel saving which would lead to a lower unit cost of electrical energy generated.

A forty-eight-hour economy test of the power plant was made to determine the distribution of the heat losses and the amount available for conversion into electrical energy. The test, with all the accompanying specifications, instructions and data to be obtained, was planned by the J. G. White Management Corporation, the operators of the Manila property.

From a study of the data and results obtained from this test it was evident that considerable saving in fuel was possible without going to any great expense for improved equipment, by securing more careful, intelligent and efficient service from the power-plant employees.

EMPLOYEES TO HAVE ONE-HALF OF SAVINGS

With the exception of most of the engineers all of the employees are Filipinos who have obtained their experience and training almost wholly in this plant. To make these men more progressive and efficient, and less dependent upon the limited supervision of the engineers, it was evident that some special form of monetary reward for meritorious service must be adopted.

A simple increase in the weekly wage was certain to fail in bringing about any great or especially lasting improvement in economy. The reward must be in proportion to the service rendered in the saving of fuel. With this object in view, the management offered the power plant employees, beginning June 1, 1915, one-half of the value of the fuel saved due to effort on their part, the distribution of the bonus to be made monthly to cover such saving as had been accomplished during the preceding month.

Notices were posted explaining carefully every detail of the plan by which it was possible for the employee to earn extra compensation in proportion to his ability to reduce the consumption of coal and decrease the cost of coal to the company.*

The standard of fuel efficiency on which a saving was to be reckoned was set at 41,000 B.t.u. per switchboard kilowatt-hour generated, this being the average efficiency obtained during the forty-eight hour plant test above referred to.

It was only fair and proper that the saving in fuel be computed on a B.t.u. basis, since the company purchases its coal on this basis, all cargoes received being sampled and the heat value determined by an outside and neutral testing laboratory.

With the exception of the engineers, the distribution of the bonus was made to include all the power-plant employees, numbering about eighty, whether or not their duties were directly connected with the consumption of

*Outline of Bonus System, M. E. R. & L. Co., for Power Plant Employees:

1. The standard basis of coal consumption per switchboard kilowatt-hour output shall be 3.50 lb. (Reduced March 1, 1916, to 3.325 lb.; July 1, 1916, to 3.20 lb.; July 1, 1917, to 3.15 lb., and Sept. 1, 1917, to 3.08 lb.)

2. The basis of 3.50 lb. of coal consumed per switchboard kilowatt hour output is based on a standard of 11,715 B.t.u. per pound of coal. This has been fixed on the results of the laboratory analysis made of Fushun coal used during the power plant economy test made March 3 and 4, 1915.

3. The standard basis of coal consumption based on B.t.u. per switchboard kilowatt-hour output shall be determined on the bases of (1) and (2), 41,000. (3.50 x 11,715.) (Reduced March 1, 1916, to 38,952 B.t.u.; July 1, 1916, to 37,488 B.t.u.; July 1, 1917, to 36,900 B.t.u., and Sept. 1, 1917, to 36,000 B.t.u.)

4. The coal consumed per switchboard kilowatt-hour output shall be determined by taking the actual weight of the coal consumed and adding thereto 1 per cent additional to cover possible errors or omissions in weighing, and possible losses of coal consumed in the pile by reason of spontaneous combustion.

5. Fifty per cent of the value of the coal saved on the basis of 3.50 lb. consumed per switchboard kilowatt-hour based on 11,715 B.t.u. per pound of coal, or 41,000 B.t.u. per switchboard kilowatt-hour output, determined by the coal consumed as per Rule No. 4, is to be distributed to certain participating employees of the power plant department as tabulated under Item 6 below.

6. If found practicable or desirable the watch making in a given month a better record than the same watch made during a preceding month, all conditions of operation being taken into consideration, is to receive an additional bonus, to be determined by the chief engineer of the power plant; and the watch making the poorest showing in the same month on the same basis is to be correspondingly penalized.

7. Bulletin boards are to be provided to keep employees posted regarding the basis of the distribution of the bonus and how applied, and the standing of each employee with respect to his participation in the bonus, in so far as it may be practicable or desirable to bulletin such information. If practicable the daily results, as affecting the different watches, should be posted for the information of the employees.

8. The chief engineer of the power plant, who is not to participate in the distribution of the bonus, is to determine the schedule of points to be allowed the different occupations of the different employees of the power plant based on the relative value of their services. He is also to establish a schedule of the penalties to be applied to the schedule of points. (Following is the latest list as modified to July 1, 1916.)

Payroll Classification	Schedule of Daily points per Employee	Payroll Classification	Schedule of Daily points per Employee
Item Number	Occupation	Item Number	Occupation
1	Sub-Foreman	15	Boiler cleaner
1	Chief coal checker	5	helpers
1	Asst. coal checkers	3	9 Watchman
1	Clerk	5	11 Other labor
3	Oilers and cleaners	2	12 Mechanic foreman
4	Switchboard tenders	3	12 Mechanics
4	Switchboard helpers	2	12 Mechanic helpers
5	Firemen	6	12 Laborers
6	Coal passers	3	13 Construction and reconstruction
7	Water tenders	10	1
8	Boiler cleaners	3	
			Total,
			79

9. A record of all penalties imposed is to be made, and the employee affected is to be notified at the time the record is made. Employees are to have the right of an appeal from any penalty imposed, first to the chief engineer of the power plant, next to the assistant general manager.

10. The monthly distribution of the bonus is to be prepared by the power plant department, verified by the accounting department, and completed at the earliest possible date following the last day of each month.

11. The payment of the bonus on a day other than the regular weekly payday will be made at the earliest possible date following the last day of the month in which the bonus applies.

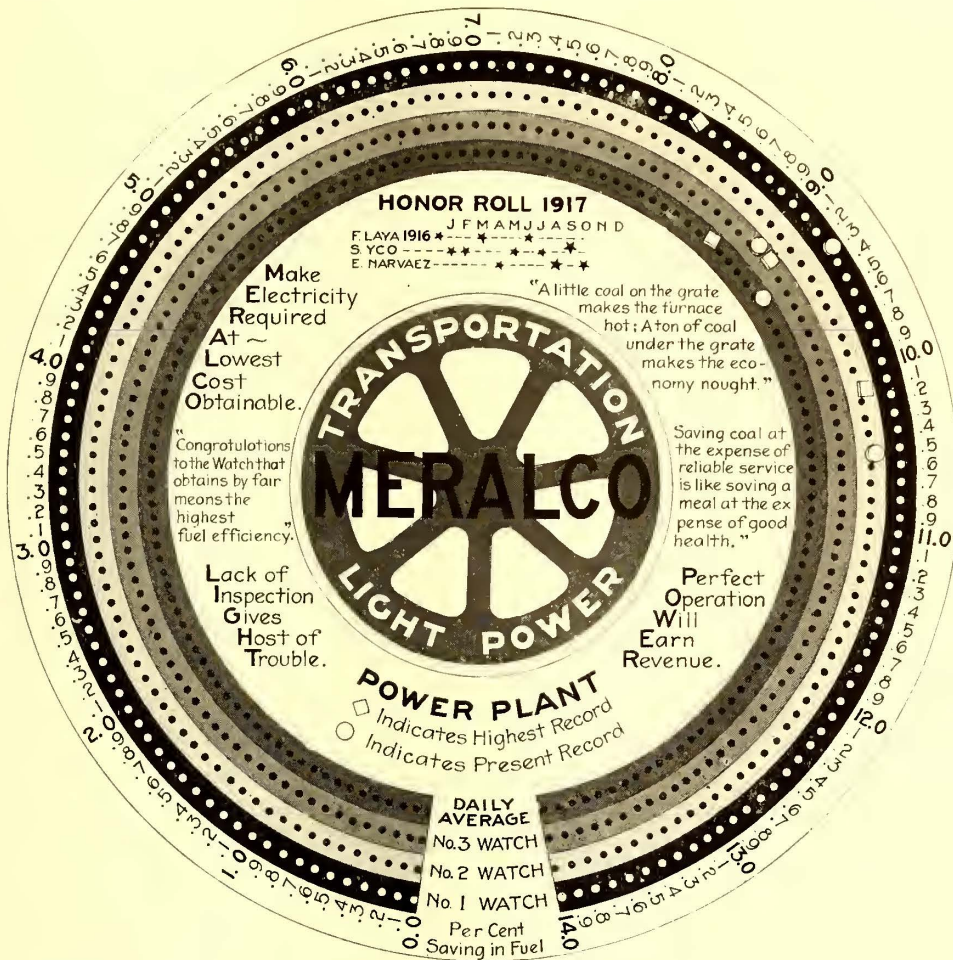
12. The company reserves the right to change the basis of the distribution of the bonus in any way it sees fit, or to discontinue it entirely.

coal or the generation of steam, as an incentive not only to improve the boiler plant efficiency but to keep the electric generating equipment in the best condition for safe and economical operation.

In the plan of bonus system when first bulletined for the information of the employees, emphasis was laid upon the fact that the operation of the plan was contingent upon the continuous, efficient and economic operation of the power plant, with respect to the throwing in or out of the various units, or overloading to their detriment, in so far as the life, the cost and the upkeep

by supplementing the bonus with penalties, the latter to be inflicted on employees breaking the established rules of proper conduct.

The plan as carried out credits each employee with a certain number of bonus points per day according to his position and opportunity to improve plant efficiency. For instance, a water tender receives ten points, a fireman six points, an oiler or coal passer three points, etc., through all the different classifications of employees. Should, however, an employee break a rule or otherwise misbehave, he is immediately disciplined by being



PEG BOARD, 18 IN. IN DIAMETER, USED IN STIMULATING COMPETITION IN FUEL SAVING AMONG POWER PLANT WATCHES

of such units would be affected by wrong practices indulged in for the purpose of saving coal. Under no circumstances would the operation of the bonus system be permitted in any way to affect the reliability and continuity of the electric service which is furnished to the public.

Although all the employees participate in the bonus, the proportion received by each varies with his responsibility or the degree in which his duties offer an opportunity to save fuel.

Profiting by the experience of many companies that have adopted a bonus system of wages only to have it meet with dismal failure in a few months on account of trouble arising of a more or less serious nature solely because no provision had been made to retain discipline, the company provided against such a contingency

penalized according to the magnitude of his offense. Absentees from duty do not receive points.

A daily record of the points received by each employee is posted where he can readily see whether or not he had succeeded in winning all the points he is entitled to for satisfactory service.

The total number of points credited to an employee during the month is a measure of his share of the total bonus earned during the month.

No attempt is made to foster competition between members of a "watch," but rather to encourage co-operation and a willingness to help each other that all may become equally proficient in fuel saving. However, a special inducement is offered to incite a sporting spirit of rivalry among the three watches, each to excell the others in fuel economy, by compelling the members of

the watch making the poorest showing in B.t.u. consumption per kilowatt-hour, as compared with the best previous record of this watch, to forfeit 10 per cent of their bonus points to the members of the watch making the best showing.

The relative standing of the watches in per cent fuel saving covering a period from the beginning of the month to date is shown on a disk hung in a conspicuous place in the employee's dressing room. The information imparted keeps up a perpetual interest and enthusiasm in everyone concerned to do his utmost to make his watch rank first in fuel economy so as to receive an extra share of the bonus as hereafter described.

The disk is about 18 in. in diameter and is painted near its outer edge with four circular stripes of different colors. Black, green and blue stripes each represent the gage of efficiency of one of the watches, while the innermost (red) strips is the average gage of efficiency for the combined watches.

A scale denoting the per cent saving in fuel circumscribes the stripes, the latter being perforated at points corresponding to one-tenth of 1 per cent divisions of the scale. Into the perforations plugs are inserted, two for each stripe.

Round-headed plugs are inserted at points in the stripes opposite the scale readings which correspond with the average per cent savings in fuel obtained from the beginning of the month, while square-headed plugs are inserted at the points in the stripes to show the highest monthly records.

At the end of the month the watch obtaining the highest efficiency as shown by the relative position of its plugs wins 10 per cent of the bonus points of the watch showing the lowest efficiency as denoted by the position of its plugs. The watch obtaining intermediate efficiency receives the regular bonus.

The center of the disk is inscribed with the company's insignia together with appropriate mottoes to encourage economical and reliable service, and an honor roll which indicates by the placing of a star each month opposite the name of the watch boiler-room foreman winning the 10 per cent extra bonus.

It is doubtful whether topnotch economy could be obtained without pitting one watch against the others. Nevertheless herein lies a very great danger to the success and permanency of a bonus system of wages.

DISCIPLINE MUST COUNTERACT OVER-ENTHUSIASM

Enthusiasm runs so high at times that over-zealous men will attempt to accomplish by foul means what they fail to gain by fair means in order to win 10 per cent extra bonus for their watch. They will fight, tamper with the coal scales, slip coal by the checker, overload machinery and otherwise take undue risks in dropping steam pressure and water level or burning fires low just before the relieving watch comes on duty, in order to gain a trifle for themselves at the expense of their opponents and of over-all economy.

To discourage such misdirected effort, prompt and energetic action is taken in penalizing those guilty by depriving them of bonus points commensurate with their offense. The chief engineer of the plant, on receiving complaints from his assistants against men under their charge, imposes the penalties, the men however having the right to appeal to the assistant general manager and from him to the general manager.

This method of discipline has proved very successful in improving the general department and service rendered.

One of the most important matters pertaining to plant operation that demands serious thought and study is securing a proper check on the weighing of coal at the time it is being received and stored on the pile, as well as when the coal is reclaimed from the pile for daily consumption.

The Manila company employs a foreman, a coal checker and a number of assistants, who in conjunction with the coal company's checkers weigh the coal as it is being discharged from the barges. The chief engineer holds these men responsible for any shortage that subsequently may be discovered.

The weighing and registering of the barrows of coal delivered for consumption to the boiler plant is performed by the operating force of coal passers as they wheel the barrows across the coal scales, always, however, under the watchful eye of a regular coal checker.

This double checking of the daily coal consumption by two opposing forces is very important, in fact necessary, for the coal checkers, being responsible for any shortage, watch the operating men closely that they steal no coal in order to increase the apparent fuel efficiency and thereby their bonus.

Further, this method makes it difficult for "Meralco's" and the coal company's checkers to enter into a conspiracy to defraud this company, knowing that the fact will be discovered when the cargo of coal has been used.

That the results obtained in this respect are all that could be desired is affirmed by the fact that not 1 lb. of shortage has occurred in the coal pile since the inauguration of the bonus system two and one-half years ago.

SOME OF THE RESULTS SECURED

An improvement in fuel efficiency began to be realized immediately after the bonus system of reward for fuel saving had been established, and the economies subsequently obtained have been far greater than anticipated.

The firemen, who formerly were mere shovelers, gradually evolved into expert boiler operators, capable of distributing coal at the right time in the right amount and in the right place and to keep an even fuel bed of the proper thickness to give the best results.

In the old method of firing each fireman had certain furnace doors to fire and the resulting efficiency obtained in the different boilers varied according to the ability and interest taken by the individual fireman attending them. The improved method compelled the firemen to follow each other down the line of boilers, at periods depending on the load, firing alternate doors, thus insuring equal furnace operating conditions in all the boilers and higher economy due to the controlling influence of the more experienced firemen in showing up and correcting the faults in firing of the less experienced men.

The water tenders learned to adjust the damper to admit only the necessary air to the furnaces to economically burn the coal required for carrying the load. The frequent use of the Orsat apparatus for testing the flue gases materially assisted in determining the most economical damper opening for different hourly load

conditions. The coal passers, also, became more careful when cleaning fires and ashpits to see that the least possible amount of coal was wasted in the refuse. Finally, the repair men increased both the amount and quality of the work performed, especially in the matter of cleaning boilers.

It became the practice to carry the greatest output possible on the most economical generating units and auxiliaries and to limit the machinery in service to that necessary safely to carry the load.

The actual saving in fuel based on 41,000 B.t.u. per kilowatt-hour, the standard set June 1, 1915, when the bonus system of wages was established, has improved during successive six-month periods as follows:

Second half year 1915.....	5.5 per cent
First half year 1916.....	12.3 per cent
Second half year 1916.....	15.3 per cent
First half year 1917.....	15.2 per cent
Second half year 1917.....	18.5 per cent (estimated)

This remarkable improvement in fuel economy was not wholly due to extra effort on the part of the employees participating in the bonus system, but partly to improvements made in the plant, improved methods of operation and improved condition of equipment, largely due to the valuable engineering advice, instructions and co-operation of the J. G. White Management Corporation, the operators of the Manila property.

It would perhaps be fair to say that the results obtained were due to the efforts of the employees to the extent of approximately 50 per cent of the fuel economy effected, and approximately 50 per cent to the improvements in the plant and its operation for which the company is indebted to the J. G. White Management Corporation.

POWER PLANT IMPROVEMENTS

Some of the changes and improvements made by the company in the power-plant equipment and operation since the bonus system became effective follow:

1. The application of additional heat-insulating material of asbestos and magnesia to the piping, boiler drums and turbine casing.

2. The installation of a combination draft gage on each boiler so located that the boiler attendants can be guided by the indication of the gage as to the condition of the fuel bed and the proper adjustment of the air supply to the furnace.

3. The daily log sheets were improved as to include all data necessary to enable the supervising force to detect defects in operation and effect improvements.

4. The vacuum obtained at the turbine exhaust nozzle was increased by reducing the resistance offered to the exhaust steam entering the condenser. This was accomplished by removing certain condenser tubes so as to open up steam lanes to a large part of the condenser surface.

5. The practice of running extra auxiliary units for no other purpose than to safeguard continuity of service was discontinued without serious consequences.

6. Deflecting arches were installed in all furnaces to effect more complete combustion of the highly volatile coal used.

The economies resulting from the improvements mentioned above necessitated from time to time a reduction in the standard basis of coal consumption on

which bonus for fuel saving was computed, according to provisions formulated in the original plan.

It was only fair to the company to lower the standard basis of fuel consumption at such times as improved efficiency had resulted from changes and improvements over which the men participating in the bonus had no control. At the same time it was necessary not only to take special care in explaining to all concerned the reasons for a change but to select a time for putting the lower standard of fuel consumption in effect when operating conditions were most favorable to economy. At such time there was the least liability materially to lower the amount of bonus to an extent which might cause dissatisfaction or suspicion that the company was not giving the employees a square deal.

Notwithstanding the reductions made in the standard basis of computing the bonus totaling 12.2 per cent, the employees have enjoyed an increasing income therefrom, amounting during 1915 to an average of \$400 per month or 23 per cent of the wages; during 1916 an average of \$600 per month or 35 per cent of the wages, and during 1917 an average of \$675 per month or 39 per cent of the wages. Occasionally the bonus distribution exceeds \$800, but this amount proves rather too generous as the increase in wages derived thereby is greater than the average employees' standard of living requires, resulting in many remaining off duty or requesting vacation leave for a few days, much to the inconvenience of the supervisory force and the resultant efficiency and reliability of the operation of the plant.

CONCLUSION

The bonus system of wages has now been in operation for about two and one-half years with the most gratifying results. The B.t.u. consumption per switchboard kilowatt-hour at the present time is nearly 25 per cent less than it was three years ago. The present saving in fuel cost, based on the latest standard of fuel efficiency put in effect Sept. 1, 1917, is 8.75 per cent. The company and the employees are equal partners, sharing alike the results obtained from fuel saving, a procedure which escapes the criticism that is sure to arise when a company appropriates the lion's share.

The plan of bonus, so successfully carried out without friction between the company and its employees, is due, in good measure, to the freedom it has enjoyed from the agitating influence of labor unions.

While the management, and especially the chief engineer of the power plant, has never wholly approved from a standpoint of principle the offering of a bonus or reward to employees as an incentive to put forth their best effort, the means employed in this plant with this end in view seem well justified, considering the great improvement in economy subsequently obtained and the benefits thereby derived by both the company and its employees.

The Ohio Electric Railway has put into effect a new schedule on all its divisions which provides for alternate limited and local hourly service. Through limited service between Columbus and Indianapolis will be continued. The new arrangement complies with the suggestion of the government for a reduction in the limited service and provides for the present necessity of reducing coal consumption in order to maintain regular operation.

Practical Traffic Relief Offered to Washington

Second Section of Beeler Report Recommends Eight Stops per Mile in the City and Six per Mile in the Suburbs—A Completely Detailed Schedule of Stop Spacings and Locations Is Embodied in the Report

THE second of the unit reports of John A. Beeler on Washington traffic problems was submitted to the Public Utilities Commission of the District of Columbia on Friday, Feb. 7.

In opening the report, the substance of which is given in the following paragraphs, Mr. Beeler pointed out that one of the chief difficulties with the service at present is the low rate of speed. While the cars are geared to run at a maximum speed of 20 m.p.h. or more, the actual rate of progress due to stops and slowdowns is but 8 m.p.h., and in the congested districts even less.

How Stops Affect Schedules.—The number of stops required per mile is for all practical purposes the factor that determines whether or not rapid transit is possible for the community served. A stop consists of three elements, all involving loss of time. The car must be slowed down from its running speed to standstill, it must stand for unloading or loading of passengers or waiting for signals, and finally it must start and again resume its speed.

As an illustration, consider an ordinary Washington street car capable of making 20 m.p.h. without stops. Require it to make eight stops of but five seconds each and the schedule speed is reduced to 10 m.p.h., or only one-half what is possible without stopping. Fourteen stops per mile will reduce the speed to 7 m.p.h.

"Stop at Every Block" Policy.—In an attempt to accommodate their patrons, the electric railways in Washington have for many years operated on the "stop at every block" plan. The result of this policy has been one of the potent factors that have slowed down the schedules, so that to-day the speed of some of the car lines is but little faster than a walk. This conserves neither the time of the patrons nor the finances of the companies, as the slow service is an economic waste for all concerned. The amount of power used, and hence the amount of coal burned in the power plant, is greater where many stops are made. It may be conservatively estimated that $\frac{1}{2}$ lb. of coal is burned for each stop made, over and above what would be needed if the cars ran through.

Irregular Length of Blocks.—The blocks in Washington are marked by the irregularity of their spacing. Some of the original squares are as much as 940 ft. in length, while others are but 260 ft. On Pennsylvania Avenue they vary all the way from 710 ft. to 150 ft. On practically all lines similar conditions exist. Intersections formed by the avenues at acute angles add still more variety to the distances. In addition to the regular streets, the so-called minor streets laid out by property owners between those originally contemplated in the plan of the city add to the irregularity of spacing.

While the average distance between stopping places is extremely short, the actual distances vary so that in certain squares the walk necessary to reach a car stop is much above this average. Few persons complain

about the walk to the nearest corner, regardless of the length of the block. As a result it may at once be inferred that no hardship will be incurred if the spacing is made to conform as nearly as practicable to the length of block which will give the best service to the public, regardless of whether a stop is made at every corner.

Proper Spacing of Stops.—It is not necessary for Washington to adopt any radical skip-stop or other program involving long distances between stops, or a plan that would call for the elimination of one-half of all the stops regardless of the length of the squares. But what is necessary and must be done before reasonably rapid transportation is possible is the equalization of the spacing on a rational basis. This will call for a spacing such that the distance will be sufficient for the cars to make a reasonable run without unduly increasing either the walking time or physical effort to reach the stopping places.

With the above ends in view, a plan for spacing the passenger stopping places on a basis of eight per mile in the city districts and six per mile in the suburbs has been worked out. This plan was presented by Mr. Beeler in elaborate exhibits. This arrangement will change the spacing from an average of about 377 ft. to about 660 ft. in the city. The maximum additional walk involved is equal to but one-half the increased distance, or 141 ft. As this will take less than half a minute at an ordinary walking gait it is readily seen that no serious hardship can result to anyone.

Practically every stopping place in the District of Columbia was examined, and care was taken to locate each stop where it will serve the greatest number, while conforming as nearly as possible to the recommended standard of spacing. In the suburban districts, where the number of persons using the cars is proportionately less, and where the residents are usually located in more or less compact groups, it is believed that the spacing of six stops to the mile will afford better service than a lesser distance. In a few stretches of country territory four stops per mile will be sufficient.

Distinct Signs for Stopping Places Necessary.—The locations for the stopping places must be clearly defined, so as to enable the passengers to be at the exact spot opposite the entrance when the car is brought to a standstill. This will save valuable seconds now lost while the passenger walks all or part of the length of the car. Traffic stanchions, raised platforms, or well-defined lines should mark the loading zones.

Better Time and Less Fuel.—Every schedule in the city will have to be rearranged. By the adoption of these stopping places the running time should be reduced by 15 or 20 per cent. This will cause a corresponding increase in service as soon as the new schedules are put in effect.

A saving of three stops per mile on each of the

Comparative Costs in Boston

Report of Mr. Beeler Shows Why Greater Use Should Be Made of Rapid Transit Operation in Subway and Elevated Facilities

ACCORDING to the report presented by John A. Beeler to the Massachusetts Public Service Commission, as summarized in the *ELECTRIC RAILWAY JOURNAL* of Feb. 9, the cost of subways and tunnels in Boston is so great that they ought to be utilized in the most efficient way, and therefore rapid transit trains should be substituted for surface cars wherever feasible. In supporting this finding Mr. Beeler included in his report some valuable comparative costs which will now be added to the preceding summary. The accompanying tables show for the year ended June 30, 1916, the relative investments, income and trackage, as well as the income and outgo per dollar of business, for the rapid transit lines in Boston, for the surface lines using subways, tunnels and viaducts, and for the street surface lines.

The operating ratio for the rapid transit lines is 54.5 per cent, as compared to 67.1 per cent for the surface system. In Mr. Beeler's opinion the rapid transit costs show the necessity of increasing the revenues on such lines, as it is impossible to make them even self-sustaining so long as it requires more than three-quarters of every dollar received to pay taxes and provide a return on the investment.

The most expensive feature in the entire Boston system, however, is the use for surface car operation of certain rapid transit facilities which are separate from the rapid transit tracks, although operated in conjunction with them. These are the Boylston Street and Tremont Street subways, the Boston tunnel, the East Boston tunnel extension and the Cambridge viaduct. For these lines the investment represents \$15.71 for each \$1 of business, so that the receipts amount to but little more than 6 per cent upon the investment.

(Concluded from page 312)

1,500,000 car-miles operated per month represents approximately a saving of 1000 tons of coal, or 12,000 tons a year.

Suggested Stop Locations.—Mr. Beeler's exhibits in the complete report show the location of all passenger stopping places within the District of Columbia, with the approximate distances between stops. The average number per mile and the average distance between stops are also stated for each section. The present system of near-side stops has been generally adhered to, although numerous exceptions have been made where it is apparent that the far-side stop will serve better.

At junction points and at crossings of electric railway tracks the present stopping places have, in most cases, been retained. However, as schedule speed increases and passenger traffic develops, it may be found necessary or desirable to move some of the present stops out of the traffic throats, as has been recommended at Fifteenth Street and New York Avenue. The stops recommended for these junction points and crossings, therefore, must not be considered as final.

As the numerous stops at the Union Station present a problem different from anything else in the city, they have not been touched upon in this section of Mr. Beeler's report, but will be reported separately.

The investment per mile of track is actually greater than that of the rapid transit system proper by \$57,749.

Moreover, on top of the interest-carrying charges consequent to this tremendous investment, requiring practically 80 cents out of each \$1, a 12½-per cent increase in the operating ratio occurs, owing to the employment of surface methods of operation instead of rapid transit. The former require 67.1 cents out of each \$1, as compared to 54.5 cents on the rapid transit lines. Mr. Beeler believes that there is only one remedy for the situation, and that is to be found in the application of rapid transit operating methods to this portion of the property.

The most remarkable feature of the surface operation, says Mr. Beeler, is the fact that the car-mile earnings were 32.9 cents, in spite of the fact that practically one-half of the 41,400,000 car-miles were performed by the small, antiquated box cars and their open substitutes.

The only efficient type, the center-door stepless trailers, performed less than 5 per cent of the mileage. This, Mr. Beeler notes, largely accounts for the fact that the expense of operation per car-mile was 22.1 cents, resulting in the high operating ratio of 67.1 per cent. The company, however, made a 2.7 per cent

COMPARATIVE COSTS IN BOSTON

	Rapid Transit Lines	Surface Sub- ways, Tunnels and Viaducts	Street Surface Lines
Miles of track.....	36.85	14.88	471.97
Investment per mile of track....	\$1,401,777	\$1,459,526	\$89,806
Revenue per mile of track.....	\$99,559	\$94,030	\$28,896
Investment per \$1 of business..	\$14.08	\$15.71	\$3.10
Receipts per car-mile (cents)...	28.4	32.9	32.9
Operating expense per car-mile (cents).....	15.5	22.1	22.1
Income and outgo per \$1 of business:			
Operating revenue.....	\$1.000	\$1.000	\$1.000
Operating expense.....	\$0.545	\$0.671	\$0.671
Taxes.....	0.056	0.056	0.056
Return on investment (5.06 per cent).....	0.714	0.796	0.147
Total outgo, not including de- preciation.....	\$1.315	\$1.523	\$0.874
Deficit.....	\$0.315	\$0.523	\$0.126
Current depreciation.....	0.094	0.071	0.071
Discarded property account....	0.038	0.028	0.028
Total deficit.....	\$0.447	\$0.621	\$0.027

profit on its surface line operations in 1916. This showed that it would have been better off had it not been necessary to construct rapid transit tunnels, subways, viaducts, etc.

The combined system of the Boston Elevated Railway had an operating ratio of 64.6 per cent, and car-mile earnings of 31.9 cents. The operating expense per car-mile was 20.6 cents. The total investment of \$116,022,060 produced an operating revenue of \$18,686,971, indicating an investment of \$6.21 for each dollar of business. On the basis of \$1 of business, the deficit for the whole company amounted to \$0.121. This figure, as well as the ones preceding, is based on an average return of 5.06 per cent on the capital investment. This was determined by an analysis of the earnings for the last twenty years. At the present time, in order to earn 6 per cent on the Boston Elevated stock, this rate of return on the entire property must be obtained.

The total cost of service for each 5 cents' worth of gross revenue is shown by the following: Rapid transit lines, 7.23 cents; surface cars in subways, tunnels and viaducts, 8.10 cents; surface lines proper, 4.86 cents, and the combined system, 5.60 cents.

Combining Loads to Gain Economies of Large Units and High Diversity Factor—II

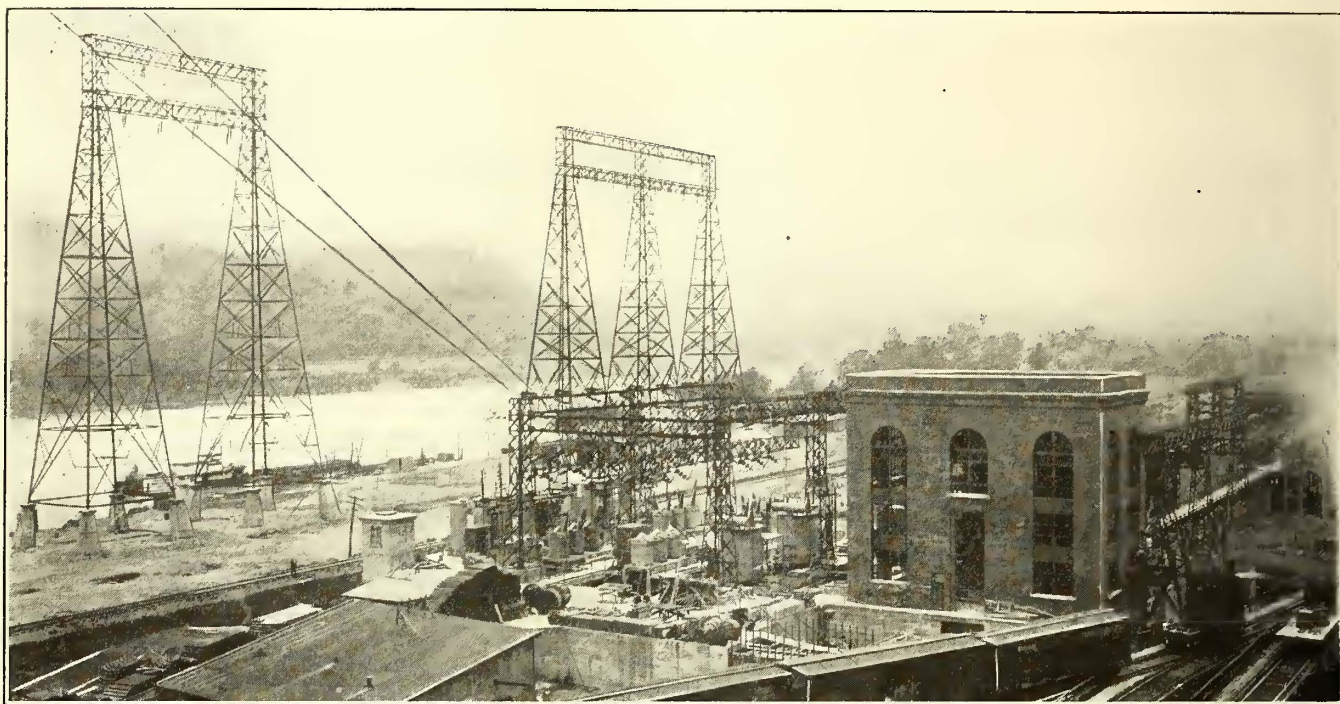


FIG. 1—SWITCH YARD OF AMERICAN GAS & ELECTRIC COMPANY, WINDSOR POWER PLANT

THE general layout of the Windsor (W. Va.) power station, and the details of the boiler plant, were covered in the issue of this paper for Feb. 9. The remaining salient features are taken up this week.

The 30,000-kw. General Electric turbo-generator units are set in a single line through the power house and grouped in pairs with the steam ends of the two units adjacent to each other and directly over the condenser pits located between them. This arrangement brings the ends of the two machines requiring the most attention, as well as the Westinghouse condensing equipments for each pair, adjacent to each other, thus making for convenient operation. Both condensing equipments for the two machines are located in the one pit between and underneath the turbines. These condenser pits were placed 74 ft. deep below the main floor, primarily because the Ohio River at Windsor has a rise of 49.8 ft. from extreme low to extreme high water, and are served by automatic electric elevators.

The basement floor of the turbine room was placed just above high-water mark, and the main floor 18 ft. above this, while the floor of the condenser pit was built low enough so that the cost of pumping circulating water at low river stages would be a minimum.

West Penn Power Company and American Gas & Electric Company Combined Generating Plant—Six Units and 200,000 Kw. Capacity—Water Supply System—Electrical Layout and Control Features—Distribution System of 11,000, 25,000, 66,000 and 130,000 Volts

joint having a new type of mercury seal placed just above the condenser. The steel cross-members which support the condensers in the pits were placed about 15 ft. above the floor of the condenser well in order to leave space in the bottom of the pit for the air and water pumps. This arrangement of double-condenser pit and wide opening between machines in the turbine room has made it possible to utilize the 110-ton turbine-room crane for handling the condensing apparatus.

On account of the low cost of energy produced by the large units, practically all of the auxiliaries are motor-driven, dependence being placed on the economizers, with which each boiler is equipped, to maintain the heat balance. Two hydraulic air pumps driven by 100-hp. motors and two hot-well pumps driven by 100-hp. motors are supplied for each condenser. The hydraulic air pumps are installed on the platform in the condenser pit which supports the condenser, making a very short and efficient suction connection, while

The condenser pits are 25 ft. 6 in. wide by 91 ft. long.

Each condenser contains 50,000 sq. ft. of cooling surface and is connected to the turbine which it serves by a pipe 13 ft. in diameter. This exhaust connection was liberally designed and was provided with an expansion

the hot-well pumps are located on the floor of the condenser pits underneath the condensers. The 50,000-gal.-per-minute motor-driven circulating pumps are located on the floor of the condenser well.

After passing through the condenser, the condensate is pumped through a primary heater in the upper part of the condenser and thence sent up into an open-type feed-water heater which is set on a platform immediately above the feed pumps. These pumps and one service pump are the only steam-driven auxiliaries in the plant. Two of these feed-water pumps are supplied for each unit, one of them being steam-driven and the other motor-driven. One motor-driven and one steam turbine-driven Worthington service pump serving the pair of

condenser-well floor, these pumps discharging directly into the bottom of the water box. For units Nos. 1 and 2, the intake for the circulating pumps is directly from the crib, while the circulating pump intakes for units Nos. 3, 4, 5 and 6 receive water through intake tunnels extended from the crib to the various machines. An extra heavy sluice gate operated by means of a hydraulic cylinder controls the flow of water to each circulating pump.

The discharge of circulating water from the condenser is made at the top and the water is delivered to the discharge well through a cast-iron pipe connecting with a discharge tunnel which lies adjacent to the intake tunnel part way to the river. From this point it

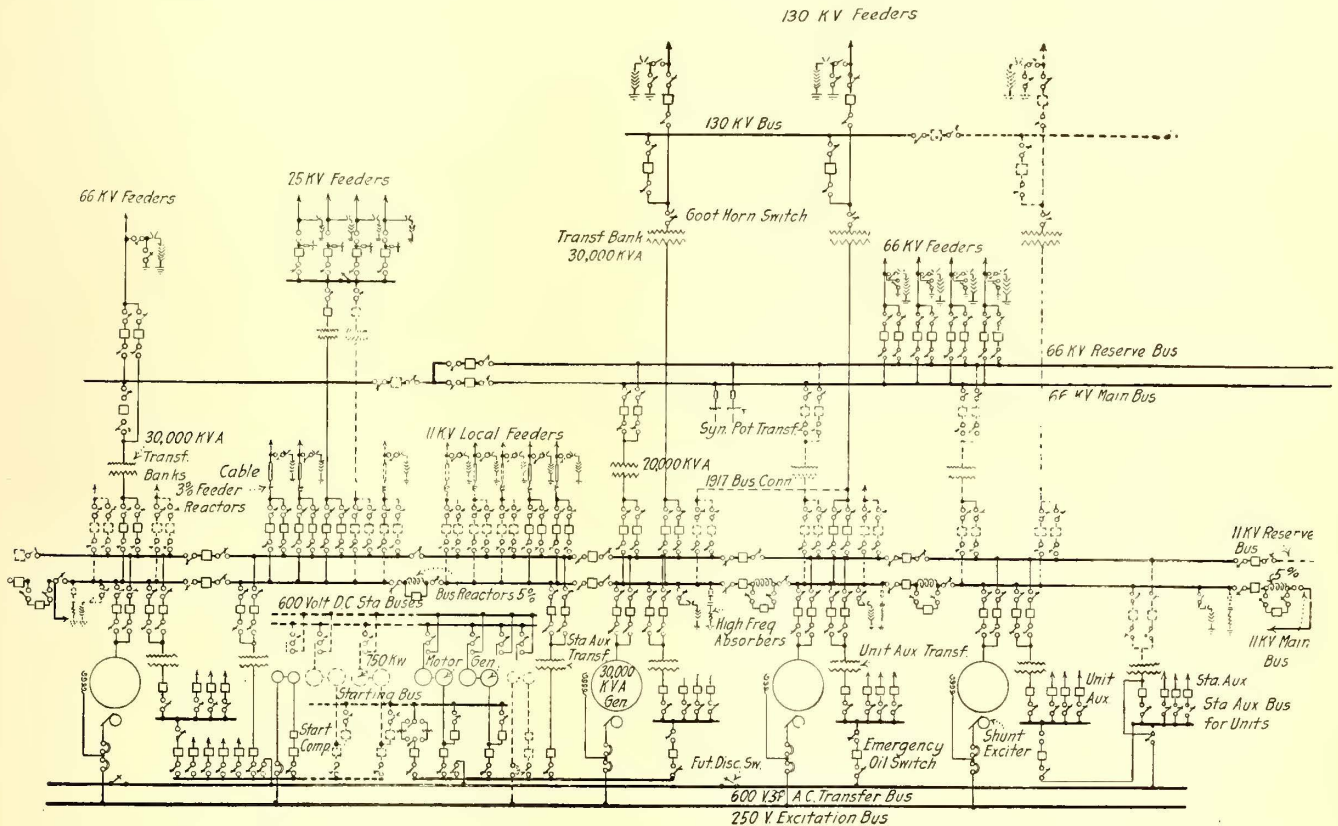


FIG. 2—SINGLE-LINE DIAGRAM OF MAIN STATION CONNECTIONS IN WINDSOR PLANT

turbo-generator sets is installed in each condenser well. These lift the water up into a steel service tank underneath the boiler-room roof, whence all service and make-up water is supplied.

All water drawn from this tank for use in the boilers is run through a settling tank and quartz filter before it flows into the feed-water heaters. This is the only treatment of the water required. Two separate paths for the water between the feed pumps and the boilers are provided in order to take water through the economizers, or deliver water to the boilers direct.

The complete water supply for the entire station is taken from the Ohio River through an intake crib which stands beside the condenser well between units Nos. 1 and 2, inside the turbine room. The water in the crib passes successively through bar iron grills, Chain Belt Company traveling screens and stationary screens to the rear chamber of the crib. From here it is taken through cast-iron pipes to the circulating pumps on the

is brought off at an angle in order to separate the discharge mouth from the intake.

The general arrangement of condenser equipment and intake crib permits the 110-ton turbine-room crane to be used for handling the screens in the crib. This turbine-room crane is equipped with a 15-ton auxiliary hoist which is used for this work. The traveling screens are mounted in a vertical position and so arranged that they can be raised or lowered to meet the conditions as the river rises and falls.

ELECTRICAL LAYOUT OF WINDSOR PLANT

The generators in the Windsor plant are 60-cycle, three-phase, 30,000-kw. units with a generating voltage of 11,000. They are arranged for connection to a double-bus system, made up of a main bus and a reserve bus paralleling it. The former will be operated on the ring system, and while the reserve bus will not be operated as a ring at present, space has been provided to install

the ring connection at a later date if this is thought advisable.

For each generating unit a bus unit is designed and equipped so as to limit the possible interchange of energy between bus sections to an amount well within the guarantee of the oil-switch manufacturer. This is accomplished by inserting a 5 per cent reactor between bus sections. These reactors may be cut in or out of the bus circuit by opening or closing a reactor short-circuiting switch. Whenever the generators are paralleled on the bus they are separated by these current-limiting reactors.

The control of the position of these reactor switches is accomplished automatically. The control circuit which is used for operating the reactor short-circuiting switch, and that for operating the generator switch on the main bus, are electrically interlocked so that if the generator switch is closed the reactor switch is open, and vice versa. This makes it impossible to parallel

Exciting current for each generator is supplied by a 210-kw. exciter mounted on the end of the generator shaft. The rating of each exciter is sufficient to enable it to carry two generators in an emergency, since the power required for the maximum field of one machine is 140 kw. Emergency excitation is further insured by the installation of a 250-volt exciter bus which runs the full length of the station. Arrangements are of course made for connecting all machine exciters and all machine fields to this bus. A 150-kw., 250-volt motor-generator set, which was installed with the first two units, is also connected to this bus to overcome any shortage of exciter capacity. Space in the basement of the switch house has been set aside for the installation of an excitation battery which will be installed later on. A Tirrill regulator has been installed for each exciter and for the motor-generator exciter set.

For supplying energy to the auxiliary equipment, an 1800-kva. three-phase transformer, stepping down the

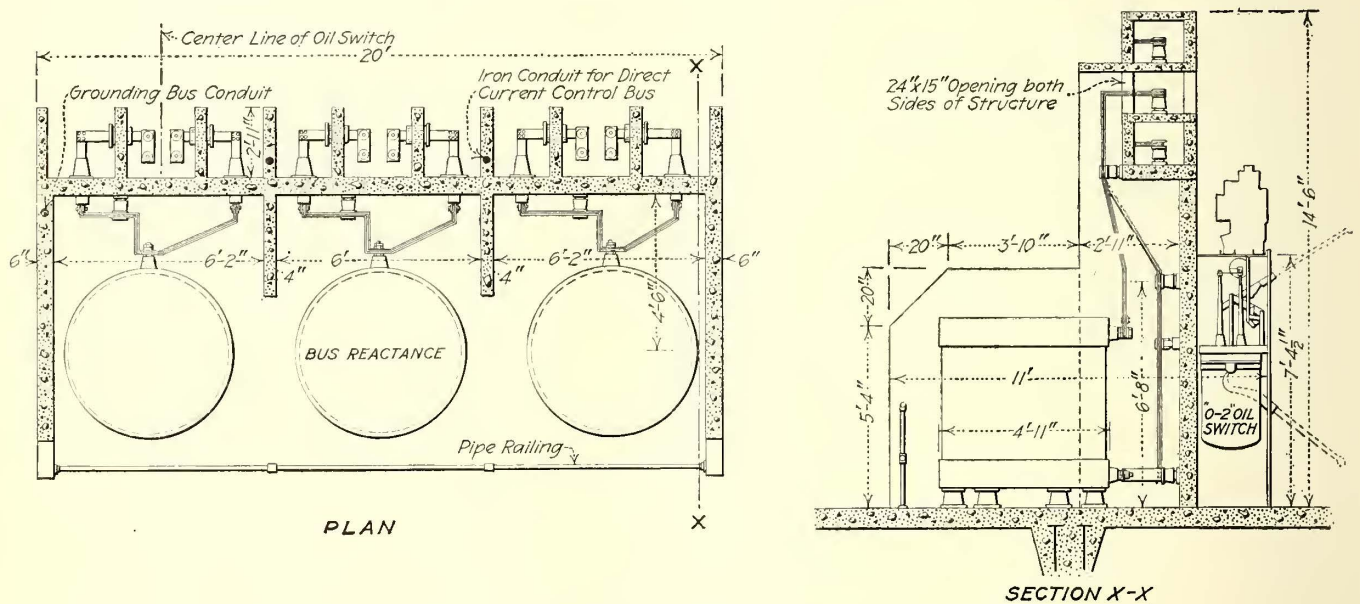


FIG. 3—PLAN AND SECTION OF BUS REACTANCE CONNECTIONS

the generators on the bus without reactors between them, although provision has been made for the independent operation of these switches when this is necessary. This arrangement of current-limiting reactors and switch gears made it possible to keep well within the guarantee of the oil-switch manufacturer, without sacrificing close voltage regulation and without incurring undue expense. In addition to the reactors, a further protection against surges has been provided by the installation of a high-frequency absorber, which is in reality an oil-insulator condenser, having the function of relieving unusual disturbances and strains.

The main 11,000-volt connections between the turbines and buses in the switch house are made through either of two 2000-amp. oil switches. The buses and switch-cell structures, which are of monolithic concrete construction, are placed on the main floor level. The 11,000-volt feeder reactors, potential transformers, lightning arresters, and excitation and control storage batteries are installed in the basement of the switch house, to which access is gained by a stairway at either end or in the middle of the building.

voltage from 11,000 to 550, has been installed for each generating unit. It requires about 1500 kva. to supply the electrical requirements for the auxiliaries serving each unit. This does not include the stoker motors, since they are direct-current machines which are operated on 600-volt current supplied by motor-generator sets which also serve the crane hoists, automatic elevators and coal-handling equipment.

In addition to the transformer installed for each generating unit, two other 1800-kva. auxiliary station transformers are installed for supplying energy to motors about the station not directly connected with any particular unit. These transformers also serve the motor-generator sets which supply energy for the direct-current auxiliaries. All electrical equipment in the power station is of General Electric manufacture.

The control of all electrical equipment within the power house and the supply of 11,000-volt energy to the two individually owned high-tension yards of the two companies are centered in the operating room located between the turbine room and switch house. This room is separated from the turbine room by a glass

partition which permits a view of practically the entire turbine-room floor. In this room are installed a bench-board, a vertical control switchboard, the Tirrill regulators and a log desk for the operators. The turbines, exciters and auxiliary transformers in the station are controlled from the benchboard, which is situated so that the operator is facing the glass partition as he works on the bench. The outgoing feeders are con-

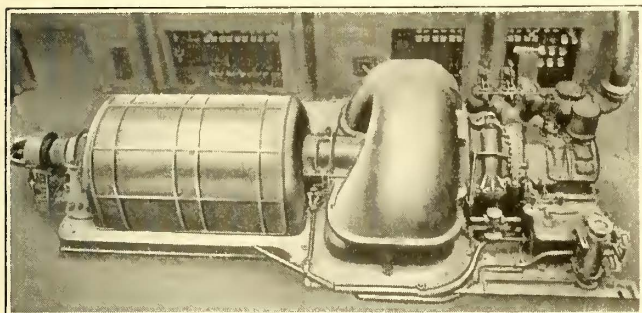


FIG. 4—ONE OF THE 30,000 KW. TURBO-GENERATOR UNITS NOW IN SERVICE

trolled from the vertical switchboard at the opposite side of the room, and the voltage regulators and curve-drawing instruments are mounted on pedestals in the center of the room. At one end of this room, also, is a battery board and behind it a motor-generator battery charging set. At the opposite end of the room is the 600-volt direct-current board. The station watt-hour meter board is located at the same end of the room as the battery board. Stairways at each end of the operating room communicate with the private offices above.

The function of this operating room as the control center of the entire plant was completed by the provision of devices for reading the temperatures of transformers in the high-tension yards, and the temperatures of important parts of the main generators. Alarm bells

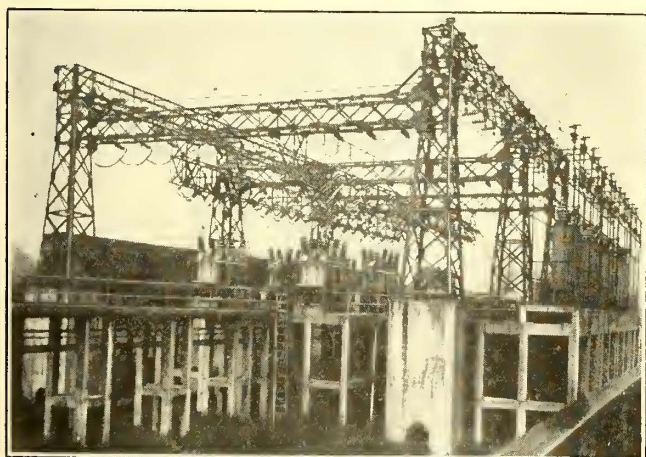


FIG. 5—OUTDOOR SUBSTATION AT WINDSOR PLANT

and signal lamps have also been installed in this room to warn the operators of any interruption in the flow of cooling water to the high-tension transformers.

Energy is carried over the 11,000-volt cables underground from the power house to the two individually owned yards of the West Penn Power Company and the American Gas & Electric Company located at the north end of the power station. Here connection is made to 25,000-volt, 66,000-volt and 130,000-volt transformers for distribution over the several high-tension lines of

the two companies. The local industries use 11,000-volt lines. Part of the West Penn lines operate at 25,000 volts, others at 66,000 volts. The latter will ultimately be operated at 130,000 volts, and the lines of the American Gas & Electric Company are operated at both 66,000 and 130,000 volts. All lines leave the high-tension yards on the radial plan, with arrangements made for parallel operation of two lines in case of emergency. It is understood, however, that radial operation is preferred and that parallel operation is purely an emergency measure. Each of the 11,000-volt feeders for the local industries is equipped with a 3 per cent current-limiting reactor which was selected to limit the current which might flow into a ground or "short" to a value well within the rating of the smallest oil switch in the circuit.

From the main 11,000-volt bus in each yard the energy which is to be transmitted at 130,000 volts leaves the yard from a 30,000-kw. bank of transformers which are tied in solid on the low-tension side. The 11,000-volt switches in the lines supplying these transformers are located inside the power station and meet the requirements of protection and control at the yard



FIG. 6—SOUTH END OF WINDSOR PLANT OPERATING ROOM

as well. In the yard a high-tension transfer bus has been installed, so that in case it is necessary to shut down one bank of transformers the load from any outgoing 130,000-volt line can be distributed over the remaining good transformers. All the 66,000-volt and 130,000-volt transformers are wound so that they may be interchanged and the 66,000-volt units may also be operated later at 130,000 volts. Further flexibility and assurance against interruption has been provided by installing lines for interconnecting the 66,000-volt buses in the yards of the two companies.

In the American Gas & Electric Company yard, a double 66,000-volt bus was installed. At present this is connected to a 20,000-kva. bank of transformers and to all outgoing 66,000-volt lines. In the West Penn yard the 66,000-volt bus is operated normally only as a transfer bus, the energy being supplied by a 30,000-kva. bank of transformers. All outgoing high-tension lines are equipped with induction-type inverse time-limit relays. The transformers are protected by definite time-limit relays. The relays on the 25,000 and 66,000-volt lines are given a minimum setting of two seconds, while those on the 130,000-volt lines are set for three seconds. The transformer relays have a minimum setting of three seconds, and the 11,000-volt feeders have not yet been equipped with the relays. All electrical equipment in the American Gas & Electric Company high-tension yard is of General Electric manufacture, while that installed in the West Penn yard is of Westinghouse make.

The Asininity of Trying to Get Blood Out of a Turnip

The Public Relations Man Who Tries to Camouflage a Reactionary Chief Executive May as Well Try to Get Blood Out of a Turnip, Get Up Steam Without Heat, Lift Himself by His Bootstraps or Attempt Any Other Impossible Stunt

By THOMAS DREIER

SEVERAL years ago the new general manager of what had been a successful manufacturing institution asked me to help him create a new spirit in his organization.

"In the old days," he explained, "this house made so much money, and did it so quickly, that the spirit of service departed. The new owners have never cared either for the public or for their own workers.

"The place is honeycombed with hatred. The present directing head is a snarling sort of person. I am telling all this to you frankly because I want you to know how things are at the start. Our first job is to find out what sort of institution we want here. Our second is to put that spirit of service into the place which will make it regain the position it once held in the estimation of the public."

"We'll have to lie like sixty," the general manager added.

"Lie?" I questioned.

He laughed. "Let us put it this way: Our job is to play a trick on the heads of this business. The folks down the line are pretty good—most of them. They want to do the right thing, and are ready to do the right thing. A few will have to go eventually. Unfortunately, I am not in position to fire the real trouble makers. They are the owners themselves.

"They have a great deal of pride, though. They boast of their integrity and the value of their word. What I want you to help me do is this: We must get out a publication that will go to both the employees here and to the public. I want you to talk with the owners from time to time, and, like a good interviewer, suggest ideas to them which you will write up later, and to which they can attach their names without suspecting that the ideas did not originate with themselves.

"We'll have to get them on record before the public. I am playing the hunch that if we once compel them by suggestion to stand publicly for certain standards of service they will have to back up their promises with performance."

It certainly was an interesting suggestion. The new manager had just come from a distant city to find out why the business was not making the profits it had made years before. He had not been on the job long before he discovered that the trouble was not in the rank and file of employees, but in the executive officers themselves. It would not have helped the work any to tell all he knew to his new employers, so he tried to reform them by suggestion.

* * *

Well, for over a year we worked merrily away. The employees who were right at heart got right into line and helped. Others were gradually eliminated. Conditions improved. But not once did we feel safe. Just when we had patted each other on the back and thought we had put it over the owners would go on a rampage, and cuss some department head in the presence of others. Or some fool order would come shooting down from the inner sanctum which riled everybody up, but which the manager was powerless to help without pouring gasoline on the flames.

It certainly was uphill going. The manager would do something to win back a section of the public that had departed before his arrival, and then, just when right relations were being cemented, along would come one of those fool owners and jam some asinine scheme through which would destroy in a week the work of months.

One night, when the manager and I were dining at the club, he confessed that life was too short for him to spend it trying to perfect a policy and an organization for men who did not know the first principles of harmony and common decency.

"I have wanted to put this thing over as a matter of pride," he explained, "and I have wanted to prove that our suggestion plan is right. But what's the use? When the source of a stream is poisonous you cannot expect pure water until you get a long ways from that source. Running water purifies itself, but sometimes it has to run a dickens of a long way. I am inclined to think that the element

of time will defeat us here. I am not going to break Methuselah's record as a long liver if I stay on this job, and only a Methuselah will have enough years to put it over right. Unless," he concluded, "we go out now and kill those sons of guns."

A short time after he was called to a bigger job, and I wiped one more client off my list of income producers.

That job paid me in two ways. It paid me in what I earned and it paid me more in what I learned.

* * *

When I was asked in New York, a few months ago, what a director of public relations for a street railway should do first of all, I answered without hesitation: "He must choose the right kind of president."

Emerson's famous statement that "An institution is the lengthened shadow of a man" is partially true. An institution is the man who directs it. His spirit is the spirit of his organization.

If you find an organization filled with mean, small-natured, narrow-gaged men, you will find at the head of it a mean, small-natured, narrow-gaged executive.

If, on the other hand, you find an organization where the department heads are personal friends, where those under them are good-natured and neighborly, where there is a spirit of harmony and good-will, you will find somewhere an executive power that expresses harmony and good-will and neighborliness.

All this leads me to say that in public-relations work it is not of first importance to have a weekly or a monthly or newspaper advertising, or any of the other publicity mediums. Street-railway men, for instance, discuss at great length the comparative merits of print paper and coated book, worry the lives of half a dozen printers getting estimates, ink their fingers and their faces in the agony of producing copy, and never once give a thought to the real essential—the spirit of the organization it is their purpose to advertise.

* * *

I yield to no man in my respect for the power of publicity. But much as I want money, there isn't enough money in any publicity job in the country to persuade me to attempt the impossible task of helping to create right relations between the public and a business institution (or any other kind of institution, for that matter) whose dominating spirit is not the spirit of service.

"How can I hear what you say," exclaimed Emerson, "when what you *are* keeps thundering in my ears?"

No matter what the skill of the publicity man, no matter what money he is given to invest, no matter how willing his employers are to give him a free hand, all he can do, camouflage as he will, is to advertise the organization as it is.

Some way or other, in ways too mysterious to explain, the truth will work its way into the publicity material—no matter how skillful a liar the writer may think he is.

Private business may get away for a little time longer with executives who have the public-can-go-to-hell spirit, and with executives who have as much regard for the feelings of their associates as a Boche has for the Belgians, but public utilities cannot do it.

The public has an uncanny way of getting a man's real number.

Like a boy in boarding school, he soon finds his rightful place and is forced to take it.

Those fellows in the old stories who used to travel incognito were wise. Think what many an executive would learn about himself that he ought to know for his own good if it were possible for him to change his form and associate on terms of equality with his own department heads.

One does not have to be pessimistic to say that there are some heads of businesses who would emerge from such an adventure with their bump of self-esteem changed into a deep and most depressing dent.

* * *

Therefore, the lesson to be learned from all this is that when you are tempted to indulge in a publicity and public relations campaign you should resist that temptation with all your strength until you are sure that the men who are in charge of the property on which the plan is proposed are right mentally and emotionally.

They may be experts in railroading, they may know all about costs and stocks and bonds and politics and God only knows what else, but if they haven't the spirit that wins and holds the respect and liking of their immediate associates, both above and below them, and if their dominant desire is not a desire to use all their power in giving service, the more nearly their publicity campaign imitates a whisper on a stormy night by the side of an angry sea, the better for everybody concerned.

Have the right spirit in the home office. Breathe it into the outside offices. Make it a part of the daily job for men to be decent and neighborly and helpful. Then you can start your work on the public with some assurance that eventually you will achieve success.

There is no sense sending the infantry over the trenches until you are prepared to support them with all the resources at your command—enough to give them some chance to win through.

There is no sense in printing papers and dodgers and posters, and the like, unless you have an organization placed back of that publicity that will carry out the promises made.

Every bit of publicity should be as sacred as a promissory note to a good business man whose credit is sacred to him.

There you have a practical ideal to work toward.

Rebuilding an Elevated Railway Under Regular Schedule Traffic

More Than \$10,000,000 Has Been Spent on Manhattan Elevated Railway in Building Twenty-three Miles of Express Track, Involving the Erection of 50,000 Tons of Steel

THE meeting of the American Society of Civil Engineers, held in New York City on Feb. 6, was devoted to the presentation and discussion of a paper by F. W. Gardiner and S. Johannesson* on "Manhattan Elevated Railway Improvements." The paper was very elaborate and the reading of an abstract by the authors, with the aid of lantern slides, brought out discussion of a reminiscent nature. The following paragraphs cover some of the points in the paper which are of general interest:

The Manhattan Elevated Railway improvements authorized by the Public Service Commission of the First District, State of New York, involved in general the addition of a single continuous express track, with express stations, to the Second, Third and Ninth Avenue Elevated Railway lines operated by the Interborough Rapid Transit Company. The improvements provided for continuous express service during the rush hours downtown in the morning and uptown in the evening.

The work included the building of 23 miles of single track elevated structure, the erection of about 50,000 tons of steel, the building of 638 foundations and the construction or reconstruction of twenty-nine stations, most of the work being in city streets often congested with traffic. The traffic on the elevated railway lines was maintained according to the regular schedule throughout the period of construction.

The reconstruction work involved especially extensive track and structure changes at junction points and terminals.

At Chatham Square the Second and Third Avenue lines intersect. Before the reconstruction the Second Avenue trains continued to South Ferry and the Third Avenue trains to either South Ferry or City Hall. It was desired as a part of the reconstruction work to continue the Second Avenue line to City Hall. The new track layout has eight tracks through Chatham Square, two of which were placed overhead in order to avoid the danger and delays due to grade crossings. The Third Avenue tracks leave City Hall on the lower deck and after passing an island platform divide into three tracks, one being for express trains. The Second Avenue tracks leave City Hall on the upper deck, but later come down to the lower grade and also divide into three tracks. On the South Ferry branch, the Second Avenue line takes the old tracks past Chatham Square, and connects with the Second Avenue tracks from City Hall at the point where the express track begins. The Third Avenue tracks from South Ferry turn out from the old tracks and rising above this grade cross the Second Avenue line and run into the Third Avenue tracks from City Hall between the local and express tracks, later connecting with them.

Another junction of the Second and Third Avenue lines occurs at 129th Street and Second Avenue, where a yard for the two lines is located. From 125th Street to 129th Street on the Third Avenue line there existed, before reconstruction, three tracks, the center one being the uptown main track and one of the others a yard track. It was desired to retain these and add an express track. The new express track rises at 125th Street and continues above the center track to 129th Street to a junction with the upper deck Second Avenue tracks. On Second Avenue the three-track line divides into four at 125th Street, the outside two continuing at the lower deck and connecting with the yard and the local tracks of the Third Avenue line at 129th Street. The two inside tracks rise above the grade of the lower deck and connect with the express track of the Third Avenue line at 129th Street. This four-track line runs across the new Harlem River bridge, with two tracks on the lower deck and two on the upper deck.

There were several other junction points where conditions of this sort had to be met.

STEEL WORK ERECTED IN CONGESTED STREETS

New columns supporting the structure in the street were generally made 15 in. square, built up of two 15-in. channels, with flanges turned in, four angles and a web plate. Columns on the sidewalk, supporting station structure only, were generally built up similar to the track structure columns, but 12 in. square. Generally all columns had to be designed so that they could be erected under the cross-girder with the foundations, including the anchor bolts, in place.

For cross-girders plate girders were in general selected in preference to lattice girders, on account of the simplicity of design and the facility with which a load can be placed at any point on a plate girder without disturbing the uniformity of design. For track stringers plate girders were also usually used, but where it was desired either to keep the construction as open as possible and conform to the existing design lattice stringers were used.

The greater part of the work on the Manhattan Elevated Railway Improvements was in public streets often congested by traffic. Therefore the steel work, the total weight of which was about 50,000 tons, could not be stored in large quantities or for any length of time at the points where it was required for erection. The receiving points for steel in New York were the company's yard at 128th Street and the Harlem River, the dock frontage of which was increased by leasing adjacent property, and a dock front at Perry Street and the North River, which was leased for the purpose.

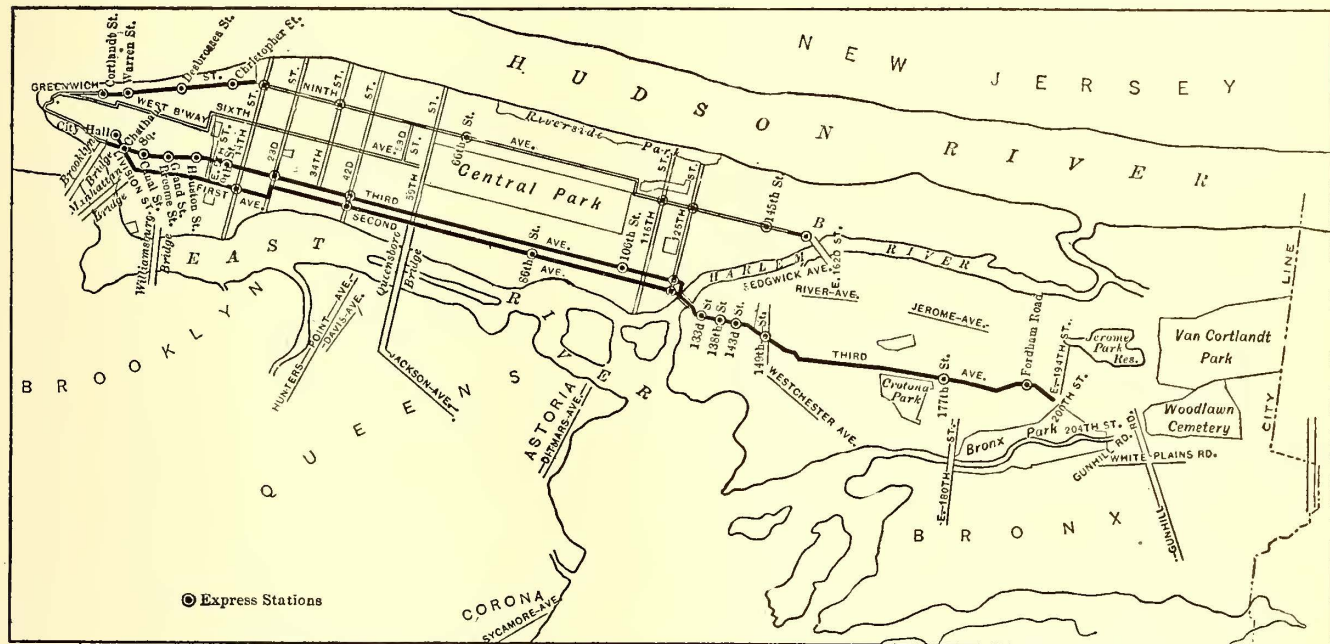
The material yard at 128th Street had an area of about 50,000 sq. ft. and a dock frontage on the Harlem

*For full text of the paper by Messrs. Gardiner and Johannesson see *Proceedings of A. S. C. E.*, December, 1917, page 2042.

River of about 700 ft. The equipment consisted of a derrick with a capacity of 10 tons, used for unloading steel from the lighters and loading on the trucks, and a traveling derrick running on rails on the surface of the yard, used mostly to handle the track timber. A derrick set on the elevated structure adjacent to the yard was used for handling the track material, which was distributed mostly with work trains. All steel work for the uptown sections was delivered at the 128th Street dock and that required by the downtown sections at the Perry Street dock. As material was needed it was lightered from the railroad's yards to the com-

at a new location very frequently necessitated changes of gas and water pipes, duct lines, sewers, and other sub-surface structures, because the locations of the columns were determined by other factors and practically without considering the sub-surface structures even if their positions were known in advance.

The foundations were built of concrete, and were usually rectangular in plan. The top was slightly larger than the base of the column resting on the foundation. The sides tapered downward to the top of a rectangular footing which had vertical sides varying from 1 ft. to 2 ft. in depth and a horizontal offset all around, varying



OUTLINE MAP OF ELEVATED LINES IN NEW YORK CITY—SOLID LINES SHOW SECTIONS IMPROVED

pany's docks, where it was stored temporarily until it could be trucked to the site of the work. Here it was deposited in the street until it could be erected, which generally meant that it remained in the street for only a day or two.

All riveting, drilling, etc., was done by compressed air, three stationary and thirteen portable compressors being used. The stationary compressors were of Ingersoll-Rand make, with Nagel locomotive-type, 100-hp. boilers. The portable compressors were of Chicago Pneumatic Tool Company or Ingersoll-Rand make, the capacity being 300 cu. ft. of free air per min. at a pressure of 90 lb. These were driven by 50-hp. electric motors, taking current from the contact rail of the existing railways. Although in some cases the erection of the steel structure was done with gin poles and jennywinks, the greater part was done with travelers.

FOUNDATIONS CONSTRUCTED WITHOUT CONSIDERATION OF SUB-SURFACE STRUCTURES

The foundation work involved not only the construction of foundations for new columns at points where no columns existed prior to the reconstruction, but also the rebuilding of the existing foundations where investigation indicated that these were not sufficient to carry the added loading. A total of 638 new column foundations were constructed, 444 of which were at new and 194 at existing locations. The placing of foundations

from 6 in. to 12 in. The bottom area of the foundation depended on the load on it and the carrying capacity of the soil, but was generally not less than 7 ft. square. Usually the size was 9 ft. or 10 ft. square. The standard depth was 15 ft. below the street surface.

The concrete used for the foundation was mixed in the proportion of one part of Portland cement, two and a half parts of sand and five parts of stone, graded to a maximum size of 2 in. On account of the long distance between the different points where the foundations were placed, and the comparatively small quantity of concrete required at each point, the mixing was usually done by hand.

"MEZZANINE" AND "HUMP" STATIONS USED

Wherever conditions permitted one or other of two standard types of express stations was adopted. One type, which required entire rebuilding of the existing station, has two island platforms, between which is the express track, with a local track on the outside of each platform. A mezzanine floor below the track structure connects the island platforms with the stairways to the street.

The second type of construction known as the "hump" station was used where there was not sufficient head room to provide the mezzanine floor. This type involved the raising of the middle express track above the level of the local tracks and the building of platforms to

serve the higher level. A maximum grade of 3 per cent was used for the ascending express track.

The stations remodeled or rebuilt were designed with an understanding of the fact that passengers arriving to take a train generally come singly or in small bodies, while on the other hand passengers discharged from a train are ready to leave a station in a body. The latter condition requires that the exits to the street be as direct as possible, without doors to obstruct passage.

The stations of both the "mezzanine" and "hump" types, as previously described, are provided with toilet rooms, which together with the ticket office are heated. Other rooms are not heated, as in that case it would be necessary to provide doors which would interfere with the progress of passengers. The platform construction consists of platform girders, on top of which are placed I-beams, carrying the wooden floor joists. The platforms are covered with canopies for either part length or full length, according to the traffic conditions and the location of the station buildings.

Throughout the reconstruction work the standard Manhattan Railway track construction was used. The ties are 6 by 8 in. in cross-section, full dimensions, and 8 ft. long. For the outside tracks, where a footwalk is required every third tie is 12 ft. long and carries the footwalk. The spacing of the ties is 18 in. center to center. The track rails weigh 90 lb. per yard, have a 5-in. base and are 5 in. high.

As an example of how the traffic conditions determined the conditions of the work, it may be mentioned that the station at 155th Street and Eighth Avenue serve the Polo Grounds, where the baseball league games are played. The work of reconstructing this station could not commence until the baseball season was over, and had to be completed before the next season started. Another example was the carrying out of the work in Ninth Avenue. There was formerly on the Ninth Avenue line a partial express service as far south as Fourteenth Street. In order to interfere as little as possible with this service, the company desired that the interruption of the express service due to the reconstruction of the stations at Sixty-sixth, Thirty-fourth and Fourteenth Streets and the grade-crossing elimination at Fifty-third Street, should be simultaneous and should not last more than fourteen days. Again when the three spans of the Harlem River Bridge were placed it was ordered that the work should be done in a night between Saturday and Sunday after midnight, at which time the traffic was lightest. As the work depended on the tide the placing had to wait until a Saturday night when the tide was favorable. In fact, throughout the construction the traffic conditions were the determining factors in the progress of the work.

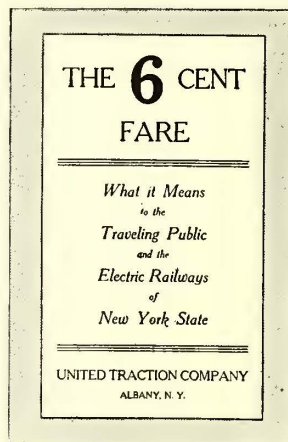
CONTRACTS ON COST PLUS PERCENTAGE BASIS

To advertise for bids, either on a lump sum or unit-price basis, and then accept the lowest bidder would have been a gamble as far as the selection of the contractor was concerned, and the odds would have been in favor of inexperienced contractors. Even if experienced contractors were secured by accepting bids which were not the lowest, the company would not have been free to select when, where and how the work should be carried out to best suit traffic conditions on the existing railway. It was, therefore, finally decided that the only way to get the work done right was to choose contract-

ors who were known by the company to possess the necessary experience to carry on the work, and to pay them the actual cost of the work, plus a fixed percentage of the same, to cover the use of their plant and their services. The soundness of the company's decision is shown by the fact that the work was completed in twenty-three months without undue delays to the train service, and practically without injuring a passenger, although more than 600,000,000 passengers were transported on 2,000,000 trains over the lines under construction. Credit for the wonderful co-operation which existed between the contractors and the railway company is given to the centralization of authority.

The total cost of the work done by the contractors was \$10,273,637.

What the Six-Cent Fare Means



THE 6-cent fare is a subject of vital interest to many electric railways in New York State and to every individual in the territories served. In order to give its public the opportunity for serious and just consideration of this matter, the United Traction Company is distributing to its patrons in Albany and Troy an interesting and instructive pamphlet. The twenty-eight

pages of this booklet, the cover of which is shown herewith, are filled with extracts from commission decisions, newspaper editorials, comments of experts and the like to show how electric railways are confronted with an immediate need for increased revenues.

Coal Consumption on the B. R. T.

The January issue of the *B. R. T. Monthly* was a coal-saving number, with short and practical articles by officers of the company and by C. Loomis Allen, formerly director Electric Railway War Board. Howard Abel, comptroller, gave the following timely and impressive data on coal as an element of cost in local electric railway operation:

In November, 1913, the gross receipts from operation of the B. R. T. system were \$1,950,374, and in November, 1917, \$2,384,035, an increase of 22.23 per cent.

The coal consumed in the former period amounted to 38,119 tons, and in the latter period 48,286 tons, an increase of 26.67 per cent.

The coal cost in November, 1913, was, however, \$82,408, and in November, 1917, \$160,783, an increase of 95.10 per cent.

The quality of the coal in the two periods is reflected in the relative consumption. In November, 1913, it required 3.10 lb. of coal to produce 1 kw.-hr. of electricity, and in 1917 3.32 lb.

To heat street cars by electricity requires about 33 1/3 per cent of all the coal used, so that it can be assumed that the company spends more than \$50,000 per month for heat.

Progress Toward Simpler Classification for Electric Railway Freight

The Author Explains Why the Recent Connecticut Public Utilities Commission Ruling Marks an Advance in the Direction of Simplicity

BY V. S. CURTIS

Secretary and General Traffic Agent The Connecticut Company, New Haven, Conn.

THE Connecticut Public Utilities Commission, in the recent ruling which became effective Jan. 1, 1918, established an important fundamental principle which will greatly simplify the conducting of trolley express and freight business in this State. This is the application of express tariff schedules rather than freight tariff schedules for this service. The decision was the outcome of a change in the schedules which was made by the Connecticut Company, effective on May 21, 1917, against which certain shippers protested. While the company considers the actual rates allowed by the commission to be too low, it is gratified by the ratification of the general theory for which it contended.

WHY REVISED TARIFF SCHEDULES WERE NECESSARY

Supplementing the descriptive article on the Connecticut Company's express department, which appeared in the issue of the *ELECTRIC RAILWAY JOURNAL* for Nov. 3, 1917, page 802, it seems desirable to point out some of the reasons why we found it necessary to abandon the use of the official freight classification with its maze of discounts from first-class rates, its *cellar* of commodity rates and its *sub-cellar* of "specifics." Let us first review the story of the genesis of this department.

The transportation of merchandise in less than carload lots on electric street railway cars in Connecticut was started at about the same time by Charles M. Cole, of Bridgeport, on the Connecticut Railway & Lighting Company's lines and by George Evans, of Hartford, on the Hartford Street Railway. Both were fairly successful, but their radius of action was too limited for the development of a great business. Both enterprises were absorbed into the Connecticut Company's express department when the consolidation of the principal traction lines in the State was accomplished.

A considerable carload business had been started previously on the Hartford lines in carrying crushed stone from quarries for road building, and sand, which is scarce in that region. This business is still growing, but as none of it requires station service the subject will not now be discussed.

As the Connecticut Company was owned by the New York, New Haven & Hartford Railroad after the consolidation by which it was formed, the steam road naturally selected men from its own freight department to operate the new electric freight service. These men were familiar with the official freight classification and naturally adopted it as their guide. They offered first, second, third and fourth-class rates, and even some commodity rates on less than carload lots, they cheer-

fully furnished station service and some wagon service, and they put all of the "classes" into the same car and gave them all identical service.

In conducting the electric freight business the company, regarding the handling of merchandise as a by-product of the passenger service, did not burden the express department with a strict allocation of its expenses. Favorable statements were accepted as a rule, and everyone came to believe after a while that the express service was extremely profitable. Attempts to analyze costs, particularly relative costs for the various classes, undertaken about a year ago, brought to mind Kipling's remark about the "conformable strata of absolutely impervious inaccuracies."

Analysis soon showed, however, that the handling of less than carload lots of freight through the stations was accompanied by such expense that it was doubtful if a dollar of revenue offset an equal amount of expense. Thus instead of the express department being the "fair-haired favorite" that it had been, it came under the suspicion of having "been in the jam closet." There was real reason for suspecting that the shipper of second, third and fourth-class freight had been getting a dividend in the shape of low rates at the expense of the 5-cent passenger fare.

The remedy proposed for the above condition was to abandon the use of the official freight classification and to substitute a classification based on the official express classification prescribed for the old-line express companies by the Interstate Commerce Commission.

THE CONNECTICUT COMPANY'S TENTATIVE, MAY 21, 1917, SCHEDULE

The first principle of the new classification, like that of the express classification, is that "*first-class rates are applicable to all property received for transportation by this company unless otherwise hereinafter provided.*" Our "provisions" are all for higher than first-class rates if exceptions are noted. The selection of exceptions and the assignment of rates on these was a difficult operation. The official freight classification, with its 400 pages and supplement, took on the aspect and characteristics of Mark Twain's "silent assertion lie"—"the silent assertion that nothing is going on which fair and intelligent men are aware of, and are engaged by their duty to try to stop." Constant attrition, however, smoothed the way, and on May 21, 1917, the new classification was put into effect and the then existing first-class rates were made the standard.

A pamphlet containing the classification was prepared

and distributed. The contents of this are not affected by the commission's action in fixing the first-class.

As soon as the new rates became effective appeal to the Public Utilities Commission was made by wholesale grocers of the State, led by a New Haven firm which had been the recipient of preferential service in the past. Hearings were held in New Haven and in Hartford and numerous data were submitted. As a result the commission decided that the new classification was justified and approved it, but suggested that the rate be made to conform to what had been the second-class rate. It fixed Jan. 1, 1918, as the date upon which the ruling should become effective. In making this conclusion consideration was given by the commission to all factors excepting to the important one of the *value of the service*.

The approval by the commission of the classification has been the source of great satisfaction to those who proposed it and who had diagnosed the previous trouble. One of the results of its operation is that we now have no difficulty in breaking in clerks to receive freight or to way-bill it, while the rest of the clerical work is much lightened and simplified, and its quality is improved. In connection with the putting of the new rates into operation a new receipt or domestic bill of lading, non-negotiable, was prepared. A feature of this is the limitation of value to \$50 or to 50 cents per pound for a single shipment unless a greater value is declared and additional charges for values are paid.

A dictum of the Interstate Commerce Commission repeatedly found in its bulletins reads something like this: "We have consistently held that classification must be based upon a real distinction from a transportation standpoint. A classification cannot be regarded as scientific, or a difference in rates as well based, which is altogether founded upon a distinction that has no transportation significance. Such a differentiation would lead to an almost endless multiplication of rates, which would find no excuse save the use which might be made of the articles transported." (Stowe-Fuller Co. vs. Pennsylvania Co., 12 I. C. C. 215).

It is true that this dictum has usually been cited in an order reducing some rate, but as a ladder would lose half its value if it were good only to climb down on, so this statement should have equal force in connection with a rate increase. At any rate, somebody ought to be able to climb up on such a ladder.

Manufacturer Takes Share of Railway Load Peak

The Westinghouse Electric & Manufacturing Company has been co-operating with the Pittsburgh Railways in the supplying of power during the rush hours on lines furnishing railway service to the manufacturing company's plants. A rotary converter installed at East Pittsburgh is used to furnish power at 500, 550, 600 or 650 volts according to line conditions and the power needs of the railway. Between 600 and 700 kw. is supplied for an hour or more in the morning, from 6.30 to 7.30 o'clock, and from about 4.45 to 7 p. m. With both companies the main consideration in making the arrangement was the improved facility for getting the employees to and from their work promptly.

Zone System Impracticable in Boston

President Brush Elaborates Testimony Given Before Public Service Commission at Hartford Hearing

IN THE REPORT of the testimony of M. C. Brush, President Boston Elevated Railway, at the Hartford 6-cent fare hearing last month, published on page 229 of the issue of this paper for Feb. 2, Mr. Brush was quoted as saying that zone fare collection was impossible on an elevated line. In answer to an inquiry addressed to him by this paper asking if he was correctly quoted, Mr. Brush explains that his statement related to the Boston Elevated System. He then gives the following interesting facts in regard to the fare system in Boston:

"The situation with respect to the application of a zone system to the Boston Elevated Railway system is simply this:

"We are the only property, so far as I know, in the world that operates street cars underground, on the surface and overhead, and operates trains underground, on the surface and overhead, covering an area of 80 sq. miles, twelve cities and towns, with universal transfers between, all six kinds of surface transfer taking place in a very large number of cases in our so-called prepayment areas or within inclosed areas, making the use of paper unnecessary.

"In addition to all such prepayment area transfers, we receive in lieu of fare somewhat more than 85,000,000 paper transfers a year. The fact that a person can ride part of his journey on rapid transit and part on surface lines, and that there is but one fare on the entire system, would make it impossible for the company to establish a zone system which would be equitable both for rapid transit and surface lines. In other words, that zone system which would be proper and fair for rapid transit lines would be wrong for surface lines and vice versa.

"It is perfectly feasible to operate a rapid transit line on a zone principle because all that is necessary is to have passengers buy tickets at any station for any other particular station and upon reaching their destination surrender the proper ticket for that station, and failing to do that pay an additional fare. But where passengers can ride part of the way on rapid transit lines, then go into an inclosed area and get on a surface car and ride either the remainder of the journey or a portion of their journey and again get on a rapid transit line, I personally know of no way by which a zone system can be arranged which would be fair. This is entirely aside from the question as to the impracticability or impossibility of collecting fares under such circumstances.

"The only way I know that a zone system can be applied to the Boston system would be to have the termini of all rapid transit lines included in the central zone. But with a terminal, such as Forest Hills, lying approximately 5 miles from the center of the city, such a large central zone would be created by this plan that the amount of riding outside of this zone at an additional fare would be comparatively small. In consequence, the additional receipts gained by the zone system would not count greatly in the problem which the Boston Elevated Railway is facing to-day."

Color Scheme to Simplify Transfer Issuing

The New York State Railways, Rochester lines, are using a plan for issuing transfers, involving the use of five colors, which does not require the printing of the date on the transfers. On each transfer a day of the week is printed in red, so that for each day of the week there are transfers of five colors available. The transfers are ordered out one day in advance of use, the color being selected but not announced in advance by

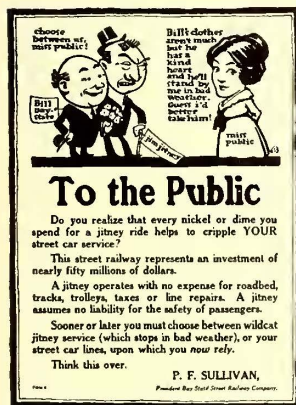
TRANSFER USED ON ROCHESTER LINES OF NEW YORK STATE RAILWAYS

the traffic agent. This makes the misuse of transfers practically impossible, as it would not pay passengers to keep track of the colors in use on different days.

This scheme for transfer issuing is the invention of B. E. Wilson, general traffic and freight agent of the company. His experience indicates that the plan is economical of paper and printing, as there are but seven printing runs in the job, and books unused on a given day are not wasted but are available for later use. Mr. Wilson has applied for a patent on the transfer system.

"Jim Jitney" Is Turned Down

How "Miss Public" ought to refuse villainous "Jim Jitney" in favor of reliable "Bill Bay State" is shown in a car-window poster recently used by the Bay State Street Railway, Boston, Mass. This poster, which is 14 in. x 18 in. in size, is reproduced in the accompanying illustration. It emphasizes the fact that the public ought to support the electric railway, for it represents, as the jitney does not, an established investment, a desire to serve, an assumption of liability for the safety of passengers and a reliability of service. One instance may be cited to show the effect of the poster. A critic wrote to one of the newspapers in the company's territory saying that jitney competition should be allowed in order to force better railway service. To this



BAY STATE PUBLICITY POSTER

the editors replied: "Cheer up! Remember how 'Bill Bay State' is going to stand by you in bad weather!" The editors added that the 6-cent fare might give revenue enough to allow the purchase of new equipment, but that obviously if the jitneys ate up the little revenue available it would not do any good on that score. Thus the message of the poster was sent on.

Freight Handling Indorsed

Representatives of Chicago Industries Favor Electric Haulage—Drafts of Freight Ordinances Presented for Surface and Elevated Lines

INDORSEMENT of the proposed plan for permitting surface and elevated lines in Chicago to carry light freight and express matter was given by representatives of several industries at a meeting of the local transportation committee of the City Council on Feb. 8. At that meeting drafts of separate ordinances for the surface and elevated lines were presented. No action was taken on either proposition, owing to a lack of time to consider the exact wording of the ordinances.

The proposed franchises permit the companies to carry light freight, such as milk, food products, baggage, newspapers, mail and parcels post; and they authorize the companies to make physical connections and enter into contracts with other electric lines for handling such matter. The design of trucks and contour of wheels of the special cars used are to be approved by the city authorities. The city reserves the right to fix reasonable rates.

The ordinance for the Chicago Surface Lines differs slightly from that pertaining to the elevated roads. The former provides that all receipts from freight business are to be considered a part of the gross revenue of the company from which the city will get its usual percentage. The elevated franchise fixes an annual license fee of \$50 on each car. Neither company is to receive any additional amount for the new grant in the event of city purchase according to values already fixed.

No objections were offered to the proposed plan, and all agreed that it would be of great help in relieving steam roads of a portion of short-haul freight. The opinion was expressed that with reasonable rates there would be a tendency to lower the prices of certain classes of merchandise in Chicago. The representative of a large banking company referred to the present necessity of hauling shipments to a point 7 miles from the downtown district in order to take advantage of the facilities offered by the Chicago, Aurora & Elgin line.

G. T. Seeley, for the Chicago Elevated Railways, said the Chicago lines could make connections that would put them in touch with about 500 miles of track in the surrounding country. C. E. Thompson of the Chicago, North Shore & Milwaukee Railroad told of the development of business from Milwaukee and said there was a continuous demand for service out of Chicago.

The committee agreed to get information as to the development of freight handling in Boston, Philadelphia, Cleveland and Detroit, so that Chicago might have the advantage of the best experience. Representatives of the Chicago lines explained that it would be necessary to get positive assurance as to the amount of business in sight before any large investment could be made in the necessary facilities.

HEARING ON IMPROVED SERVICE

The reopening of discussion for improved service in Chicago was marked by the appearance of President Busby of the Chicago surface lines, and representatives of the elevated lines, before the local transportation committee of the City Council on Feb. 11.

Mr. Busby confined his talk to the physical features of the report presented a year ago by the Traction and

Government Must Help Utilities

Needs of Public Service Corporations Set Forth in Hearing on War Finance Bill Held by Senate Committee on Finance

REPRESENTATIVES of the public utility companies of the United States have had two opportunities in Washington within the past week to present the problems of the utility companies to Government legislators and officials, and are much encouraged with the reception of their views. On Jan. 8 a presentation of these problems was made to the capital issues advisory committee of the Federal Reserve Board, with Governor Delano and Governor Hamlin present, and Allen B. Forbes, chairman, presiding, and on Feb. 12 representatives of the utility companies appeared before the Senate committee on finance to discuss the proposed war finance corporation bill.

The argument before the capital issues advisory committee was presented by P. H. Gadsden, president Charleston (S. C.) Consolidated Railway & Lighting Company, a member of the War Board of the American Electric Railway Association, at the request of John J. Stanley, president of the association. Mr. Forbes, the chairman of the advisory committee, had requested the heads of all the big utility organizations to be present, and, in addition to Mr. Gadsden, among those present were the following: John W. Lieb of the New York Edison Company, president of the National Electric Light Association; Alfred Forestall, president of the American Gas Institute; E. K. Hall, Electric Bond and Share Company, New York; H. H. Crowell, vice-president Michigan Railway, and representing the Hodenpyl-Hardy interests in Michigan; C. M. Clark of E. W. Clark Company, Philadelphia; and H. G. Bradlee of Stone & Webster, Boston.

At the hearing before the Senate finance committee statements were made by S. R. Bertron of Bertron, Griscom & Company, New York; H. H. Crowell and Mr.

Gadsden. The argument, which was substantially the same at both hearings, was, in effect, as follows:

First: Public utility rates must be increased, as labor and materials are eating up equities in these properties. The fundamental remedy is to restore values by increase in rates.

Second: During the war the companies should be relieved of franchise requirements, such as paving streets and placing wires underground. Such work should be regarded as unnecessary capital investment at this time.

Third: The companies are being called upon to make large expenditures for extensions and betterments to meet the needs of government plants for power, transportation, and other parts of the war program. It is estimated that these expenditures for the year will be between \$100,000,000 and \$200,000,000, required for Government purposes. Some way must be provided for the Government to furnish this money.

Fourth: The public utilities, railway, gas and electric companies, have maturing obligations in 1918 of about \$225,000,000. Under present conditions, where the Government has monopolized the whole money market, it is impossible to finance these maturities through the banks, and if the companies are to continue to perform their essential part in furnishing facilities for the speeding up of industry in this country, the Government must furnish the public utilities some relief in taking care of the maturing obligations.

It is understood that the Senate committee on finance was evidently seriously impressed by the situation which confronts the companies, as explained by the witnesses. Members of the committee frankly asked the gentlemen before them if it is not possible for Congress to grant some relief. It is felt that the committee practically unanimously felt the force of the rate question, as well as sympathized with the suggestion that the companies be relieved from non-essential expenditures; also there was apparently no question but that the committee realizes that much new capital will be required by the companies in order to meet the Government's war needs. The committee, by its questions, indicated an apparent unwillingness to grant such unlimited powers as those conferred in section D of the proposed war finance corporation bill. Mr. Gadsden took the position before the committee that public utility securities are a class which must be taken care of, and suggested to the committee that the words "Public Utilities" be inserted in this section of the bill, to leave no doubt that it was the intention to provide for them. A hearing at which representatives of the public utilities will be present will soon be held on this bill before the House committee on ways and means.

The Public Service Commission for the First District of New York has authorized the Public Service Commission Association to look after the commission's employees, now numbering 218, engaged in military or naval service. It is proposed to provide a Christmas box for each of the men, to furnish comfort kits and such other necessities as may be required, to aid the families of the men in such emergencies as may arise during their absence and to meet such other conditions as may arise from time to time. In order to carry on this work each employee will be assessed from 25 cents per month to \$1.50 per month.

(Concluded from page 325)

Subway Commission. He said there would be time enough to talk about enabling legislation and rate of return after an agreement has been reached on a physical program which will meet with popular support. He referred to the commission report as being fundamentally sound, but said there were certain modifications which appeared to the companies as having merit from an operating point of view.

Mr. Busby said he did not believe in painting pictures as to what might be had in the distant future in the way of subway development, and he thought if the purpose could be served at an earlier date by an extension of elevated lines, this should be done. His statement was well received by certain of the aldermen, who had opposed the commission report for holding out no relief in the near future for their districts in outlying parts of the city.

Mr. Busby said that rapid transit development in Chicago had been at a standstill for many years. It is now only 14 per cent of the total mileage, whereas New York will soon have from 40 to 45 per cent rapid transit service. Chicago's development depends upon the extension of rapid transit service, and the only limitation to be kept in mind is that which would insure such a system to be self-supporting.

CONSTRUCTION, MAINTENANCE AND EQUIPMENT

ENGINEERS, MASTER MECHANICS AND OTHERS WHO HAVE DEVELOPED ECONOMICAL PRACTICES, OR WHO HAVE WORTH-WHILE IDEAS ARE INVITED TO TELL READERS OF THE JOURNAL ABOUT THEM IN THIS DEPARTMENT



FLEET OF AUTO BUSES IN FRONT OF SAN FRANCISCO MUNICIPAL CAR HOUSES

First Special Monthly Mechanical and Engineering Number Appears Next Week

THIS will be the last issue for the present in which the short technical articles will be grouped in a separate "Construction, Maintenance and Equipment" department. These articles, which have proved so useful to the readers of the paper, will continue to be printed, but either segregated in the third issue of the paper for each month or scattered among the longer articles in the weekly issues.

Appreciating an urgent demand for practical articles dealing more comprehensively with the elements of the mechanical and engineering aspects of electric railroading, the editors of this paper have arranged definitely to meet this demand. The co-operation of a group of qualified writers has been secured and a large section in the Feb. 23 issue will be devoted to the first group of special articles which they have prepared. In these articles the authors give facts and figures which will help the ambitious youngster to rise faster, and they will contain much by way of suggestion for more experienced men.

The editors desire to emphasize, however, that while the special writers will supply a considerable number of articles there will always be space available for worth-while contributions from the many occasional contributors who have done so much to help the JOURNAL in serving its clientèle.

Municipal Auto Bus Traffic Feeders at San Francisco

BY N. A. ECKART

Railway Engineer Board of Public Works

THE Municipal Railway of San Francisco, on Jan. 15, 1918, put in service a bus system to serve as a feeder to its Geary Street car line and to render service to the residential section known as the Sunset District. Transfers are exchanged between the buses and the cars for the usual 5-cent fare. For the present the buses operate over two routes, 1 and 2 miles in length respectively, each crossing Golden Gate Park. On both lines the route is paved except for the half mile of oiled macadam across Golden Gate Park. Two buses maintain a ten-minute headway on the 2-mile line, and a single bus runs on a fifteen-minute schedule on the other. The average speed is 12 m.p.h. Thus the fleet of five buses which the city has purchased serves the two routes and allows two buses to remain in reserve.

The buses, which are arranged to seat eighteen passengers, and will carry as many more standing, are of the prepayment type, designed for one-man operation. They are mounted on White 2-ton chassis, and are equipped with 37-in. x 5-in. pneumatic tires, single on the front wheels and double on the rear. They are 15 ft. long, 7 ft. wide, and have a wheelbase of 13 ft. 8 in. The weight, light, is 7830 lb. The buses are fully inclosed with drop sash and are finished inside and out in harmony with the standard practice of the municipal railway cars.

The plans and specifications under which the buses were purchased were prepared under the general direction of M. M. O'Shaughnessy, city engineer. These were so drawn that bids were received and the contract awarded to the lowest bidder on the basis of a bus which would show the lowest net operating cost over 125,000 miles of operation. The items considered were depreciation, as determined on probable turn-in allowance, fuel

Car Axles, Their Design, Manufacture and Service

PART III—MANUFACTURE AND CARE

BY NORMAN LITCHFIELD

AFTER the general study of the theory of axle design and its application to typical cases, it is fitting that some attention should be given to the manufacture and care of this important element of successful railway operation. The subject naturally divides itself into the materials from which axles are made and the treatment which they should receive when in operation.

AXLE MATERIAL

So much has been said of the value of this or that material, or of some particular method or process of manufacture that it seems well to review for a moment the elements which go to make up a desirable material.

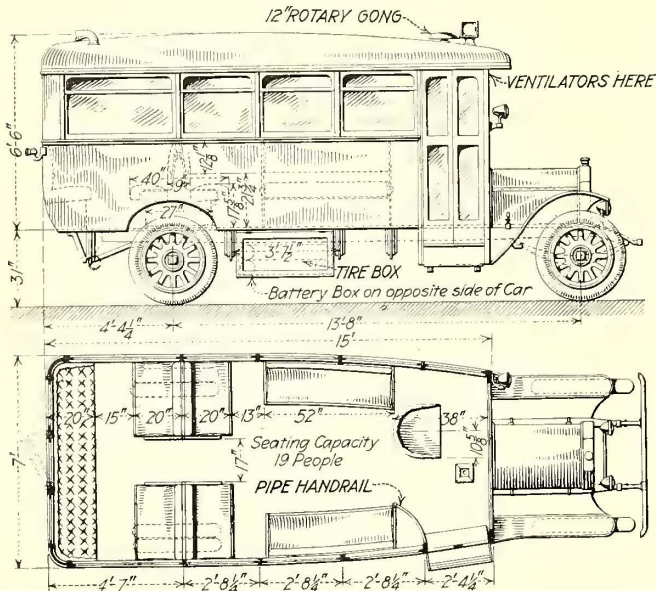
The earliest axles were, of course, made of wrought iron, and in the days of good puddled iron and light-weight cars this material undoubtedly made a good axle. But the increase in weight of cars demanded a stiffer material, and steel came into general use. The open-hearth process is the one that has proved satisfactory both from the commercial standpoint and from that of the axle user.

Claims have been made of a difference in value between the acid and the basic open-hearth varieties but experience has shown that, with equally careful handling, either process can be made to yield a good product. In the details of manufacture the user must necessarily depend to a large extent on the experience, ability and honesty of the manufacturer. Attempts have been made from time to time to lay down specific rules affecting the inner workings of the manufacturer's process or organization, but these have not been proved necessary. There are, however, certain points which the user may reasonably request to have covered should he consider that his service is of a severity warranting the expenditure. A number of these points are touched upon here. While it is not claimed that all of them are necessary for every user, they are nevertheless of value and in some instances are warranted.

MOOTED POINTS IN AXLE STEEL MANUFACTURE

Taken in the order in which they occur in the process of manufacture, the first of the points on which argument between user and manufacturer is desirable is the amount of the ingot which is to be discarded and not used for making axles. There are various shapes and sizes of ingots and various methods of pouring, some from the top and some from the bottom. All of this has an effect on the amount desirable to be discarded. Probably as safe a way as any is to agree with the manufacturer as to what shall be the minimum

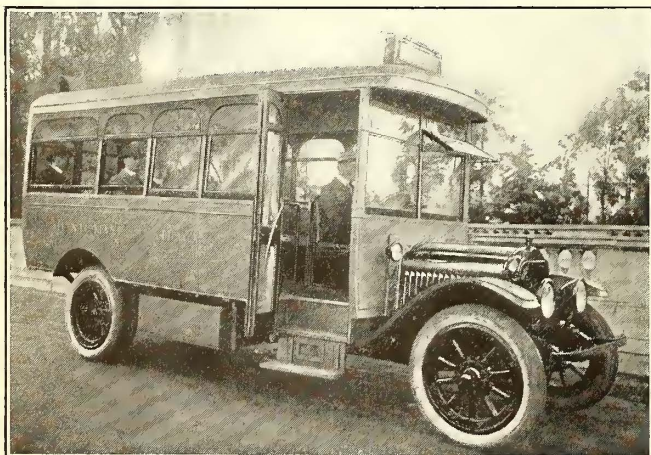
San Francisco conditions and included grades up to 10 per cent. Under the same conditions of loading, the car ascended a 5 per cent grade on fourth gear, 10 per cent grade on second gear, 18.9 per cent grade on first gear and reverse, all as required in the specifications. The following gear ratios were used in the final test: first, 22.75; second, 14.62; third, 9.63; fourth, 6.83; reverse, 30.4.



GENERAL ARRANGEMENT OF MUNICIPAL RAILWAY AUTO BUSES

consumption to be determined on the basis of a 100-mile run over a prescribed route with 3.6 stops per mile, and all other elements affecting the operating cost. The contract price was \$5,624 each, fully equipped.

In the final acceptance test the performance was as follows on a run of 103.7 miles: Fuel consumption (Standard Oil distillate at 9 cents per gallon), 15 gal., or 6.9 miles per gallon (the bid guarantee was 6 miles per gallon); total elapsed time, including 361 full stops



AUTO BUS USED AS FEEDER ON SAN FRANCISCO MUNICIPAL RAILWAY

of ten seconds each, eight hours and twenty-five minutes, or an average speed of 12.33 m.p.h. against the specification requirements of 12 m.p.h.

The conditions of the foregoing test were that the bus be loaded with 4000 lb. above the standard equipment, and that the speed could at no time exceed 20 m.p.h. The test course was so selected as to represent average

amount of discard in any case, and to provide that the customer's inspector shall have the right to say whether or not this minimum shall be exceeded and to what extent. In some cases the minimum is made as high as 30 per cent. Demands of the inspector which the manufacturer considers unreasonable can be made a matter of individual settlement.

After discard comes the question of the processes of forging of which there are three in general use, namely, rolling, hammering and pressing. It is generally felt that rolling (except as a preliminary process) does not give a thorough working of the metal. With the other two processes the user should satisfy himself that the hammer or press equipment of the manufacturer is of such weight or power as will give thorough penetration. Good evidence of thorough working will be found in the ends of the axle, which if well worked will have more or less of an egg shape. On the other hand, if there has been only "skin forging" the ends will be concave.

With regard to the consumer's requirements as to the details of the chemical composition of the steel, different opinions have prevailed, but it seems fair that the manufacturer should make his own mixture in accordance with his best judgment as to what will give the character of steel which the purchaser desires. That is to say, if a carbon steel of certain physical qualities is desired the manufacturer should be permitted to state what proportions of carbon, manganese and silicon there shall be. On the other hand, the user has a right to ask for certain limits for impurities, such as phosphorus, and for the privilege of making check analyses of the full chemistry to see how uniformly the desired chemical composition is being maintained. If he considers it necessary he may also provide that drillings taken from the completed axle shall not exceed a given maximum of impurities, and also not exceed a given variation in carbon content between the center and the outside to provide against undue segregation. It must not be forgotten, however, that to some extent these are niceties which are not justified in every service, and necessarily increase the cost of the axles.

HEAT TREATMENT

Next in order comes the so-called "heat treatment," a much-abused word which has been used to cover a variety of heating processes after the final forging. This treatment, in the minds of some, has been thought in some mysterious way to provide an axle which is free from all troubles regardless of its design, chemistry and handling in the process of manufacture. When it is understood, however, that heat treatment is applied simply to obtain a more closely-grained structure, and in some cases to increase the tensile and ductile properties, it will be recognized that heat treatment merely adds one more step in the production of a high-quality axle. It in no way lessens the necessity for careful attention to the previous steps mentioned.

Until some ten years ago the usual method of handling high-class axles after forging was to bury them in hot ashes and allow them to cool slowly. This operation, when carefully performed, often produced very good axles. As demands of service became more exacting other methods were resorted to for producing a stronger and more uniform product. This led to the use of alloy steels and finally to "heat treated" or, more

properly, quenched-and-tempered material, the quenching medium varying with the ideas and methods of the manufacturer.

While all the steps in the axle manufacture are important and require great care, that of heat treatment, affecting as it does the very molecular structure of the material itself, is most susceptible to improper handling. In consequence, attempts to get results by inexperienced operators have failed and have led in some quarters to condemnation of all heat treatment. But it is generally recognized that some form of heat treatment tends to produce a closer grained and more uniform material, some preferring simple annealing, and others quenching and tempering.

It is not the purpose of this paper to set forth any one set of physical qualities as being more desirable than another, and no opinion can therefore be expressed as to the relative merits of simple annealing, or quenching and tempering. Suffice it to say that it is generally agreed that after forging the axle should be reheated in a furnace under carefully regulated conditions to reduce any inherent strain and to refine the grain of the material.

The details of the type of furnace used, quenching medium, etc., while important, are nevertheless, as recently pointed out in an editorial in this paper, subservient to the honesty, integrity, ability and experience of the operators and to the care with which the results obtained are checked, either by the producer or the consumer.

TESTING AXLES FOR CONFORMITY WITH SPECIFICATIONS

The point last mentioned above brings us to the consideration of the number and character of the tests which should be made by the user to satisfy himself that the product is satisfactory. The M. C. B. committee of 1896, before referred to, reported as follows in regard to the specification it was presenting at that time: "For steel axles the specifications submitted will insure, within a reasonable probability, that the lot from which one is taken is fairly represented by the one axle tested." It will be noted that this specification merely required the drop-testing of one axle from each open-hearth melt, which might include 100 or more axles.

It need hardly be stated that the optimism of the committee has not been entirely justified by experience. More recent specifications, such as the standard specifications of the American Society for Testing Materials, require that each axle be made with a prolongation at one end and that one axle be selected for test from each annealing charge. This usually means that one of each twenty or thirty axles is tested for tensile properties and has check analyses made of chemical impurities. This, of course, represents a marked advance over the old M. C. B. method of merely drop-testing one axle from each open-hearth melt. But it is questionable whether even this represents all the care that should be taken for such an important part as a passenger-car axle used in severe service.

Experience shows that, even where the best of material has been used, occasional failures will occur. To eliminate these occasional failures, which while not representative of the rest of the axles may prove troublesome, it may be justified in some cases to subject each axle to test. While this, of course, adds to the initial

cost of the axle, it is warranted by the character of the service. It may even pay to make the axles with a prolongation at each end, and to take tension and cross-bending pieces and drillings for analysis from both ends. Carbon determinations may also be taken at the center of the axle and at the periphery, and the carbon content may be required to vary not over a given per cent. Where desirable, occasional microphotographs may be taken to show the closeness of the granular structure. By so doing, the user has satisfied himself as nearly as may be that the axles are uniform in quality, and it cannot be too strongly emphasized that uniformity is the most necessary quality.

Axles made to the old M. C. B. specification, if uniformly of the same quality, would undoubtedly be satisfactory for many services. All of the improvements in manufacture have their best result in the production of a more uniform structure, and it would therefore seem that the user is justified in taking precautions to ascertain that this uniformity has been obtained.

A last and very important check on the soundness of the axles is the subjecting of each to a proof test by dropping thereon a weight from such a height as not to strain the steel above its elastic limit. This matter has received attention from the American Society for Testing Materials, the latest *Proceedings* making reference to the desirability of some such test and quoting two different standards. It is not as yet determined which of these is the more desirable. Experiments including some recently made indicate that neither of them is entirely proper. It is probable that this matter will receive further attention in the near future.

CARE OF THE AXLE IN SERVICE

The general procedure in purchasing axles is for the user to receive the axles from the manufacturers in the rough-turned state and to finish-turn them in the railway shops. In turning care should be exercised that the true radius of the fillets is maintained, as a sharp corner or tool mark made by a careless workman may defeat all the care used on the design and preparation of the axle.

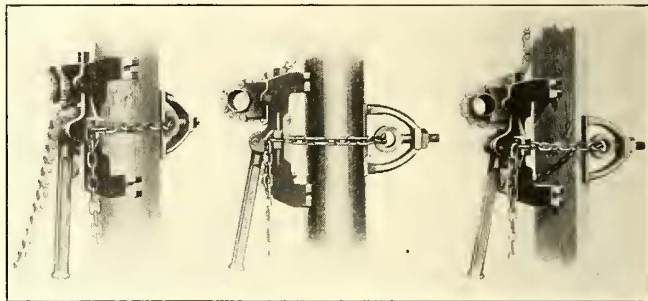
Even with the best of care a poor axle may slip by, and it is therefore necessary to have some means of inspection of the axles in service to be sure that they have not cracked. Before considering inspection methods it may be well to review the nature of the common failures.

CHARACTER OF FAILURE

Where poor metal has been provided, or the design is abnormally weak, instances are found of a "clean break," but by far the most troublesome difficulty is the gradual or so-called "detail" fracture, which starts with a small very fine crack and gradually progresses through the axle. The appearance of the broken axle is in general of two different aspects, one wherein the failure runs around the periphery of the axle and gradually works around the center more or less concentrically, and the other wherein a succession of crescent-like sections are found, each enlarging as the center is approached. These failures are characteristic and when once recognized are always readily distinguishable from a clean break. These detail fractures when they have progressed but

New Portable Pipe Vice Which Employs Chain-grip Feature

THE "Chain-grip" pipe vise is a simple portable vise which can be quickly moved from one location to another and fastened to any horizontal or vertical support without the use of bolts. It locks pipe or conduit of any size within its limit by the slight push of a lever. The base support is in the form of an inverted V, and the vise is held in position by a heavy wrought-iron chain. This chain, passing around the supporting



PORTABLE VISE ADAPTED FOR USE ON ANY SUPPORT

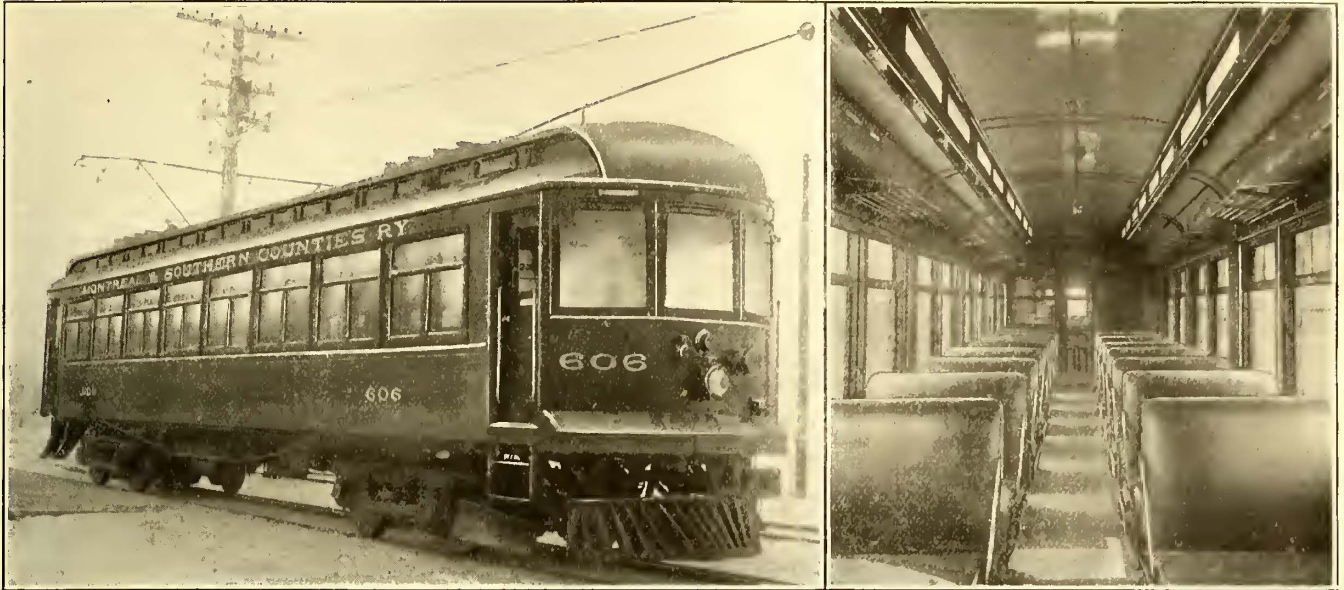
column, catches in a socket, the tension being adjusted by a nut on an eyebolt, as shown in the accompanying figure.

The locking motion of the pipe between the steel jaws and the close-link chain is accomplished by the movement of the handle toward the vise. Beneath the fulcrum point the handle has the shape of a cam, and operates against a movable horizontal bar to the end of which is riveted the steel gripping chain. The fulcrum point of the bar is supported by a threaded bolt, rotation of which raises or lowers the fulcrum point and provides an adjustment of pressure on the gripping chain. The "Chain-grip" pipe vise is manufactured by the Gerolo Manufacturing Company, Chicago, Ill.

part way are very difficult to locate, the crack being so fine that it cannot be discerned even with a glass. A good method for periodical inspection for cracks is to immerse the axle (with the wheels mounted) in a tank of hot oil, and then to wipe the oil carefully off and cover the axle with whiting. The axle is then rested on a block at its center, with the wheels hanging free, and is struck several blows with a heavy sledge. Wherever there is a crack a fine thread of oil works up from the crack under the vibration set up by the sledge blows and is readily seen against the whiting. A careful record, signed personally by the inspector, should be kept of each inspection.

CONCLUSION

As has been before stated, the writer does not claim that all of the safeguards mentioned herein are necessary to be followed in all cases, but he has simply outlined them so that they may be readily available to axle users in general. To the discretion of the individual must be left the determination as to whether his service conditions demand the insurance provided by these means, or whether there are still further means that he can take to satisfy himself of the quality and condition of the axles.



NEW INTERURBAN CAR FOR MONTREAL & SOUTHERN COUNTIES RAILWAY

Light Interurban Car for Montreal & Southern Counties Railway

Cars Have Spring Buffers, Center Sills Continuous From Bumper to Bumper and All-Steel Underframes of Through Platform Type

BY J. A. WILSON

Superintendent Car Department Ottawa (Canada) Car Manufacturing Company, Ltd.

THE Montreal & Southern Counties Railway, Montreal, Canada, has recently received from the Ottawa Car Manufacturing Company, Ltd., two of three motor cars for interurban service. As these cars operate over the Victoria Bridge they were built as light as possible consistent with strength, the weight completely equipped being 61,000 lb.

The car is built on a special lightweight all-steel underframe of through platform type, the side sills being of 5-in. Z-bar, weighing 11.6 lb. per foot, and the center sills of 10 in. channel weighing 20 lb. per foot, continuous from bumper to bumper. Knees and bumpers are of 6-in. channel with headstocks built up of plates and angles. The bolsters are built up of pressed steel sections, plates and steel castings, and the body is strengthened with both top and bottom truss rods. An anti-climber spring buffer, as described in the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 10, 1917, page 867, is installed at each end of the car to take up slight collisions, being guided by channels supported by the center sills.

The body is of wood, well braced, finished on the inside in Mexican mahogany, the outside being painted in Pullman green, the lettering being in gold.

The bodies are mounted on Taylor trucks with Davis steel wheels, the motor equipment consisting of four Westinghouse-306 motors. The air brakes are of Westinghouse type AMM with supplementary reservoirs and governor synchronizing systems arranged for trolley circuits. Other features are the Westinghouse HL control and electropneumatic signal system, pneumatic sanders, luminous arc headlights, strong locomotive-type pilots, steel snow scrapers, Tomlinson automatic car and air couplers, etc.

Attention is directed also to the trap door hinged to the bottom of the vestibule door to cover the step well, and held up with a spring latch when the door is open. (See ELECTRIC RAILWAY JOURNAL, Nov. 17, 1917, page 910.) All vestibule doors are equipped with the Ottawa Car Manufacturing Company, Ltd., holdbacks. The seats are Montreal & Southern Counties' standard reversible type, upholstered in green Pegamoid and the headlining is of Agasote painted green.

Motor-Generator Set for Interurban Car Lighting

A NEW type of motor-generator set has been put on the market by the General Electric Company for the purpose of providing a system of car lighting which will be independent of trolley voltage. It consists of a motor which is driven from the trolley circuit and a compensating generator which produces about 32 volts

at any speed at which the motor is likely to operate even under unusual conditions.

The principle upon which the generator operates is shown in the accompanying diagram. The generator armature is series wound, and the field contains twice as many poles as the number of poles for which the armature is wound. In the diagram but four

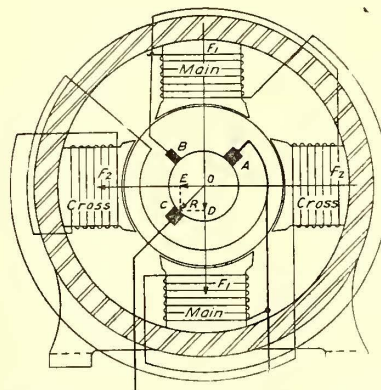


DIAGRAM OF GENERATOR FOR PRODUCING CONSTANT VOLTAGE WITH VARYING SPEEDS

poles are shown. The lighting circuit is taken from the brushes A and C, and in addition to these load brushes there is a third brush B placed 90 electrical degrees from the load brushes. From the diagram it is apparent that the electromotive force between A and C is the algebraic sum of two electromotive forces produced by the

pairs of poles which are marked "main" and "cross" respectively. The way in which it is possible to have a practically constant electromotive force between *A* and *C* is explained as follows:

The field may be considered to consist of two independent magnetic circuits. One of these, F_1 , is saturated, and the corresponding flux may be called the main flux of the machine. The second magnetic circuit, F_2 , is not saturated and the corresponding flux may be called the cross flux. The main flux generates, between brushes *A* and *B*, an electromotive force which can appropriately be termed the main voltage of the machine, while the cross flux generates what may be termed the cross voltage. The excitation, which is taken from brushes *A* and *B*, consists of two branches, one exciting the main poles, the other the cross poles.

Since the main circuit is saturated the main flux remains constant, and the main voltage *AB* is proportional to the speed. Therefore, the excitation of both the main and the cross fields is proportional to the speed. As the cross circuit is not saturated the cross flux will increase in proportion to the speed, and hence the cross voltage *BC* must increase with the square of the speed. As the speed increases *AB* increases, but since *BC* increases faster the difference is constant. Test shows that it can be made constant over a wide speed range.

Of course, in a machine of this type it is necessary to provide for armature reaction. Since the line current is taken from the brushes *A* and *C*, there exists an armature reaction *OR* in the direction *AC*. This may be resolved into two components, *OD* in the direction of the main flux and *OE* in the direction of the cross flux. As the main magnetic circuit is saturated the additional excitation due to the armature reaction cannot add anything to the main flux. The component *OE* will, however, interfere with the cross flux and disturb the regulation of the machine if not counteracted. To overcome it, a series winding is added to the cross poles. This compensating winding provides for adjustment of the compensation, permitting the neutralization of the resistance drop.

That the compensation is effective is shown by tests made to determine the relation between trolley and generator voltages. One characteristic curve plotted between these voltages shows 30 generator volts at 350 line volts, $33\frac{3}{4}$ at 550, and $30\frac{3}{4}$ at 750. The maximum is $33\frac{3}{4}$ volts.

The low voltage of 32 was selected for the system in which the new motor-generator is employed to minimize weight and size of the machine, to produce the proper voltage for the operation of incandescent headlights and multiple operation of lamps, etc. It also furnishes current for the operation of control equipment if desired.

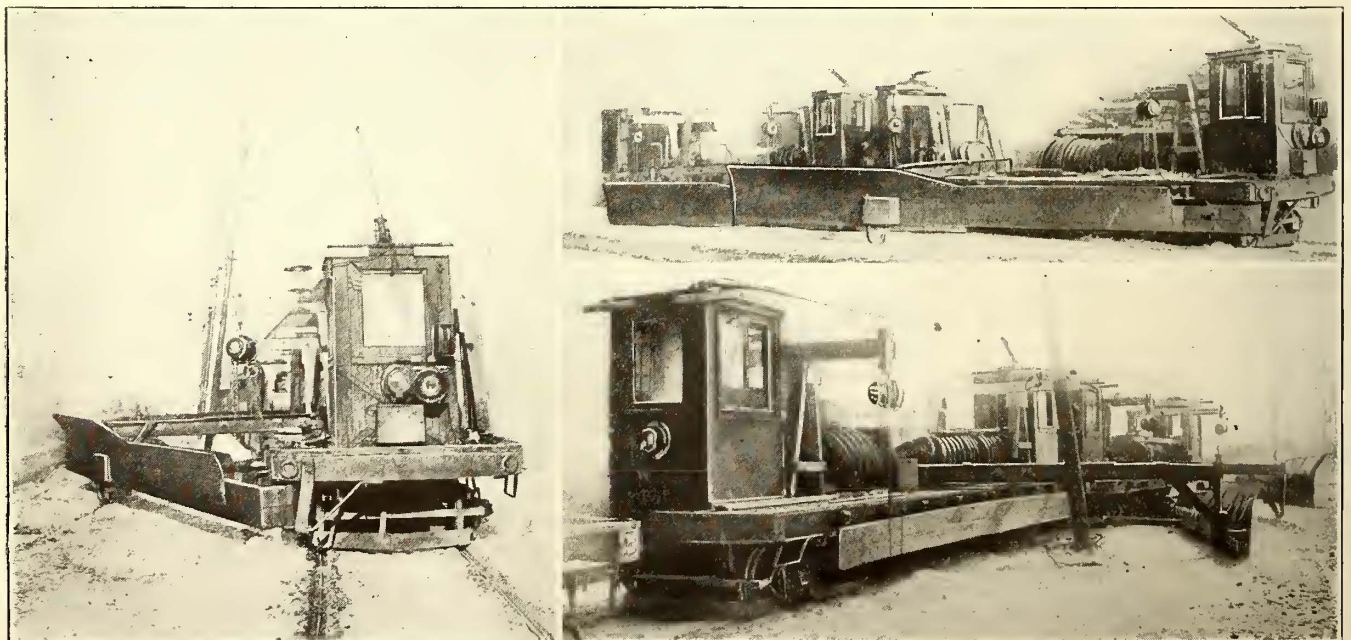
The estimated cost of operation of the lighting of a car equipped with a 250-watt headlight, and one circuit of seven 75-watt and three 25-watt lamps is \$153.50 per year, assuming that the lamps burn 1707 hours. Energy is figured at $1\frac{3}{4}$ cents per kilowatt-hour and haulage at 5 cents per pound per year.

Further details of the lighting system employing this generator will be found in an article by W. J. Walker in the February, 1918, *General Electric Review*, and in an article to appear in an early issue of the *Proceedings* of the A. I. E. E. S. R. Bergman will explain more fully the principles involved in the generator design.

Work Cars Used as Snowplows

SUPPLEMENTING the article printed in last week's issue of the JOURNAL on the use of steel-shod wings on sprinklers and work cars the accompanying three illustrations are reproduced. These pictures have come to hand since last week's article was printed. They show the equipment described in the latter part of that article.

The apparatus illustrated consists of two work cars coupled permanently. Wings are provided on each, that on the front car being used to take off the upper layer of snow from high banks, the one on the rear being set closer to the rail. As was mentioned last week, two additional work cars are used in the rear to augment the propelling power.



THREE VIEWS OF WORK-CAR TRAIN EQUIPPED WITH WINGS FOR LEVELING SNOW, CHICAGO SURFACE LINES

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

St. Louis Strike Settled

United Railways Recognizes Union, but Matter of Wages Will Go to Arbitrators

The strike of the union employees of the United Railways, St. Louis, Mo., was settled on Feb. 7. The agreement was reached when Richard McCulloch, president and general manager, and some directors of the company and a committee of the men met with a special committee appointed by the Chamber of Commerce. This conference continued until after midnight. The agreement reached at that time was ratified by the union at a meeting on the morning of Feb. 8, and cars were again in operation for the evening rush hour on that day. The terms of the agreement are as follows:

1. Right of the men to unionize recognized by United Railways.
2. Men employed in future to be taken in on the preferential shop basis, which means that union men shall be given preference over non-union applicants for work.
3. All old employees of the company to be retained on the same basis they occupied before Jan. 1, whether members of the union or not. All conductors and motormen employed by the company since the start of the strike to be discharged immediately upon ratification of the agreement by the union as a body.
4. The question of wages, hours and other details to be settled at further meetings of committees from the board of directors of the company and the union, these conferences to be held within the next few days.

STRIKE DECLARATION

On the afternoon of Feb. 2 a committee of men left at the office of the company a series of demands including increases in wages which were to be accepted by midnight to avoid a general strike of motormen and conductors. At that time it was estimated that 200 employees and ex-employees of the railway had formed a local union with which the remaining 2500 motormen and conductors were not affiliated in any way. At midnight the union men stopped the cars and the tie-up Sunday morning was practically complete. On Monday, Feb. 4, the company operated sixty cars, on Feb. 5 ninety cars, on Feb. 6 100 cars, and on Feb. 7 about 150.

The strike was accompanied by very little lawlessness. A few cars were stoned on the first day and some glass broken and during the four days a great deal of annoyance was caused by short-circuiting the trolley wire and the rail with gas pipe. In only one case

did the riot result in any injury. This happened to innocent bystanders, two of whom were wounded by stray bullets fired by the police.

On the second day of the strike, the company appealed to the Missouri Public Service Commission for an increase in revenue. The way in which the increase is to be accomplished is not indicated, but the most probable methods are as follows:

ALTERNATIVE REVENUE PROPOSALS

1. Increase to 6-cent fare. (This would increase the total revenues more than \$2,000,000 a year.)
2. Permission to charge 1 cent for each transfer. (This would increase the total revenues about \$1,250,000 a year.)
3. Adoption of a zone system.
4. Accomplishment of increase in earnings by a reduction in taxes. (Net income could hardly be increased more than \$300,000 by this method.)

MEN WANT FORTY TO FORTY-FIVE CENTS

It has been estimated that the advance in wages demanded by the men will increase total wages \$2,000,000 for the year, while the company's net income last year was only about \$600,000, all of which was put into betterments. It is evident, therefore, that to increase wages materially there must be an increase in fare. The present scale of wages varies from 26 to 32 cents an hour according to length of service. The strikers demand a scale ranging from 40 to 45 cents.

Cars for Toronto Delayed

A hearing was held at Toronto, Ont., on Jan. 30 before the Ontario Railway and Municipal Board with respect to the failure of the Toronto Railway to comply with the order of the board requiring the company to put 100 new cars in service by Jan. 1, last. The company introduced as witnesses P. J. Honold, purchasing agent of the New York State Railways, and D. E. Blair, superintendent of rolling stock of the Montreal (Que.) Tramways Company.

Mr. Honold said that the manufacturers had pleaded inability to get steel, owing to the priority of war work, and had contended that they were handicapped by labor shortage. Mr. Blair stated that the Montreal Tramways had secured bodies and trucks for ninety-six cars, but had been unable to secure equipment. During the war deliveries had been slow and equipment ordered on Sept. 1, 1917, had not been delivered. Great difficulty had been experienced in getting motors.

It was planned to continue the inquiry into the car shortage on Feb. 11.

Causes of Labor Unrest

National Mediation Board Points Out Weaknesses in Present Industrial System and Suggests Relief

Greater co-operation between capital and labor is needed in this country in order to secure maximum efficiency. Such is the opinion of President Wilson's mediation commission which has just finished a survey of the labor unrest west of the Mississippi.

Among the causes of unrest the commission says the following stand out:

1. To speak broadly, American industry lacks a healthy basis of relationship between management and men. At bottom this is due to the insistence by employers upon individual dealings with their men. Direct dealings with employees' organizations is still the minority rule in the United States. In the majority of instances there is no joint dealing, and in too many instances employers are in active opposition to labor organizations.

2. Too many labor disturbances are due to the absence of disinterested processes to which resort may be had for peaceful settlement. Force becomes too ready an outlet.

3. There is a widespread lack of knowledge on the part of capital as to labor's feelings and needs and on the part of labor as to problems of management.

4. Wage increases are asked mostly in order to meet the increased cost of living. Such demands should be met in the light of their economic causes.

Too often, in the commission's opinion, is there a glaring inconsistency between American democratic purposes in the war abroad and the autocratic conduct of some of those guiding industry at home. To remove the causes of labor unrest the commission suggests in part the following:

"The elimination to the utmost practical extent of all profiteering during the period of the war is a prerequisite to the best morale in industry.

"Some form of collective relationship between management and men is indispensable. The recognition of this principle by the government should form an accepted part of the labor policy of the nation.

"There is needed the establishment of continuous administrative machinery for the orderly disposition of industrial issues and the avoidance of the waste of disturbances.

"When assured of sound labor conditions and effective means for the just redress of grievances that may arise, labor in its turn should surrender all practices which tend to restrict maximum efficiency."

New York Commissions Report to the State

Review of a Decade of Utility Regulation in the Reports Transmitted to the State Legislature

The Public Service Commission for the First District, embracing the city of New York, recently presented to the Legislature its eleventh annual report for the year ended Dec. 31, 1917.

On July 1, 1917, the commission completed its first decade, having been organized on July 1, 1907. In each year of the ten, the commission has carried on its functions of rapid transit and regulatory work.

The commission says that the past year has been one of the most notable in respect to the construction of commission laws, in that the course of judicial decision has finally clarified the commission's powers and has placed the commission in position to make reasonably effective its orders for the improvement of service and facilities.

\$700,000,000 IN SECURITIES

In the last ten years the commission has passed upon the issuance of nearly \$700,000,000 in securities of the various corporations.

The decade has also seen vast improvement in transit conditions. The passenger traffic upon street surface lines has increased more than 600,000,000 since 1907.

For several years the commission has given its attention to the construction of the new dual system of rapid transit, the world's largest engineering undertaking, which will cost in the neighborhood of \$400,000,000, or more than the cost of construction of the Panama Canal. Its hundreds of miles of track on city and company-owned lines will effect approximately an increase of more than 100 per cent in the city's transit facilities as they existed in 1907.

At the end of the year there remained only five construction contracts to be awarded on the dual rapid transit system. Contracts already let amount to more than \$200,000,000 upon lines to be owned by the city of New York.

The contracts awarded during the year were divided as follows:

Class	Number Awarded	Amount of Contract
Construction	1	\$257,164
Steel	2	1,456,055
Station finish.....	8	2,237,112
Track installation....	3	368,862
Track materials.....	8	302,297
Miscellaneous	19	376,833
Totals.....	41	\$4,998,323

\$100,000,000 FOR RECONSTRUCTION AND EQUIPMENT

Besides the contracts on city-owned lines awarded by the city, the Interborough Rapid Transit Company and the New York Municipal Railway Corporation (Brooklyn Rapid Transit) had either completed or under construction at the end of the year improvements to their elevated railroads amounting to \$52,000,000. The companies have also under way provision

of equipment for all lines amounting to \$56,000,000.

In addition to their payments for new equipment and construction costs of elevated third tracking reconstruction and other improvements, both companies have also contributed substantially to the cost of construction of city-owned lines—the Interborough Rapid Transit Company to the extent of \$58,000,000, and the New York Municipal Railway Corporation to the extent of about \$14,000,000.

The total expenditures of the commission for the calendar year amounted to \$3,253,809, of which \$3,001,420 was defrayed from the city treasury and \$252,389 was paid by the State.

The commission then reviews the new rapid transit lines opened in 1917 and the ones likely to be opened in 1918.

REGULATION OF CORPORATIONS

At the close of the year 1917 there were 104 corporations under the jurisdiction of the commission, seventy-four being operating and thirty lessor companies. These companies had stocks and bonds outstanding amounting to \$1,557,319,355 at the end of the year. Transportation companies had \$1,121,296,001 of this total and the gas, electric and steam companies \$436,023,354. The increase for the year was \$124,398,223.

No stock issues were authorized by the commission in 1917, but bonds were authorized of a par value of \$44,167,200. Action was either deferred upon or proposed issues were disapproved amounting to \$2,632,572. There were also pending at the end of the year applications from other companies yet undecided for security issues amounting to \$5,411,900. Since its establishment in 1907 the commission has allowed issuance of \$696,134,677 in securities out of a total of \$886,633,329 applied for.

WHAT THE UP-STATE BOARD SAID

The Public Service Commission for the Second District of New York, in its statement to the Legislature, reports that under present conditions, recognized as extraordinary and without precedent because of existing uncertainty as to the immediate and ultimate effect upon the commission of the control of railroad transportation by the government, and the not improbable extension of government control to other public utilities, at least indirectly, it has been considered advisable to eliminate general comment from the commission's report.

Due to the existence of war conditions the question of capitalization of public utility companies has assumed more importance than could heretofore be attached to it. Many of the public utility companies have been directly called upon by the federal government

either to furnish energy in large amounts or to establish and maintain additional and enlarged facilities for transportation.

The expansion of facilities for the purpose of meeting these demands has necessitated the procuring of new and additional capital in amounts even beyond those which are ordinarily necessary to enable companies to keep abreast of the ever-increasing normal demand. It has been necessary for the public utility companies to find these additional amounts of capital at a time when the world war had caused financial conditions to have become unsettled, and at a time when the savings of the nation were being borrowed by the federal government on very favorable bases and in unprecedented amounts. That the public utility industry has been able to finance itself at all in the face of conditions such as have existed in the last three-quarters of the year is believed to be a remarkable achievement.

COMMISSION CO-OPERATION

In the present period of stress the commission is lending all possible encouragement to legitimate financial undertakings, and by advice, suggestion and constructive criticism, based upon its wide experience in such matters, is aiding all properly disposed enterprises to solve their financial problems to the end that their service to the public may be maintained and improved.

Stockholders Approve Lease

The stockholders of the Philadelphia (Pa.) Rapid Transit Company on Feb. 8 authorized the board of directors to accept the lease of the projected high-speed city lines. This leaves only the approval of the Public Service Commission to be obtained. The board of directors of the company will meet on Feb. 18 to ratify the lease. The city then will be notified and arrangements will be made to take the matter before the Public Service Commission. After it is submitted to the commission, thirty days will be allowed for protests and suggestions, and then the final hearings will be held.

In discussing the action of the stockholders, W. S. Twining, director of the Department of City Transit, said:

"The action of the stockholders is gratifying because it brings the city and the company into accord on the subject of an operating lease, and thus removes what since 1913 has been an obstacle to transit development in Philadelphia. Until Aug. 17 of last year, when the present lease was submitted to Councils, no progress toward the consummation of a contract had been made. Now that the stockholders have authorized the company to accept the lease, the board of directors probably will meet soon and sign it, after which it will be sent to the Mayor for his signature."

The underlying principles of the lease were discussed in an editorial in the ELECTRIC RAILWAY JOURNAL of Jan. 26, page 166.

May Electrify Belt Lines

Tremendous Traffic Demand at Buffalo Uncovers Heretofore Neglected Transportation Artery

The New York Central Railroad which owns and operates a six-track belt line service around the city of Buffalo, N. Y., has been asked by Mayor George S. Buck to electrify two of its tracks and operate cars or trains on frequent schedules. John C. Brackenridge, retained by the City Council to make a survey of traffic conditions on the lines of the International Railway, recommended this improvement as a solution to the transportation problem in Buffalo. It is pointed out that the population of the city has increased almost 100,000 within the last twelve months and that the city railway is unable adequately to handle the large number of extra passengers. The location of new industries in the northern section of the city, far from the homes of the working classes, has greatly increased the transportation problem.

Details of the plan suggested by Mr. Brackenridge propose a charge of 3 cents as fare over the belt line with an additional charge of 2 cents for a transfer to any local line of the International Railway. The New York Central Railroad already has stations at many points along the 15-mile belt line. This line makes a complete loop around the city intersecting the business and residential sections. It is not intersected by any other railroad and for a greater part of the distance the tracks are either elevated or below the streets. More than 60 per cent of the city's industries are located along the line. The belt line crosses all of the east and west-bound surface railway lines on the east side. Mr. Brackenridge is of the opinion that with the electrification of the belt line Buffalo would have a transportation system better than that of any other city of the same size in the world.

T. W. Evans, general superintendent of the New York Central for the western division, which includes Buffalo, is impressed with the possibilities of this new service. He has been in conference with Mr. Brackenridge and members of the Buffalo Street Railway Commission and the City Council. Unofficial reports to the City Council indicate the New York Central is now collecting \$1,750 daily as fares on the belt line under the service as recently improved by the company.

Allowances Increased

Increasing Prices for Materials and Labor Jeopardize Fares Under the Tayler Grant at Cleveland

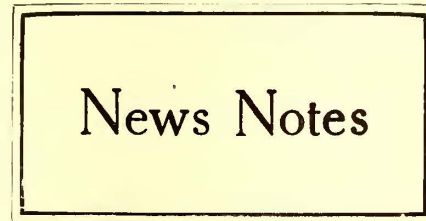
The street railway committee of the City Council at Cleveland, Ohio, on Feb. 8 approved the Cleveland Railway's request for an increase of 1½ cents per mile in the operating allowance, but cut the requested advance of 3 cents a mile for the maintenance allowance to 1 cent. This will make the allowances

16 and 6 cents respectively, instead of 14½ and 5 cents, as in the past. The company will also be permitted to charge off the deficit of \$500,000 of last year at the rate of \$30,000 a month. President J. J. Stanley fears that, with the continuance of high prices for all kinds of materials and increasing cost of labor, even this will not be sufficient to meet the expenses.

Fielder Sanders, street railway commissioner, says the prospects are rather gloomy for escaping the maximum rate of fare. This rate is 4 cents cash, seven tickets for a quarter and 1 cent for a transfer with no rebate. He said that 15 per cent of the total equipment was in the repair shop and delivery of new cars and materials seemed almost out of the question. Motormen, conductors and other employees of the company are clamoring for more wages. Their demands must be taken up in May.

PARING EXPENDITURES

No money is to be spent this year on new carhouses or extensions of the present houses, and the program for track repairs and replacements calls for just as little expense as possible consistent with safety and the upkeep of the property. No more cars will be purchased than are actually required by the traffic.



News Notes

New Commissioners Confirmed.—The Senate of New York has confirmed the nominations of Charles B. Hubbell, New York, and Frederick J. H. Kracke, Brooklyn, to be members of the Public Service Commission for the First District.

Fire in Toronto.—Fire destroyed the carhouse of the Metropolitan division of the Toronto & York Radial Railway on the west side of Yonge Street south of St. Clair Avenue, Toronto, Ont., on Feb. 5. Six interurban cars were completely burned.

Municipal Extension Opened.—The opening of the Seattle Municipal Railway extension into Ballard was celebrated on Jan. 27. C. B. Fitzgerald, president of the City Council; Mayor H. C. Gill and Superintendent of Streets Case were among the speakers at the ceremony attending the opening.

Strike Declared Off.—The strike of the trainmen of the Chattanooga Railway & Light Company, Chattanooga, Tenn., begun on Oct. 5, last, has been declared off by vote of the members of the local union there. At its inception the strike took on a serious aspect, but the company promptly replaced the men who went out and service was soon restored to normal. The declaring off

of the strike at this time is merely a formality and leaves the present members of the union free agents to seek re-employment.

Minneapolis Union Heard.—Representatives of the union of the Twin City Rapid Transit Company, Minneapolis, Minn., gave their side of the recent strike there to the President's mediation commission at a conference on Feb. 4. Temporary adjustment of the difficulty was effected when the commission visited the Twin Cities.

Search for C. Loomis Allen.—During the past week the daily papers in Syracuse have published several articles in regard to the disappearance on Jan. 10 from Baltimore of C. Loomis Allen, director of the War Board of the American Electric Railway Association. It was reported at first that no clues could be found, but on Feb. 11 the daily papers carried a story that Mr. Allen had suddenly gone to Mexico without notifying his associates in Allen & Peck, Inc. On Feb. 1 his resignation as director of the War Board was presented to the board by J. N. Shannahan.

Programs of Meetings

Central Electric Railway Association

The annual meeting of the Central Electric Railway Association will be held in the Miami Hotel, Dayton, Ohio, on Feb. 28 and March 1. The executive committee will meet at 1.30 p. m. on Feb. 28, and the regular business session will be held at 2.30 p. m. The regular business session on March 1 will convene at 9 a. m. The program for the meeting has not yet been announced.

SINGERS WANTED FOR MEETING

J. F. Starkey, general passenger agent of the Lake Shore Electric Railway, Sandusky, Ohio, is anxious to get the names of anyone who can sing and will join a quartet, perhaps a double quartet, for singing patriotic songs at the coming meeting in Dayton. Those willing to volunteer should notify Mr. Starkey promptly and tell him what voice they sing. If possible a rehearsal will be arranged to take place in Dayton on Feb. 27.

Southwestern Electrical & Gas Association

The general convention committee has decided upon April 15 and 16 as the dates for the convention of the Southwestern Electrical & Gas Association at Galveston, Tex., the headquarters to be the Galvez Hotel. In order to be consistent in the matter of economy the committee has made this a two-day convention instead of a three-day convention as hitherto. There will be no general entertainment for those attending, it being the idea of the committee to economize expense and time and make the meeting strictly a business convention. The details of the program are now being arranged and will be announced later.

Financial and Corporate

Another Abandonment

Ware & Brookfield Street Railway Operating Eleven Miles in Massachusetts to Be Sold

The Ware & Brookfield Street Railway abandoned operation on Feb. 3. The property will be sold for its scrap value unless its future purchaser decides to continue operation. The road is about 11 miles long and has operated in the towns of West Brookfield, Ware, New Braintree and Hardwick, Mass., forming a connecting link in the route between Worcester and Springfield via Spencer and Ware. In April, 1917, the fare unit was increased from 5 to 7 cents. The first six months' operation under the higher fare resulted in about \$2,500 increase in revenue, but the traffic decreased about 20 per cent. The total deficit on Dec. 31, 1917, was about \$188,000.

IN RECEIVER'S HANDS IN 1905

The road was organized in 1900 as the Hampshire & Worcester Street Railway. It went into the hands of a receiver in 1905 and was sold under the decree of the court to the present owners. No dividends have ever been paid and the bond interest has not been met since the reorganization. The gross earnings in 1916 were \$32,299 and operating expenses \$44,847. Taxes were \$440; interest on funded debt, \$6,750; deficit for 1916, \$19,739. In 1916 the road carried 566,773 revenue passengers. The principal items of operating expense were: Conducting transportation, \$11,852; maintenance of way and structures, \$9,699; maintenance of equipment, \$7,620; power (purchased from Central Massachusetts Electric Company), \$11,259; general and miscellaneous, \$4,015. The outstanding bonds total \$135,000 par value.

A few weeks ago, when it was seen that operation could no longer be indefinitely continued under the conditions then prevailing, J. Edward Brooks, president of the company, sent a letter to the selectmen of the various towns served and discussed the future of the property at various conferences. The Ware Board of Trade endeavored to raise local capital to save the property from dismantling, but was unsuccessful. The road was not hampered by jitney competition. Its chief difficulty was low density of traffic combined with high cost of labor and material. Five box cars are owned by the road and there were twenty-two employees on its payroll. President Brooks offered to sell the road to local capital for between \$60,000 and \$75,000, but nothing has come of this offer. The road has not as yet been placed in the hands of a receiver, but it is probable that one will be appointed within about two weeks. Practically no revenue has been derived for trolley express traffic.

All the territory served is rural in character, although some industrial travel has been cared for between Ware and Gilbertville. These points, 4 miles apart, are connected by a branch of the Boston & Albany Railroad.

Annual Meeting in Cleveland

Increased Allowance Wanted for Maintenance and Operation—New Stock to Be Issued

At the annual meeting of the stockholders of the Cleveland (Ohio) Railway on Jan. 30, the following income statement for 1917 was presented:

Operating revenue	\$10,176,125
Actual expenses	7,562,338
Net operating revenue	\$2,613,787
Non-operating income	80,389
Gross, less expenses	\$2,694,176
Taxes	643,108
Net income	\$2,051,068
Interest	1,928,856
Surplus	\$122,212
Obsolete property	524,000
Net deficit	\$401,788

The company has asked for increases in allowances from 5 to 8 cents per car-mile for maintenance and from 14.5 cents to 16 cents per car-mile for operating in order to reduce the deficit more rapidly.

Expenditures for betterments during the year aggregated \$1,219,715. The largest items were for laying 11½ miles of new track, building and equipping a new transformer station on Ashland Road and the purchase of seventy-six new trail cars and twenty-five motor cars. The company invested \$500,000 in Liberty bonds.

With the population estimated at 800,000, the gross receipts per capita were \$12.82. The number of passengers carried was 398,378,894, as compared with 375,382,748 the preceding year. Passengers paid \$9,944,350, or an increase of \$654,450 over 1916.

If approved by the Public Utilities Commission and the federal authorities, the company will offer stockholders of record of March 1, 1918, \$2,700,000 of new stock at par. The right to subscribe will expire on March 15. Subscriptions are to be payable in installments on sixty days' notice.

Proceeds of the sale of stock are to be used to reduce the bonded and floating debt, to pay for extensions, betterments and permanent improvements and for any other purpose found necessary. Should the authorities disapprove of an issue of this size now, the amount will be reduced to the immediate requirements of the company. This is the first time stockholders have had an opportunity to enlarge their holdings since 1914.

Save the Road!

This Is the Plea of the Patrons' Committee to Prevent Abandonment of Taunton & Pawtucket Line

Residents along the line of the Taunton & Pawtucket Street Railway, Taunton, Mass., have not given up hope of saving the road from the scrap heap. The committee of patrons has been very busy soliciting subscriptions to stock in the new company which it is hoped will take over the property. A house-to-house canvass has been announced. Meanwhile the committee has outlined to patrons of the road through placards in the cars the situation with respect to the road and has stated how the committee hopes to accomplish its work. This statement by the committee follows:

FEB. 21 LAST DAY TO ACT

"This railway has been sold at auction for its debts. The sale is very likely to be confirmed in court on Feb. 24; if so, the road passes into the hands of purchasers who do not intend to operate it. They are, however, willing to sell. Therefore the property owners and others interested have until Feb. 21 to raise the money necessary to buy the railway property and keep the road running.

"The present assets of the Taunton & Pawtucket Street Railway, according to a very recent inventory approved by the State Public Service Commission, were more than \$225,000. The sum necessary to be raised by the patrons of this road to secure a successful purchase is \$75,000, because assurance is given the committee that if \$75,000 is raised by the property owners, etc., the balance of \$50,000 will surely be forthcoming.

"Do not depend upon the bill presented by Senator Silas D. Reed, for even if it should pass the Legislature—which is extremely doubtful—it will not be in time to save this road, as we have only until Feb. 21.

PUBLIC URGED TO TAKE STOCK

"The shares are \$100 each and it is up to you to go the limit and take as many as you possibly can and then some. The stopping of this road will cause a vast reduction in the valuation of your property and a very great inconvenience to you and your tenants. We have talked and talked that we must keep the road running. Now let us do it by subscribing to our utmost limit to the fund for the purchasing of this property. The committee will call upon you for your subscription. The committee also has many others to call on, so please be prepared for their coming."

The fare unit on the line has recently been increased from 5 cents to 7 cents, making the through fare between Attleboro and Taunton 28 cents instead of 20 cents. In addition a charge of 2 cents is made for transfers. This change and previous steps affecting the road were referred to briefly in the ELECTRIC RAILWAY JOURNAL of Jan. 26, page 199.

Rochester Will Appeal

Will Carry Up Fare Case Decided
Against It by the State Supreme
Court

Corporation Counsel Benjamin B. Cunningham of Rochester, N. Y., has announced that the city will appeal to the Court of Appeals from the decision of Supreme Court Justice Wesley O. Howard, Troy, who denied the city's application for a writ prohibiting the Public Service Commission from hearing the Rochester fare case.

The city contests the right of the commission to hear the case on the ground that the fare was fixed by law passed after the public service commission law and on the ground that the commission has no authority to invalidate the franchise contract between the city and the railway company which stipulates that a 5-cent fare shall be charged.

Emergency Rates in Sheboygan

Wisconsin Commission Authorizes
Eastern Wisconsin Electric Com-
pany to Raise Rates

The Railroad Commission of Wisconsin under date of Jan. 29 rendered its decision in connection with the application of the Eastern Wisconsin Electric Company to increase its power and lighting rates, with the exception of the residence lighting rates, in the city of Sheboygan.

In its application the company requested permission to increase the rates 0.75 cent per kilowatt-hour, and to discontinue the sale of six tickets for 25 cents. In its decision the commission granted authority to increase the power rates and all lighting rates other than the residence lighting rates 0.25 cent per kilowatt-hour beginning Feb. 1 and continuing to Aug. 1 of this year, at which time the former rates again become effective, unless upon application the commission approves of a continuance of the rates granted under the present emergency order. The minimum lighting rate was reduced from \$1 to 75 cents, and permission was granted to the company to discontinue the sale of six tickets for 25 cents for the period mentioned.

OTHER APPLICATIONS MADE

The company has also made application to the Railroad Commission for authority to increase its lighting and power rates at Fond du Lac 1½ cents per kilowatt-hour and to eliminate the sale of the six tickets for 25 cents at that point, and an application has been filed and hearings held in connection with the elimination of eight tickets for 25 cents on the Oshkosh property of the company. No decisions have as yet been rendered in connection with these last two applications made by the company.

The company operates 34 miles of railway and does a general lighting and power business.

Transportation News Notes

Against One-Man Cars.—The City Council of Dubuque, Iowa, at a recent special meeting, tabled the petition of the Dubuque Electric Company for permission to use one-man cars and amended the ordinance which prohibits the use of the cars in that city.

Company Publication at Joliet.—J. R. Blackhall, general manager of the Chicago & Joliet Electric Railway, Joliet, Ill., contemplates the publication of a weekly bulletin, which will have as its object the cultivation of better understanding between the company and its patrons.

Relief from Service Order Denied.—The Public Service Commission of West Virginia has refused to modify its order of Dec. 11, 1917, prescribing certain standards of service for the Wheeling Traction Company on its Moundsville-Wheeling line. The order as issued originally was made effective from Feb. 1. The company sought to obtain a stay of the order until March 15.

Fare Ordinances Presented.—Two ordinances have been presented to the City Council at Frankfort, Ky., one providing for an increase in fares on the city lines of the Kentucky Traction & Terminal Company from 5 to 6 cents and the other for increases on the interurban lines so far as the city is interested. They are to be supported by a detailed statement of cost of operations from the railway.

Pennsylvania Fare Hearings on Feb. 19.—The Public Service Commission of Pennsylvania has fixed Feb. 19, in Harrisburg, as the time and place for a hearing of complaints against electric railways that have asked permission to advance their fares from 5 to 6 cents in cases where such advances are alleged to be in violation of ordinances under which the companies hold their franchises. Among the cities said to be included in the protests filed with the commission are Pittsburgh, Scranton, Shamokin and Ashland.

Corporation Counsel to Act in Case of Fare Request.—The City Council of Seattle, Wash., has authorized Hugh M. Caldwell, Corporation Counsel, to take such action as he may regard as necessary to prevent the Public Service Commission from acting in the event the Puget Sound Traction, Light & Power Company petitions the commission for permission to increase railway rates. Mr. Caldwell advised the Council that in his opinion the commission has no right to invite or consider such an application.

Pro Bono Publico Fined.—A decision recently handed down by Circuit Judge Tucker, Portland, Ore., affirms the conviction in the Municipal Court of Albert

Stevens, a jitney driver "employed" by the so-called "Pro Bono Publico" Club, and declares that the organization and operation of the "Club" for a short time last fall was nothing but a subterfuge employed by the local jitney men in an effort to evade the anti-jitney ordinance passed by the voters of Portland. Judge Tucker confirmed the \$25 fine placed on Stevens by the Municipal Court.

One-Man Cars Again Demonstrate Their Worth.—According to reports, the one-man cars installed in Vancouver, Wash., by the North Coast Power Company are proving entirely successful. The three car lines include the Orchards-Sifton interurban line, extending 7 miles northeast from Vancouver; the Capitol Hill line, reaching the residence section of the western part of the city, and the line from the depot to the bridge. One-man operation was resorted to by the company as its last hope of being able to operate the railway lines at a profit.

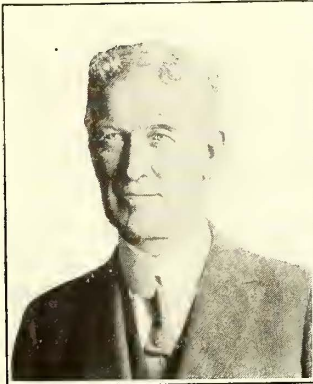
Enforcement of Jitney Ordinance Postponed.—Enforcement of the recently enacted jitney ordinance in Dallas, Tex., was delayed till Feb. 1 by order of the City Commission. This action was taken on application of the Dallas Jitney Drivers' Association and others, who took the position that the new ordinance contained much of the restriction in the old ordinance now before the Texas Supreme Court on application for a writ of error from the Court of Civil Appeals at Dallas, and that the City Commission should await the decision of the higher court before enacting a new ordinance containing these provisions.

The Three "C's."—The Twin City Rapid Transit Company, Minneapolis, Minn., in a recent newspaper display advertisement 9 in. wide by 10 in. deep, told very effectively how much more it is costing at present to furnish electric railway service than it did before the war. Percentages of increases in costs were presented in a table containing eighteen typical items. The company said that the three big "C's" of the electric railway business are coal, copper and cars. As a specific instance of increased prices it was pointed out that the cost of a car, which is about equally divided between material and labor, had increased more than 60 per cent since 1914.

Wants Board to Require Adoption of Mr. Witt's Suggestions.—The City Commission of Trenton, N. J., has asked the Board of Public Utility Commissioners for an order to direct the Trenton & Mercer County Traction Corporation to make certain improvements recommended in the report of Peter Witt, by Sept. 20, 1918. The company, under the rules of the commission, has two weeks in which to file an answer, after which a date for a public hearing will be fixed. The recommendations of Mr. Witt included the suggestion that the company purchase fifty one-man cars. His findings were reviewed in the ELECTRIC RAILWAY JOURNAL for Jan. 19, page 138.

Personal Mention

T. J. Day has been appointed general freight agent of the Pacific Electric Railway, Los Angeles, Cal., succeeding to part of the duties performed previously by D. W. Pontius. Mr. Day has been in the service of the Pacific



T. J. DAY

Electric Railway for ten years, and has had twenty-eight years of railroad experience, beginning with the Denver & Rio Grande Railroad. He was formerly assistant in charge of freight operation of the Pacific Electric Railway.

Harry M. Slater has been appointed chief transportation rate expert of the Public Utilities Commission of Illinois.

Murray Parsons has been appointed roadmaster of the Visalia Electric Railroad, Exeter, Cal., to succeed Samuel W. Card.

J. J. Mahoney has been elected first vice-president of the Fresno (Cal.) Interurban Railway to succeed Paul C. Fratessa.

James Favor has been appointed general manager of the Central Power & Light Company, Walnut Ridge, Ark., to succeed John F. Wilson.

W. R. Kennedy has been appointed purchasing agent of the Fort Smith Light & Traction Company, Fort Smith, Ark., to succeed W. J. Parker.

L. M. Stevenson has been appointed master mechanic of the Alaska Gastineau Mining Company, Thane, Alaska, to succeed William G. Carlberg.

H. A. Nevans has retired as auditor of the Aurora, Elgin & Chicago Railroad, Aurora, Ill., to accept a position with an insurance company in Chicago.

David Bruce has resigned as superintendent of the Lawrence division of the Bay State Street Railway, Boston, Mass. He has been succeeded by John H. Hayes.

Milton G. Potts, formerly treasurer and general manager of the Lykens

Valley Traction Company, Williams-town, Pa., is dead. He was seventy-three years old.

A. Patterson has been appointed electrical engineer and engineer of overhead construction of the Southwestern Gas & Electric Company, Texarkana, Ark., to succeed George O. Bernard.

John H. Hayes, who has been superintendent of the Hyde Park division of the Bay State Street Railway, Boston, Mass., has been appointed superintendent of the Lawrence division of the company.

Henry F. Atherton, Albany, N. Y., has been appointed assistant general manager of the Hudson Valley Railway, with office at Glens Falls, N. Y. Mr. Atherton has been treasurer of the United Traction Company, Albany, and



H. F. ATHERTON

Hudson Valley Railway for the last five years and his new appointment is a well deserved and earned promotion. Mr. Atherton will be in charge of the company's passenger and freight schedules, thus relieving A. E. Reynolds, general manager, of the details of operation.

George A. Fernald, Boston, Mass., has been elected president of the Nashua (N. H.) Street Railway, operated under lease by the Bay State Street Railway. Mr. Fernald succeeds John A. Fisher, resigned.

Ray W. Reynolds, general manager of the Mesaba Railway, Virginia, Minn., has been commissioned a captain in the army engineering corps and has been ordered to report at Fort Lee, Petersburg, Va. Mr. Reynolds was formerly superintendent of the Hartford & Springfield Street Railway, Warehouse Point, Conn., and was also connected with the Springfield (Mass.) Street Railway.

H. S. Newton, who has been general manager of the Ohio Valley Electric Railway, Huntington, W. Va., for sev-

eral years, will on Feb. 15 become manager of railways for the Monongahela Valley Traction Company, Fairmont, W. Va.

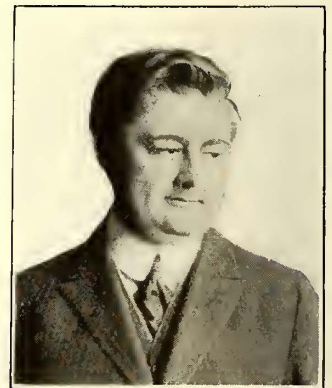
John C. Stone, who has been assistant traffic manager of the Northern Electric Railway, Sacramento, Cal., for the last four years, has been appointed traffic manager of the Central California Traction Company, Stockton, Cal., effective March 1.

R. D. Voshall, superintendent of equipment of the Birmingham Railway, Light & Power Company, Birmingham, Ala., has also been appointed master mechanic of the Birmingham-Tidewater Railway, which the Birmingham Railway, Light & Power Company controls, to succeed J. L. Mason.

E. W. Rice, Jr., president of the General Electric Company, and Gerard Swope, vice-president of the Western Electric Company, who have been visiting Japan, after extended tours in Eastern Asia, investigating industrial fields for electric plants, have been decorated by the Emperor of Japan.

G. B. Treat, assistant general manager and chief engineer of the Oklahoma Railway, Oklahoma City, Okla., has been appointed consulting engineer of the United States Fuel Administration for the State of Oklahoma. The appointment was made by P. A. Norris, Federal Fuel Administrator for Oklahoma.

O. A. Smith has been appointed general passenger agent of the Pacific Electric Railway, Los Angeles, Cal., succeeding to part of the duties per-



O. A. SMITH

formed previously by D. W. Pontius, now general manager of the San Diego & Arizona Railroad. Mr. Smith was formerly assistant to Mr. Pontius in the passenger department. He is thirty-two years old. He became connected with the Pacific Electric Railway nine years ago, going to that company from the Missouri, Kansas & Texas Railroad.

Fred M. Smith, Dixon, Ill., who has for several years been in charge of the safety work of the Illinois Northern Utilities Company and has in this way been rather closely connected with the bu-

reau of safety of the Middle West Utilities Company, Chicago, Ill., has become connected with the bureau as one of its representatives.

Eugene C. Clarke has received the title of superintendent of instruction and efficiency of the Tacoma Railway & Power Company and the Pacific Traction Company, Tacoma, Wash. In November last Mr. Clarke resigned as supervisor of instruction of the Brooklyn (N. Y.) Rapid Transit Company to direct the instruction of trainmen and to handle general efficiency work for the companies at Tacoma. A portrait and a biography of him were published in the *ELECTRIC RAILWAY JOURNAL* of Dec. 1, 1917.

N. W. Smith, general counsel of the Rhode Island Company, Providence, R. I., from about the time the New York, New Haven & Hartford Railroad took over the electric railways in Rhode Island until the Rhode Island Company was separated from the New Haven Railroad by the federal decree in the dissolution suit, has been made general attorney for the New Haven Railroad, with offices at New Haven, Conn. Mr. Smith was born at Providence on Nov. 18, 1873. He was graduated from Yale in 1896 and later from the New York Law School. In 1899 he became junior partner in the firm of Edwards & Angell, Providence, and in 1904 was appointed assistant attorney for the New Haven Railroad for Rhode Island.

I. L. Ward, formerly with the Southern Pacific Company in San Francisco, was recently appointed purchasing agent for the Pacific Electric Railway,



I. L. WARD

Los Angeles, Cal. He succeeded F. W. Taylor, who left the Pacific Electric to become purchasing agent of the Southern Pacific's System in the territory from El Paso to Portland. Mr. Ward is thoroughly familiar with railroad purchasing. By taking over the Pacific Electric purchases Mr. Ward becomes practically the largest purchaser of materials in southern California. Mr. Ward was for nine years with the Chicago, Rock Island & Pacific Railway in the maintenance of way, mechanical and store departments. For the last eight years he has been with

the Southern Pacific, serving first as chief clerk to the general storekeeper, as storekeeper, general stores, and chief clerk of the purchasing department.

James F. Hamilton, general manager of the New York State Railways, Rochester Lines, on Feb. 8 was made vice-president of the entire system of the New York State Railways, including the properties at Rochester, Syracuse and Utica. Mr. Hamilton will at once assume the entire management of the properties, with headquarters at Rochester, the several local managers reporting directly to him. Mr. Hamilton began his railroad career in 1897 as a conductor on the lines of the International Railway at Buffalo, and after various promotions with that company, he resigned in 1902 to accept a position as assistant superintendent of the Schenectady Railway and was promoted to the position of superintendent in 1909. Mr. Hamilton was appointed in 1911 general superintendent of the United Traction Company, Albany, and was retained by the Schen-



J. F. HAMILTON

ectady Railway in an advisory capacity. In 1912 he was promoted to the office of general manager in charge of both the Schenectady Railway and United Traction properties. He resigned from these positions to assume the duties of general manager of the New York State Railways, Rochester Lines.

W. P. Power, who has been general manager of the light, heat and power interests of the Ohio Valley Electric Railway, Huntington, W. Va., has in addition been made general manager of railways of the company to succeed H. S. Newton, appointed to the Monongahela Valley Traction Company, Fairmont, W. Va.

Samuel Insull, Chicago, has resigned as president of the West Penn Railways and the West Penn Power Company, Pittsburgh, Pa., because of inability to devote the time necessary to the duties of that office with the companies. Mr. Insull has been re-elected a director. Mr. Insull became president of the companies several years ago.

A. E. Reynolds, who has been acting general manager of the United Traction Company, Albany, N. Y., has been made general manager of the company. Mr. Reynolds began his electric railway career in the city of Plattsburgh, N. Y., in 1896, with Sanderson & Porter, New York, the principal owners and operators of the Plattsburgh Traction Company. He continued with that company from the time of its purchase by the Delaware & Hudson Company in 1907 until June 1, 1909, when he was transferred to Glens Falls, N. Y.,



A. E. REYNOLDS

as general manager of the Hudson Valley Railway. Under Mr. Reynolds' management the physical condition of the Hudson Valley Railway was greatly improved and the property is at present considered one of the best interurban lines in the State of New York. On Oct. 1, 1917, upon the resignation of Charles F. Hewitt as general manager of the United Traction Company Mr. Reynolds was appointed acting general manager and continued as such until Feb. 1 when announcement was made of change in title to general manager. Mr. Reynolds remains as general manager of the Hudson Valley Railway, Albany. With these important systems Mr. Reynolds has under his operation the lines in Albany, N. Y., Cohoes, Waterford, Mechanicsville, Saratoga, Ballston, Glens Falls, Lake George and Warrensburg, a combined trackage of considerably more than 250 miles. Mr. Reynolds has won for himself a firm place in public opinion at Glens Falls as witnessed by the following comment from the *Post-Star*: "If Mr. Reynolds maintains the same interest in matters of public weal for Troy and Albany that he has always shown in Glens Falls, those cities will gain a prominent and energetic worker for all civic undertakings. If he continues the same co-operation with Troy and Albany newspapers that he has always shown in Glens Falls, the readers of those papers will gain a better knowledge of the railway and be brought to a better realization of the company's efforts to give good service." Mr. Reynolds will direct the operation of both companies from Albany.

C. E. Bennett will be assistant to Charles G. Adsit, consulting engineer of the Georgia Railway & Power Company, Atlanta, Ga., after Feb. 15. Mr. Bennett has been associated with Curtis A. Mees, consulting engineer, Charlotte, N. C., since last summer. In the summer of 1915 Mr. Bennett resigned as electrical engineer with the Northern Contracting Company and the Georgia Railway & Power Company to become associated with Hugh L. Thompson, consulting engineer, Waterbury, Conn. Prior to that time he was electrical engineer with L. B. Stillwell, New York City, and later with Charles O. Lenz, New York City. He was also connected with J. G. White & Company, New York City.

Obituary

George T. Bergen, who twenty years ago and for some years thereafter was general purchasing agent of the Chicago (Ill.) City Railway, is dead. Mr. Bergen attended many of the early conventions of the American Electric Railway Association. He retired from the electric railway field about ten years ago, but had recently been in steam railroad work.

John H. Ruhlman, Youngstown, Ohio, interested in the building of interurban railways, died on Jan. 31 of pneumonia. He was active in the building of the Youngstown & Southern Railway between Youngstown and Columbiana and for several years had been working for the construction of the Lake Erie & Youngstown Railroad, which was to connect Youngstown with Lake Erie at Conneaut.

James D. McDonel, secretary, treasurer and general manager of the Fostoria & Fremont Railway, Fostoria, Ohio, is dead. Mr. McDonel was a store owner in Fostoria and was also engaged in the real estate business in that city in association with his brother. He was injured more than seven years ago during the construction of the railway and is said never to have recovered fully from the hurt which he sustained at that time.

Frank Curtis, a pioneer in city railway operation in New York and formerly president of the Sixth Avenue Railway, now included in the system of the New York Railways, died on Feb. 4. Mr. Curtis was born in Sheffield, Mass., in 1839. At the age of twenty-five he identified himself with the Belt Line Railroad in New York and soon thereafter was elected president of the company. In 1884 he was made president of the Sixth Avenue Railway and finally negotiated the lease of its property to the Metropolitan Street Railway, the predecessor of the New York Railways. Besides his activities in railway enterprises, Mr. Curtis was prominently identified with various financial institutions in New York.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Empire Railroad, Sylacauga, Ala.**—Incorporated to construct a line from Sylacauga to Marble Valley, 15 miles. Officers: W. C. Lancaster, president; W. L. Legg, vice-president and W. J. Rowland, secretary.

Franchises

Kansas City, Mo.—The Board of Park Commissioners of Kansas City has granted permission to the Kansas City Railways to build a loop at the end of the Marlborough line at Seventy-ninth Street and the Paseo.

East Cleveland, Ohio.—Officials of East Cleveland are preparing a new franchise for the Cleveland Railway. The fare between Cleveland and East Cleveland will be 5 cents and within the boundaries of East Cleveland 3 cents.

Marion, Ohio.—The Columbus, Delaware & Marion Electric Company has asked the City Council for a twenty-five-year franchise for the operation of its street railway and light plant. It has been announced that \$1,000,000 will be spent at Marion in power plant and track improvements.

Track and Roadway

Pacific Electric Railway, Los Angeles, Cal.—Application has been filed with the Railroad Commission of California by the Pacific Electric Railway for authority to abandon and remove its line serving the Arcadia race track.

Southern Traction Company of Illinois, East St. Louis, Ill.—Plans are being made by Senator A. E. L. Gardner of Clayton, Mo., to reorganize the defunct Southern Traction Company of Illinois, which at one time operated an electric interurban line from the present east approach of the Municipal Free Bridge to Belleville. The plan is to repair the road and operate it by electricity as a freight line. Coal is the principal article it is proposed to carry. Mr. Gardner will soon go to Washington to confer with Director General of Railroads McAdoo on the proposition. Mr. McAdoo will be asked to sanction the company's use of the Free Bridge so that coal hauled by the company may not be delayed on the east side of the river.

***Geneva Lake, Sycamore & Southern Railway, Sycamore, Ill.**—This company has been organized with a capital stock of \$150,000 to construct an electric line from the southern shore of Lake Geneva, Wis., through McHenry, DeKalb, Kendall and LaSalle Counties, Ill. The head office will be at Sycamore, Ill.

***New Haven, Ind.**—Plans are being made by a large number of New Haven people for the construction of an electric line to connect New Haven and Fort Wayne. A number of residents have pledged to donate a right-of-way. It is reported that plans are under way to meet with the stockholders of the Fort Wayne & Northern Indiana Traction Company in regard to the new line, as it may be possible some plans may be made to interest this company.

Cheboygan Electric Light & Power Company, Cheboygan, Mich.—The project of building an electric line between Cheboygan and Petoskey through the northern resort section has been abandoned. The Cheboygan Electric Light & Power Company, which received a franchise from the city of Cheboygan, paid over to the city the sum of \$5,000 for failure to construct the road, stating that present conditions do not warrant starting operations. [May 31, '13.]

***St. Louis, Mo.**—In a communication addressed to the Board of Aldermen, the Lindenwood Improvement Association asked that the city of St. Louis build and operate a municipal electric railway from the end of the Tower Grove line of the United Railways to Lindenwood.

Public Service Railway, Newark, N. J.—An extension from the Lackawanna Station to Port Newark terminal has been placed in operation by the Public Service Railway. The new line touches the Lackawanna station, Hudson & Manhattan tubes, Public Service terminal and the Ferry Street station of the Central Railroad.

New Jersey & Pennsylvania Traction Company, Trenton, N. J.—This company has complied with the order of the City Commission and has removed its feed wires along Calhoun Street and Pennington Avenue. The wires had never been used, the company at one time contemplating the extension of its lines on the two thoroughfares.

Brocklyn (N. Y.) Rapid Transit Company.—The work of third-tracking the Myrtle Avenue elevated railroad line between Myrtle Avenue and the Ridgewood depot, Borough of Queens, is rapidly nearing completion. The completion of this work will do much toward relieving the transit grievance of upper Ridgewood, for, with the express service once in operation between Ridgewood and the Williamsburg Bridge, considerable time will be saved

over the present system. From Ridge-wood to Chambers Street in twenty minutes will be possible under the new scheme, which will include express service on the third track between the Wyckoff Avenue and the Marcy Avenue stations, at the Williamsburg Bridge approach, continuing under local service across the bridge and thence through the tube to the Municipal Building.

New York (N. Y.) Railways.—Chairman Straus of the Public Service Commission for the First District of New York, has written to Mayor Hylan asking him to initiate proceedings for a relocation of the surface railroad tracks in Central Park West. Under the law the commission can only act in the matter on a complaint by the city authorities, and a complaint made by the last city administration failed because it was defective. One suggestion made was that the northbound track should be placed to the west of the present southbound track, thus leaving space on each side of the track for vehicles.

Pennsylvania Railroad, New York, N. Y.—It is reported that the application of the Pennsylvania Railroad and Lackawanna Railroad to serve the Niagara frontier from Buffalo by acquiring the property and right-of-way of the Frontier Electric Railway, is to be granted. The Pennsylvania and Lackawanna railroads, in return for getting permission to operate through this territory are to build an elevated line through the Tonawandas and the International Railway, whose new Falls line parallels the Frontier Electric Railway's right-of-way, is to extend its embankments as far as the north city line of North Tonawanda. The decision to permit the Pennsylvania and Lackawanna railroads to enter this territory will come shortly from the Public Service Commission for the Second District of New York to which application was made nearly two years ago for permission to operate the Frontier Electric Railway line.

***Rochester, N. Y.**—The city of Rochester is having preliminary plans prepared by F. L. Raschig, Cincinnati, Ohio, for the construction of an 8-mile electric railway through the old bed of the Erie Canal to cost about \$3,000,000.

***Chillicothe, Ohio.**—Bids will be received at the office of the City Clerk of Chillicothe until Feb. 16 for the construction of an electric railway on Paint Street from Second Street to Riverside Street, on Water Street from North Walnut Street to the abandoned Ohio Canal, through City Park from Riverside Street to the right-of-way of the Baltimore & Ohio Railroad.

Windsor (Ont.) Street Railway.—The Ontario Railway Board has ordered the Windsor Street Railway to provide a two-way service on the West Side. It is estimated that the improvement will cost about \$100,000.

Lewistown & Reedsville Electric Railway, Lewistown, Pa.—Notice has been filed with the Public Service Commission of Pennsylvania by the Lewistown &

Reedsville Electric Railway of the issuance of bonds for \$68,000 to provide for extensions and improvements.

Grand Trunk Railway, Montreal, Que.—It is reported that construction has been begun of an extension from the main line of the Grand Trunk Railway to the Military Hospital at Whitby, Ont. It is stated that this line will be electrified and will ultimately form a part of the electric lines to be built under the plans of the Hydro Electric Power Commission of Ontario.

Montreal (Que.) Tramways.—Under the terms of the new thirty-five year franchise, the Montreal Tramways is ordered to build double tracks on about 13 miles of new line. Work is to be begun in June and completed by November.

Dallas (Tex.) Railways.—Officials of Dallas are working out plans which will soon be placed before M. N. Baker, Supervisor of Public Utilities, and officials of the Dallas Railways for approval, looking to the removal of all street car tracks on Main Street from Preston to Lamar. It is the plan to improve Main Street and make a thoroughfare for automobiles and light vehicles. There are now double tracks on Commerce and Elm Streets, running parallel to Main Street and one block on either side, and it is claimed that the street cars that now use the tracks on Main Street could be re-routed so as to use these tracks. The Dallas Railways has already set aside a sum from the budget to be used in rebuilding the Main Street line and it is the plan of the City Commission to permit the company to use this money for other improvements.

Houston, Richmond & Western Traction Company, Houston, Tex.—A report from H. C. McMahon, secretary of the Houston, Richmond & Western Traction Company, states that construction of its proposed line will be begun in about sixty or ninety days. The line will consist of 196 miles of single track and will connect Houston, Richmond, Rosenberg, Garwood, Gonzales, New Berlin, San Antonio and other smaller towns. It is also proposed to extend East as far as Orange. The line will serve the exposition grounds at Houston and possibly one park near San Antonio. The power station will be located at Gonzales and the main repair shops at Houston. [June 16, '17.]

Puget Sound Traction, Light & Power Company, Seattle, Wash.—A. L. Kempster, manager of the Puget Sound Traction, Light & Power Company, Seattle, states that within three weeks the West Street car approach to the high level bridge across the West Waterway near Spokane Street will be completed, and street cars will begin operation over the new structure. The new bridge will be provided with double trackage, and will replace the low level bridge nearby, which has occasioned much transportation delay because of the fact that a scow could not be taken up the Duwamish Waterway without the opening of the bridge.

Shops and Buildings

International Railway, Buffalo, N. Y.—Notice has been served upon the International Railway that it must stop work on the reconstruction of its Forest Avenue carhouse until the city determines whether or not the walls of the old structure encroach 7 ft. upon city property as disclosed by city maps. The company was also warned that it started to rebuild the burned structure without filing plans with the bureau of buildings and without obtaining the permit required by law. The company proposes to spend \$30,000 for the reconstruction of the destroyed carhouse on the old site at Forest Avenue and Tremont Street.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded to Walter Farrington, New York, the lowest bidder, at \$217,655, the contract for the construction of station finish for four stations on the new rapid transit lines. These stations are at Whitehall Street, Manhattan, and at Clark Street, Court Street, and Borough Hall, Brooklyn. The station at the latter point adjoins the present Borough Hall station, and, like the Clark Street station, is on a line for operation by the Interborough Rapid Transit Company.

Power Houses and Substations

Pine Bluff (Ark.) Company.—This company is now installing a 2500-kv. General Electric, three-phase, 60-cycle, 2300-volt generating unit in its power station.

Pacific Gas & Electric Company, Sacramento, Cal.—This company plans to extend its transmission lines to Guinda, Rumsey and Brooks.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—Additional boilers are being installed by the Wilmington & Philadelphia Traction Company in its power house.

Albia Light & Power Company, Albia, Iowa.—Work has nearly been completed on the reconstruction of this company's power plant at Albia.

Hagerstown & Frederick Railway, Frederick, Md.—A 6250-kva. turbine is now being installed by the Hagerstown & Frederick Railway at its Security power plant.

Southern Canada Power Company, Montreal, Que.—The Southern Canada Power Company, of which the Sherbrooke Railway & Power Company is a subsidiary, contemplates the erection of about 100 miles of high tension transmission line and has asked for bids on poles, cross arms, insulators, cross arm braces, wire and other material for same.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Car Roofing Manufacturers Report Conditions Quiet

Prices Have Not Been Revised Recently—Shipments Out of Stock, But Deliveries Uncertain

With comparatively little new car construction going on, a majority of the builders having their plants largely devoted to government and war material work, the manufacturers of car roofing or headlining report business quiet. Such sales as have been made to electric railways is for maintenance or replacements. One manufacturer said that while no special changes had recently occurred in prices, the revision followed the metal markets to a very great extent. At any rate, quotations for car roofing material held good on an average of fifteen days for acceptance, but in some instances prices are subject to change without notice. As new rolling stock orders are concededly few and far between at present, trade is far from active, although the call for the material could be properly described as steady. Shipments are promptly made out of stock, and this company is prepared to handle any size order. Deliveries are dependent on the embargoes, which were seriously hampering all lines of business east of Pittsburgh.

A couple of other car roofing manufacturers expressed themselves along similar lines. There had been no change in price, in one instance, within two months. Prompt shipments could be made out of factory stock, but deliveries were subject to embargo restrictions. No business had been lost, however, as every concern in all lines was feeling the inconvenience of the present tangled transportation situation. Slight relief had been afforded during the past week. The railroads propose to try other methods of handling freights, it was observed, but it would doubtless be ten days or more, even with favorable weather, to clear up the congestion along the Atlantic seaboard. This manufacturer was handling government work, but it did not interfere with caring for the needs of the regular trade.

Still another manufacturer stated no change in his price quotations had been made in a year, nor was any contemplated. Shipments could be met promptly from warehouse stock, but the embargoes held up deliveries to the consignee, so that his company was obliged to name figures f.o.b. factory in self-defense, if for nothing else. It is the safest policy for the seller and equitable to the buyer, the company explained. No trouble was experienced in securing raw material.

Window Glass About to Advance

Production Has Been Decreased 75 Per Cent and Wages Increased 25 to 30 Per Cent

Evidently the price of car window glass is on the point of an advance. All window glass manufacturers, pending the placing of an important government order, withdrew their prices on Jan. 1. Since then no prices, according to one of the largest companies in the country, have been quoted either on car or any other kind of window glass, nor are orders accepted but conditionally. It is expected, however, that the waiting of the factories will soon be over, the official requisition allotted among the plants, and the quoting of prices resumed, but on a higher level. Supporting this report is 25 to 30 per cent increase in the wages of skilled glass workers as of the beginning of the present "fire," namely Dec. 8, last. Owing to the fuel order production has been reduced 75 per cent. That some sizes of glass are already off the market is denied, but it seems true that stock in the hands of jobbers is meager.

Laconia Car Company Reorganized

New Officers Elected and a Different Product Decided Upon—Changes Announced

Following the readjustment of the affairs of the Laconia Car Company, Boston, Mass., it is reported that the company will give most of its attention to the building of freight rather than electric cars. This policy will be followed for an indefinite time. Early in December last the following reorganization committee was selected in the interests of the creditors: Clifton H. Dwinnell, chairman, vice-president First National Bank; Herbert K. Hallett, president Fourth Atlantic National Bank; John J. Martin, president Exchange Trust Company; W. J. Bryan, Hunter Illuminated Car Sign Company, and V. C. Bruce Wetmore, Wetmore-Savage Company, all of Boston. Arrangements were made with the creditors, and the committee announced the following policy:

1. To see that the company is operated as economically and efficiently as possible, only authorizing the payment of payrolls and other necessary expenses, and the purchase of such materials and supplies as are necessary to carry out present orders, or may be required for new business which may be taken at a profit.

Revised Rules for Obtaining Federal Priorities

War Industries Board Formulates New Regulations for Determining Precedence

The priorities division of the War Industries Board of the Council of National Defense has made public Priority Circular No. 3, defining the regulations which the priorities division now has in effect for determining precedence in orders and work and describing the methods of administering them. The regulations are subscribed to by the Secretary of War, the Secretary of the Navy, the chairman of the Shipping Board and president of the Emergency Fleet Corporation and the chairman of the Council of National Defense. The circular discloses a much wider field of operations than that defined in the first circular issued in September of last year. The priority regulations apply to all individuals, firms, associations and corporations engaged in the production of copper, iron and steel and in the manufacture of their products; of chemicals, cotton duck and woolen cloth, and all such raw materials and manufactured products as the committee may deem necessary from time to time.

Under the new regulations all orders

and work are divided into four general classes instead of three as heretofore: Class AA, class A, class B, and class C, with such sub-divisions as class AA-1, class AA-2, etc., class A-1, class B-1, etc. Class AA comprises only emergency war work of a special or urgent nature.

The new regulations in no way change or modify any priority orders previously issued. The rule of procedure from now on is that orders and work in class AA shall take precedence of those in all other classes, orders and work in class A preceding those in class B and those in turn orders and work in class C, irrespective of the dates the orders were placed. The committee's work does not cover transportation, and it does not attempt to expedite transportation.

No industry, plant, material or commodity will be classified as such. Only specific orders for materials, commodities or work classified according to their importance in war preparation or in work necessary to the public interest or otherwise of exceptional importance.

2. To see that all creditors are treated alike, and that no preferences are accorded on the indebtedness which has accrued, except that all claims of less than \$1,000 will be paid in full, and that money due from or advanced to the company shall have priority over the notes accepted by creditors.

3. To see that as soon as and as often as possible payments are made on account of the present indebtedness, the same percentage being paid to all.

Changes were made in the executive staff and management of the Laconia company, due to the resignation from the vice-presidency of C. S. Clark, as follows: J. E. Johnson, who, for years has been in charge of the company's Boston office, was appointed vice-president in charge of sales and purchases. C. A. Towle, formerly works manager, became vice-president and general manager, in charge of operation and management.

Well-Known Welding Concern in Merger

Large Metal and Chemical Interests Combine Business Under New Name

Announcement is made that the business of both the Goldschmidt Detinning Company and the Goldschmidt Thermit Company will hereafter be conducted by the "Metal & Thermit Corporation," with general offices at 120 Broadway, New York. These two concerns have been practically combined for the last two years and have occupied joint offices at the above address. The combination, which is controlled exclusively by Americans, has now been put in more permanent form as it is felt that this will tend towards greater efficiency and co-ordination of effort.

The detinning department of the Metal & Thermit Corporation will carry on one of the largest industries of its kind in the world, *i. e.*, the recovering of tin from tin scrap. Approximately 100,000 tons of tin scrap are treated yearly by this department and the recovery approximates the equivalent of 2000 gross tons of metallic tin. The output of this department consists of pig tin, tetrachloride of tin and detinned billets.

The Thermit department will continue the production and sale of Thermit welding materials and apparatus as well as the various carbon-free metals and alloys which are produced by the aluminothermic process. This process was introduced in the United States in 1902. Since then the business has grown very fast, particularly in recent years. In addition to its line of carbon-free metals and alloys, the company produces pure tungsten powder and is also selling agent for the output of a large plant in the Middle West producing 50 per cent electric furnace ferro-silicon.

The Thermit welding process is well known in the electric and steam railroad fields for welding heavy broken parts as well as for welding rail joints in paved streets. In fact, in the railway and steel industry alone more than 1,000,000 lb. of Thermit is used annually.

The Metal & Thermit Corporation operates four different plants, located respectively in Jersey City; Chrome, N. J.; Wyandotte, Mich., and East Chicago, Ind. The Chrome and East Chicago plants are devoted to the detinning industry; the Wyandotte plant to the production of liquid chlorine, and the Jersey City plant to the Thermit products, including welding materials, carbon-free metals and alloys and pure tungsten powder. The corporation operates branch offices and welding shops in Pittsburgh, Chicago, San Francisco and Toronto.

The following are the officers and directors: W. T. Graham, Edgar L. Marston, Daniel G. Reid, F. S. Wheeler, Hubert E. Rogers, F. H. Hirschland, E. L. Ballard, L. A. Welles, Chas. F. Dane, Philip Gensheimer and Fred W. Cohen.

Sale of Overhead Material Restricted by Conditions

Price Changes Not Recent—Shipments and Deliveries Are Held Up by Freight Embargoes

With electric railways confining their purchases to immediate requirements, manufacturers, distributors and sales agents of overhead material and accessories do not say business is reflecting any marked degree of activity. More or less buying is mentioned, but apparently to replace either breakages or maintain the equipment at passable if not 100 per cent efficiency. With the placing of a recent order for new rolling stock and extension equipment through the Emergency Fleet Corporation that opened up a vista of promise, the hope was entertained that possibly similar requisitions may come along to supply deficiencies in traction roads furnishing transportation to other shipyards, or large manufacturing enterprises engaged in the production of war material. In this instance the wish was father to the thought which the overhead material man regarded as a part solution of the buyingless capacity of so many electric railway companies in all sections of the country.

Aside from this rather fanciful idea the sale of overhead material is curtailed by natural conditions. The demand for second-hand cars and adaptable equipment is still a factor in the market. Wire manufacturers and distributors, while having the full capacity of their plants engaged, declare the government is taking the greater portion of the output. Their sales of bare wire—waterproof, rubber covered and cable—to the electric roads is on a low level, and they figure only as maintenance and replacements. Prices are the same and deliveries have not improved.

A manufacturer of wire and cable connections informed the ELECTRIC RAILWAY JOURNAL that the demand for the past year was unusually heavy, a great part of which was for central station work, due to unusual expansion to meet extraordinary industrial needs. Three-quarters of the company's facilities were devoted to government requirements. No change had been made in the price in a year, so far as these particular products were affected. Shipments were met promptly; that, is, three or four weeks back, but deliveries was another question, in which the embargoes controlled.

Poles and line material had been subject to no late changes, respecting either price or deliveries. A distributor with many connections and a wide

field of operations which handles quantities of wire related as an illustration of the obstacles encountered in making deliveries a late occurrence, where a Connecticut manufacturer had a shipment of 600 lbs. of wire going to a Pennsylvania customer. The railroad refused to accept but 500 lbs. and the shipper was compelled to cut the lot in two so the goods would comply with what seemed an arbitrary regulation and go forward.

Cross-arms and other line material also remained unchanged in price. Everything had been frozen up and it was difficult to get shipments of goods through. Line wiring devices were likewise in the same position. With the arrival of more favorable weather possibly conditions would greatly improve. A manufacturer of line splicers stated that, from his own experience and what he learned from others making these specialties, there was no great demand just at present. There were no price revisions, and deliveries depended materially upon the strictures of embargoes and who the buyer was.

Glass insulators are spoken of as in none too ample supply. Prices have been moving upward steadily from time to time, the last of 15 per cent jump being sent out about the first of the year. One of the manufacturers declined to be quoted on the situation. He admitted his works were in about the same place as other manufacturers so far as fuel and labor were considered, and he was simply awaiting developments. Line men's tools, or devices or kits are not selling any more freely than for some time past.

Date Your Catalogs

American Chamber of Commerce, Paris, France, desires to bring to the attention of American manufacturers who are sending copies of their catalogs to France the advisability of printing on such catalogs the date of their issuance. While catalogs sent to chambers of commerce and consulates are stamped with the date of their receipt and therefore an approximation of when they were issued is possible, if a business house or other recipient does not so stamp an incoming catalog there is a great chance of confusion of dates, with consequent misunderstandings between the foreign buyer and the American seller as to price, patterns, etc.

Rolling Stock

Toronto & York Radial Railway, Toronto, Ont., Can., lost six interurban cars on Feb. 5 in a fire which destroyed the company's Metropolitan division carhouse.

International Railway, Buffalo, N. Y., had four cars destroyed by fire on Feb. 6. Three of the cars caught fire in the Cold Spring barns at Main Street and Michigan Avenue and were burned, with a loss estimated at \$15,000, and the fourth car caught fire while being operated in Hertel Avenue and was destroyed with a loss estimated at \$4,500. These four cars are in addition to the forty-eight cars recently lost in the destruction of the Forest Avenue carhouse.

Southern Public Utilities Company, Charlotte, N. C., it is reported, has purchased two second-hand cars from the Waycross Street & Suburban Railway, Waycross, Ga., which will be converted into the one-man type. The work is being done in the company's shops at North Anderson, S. C.

Illinois Traction System, Peoria, Ill., is reported to have ordered sixteen electric locomotives for handling freight trains exclusively. The engines are said to be of a new type, far heavier and more powerful than those now in use, which draw from twenty to thirty cars. Mention was made in the ELECTRIC RAILWAY JOURNAL of June 2, 1917, of the traction company ordering six locomotives. The company's freight traffic has been growing rapidly.

Trade Notes

Crocker-Wheeler Company, Ampere, N. J., announces that Ben D. Christian and D. B. Graze will hereafter represent it on the selling staff at Cleveland, Ohio, succeeding Howard Dingle and W. W. Clark.

Standard Electric & Elevator Company, Inc., Baltimore, Md., has been reorganized and is offering \$100,000 of 7 per cent accumulative preference stock for public subscription. The money realized through this stock issue

is to be applied to the development of the company's physical facilities necessary to present demands.

W. G. Arthur Reid has been appointed general manager of the Bryan-Marsh branch of the National Lamp Works of the General Electric Company, centering at Detroit, Mich. This will be a separate division.

Burton French, who has been associated with the Insull organizations in Chicago for the last eighteen years, has opened an office at 492 Continental and Commercial National Bank Building, as a consulting engineer, to engage in the preparation of appraisals, examinations, investigations and reports upon public utility properties for financing and operation.

New York Municipal Railway Corporation, Brooklyn, N. Y., has installed twenty Johnson fare boxes on its subway system, and ten more have been ordered from the National Railway Appliance Company, Eastern agents for the Johnson Fare Box Company, Chicago, Ill.

Boston Insulated Wire & Cable Company, Hamilton, Ont., has been chartered with a capital stock of \$200,000 to manufacture cables, wire, etc. The incorporators are: Benjamin T. Burley of Worcester, Mass.; Harry B. Burley of Brookline, Mass.; Grant W. Arnold of Hamilton and others.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has just established permanent offices at 627 Plymouth Building, Minneapolis, Minn., to serve the north central States and Canadian trade. Richard K. Papin, formerly the St. Louis and Southwestern representative of the Davenport Locomotive Works, and for ten years manager of the Zelnicker company's equipment department, is in charge.

Esterline Company, Indianapolis, Ind., announces the appointment of the F. R. Jennings Company, 616 Ford Building, Detroit, Mich., as its sales representative for graphic instruments for Michigan. Mr. Jennings will handle that entire State for the Esterline Company, with the exception of the northern peninsula, which is taken care of by the Milwaukee office.

Electrical Engineers' Equipment Company, Chicago, Ill., announces the

removal of its general offices and a portion of the manufacturing departments to 710-714 West Madison Street. This new location is directly opposite the company's present quarters at 711-715 West Meridian Street. The major portion of the factory proper, together with the shipping and stock departments, will remain at the latter address, which is connected to the Madison Street building by means of a run-way.

New Advertising Literature

Automatic Ventilator Company, New York, N. Y.: Calendar with European war map to date, flags of the ally nations in correct colors and illustrations of the company's chief products.

Roller-Smith Company, New York, N. Y.: Bulletin No. 500 covering "Enclosed Type Plain No-Voltage Circuit Breakers," the particular application of which is therein described, with accompanying illustrations.

Browning Company, Cleveland, Ohio: Illustrated pamphlet—a fine example of typography—entitled "Browning Buckets"—the "buckets that bite." It is claimed there is no operating condition with which they are not thoroughly familiar.

Baldwin Locomotive Works, Philadelphia, Pa.: The company is distributing record No. 88, descriptive of their Santa Fe type locomotives. They have also prepared record No. 89, descriptive of the development of the eight-driving-wheel locomotive.

Ohio Brass Company, Mansfield, Ohio: Illustrated cardboard folder entitled "Basing Selections on Conditions," describing the company's line of Crouse-Hinds' Imperial headlights—Incandescent, luminous (electrode) arcs and carbon arcs—for which it is general sales agent.

National Lamp Works of General Electric Company: Bulletin entitled "Fundamentals of Illumination Design," which the engineering department of the company has presented, in simple and readable language, a discussion of the broad principles which underlie illuminating engineering practice.

RAILWAY MATERIALS

	Feb. 6	Feb. 30
Rubber-covered wire base, New York, cents per lb.	30-32	30
Wire, weatherproof (100 lb. lots) cents per lb., New York	28 1/4-34 1/4	28 1/4-34 1/4
Wire, weatherproof (100 lb. lots), cents per lb., Chicago	38.35	33 1/2-38.35
Rails, heavy, Bessemer, Pittsburgh	\$55.00	\$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	\$57.00	\$57.00
Wire nails, Pittsburgh, per 100 lb.	\$3.50	\$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	\$3.90	\$3.90
Steel bars, Pittsburgh, per 100 lb.	\$5.00	\$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	\$5.80	\$5.80
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	\$4.85	\$4.85
Galvanized barbed wire, Pittsburgh, cents per lb.	\$4.35	\$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	\$3.95	\$3.95
Cement (carload lots), New York, per bbl.	\$2.25	\$2.25
Cement (carload lots), Chicago, per bbl.	\$2.31	\$2.31
Cement (carload lots), Seattle, per bbl.	\$2.65	\$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	\$1.31	\$1.31
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	\$1.32	\$1.32
White lead (100 lb. keg), New York, cents per lb.	10	10
Turpentine (bbl. lots), New York, cents per gal.	49	48 1/2

NEW YORK METAL MARKET PRICES

	Feb. 6	Feb. 13
Copper, ingots, cents per lb.	23 1/2	23 1/2
Copper wire base, cents per lb.	27	27
Lead, cents per lb.	7	7
Nickel, cents per lb.	50	50
Spelter, cents per lb.	7.87 1/2	8
Tin, Straits, cents per lb.	*85.00	*85.00
Aluminum, 98 to 99 per cent, cents per lb.	34-36	34-36

OLD METAL PRICES—NEW YORK

	Feb. 6	Feb. 13
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19 1/2	19 1/2
Red brass, cents per lb.	17 1/2	17 1/2
Yellow brass, cents per lb.	13	13
Lead, heavy, cents per lb.	5 1/2	6
Zinc, cents per lb.	5 1/2	5 1/2
Steel car axles, Chicago, per net ton	\$42.42	\$42.42
Old carwheels, Chicago, per gross ton	\$30.00	\$30.00
Steel rails (scrap), Chicago, per gross ton	\$35.00	\$35.00
Steel rails (relaying), Chicago, per gross ton	\$60.00	\$60.00
Machine shop turnings, Chicago, per net ton	\$17.00	\$17.00