

Electric Railway Journal

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HIGHER FARES ARE NOW NECESSARY

"How do the public service corporations manage to maintain the old prices when the ice man, the coal dealer, the dairy man, the doctor, lawyer, merchant and chief all are boosting the prices of their own wares?" In the face of the admitted increase in public utility expenses, it is no wonder that the *St. Joseph (Mo.) Gazette* recently asked editorially the foregoing question. The paper did not present any answer, but only one would have been possible. Continuously rising costs, with prices rigidly fixed, can be met only by forcing economies beyond the demands of efficiency and suppressing development below the demands of the public. That is how the electric railway industry has been able up to this time to continue operation under the old price of a nickel. But with all costs still on the upward march, a limit has been reached, and the present seems logically the time to increase fares. The issue came to the front in New York this week through publication that at least one electric railway company in New York City had held informal discussions with the Public Service Commission, First District, in regard to higher fares and also through an address on the subject by President Loree to the stockholders of the Delaware & Hudson Company at the annual meeting of that corporation. In this address Mr. Loree, in referring to the situation on the trolley roads owned by that company, said that an abolition of the pavement charges would help greatly, but he also suggested as the two main methods of increasing revenue, a charge for transfers, and a 6-cent fare. We are inclined to favor the last-named method as a general solution, for we feel that the popular idea of having the nickel as a fare limit should be thoroughly killed. The problem is big, and it demands a big solution.

WOMEN CONDUCTORS A POSSIBILITY?

Even if we had not the experience of Canada as well as of the European countries to guide us, it would be possible to say with certainty that, if the United States Government is ever able to stop talking and get the country on a war footing, a distinct shortage of labor will confront the electric railway industry. To meet this the most obvious possibility in the train service seems now to be the employment of women conductors. Clearly enough, the plan, according to experience in Great Britain, is practical and, as a means for releasing men for other services in case that necessity arises, is unquestionably effective. Of course there are difficulties in the way, such as the conservatism of the public and the necessary reorganization of the service and operating practice to make provision for woman's

inferior strength and endurance. Nevertheless, this latter feature is not of great import where modern prepayment features and fully-inclosed vestibules are installed on the cars, and since opposition to such a change cannot be insurmountable where a real need for it exists, we feel that the experiment might well be tried out where existing circumstances permit a reasonable chance for its success. Certainly the conductor on a modern car is little more than a change clerk, and it seems only logical that women, whose adaptability for this kind of work has been amply demonstrated in other businesses, should be employed for the purpose by electric railways.

TRUCK GARDENS ON RIGHT-OF-WAY INVOLVE RISK

In the present general movement to lease out railway right-of-way for truck gardening purposes, certain risks are involved which should be guarded against by the companies granting the lease right. Basically, the movement is a most commendable one and in harmony with the war-made necessity for increasing our production of foodstuffs. The railways are doing well to grant this privilege with as few restrictions as practicable. However, the practice does tend to reduce the railway's control of its right-of-way, since it encourages trespassing—an always dangerous and wisely-prohibited act. Hence, while we believe in railways acting in accord with patriotic incentive, they should also protect themselves against the possibility of any resulting serious accidents which would incur a liability to the company and a loss to the community entirely incommensurate with the good to be gained. Precaution should be made against this danger by a clause, prominently inserted in the lease, calling attention to the risks involved by proximity to railway track and absolving the company from responsibility should the lessee meet with personal injury or property damage in the course of his agricultural pursuits. In addition it would be well to follow the example of those railways which have required that no corn or high-growing plants shall be permitted at any point where the view of motormen might be obscured and that no children be permitted to attend gardens located along the right-of-way. With these precautions there is nothing particularly radical about the procedure. It has been in use for a number of years by electric railways on the Pacific Coast, notably in the fertile Sacramento Valley, where the plan of leasing sections of the right-of-way at a nominal rental to farmers along the line was adopted as a substitute for planting grass to keep down dust or unsightly growths of weeds, and here it seems to have worked out satisfactorily to all concerned.

THE REAL AMERICAN AUTOCRACY

We had to smile at the ridiculous analogy which the *New Republic*, in its issue of April 28, drew between the European War and the recent street railway strike in Washington, D. C. In its opinion, the supremacy of autocracy or democracy was the issue in the capital city, as it is in the present world conflict. You wonder how! Listen. The Washington Railway & Electric Company, confronted with a demand from its Amalgamated Association employees for a "closed shop," dared so far forget American democratic principles as to offer attractive individual contracts to its loyal employees. This awful display of autocratic power, which has resulted in normal operation under a partly new but wholly satisfied organization, is "an outrage," it is said, "a vital blow to the future of industrial democracy."

Now, liberty and democracy are glorious words, but we insist that they ought not to be used to justify the unbridled license which destroys freedom—in other words, that license which robs some of their freedom to use their capital in a legitimate business enterprise; others of their freedom to ride at their convenience on a public carrier, and still others of their freedom to work and make individual contracts. There are many people in this country who do not yet fully realize that individual liberty does not mean liberty to tyrannize over others. Labor leaders especially are blind to the fact that others have rights as well as themselves, and some of them, with the arrogance that betrays the real autocratic leader, have loudly insisted that they belong to a privileged class. Yet all such penny imitators of the Kaiser may well pause and ponder, for world events now show, as never before, that privileged classes must go.

The *New Republic* alleges that the power of the Washington company to enforce its autocratic will against its disorganized employees is absolute, "for any attempt at collective action on the part of the men, for the redress of any grievance whatsoever, would not only make them liable to immediate discharge for insubordination, but would also expose them to legal prosecution." The fact is, however, that the individual agreement signed by the Washington employees provides for an "open-shop" and for the presentation of grievances on stated days to the superintendent, with an appeal to the president and finally to the Public Service Commission. The matter of discharges can also be carried up similarly to the commission for final determination. The only restrictions are that the men shall present complaints in person or through a committee of employees, and that there shall be no strike action, although single employees may leave the service peaceably.

These provisions constitute no attack upon personal freedom in so far as it is compatible with public welfare. The company retains the right of discipline, which is necessary for efficient operation. On the other hand, the employees are protected from discharge without cause; they can approach the company collectively, through their own committees, and they can seek other

employment, if they as individuals so desire. But, and to the *New Republic* this seems the unpardonable sin—they agree not to suspend service collectively in disregard of the paramount public interest.

"For the sake of decent and harmonious industrial relationships, which have such critical importance to the nation at this time," to use the magazine's own words, we hope that our contemporary will read the Adamson decision and then devote a little energy toward helping labor to see that it is part of the public, and not *vice versa*. We do not look upon the individual working agreement as a perfect instrument for bringing industrial peace, but it is useful means to a worthy end. For it is quite possible that its wider use may put labor in a more receptive mood for wage fixing by scientific methods rather than by brute force.

SELECTING LINE INSULATORS

As line voltages have increased with the development of electrical transmission the insulator has been the element of greatest weakness and has, therefore, been the cause of greatest anxiety on the part of manufacturers and operators. The end is not yet in sight, either, but progress is being made. The "liveness" of the subject is indicated by the attention being given to it by the electrical engineers. A whole session of the coming convention of the A. I. E. E., to be held at Hot Springs, Ark., will be devoted to four papers on high-tension insulators and the accompanying discussion. Two of these appear in the May issue of the *Proceedings*, and show clearly what the present problems are in general and in detail. An important paper on insulator testing was read at the December meeting of the same association.

In the pioneer days of power transmission development selecting line insulators was very much like buying hats at a cross-roads general store. If the desired style and size were available everyone was happy. If not, the purchaser did the next best thing and took what he could get. The selection was perforce easy. Since that time, however, the duty of the insulator has been made the subject of scientific investigation, and equally careful studies have been made as to the methods of selecting the proper type of insulator for a given duty. Tests have been devised for the purpose of detecting faulty parts while the insulator is in process of manufacture and also for the purpose of determining the relative efficiency of different types or designs. Various technical societies have done notable work both in carrying on active investigations and in securing the co-operation of experts in the insulator field. They have proposed standard specifications which are valuable as a guide in the selection of new insulators for a given service.

The selection problem, as it interests the electric railways, is to a great extent that of selecting new insulators for replacing broken down or otherwise defective ones. While not as simple as it once was, the whole process has been placed upon a more scientific basis, and properly selected new insulators should give much

better service than did the old ones which they replace. The selection process itself, in most cases, is somewhat simplified by the fact that the line supports admit of the use only of the pin-type insulator. With the physical and electrical characteristics of the line known the mechanical and electrical stresses which the insulators must withstand can be pretty definitely predetermined. Climatic conditions usually have much to do with the choice of petticoat shapes. With these conditions known, and the desired electrical and mechanical characteristics either calculated or determined by actual test, the final process in the problem is the mating of these requirements with a commercial type of insulator. The very complete data furnished nowadays by reputable insulator manufacturers relative to their various types of insulators greatly facilitate the mating process.

In making replacements there seems to be considerable tendency to use better insulators than were those being replaced. It is quite true that the promiscuous mixing of the newer and stronger insulators with the older ones may hasten the retirement of the latter. Despite this fact, however, we believe that the policy of using a higher grade of insulators for replacement work is, at least as far as the older types are concerned, a good one, for on a live railway both the duty imposed on insulators and the demands as regards standards of service are increasing.

RETIRING THE VETERAN POWER PLANTS

We are giving a prominent position and much space in this issue to a new power plant of small immediate size because it is typical of the metamorphosis through which the power plant, considered as a species, is going at the present time. The old-time, slow-going but sturdy engine is giving place to the humming turbine, much to the benefit of the coal pile. At the same time improved condensers, boilers, furnaces and auxiliaries are being substituted for less efficient types, while labor-eliminating devices are producing savings commensurate with those accomplished along the lines of fuel and water saving. All of these things are illustrated in the New Haven plant under discussion this week.

This station is also of unusual interest as an example of what can be done in the way of rapid construction, even in times of slow delivery, when the utmost is made of available resources. So rapid has been the progress in turbine and auxiliary design that the installation of second-hand equipment is economical only under unusual conditions. In this the minimum steam consumption is about 16 lb. per kilowatt-hour whereas a modern turbine would use, say, 20 per cent less steam. To offset this difference, however, there is the lower cost of the unit and the promptness with which it could be obtained. Tests already made in the new plant indicate a unit coal consumption of about 2.5 lb. per kilowatt-hour, the coal running from 14,000 to 14,200 B.t.u. per pound. As 1 B.t.u. is the equivalent of 0.293 watt-hour this 2.5 lb. would produce from 10.2 to 10.4 kw.-hr. if there were no loss in transformation. The

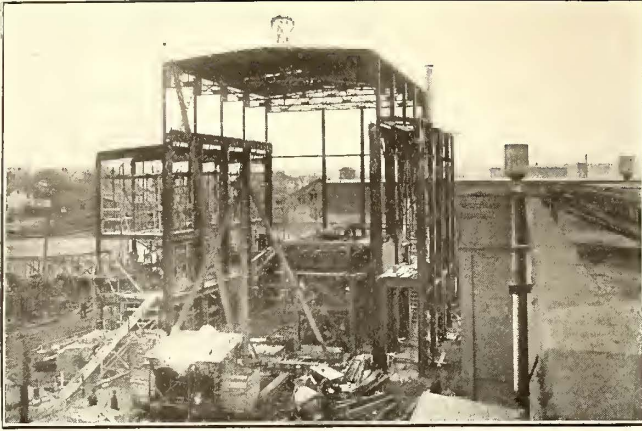
efficiency of the plant from coal pile to switchboard is, then, about $9\frac{3}{4}$ per cent, or in round numbers 10 per cent. This will be recognized as a creditable showing when one considers that the turbines and condensers are far from modern, that the generating unit is not yet economically loaded, and that the plant as a whole is new.

TACT NEEDED IN INTRODUCING ONE-MAN CARS

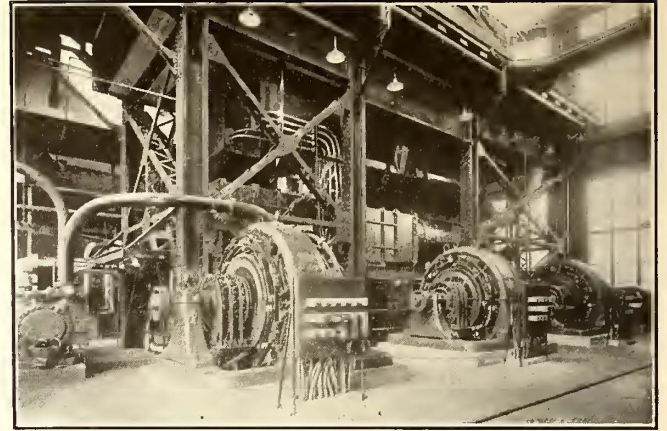
The experience of some operating companies in the introduction of one-man cars emphasizes the importance of bringing forward such equipment in a tactful way with respect to all interested parties. The design of the one-man or "safety" car, as it has well been called, appears radical to some municipal authorities and has been known to arouse an entirely unjustified opposition on the part of the public when reports have been spread abroad in the daily press that a revolution in rolling stock is under contemplation. Labor interests, too, have come forward in some cases to oppose the introduction of one-man cars on the ground that their use threatens the permanency of employment of the men on the existing transportation payroll.

Within certain fields, which are well understood by many operating men, this type of car is definitely proving its usefulness. But in such places it has been more successful when used primarily to increase the gross receipts by giving a more frequent service rather than to decrease the operating expenses through a reduction of the transportation force. For war conditions, it is true, when additional labor is difficult to obtain, the one-man car would appear to be exceptionally well adapted for moderate or light traffic routes, but in most cases the natural growth of traffic should banish fear on the part of the trainmen that their tenure of employment will be jeopardized. The situation is not unlike that in the central station field when the tungsten lamp first made its appearance in that the new product greatly increased the popularity of electric service in competition with older forms of illumination and resulted in a largely increased use, despite the early and ungrounded fears of some central station managers that only the same amount of light would be used.

Since the exact field of usefulness of the one-man car on many properties must be demonstrated by experience, the installation of such units in small groups without elaborate advance publicity appears a wise policy. Many critics of the one-man car have never seen it in service, much less ridden in one. To acquaint the public officials with actual service performance in neighboring cities or towns will prove helpful through personal demonstration when such a course is feasible, as thereby opposition will be disarmed well in advance of the appearance of a few trial units on the streets. Such opposition may be aroused by present hostility based upon entirely mistaken notions that the introduction of the new service means less service for the public. Let the one-man car tactfully feel its way, and we are convinced that it will become increasingly popular in the field of its economic usefulness.



CONNECTICUT COMPANY POWER PLANT—CONSTRUCTION VIEW SHOWING FRAMING OF BUILDING AND TURBINE FOUNDATION



CONNECTICUT COMPANY POWER PLANT—VIEW IN TURBINE ROOM SHOWING TURBINE SUPPORT, CONDENSERS AND ROTARY CONVERTERS

Connecticut Company's Power Plant

The New Grand Avenue Plant Is Being Superimposed on the Old One Without Interruption to Service—The Design Has Been Complicated by Market Conditions Which Have Made Necessary the Adaptation of Some Second-Hand Equipment

FINDING itself short of power, particularly for the needs of the New Haven division at the moment, the Connecticut Company decided a year or more ago to remodel its Grand Avenue steam plant in New Haven. It would be more accurate to say that it was decided to retire the old plant as rapidly as possible, substituting for it one of modern design and using only such of the existing equipment as was strictly modern. As the engineering staff of the company was fully occupied with its operating problems, unduly heavy on account of the extra traffic due to the munitions business in its territory, the J. G. White Engineering Corporation was called in to design and supervise the construction of the first unit of the new plant. The design and construction were pushed rapidly during the summer, fall and winter, and the work is now practically completed.

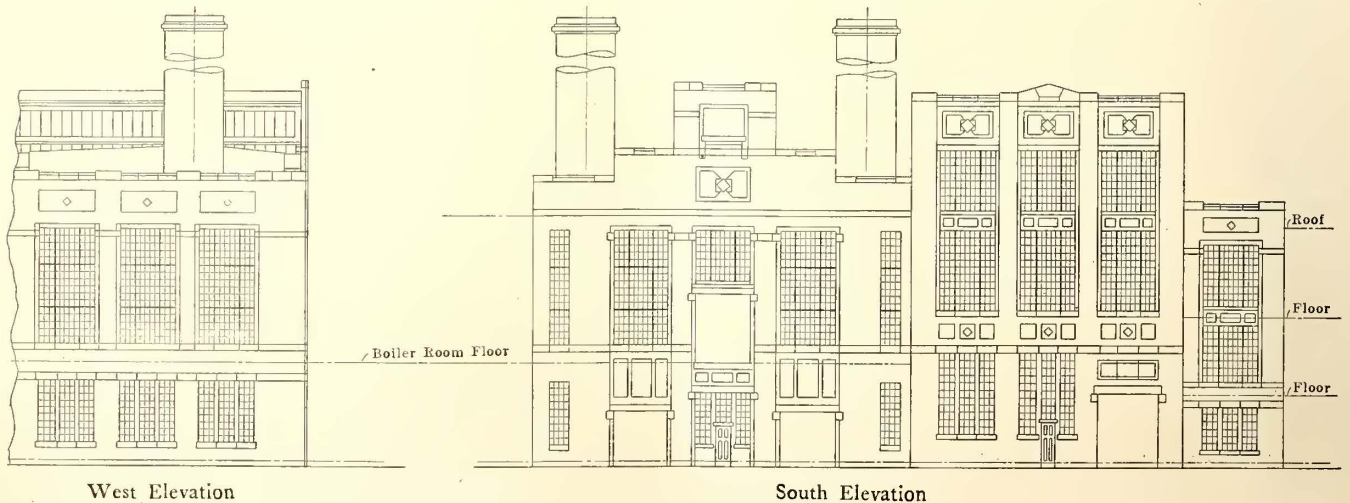
SOME SECOND-HAND EQUIPMENT HAD TO BE USED

On account of market conditions it was necessary to purchase some second-hand equipment and to work this into the scheme so that eventually it could be replaced

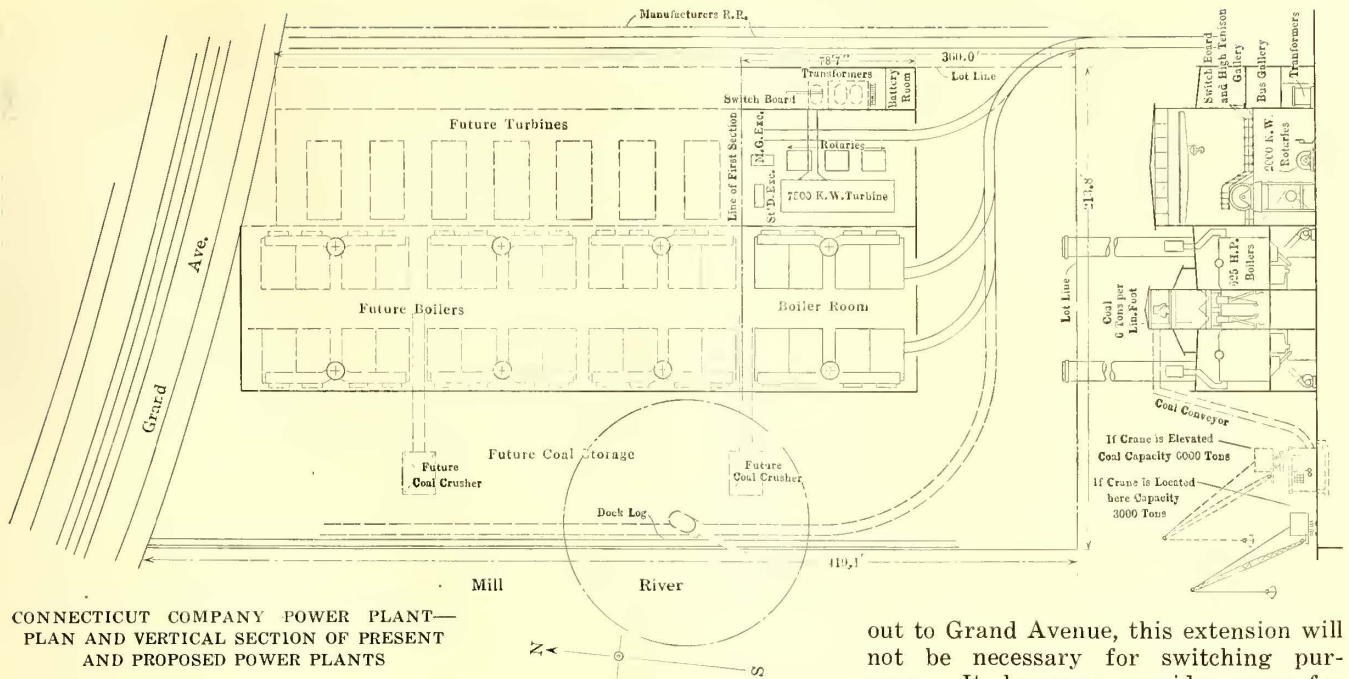
with larger and more modern apparatus without interfering with the logical development of the plant. While providing for immediate power requirements, the new plant was designed as one section of a power station of 100,000-kw. capacity or more, laid out economically to use the entire available site. The layout of the complete plant as tentatively outlined is shown in an accompanying simplified drawing, on which the first unit is indicated by solid lines. To avoid confusion the parts of the original plant which will be retained for the present are omitted. The earlier plant formed the basis of an illustrated article in the issue of the ELECTRIC RAILWAY JOURNAL for March 3, 1906, page 338. At that time it had been in operation for about twelve years, but since the article was published there have been some additions to the equipment, particularly in the boiler room. In the present article, however, attention will be focussed on the new part of the plant.

THE COMPANY IS LOOKING TO THE FUTURE

In a study of this plant, as projected and as already completed, it must be borne in mind that the problem



CONNECTICUT COMPANY POWER PLANT—ELEVATIONS OF BUILDING, SHOWING GENERAL ARCHITECTURAL TREATMENT OF DETAILS



CONNECTICUT COMPANY POWER PLANT—
PLAN AND VERTICAL SECTION OF PRESENT
AND PROPOSED POWER PLANTS

was to provide an immediate power supply, and at the same time to allow for future expansion at minimum expense. The first unit was also to contain a substation for local demands for direct current. The ultimate plant, of course, will furnish power over a large territory, so that the first unit was designed to tie in with a general distribution and generating system.

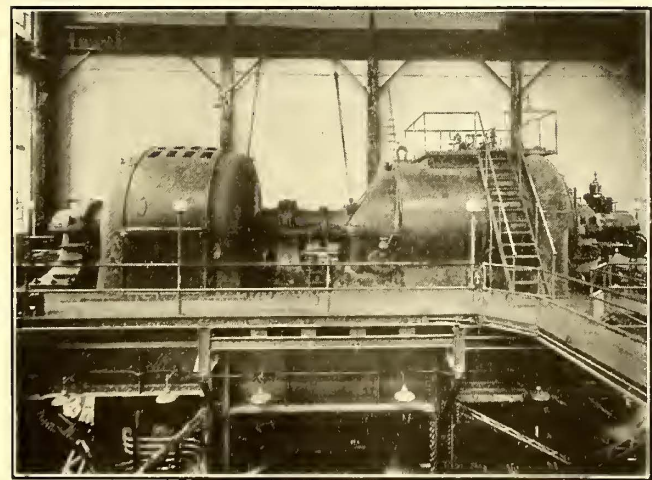
The proposed complete plant layout shows the first unit to differ considerably in plan from those which are to follow. The reasons for this are as follows: The second-hand 7500-kw. Westinghouse turbine purchased for this unit is longer than more modern turbines even of much greater capacity; hence it was placed lengthwise with the building. It was considered probable, also, that it would be desirable to replace this machine with a 30,000-kw. unit as local demands for power increased, and the supporting structure was designed to this end. Further, the longitudinal arrangement of the turbine provided a convenient spacing of the rotary converters, which will not be required in the later units. This arrangement of turbine and rotaries permitted the laying of a railroad track into and through the turbine room, greatly facilitating construction and repair. The switchboard bay containing three galleries is a feature of the first unit, and, while the plan shows it extended

out to Grand Avenue, this extension will not be necessary for switching purposes. It, however, provides space for larger turbines than those shown in case changes in plan make the use of such turbines desirable, and for transformers which may be required for stepping up the voltage for power transmission to distant points.

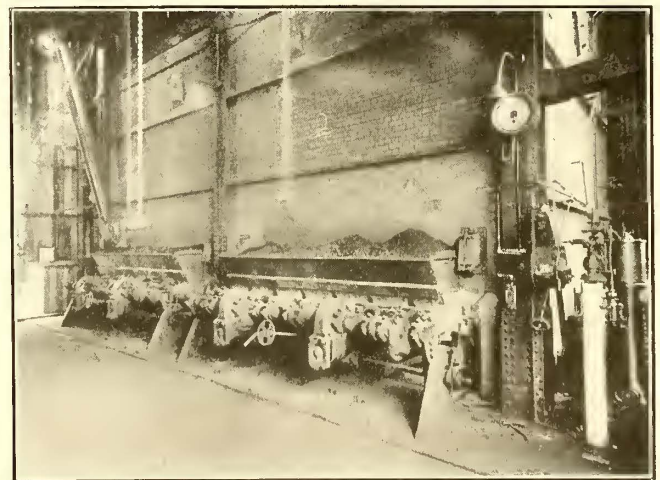
ACCESSIBILITY IS CONSPICUOUS IN THE
TURBINE ROOM

On entering the turbine room one is struck by the location of the turbine high in the air, its base being 27 ft. above the floor. It was so located to permit all accessories to be practically above floor level, and to provide space for a much larger future condenser. The steel turbine foundation consists of an eight-column, diagonally braced frame carrying deep plate girders at the top. It is strong enough for a modern 30,000-kw. unit. This, of course, would not be proportionately heavier than the present 7500-kw., 25-cycle, 750-r.p.m. machine, which weighs about 715,000 lb., as it would be of higher speed and modern design. The turbine is now running on its elevated support with very little vibration, which is least at heaviest load.

A walkway around the base of the machine is bracket supported and floored with checkered steel plate. It connects by a bridge with the switchboard gallery and will ultimately join on the same level the walkway around



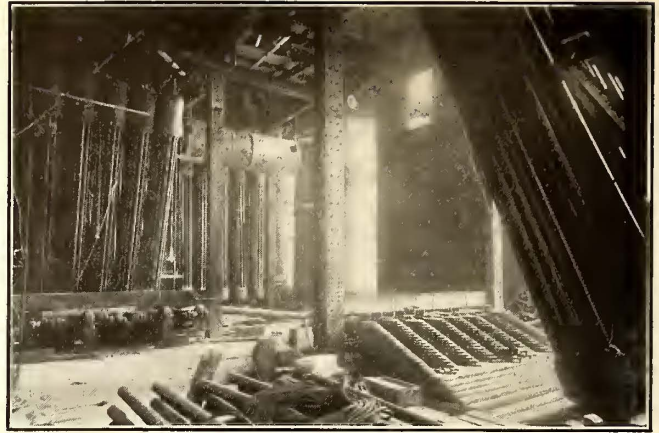
CONNECTICUT COMPANY POWER PLANT—7500-KW. TURBINE AND GENERATOR



CONNECTICUT COMPANY POWER PLANT—BOILER FRONTS WITH STOKERS AND SPOUT LEADING FROM WEIGHING LARRY

the contiguous turbine unit. The bridge was made removable to provide clearance in moving heavy pieces. In the turbine room is a 50-ton, motor operated Shaw crane, powerful enough to handle any part of the present or prospective equipment safely and expeditiously.

At present two condensers are used for the one turbine, a temporary expedient due to the impossibility of obtaining a single condenser in reasonable time. Both condensers are of the surface type, Worthington make, one



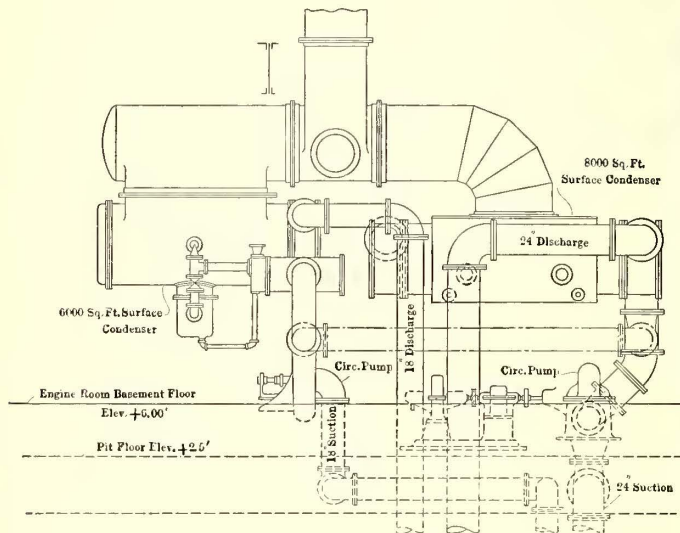
CONNECTICUT COMPANY POWER PLANT—CONSTRUCTION VIEW IN BOILER ROOM

the piles, as they are continuously below tide water. In other parts of the building Raymond concrete piles are used wherever the piles project above low-water level.

BOILER ACCESSORIES ARE LARGELY IN THE TURBINE ROOM

In space projecting under the boiler room and opening into the turbine room are located most of the turbine and boiler auxiliaries, including the two steam-driven stoker fans, the feed-water heaters, the dry vacuum pump and the boiler feed pumps. This arrangement places all of the steam machinery of the plant together and within easy reach of the turbine-room attendants. The boiler-room auxiliaries are thus away from the dust of the boiler room, and can have better attention than would be possible otherwise. At the same time these auxiliaries are as close to the boilers as they could well be placed. The feed-water heaters mentioned above are of National make, two in number, each large enough for the present plant capacity. They are equipped with Bailey V-notch meters, which with the coal-weighing larry, referred to later, permit the keeping of accurate boiler-room records.

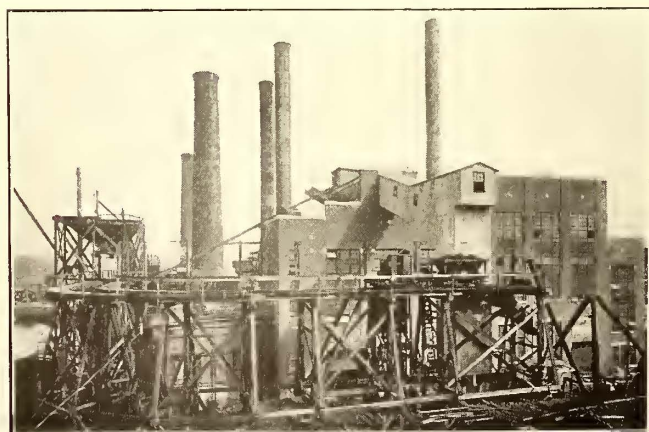
The boiler section of the new plant contains eight



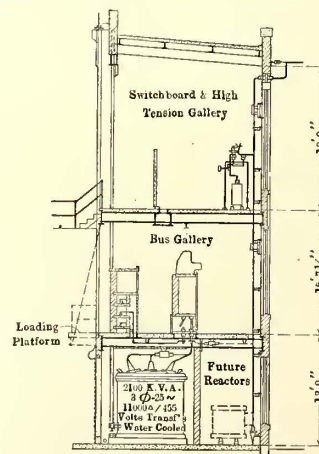
CONNECTICUT COMPANY POWER PLANT—ELEVATION OF CONDENSERS AND PIPING

having 8000 sq. ft. and the other 6000 sq. ft. of condensing surface. A drawing is reproduced to show how the piping arrangements were worked out for this unusual case. Like the turbine, the condensers were purchased second hand. The larger one was originally a four-pass base condenser and it was changed to two-pass; the other was of the side-bottom inlet type, but in adapting it to the present location the shell was turned, making a side-top arrangement. The exhaust connections were made of steel plate because cast iron could not be procured in reasonable time.

The turbine foundation rests upon the 2-ft. wall of the intake-discharge tunnel structure, which is 16 ft. wide outside. This structure provides a 6-ft. x 12-ft. discharge tunnel above and an intake tunnel of the same size below. It in turn rests on a pile-supported, heavy concrete cap. The soil is light in texture and is saturated with water below tide level, necessitating unusual substantial footings. In this case wood is used for



CONNECTICUT COMPANY POWER PLANT—SOUTH AND WEST SIDES OF BUILDING, SHOWING TEMPORARY COAL-HANDLING EQUIPMENT



CONNECTICUT COMPANY POWER PLANT—CROSS-SECTION OF TRANSFORMER AND CONTROL GALLERIES IN TURBINE ROOM

Hornsby-Biglow boilers, set high enough above ground level to permit railroad cars to be pushed directly under the ash hoppers. The boilers are rated at 625 hp. and they are furnished with Taylor stokers to permit forcing to 250 per cent of rating. In each is a superheater of a size to produce 100 deg. Fahr. superheat at maximum load. Air is furnished by the two steam-driven blowers already mentioned and a motor-driven

one on the side of the boiler house away from the turbine room. A cross-section of the boiler room is reproduced, which, with the accompanying halftones, will serve to show its salient features.

The stokers have the new steam-operated dumping plates by means of which the ashes can be dumped in a half minute or less, without affecting the boiler pressure. The plates are controlled by levers at the side of the boiler, so placed that a full view of the dump plates can be had during the dumping operation if this is desired.

For the present the steel stacks of the old plant are being used, but each battery of four boilers will eventually have its own steel stack, of 13 ft. 8 in. internal diameter, the flue diameter inside the brick lining being 9 ft. 10 in. These with the flue breechings will rest on the roof, with risers from each boiler passing upward through the roof.

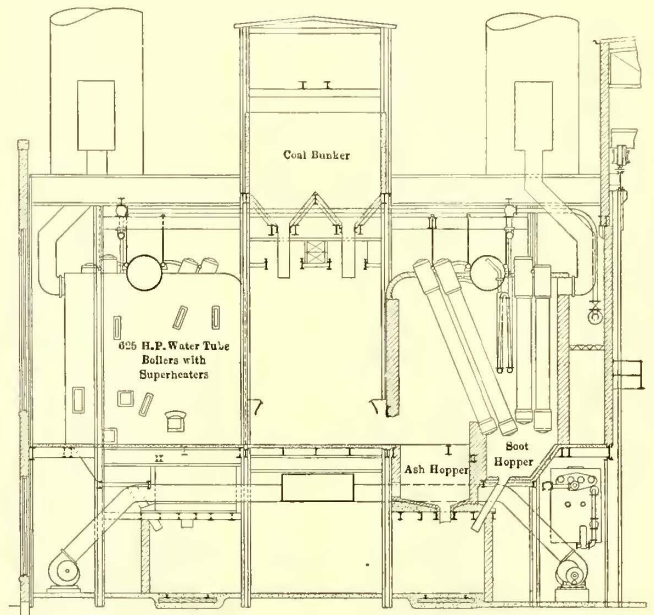
PRESENT AND FUTURE PROVISIONS FOR COAL HANDLING

The coal and ashes handling problem in this plant is a comparatively simple one, owing to the ideal location of the site with respect to steam railroad and water connections. The details of this matter for the complete plant have not yet been worked out, but suggested plans are shown in the drawing first referred to. That shows a locomotive crane traveling on a track along the Mill River dock, either skirting the edge of a storage pile to occupy the space between the power house and the dock, or on an elevated structure above the storage space. The track will connect with the Manufacturers' Railroad, which in turn furnishes connection with the New Haven Railroad. Eventually there will probably be two elevator conveyors which will take the coal from storage to the overhead bunkers.

For some time, however, the very satisfactory, although temporary, coal-handling equipment which appears in one of the accompanying halftones will continue to be used. It consists of a short and considerably elevated track on a light timber trestle connecting a point on the dock with one opposite the end of the boiler room. At the dock end is an elevated hopper served with a derrick by means of which coal is transferred to it from the barges. A coal car of design special for this work has been built, as has also a simple electric locomotive

for use in carrying the coal from the overhead hopper to a conveyor, which distributes it to the boiler room bunkers.

These bunkers are designed for 6 tons of coal per foot of length, the total capacity being 450 tons for the

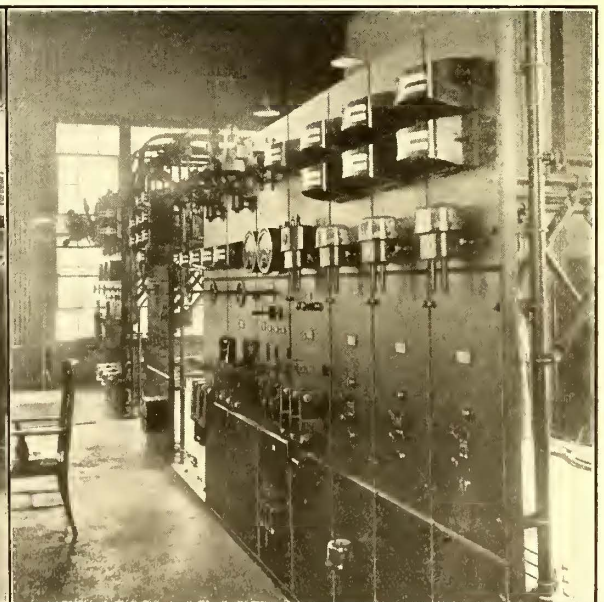


CONNECTICUT COMPANY POWER PLANT—CROSS-SECTION OF BOILER HOUSE

original eight boilers. Below them is a traveling weighing larry from which the coal is spouted to the stoker hoppers.

ELECTRICAL EQUIPMENT IS PRACTICALLY STANDARD

The interesting features of the electrical end of the new plant are shown in a cross-section of the gallery side of the turbine room. On the ground floor is a row of three three-phase, 11,000:445-volt, water-cooled transformers, behind which will later be placed a set of reactance coils (one of which is shown in dash lines in the drawing). Immediately over the transformers at the front are the compartments containing the flat busbars, and at the rear the motor-operated oil switches. These



CONNECTICUT COMPANY POWER PLANT—OIL SWITCH AND BUSBAR COMPARTMENTS ON MIDDLE GALLERY—ALTERNATING-CURRENT AND DIRECT-CURRENT OPERATING PANELS ON TOP GALLERY IN TURBINE ROOM

Principles in Computing Depreciation of Plant

British Engineers Prefer Sinking-Fund to Straight-Line Method—Summary of the Conclusions Reached by the Authors

A RECENT issue of the *Journal* of the Institution of Electrical Engineers contains a paper on "Principles Involved in Computing the Depreciation of Plant," by F. Gill and W. W. Cook. This paper is an attempt to get at a first principle sufficiently sound to be worthy of general adoption for British companies, and as such will be of interest to electric railway officials in this country.

To avoid misunderstandings, the authors define "depreciation" at the outset. They interpret it as: "(1) Provision for the diminution in value of plant in place and working (that is, its loss in value to the owner as a continuing plant), by reason of causes outside his control, such as age, wear and accidents; this provision is called 'renewals.' (2) Provision to enable the owner to take plant out of commission before its physical life is exhausted in cases where, from either progress of the art or growth of the business, it is economically advisable to do so (that is, by reason of causes within his control); this provision is called 'improvements.'"

The various methods of computing depreciation charges are discussed in detail, tabular and other information being presented for each one. The following conclusions are reached:

METHODS OF COMPUTING DEPRECIATION CHARGES

"There is only one common method for the financier, the accountant, and the engineer. This common method is the best studied in the annual charges for plant, determined in advance of construction. To determine the amount in the annual charges for depreciation it is necessary to estimate the first cost, residual values, and the physical and economic lives of the various classes of plant. It is also necessary to fix the treatment of the capital account and to estimate the charge for return on capital. The interest to be earned by the reserve funds must be credited to its source.

"The reserves are preferably handled by means of two funds, as follows: (a) A renewals fund for providing the necessary money at the end of the physical life; that is, the end of the period during which the plant will give its service satisfactorily under all conditions outside the owner's control. (b) An improvements fund for providing sufficient additional money to enable the plant to be taken out of commission for reasons within the owner's control, and while it is still giving its service satisfactorily.

"The calculation of the amounts to be contributed to these two funds must include the interest which should be earned by the money before it is required at the end of the life. The amount, calculated as above, which should be in the renewals fund, gives the correct diminution in value, when considering the value to the owner, of the plant in place and working at any period in its history. The amounts, calculated as above, which should annually be put to the two funds, renewals and improvements, determine the correct depreciation charge against the undertaking for the purpose of assessing profits, fixing rates and, under certain conditions, assessing the value of an undertaking as a going concern.

"The sinking fund method fulfills all the requirements. The straight-line method does not. All estimates, such as first cost, physical and economic lives, and interest earned by funds, will require revision from time to time, either as a result of experience or of changes in conditions."

Forecast Traffic at Duluth, Minn.

Studies Reveal Influences of Precipitation, Wind, Temperature and Cloudiness on Traffic

INVESTIGATIONS undertaken at Duluth, Minn., with a hope of merely demonstrating positively that weather conditions influence passenger traffic to a greater degree than ordinarily supposed have revealed the fact that traffic may be forecast within a reasonable degree of accuracy. The methods employed and the results obtained are described by Eugene Van Cleef in the issue of the *Geological Review* for February, 1917. Duluth was selected for this study, as many people walk to and from work and because the writer was familiar with that city.

The weather during 1914 was not unusual; no strikes occurred and the "jitney" had not been developed. It was decided to base the comparisons on temperature, precipitation, wind, velocity and cloudiness. Humidity combined with excessive heat or cold winds is uncommon in the locality where the study was made and was not taken into consideration.

Average conditions for both morning and afternoon were recorded and, in the case of temperature, figures were taken at times when the traffic is heaviest, namely, 7 a. m., 12 noon, and 6 p. m. These conditions were plotted to scale and grouped according to similar days of the week. The average number of passengers for similar week days were also recorded, the year being divided into four divisions commencing with the months December-January-February. From the collected data, 100 forecasts were made covering a period from March to July, 1914, inclusive, 79 per cent of which involved an error of less than 5 per cent.

From an analytical study of the statistics and charts, the various factors assume the following order in degree of magnitude for reducing traffic: (1) Precipitation accompanied by wind; (2) precipitation alone, except light snow; (3) a considerable drop in temperature accompanied by a moderate to strong wind; (4) a strong wind, but most effective when in combination; (5) a decided drop in temperature regardless of other elements.

Projected Electric Tramway in Australia

A report by a firm of consulting engineers on the proposed electric tramway from Toorak road, South Yarra, to Clifton Hill Railway station, gave the estimated cost at \$844,298; estimated revenue, \$204,686; estimated expenditure, \$195,550, and surplus revenue over expenditure, \$9,152, according to the *Melbourne (Australia) Age*. The approximate length of track is 3.9 miles. The permanent way and overhead construction would be similar to that adopted by the Prahran-Malvern and Hawthorn tramway trusts. Power would be obtained from the Melbourne Electric Supply Company. Provision is made for ten single-truck and ten bogie cars capable of carrying forty and sixty passengers, respectively, and these would be housed at the Hawthorn Tramway Trust's depot, Hawthorn. An approximate population of 46,700 would be served by the tramway. The engineers expressed the opinion that the proposed tramway would supply a great public need, and set down the cost to each municipality as follows: Prahran, \$202,704; Richmond, \$320,543, and Collingwood, \$321,050. Among the items of estimated expenditure are: New bridge over Yarra, \$137,895; construction of double track, \$234,374; altering water mains, \$82,890; overhead construction, \$43,655; cars, equipment, etc., \$276,789.

Electric Railways in War Time

Further Comments on Canadian Activities and Experiences Are Presented, Together with Notes on Conditions in the United States, Where the Movement Toward Increased Agricultural Production Is Growing—Women Conductors Are Being Seriously Considered in Many Cases

IN the rapidly-moving series of events which the war has brought before the electric railway industry two features stand out most prominently at the present time. The more important of these is the wide extent to which electric railways have entered into the national movement for increased production of foodstuffs, and to this end a great variety of methods appear to have been adopted. These range from the mere granting of permission for employees to cultivate unused land owned by the company, through different co-operative arrangements whereby the company supplies seed or does the plowing, and include cases of the railways themselves doing all the work of cultivation with the idea of selling the produce to employees at cost. In all accounts of such plans the need for prompt action is sounded—obviously because the time available for planting garden truck for this summer's crop is growing very short.

The other feature that has assumed particular prominence in the recent developments has been the interest displayed in employment of women conductors. In no case, of course, has this reached the point where women have actually been thus placed upon electric railway cars in this country, and as a matter of fact it has hardly gone far enough to warrant any certain prediction that women conductors will be introduced in the near future. But the number of companies giving serious consideration to the possibility makes the subject worthy of serious thought. As described in the *ELECTRIC RAILWAY JOURNAL* for May 5, women conductors have been successfully introduced in Canada, according to the report of one company operating north of the border, and it must be remembered that Canadian prac-

tice and operating conditions are very similar to those obtaining on the electric railways of the United States.

COMMENTS ON THE WAR FROM CANADA

Among the other reports on war-time conditions that were received from electric railways of Canada in connection with last week's article was one from Wilford Phillips, manager Winnipeg Electric Railway, who made extended comments of special interest on the general situation in the large Western city of Winnipeg. These comments are published in part herewith as an additional means for visualizing the progressive results of the Great War upon a country that is, like ourselves, far removed from the actual front:

"I have great pleasure in complying with your request for an outline of electric railway conditions in Canada since the war, and trust that the experience of this company may be of some assistance to our allies in the United States.

"When war was first declared in August, 1914, the Winnipeg Electric Railway Company was in a prosperous condition; its men were efficient and well satisfied. Our first step after the declaration of war was to place armed guards at our own expense at strategic points on the company's system, guarding the power houses, gas works, etc., to prevent any alien enemy from interfering with our operations. These guards are still on duty, and up to the present time we have had no trouble in this connection.

"Almost immediately after war was declared the governments of France and Great Britain called their reservists to the colors, and a large number of our oldest and best men left us, practically without notice, to take



RECRUITING CAR OF OTTAWA ELECTRIC RAILWAY WITH RECRUITS OBTAINED DURING ONE SUNDAY AFTERNOON TRIP

their places at the front. Volunteer battalions were formed, and the company did everything in its power to assist recruiting among its employees. When we compiled our Honor Roll recently we found that more than 30 per cent of our men had left us for active service, coming from all departments of the company. [This Honor Roll as of March 31, 1917, contains 560 names, of which 517 had been accepted by the government. About 220 of the men were in battalions formed early in the war and have seen much active service, and of these twenty-six have been killed in action or have died of wounds; thirty-eight have suffered disabling wounds or shell shock, while five have returned because of sickness or injury. Only three out of the 220 men have been taken prisoner!—EDS.]

"An efficient provincial organization was formed for the purpose of taking care of soldiers' dependents during their absence at the front. This company and its employees during the first twelve months of war supplied approximately \$20,000 to the Manitoba Patriotic Fund, and since then have subscribed additional large sums from time to time. The fund is now in a splendid financial condition, and finds practically no difficulty in doing its work satisfactorily.

"The following table showing revenue passengers carried and car-miles operated by this company for the month of March for each of the past five years will show the progressive effect of the war upon our traffic:

	Revenue Passengers	Car- Miles
Month of March, 1913.....	4,884,609	698,505
Month of March, 1914.....	4,992,593	706,617
Month of March, 1915.....	4,419,031	833,808
Month of March, 1916.....	5,291,960	906,960
Month of March, 1917.....	5,120,533	873,466

"Immediately after war was declared many large industries, owing to their inability to obtain funds, were obliged to close down. Construction of almost every kind ceased entirely, as it was thought that every available cent should be devoted to the prosecution of the war. I believe that more than 20,000 men out of a total population of approximately 200,000 have left the city of Winnipeg. In many cases these men have been followed by their families, or their families have moved away to other places. Although there is a natural increase in the population, and new people are continually coming in, we find there is an actual large net decrease and this naturally has its effect on traffic.

"Large numbers of soldiers during the winters of 1914-1915 and 1915-1916 were, of course, in barracks in Winnipeg, and this caused an increase in traffic. But all went into camp in the summer months, and the sudden withdrawal of large numbers of men from the city caused a decided depression in business and consequently in our receipts.

"The advent of the jitneys has also had an effect, and a very substantial one, on our traffic. Had it not been for the war we are strongly of the opinion that many of the jitney drivers would have been able to find more profitable employment and would not have gone into the jitney business. But owing to the war and the general depression which followed it, many large industries ceased construction work, as stated above, through inability to procure new capital, and many men were thrown out of employment. These men, together with real estate agents and other local men whose employment ceased because of war conditions, became jitney drivers and were licensed by the city.

"Naturally the increase in the number of automobiles operating on the streets in the city caused a very large increase in our automobile accidents.

"Our motormen and conductors are paid a graduated

wage scale, and we have noticed a steady rise in the average wage per man-hour. This we attribute to the fact that men enter our service, stay with us a few months or a year, and then enlist, while those married men with families, or men who for personal reasons did not wish to enlist, stayed with the company because they were unable to find as reliable and profitable employment elsewhere. At the present time more than 60 per cent of our man-hours are worked by the men who have been with the company more than three years.

"I feel honored by your request for advice for the electric railways of the United States. If I could offer any remark to this end, it would be that the electric railways go to war with all their might and place every cent of their resources and every man in their employment at the disposal of the authorities until such time as the war is successfully concluded. If this is done, we need have no fear for the future, as that will take care of itself."

RETRAINING DISABLED SOLDIERS IN CANADA

A feature of another report, which was sent to this paper by A. G. Graves, Commissioner of Public Utilities, City of Calgary, Canada, was an explanation of the means taken by the Canadian government for providing returned soldiers with occupations. In part Mr. Graves states: "I might mention that the military authorities have about 200 men in the Ogden Military Hospital which has been established at the end of one of our car lines, some 4 miles from the center of the city. These men have been wounded at the front and have returned, being now in all stages of convalescence. Many of them are entirely unfitted to follow their former occupations. Consequently the provincial government has established a school of technology and art in the city of Calgary, and all returned soldiers who desire it are being taught some trade or calling so as to enable them to become self-supporting. The street railway transports these men to the hospital and school and return at the price of one fare.

"Furnishing occupations for returned soldiers is probably one of the greatest after-the-war problems that this or any country will have to face. In Canada it was soon found that from 10 per cent to 30 per cent of the soldiers that returned from the front, owing to wounds or illness contracted in the service, could not take up their previous callings. Consequently, in each province of the Dominion a committee composed of leading business men was formed to make provision for examining and training these men in new vocations. At the present time about 200 soldiers, or say 10 per cent of the total number from this province who have returned from the front, are being trained in about twenty different occupations. These include office work, wood carving, poultry raising and gardening. There is also a school of agriculture for those who have shown a preference for farming. The bulk of the training is being carried on at the Provincial Institute of Technology and Art, which started operations in September, 1916. Here the soldiers are given shop work involving repairing and handling of machines and engines, as well as instruction in electricity, chemistry, mathematics and business correspondence. The course lasts for eight months and the soldier and his family are kept by the government for that time. At the end of this course each man is practically guaranteed a position in his chosen occupation.

"The employment of the returned soldier is not a serious problem at present, but as soon as peace is declared and demobilization begins, a more serious problem will confront the Dominion. Fortunately many of the firms will provide positions for those who return, and the government will probably begin large undertakings,

such as permanent roads, building of docks, etc., which will absorb a great deal of labor. At the present time plans are on foot to provide each returned soldier who wishes to go on the land with 320 acres and a loan of \$1,500. If land can be procured adjacent to railway facilities, there is no doubt that many veterans will take advantage of it."

In connection with the percentage of enlistments of electric railway employees, figures have been received from L. A. Thornton, city commissioner, City of Regina, Canada, which show that the withdrawals of the employees from the service of the local municipal railway through enlistment was 35.5 per cent—apparently a maximum for the Dominion. Of these withdrawals, 37.8 per cent were conductors and motormen, while 28 per cent came from the other classes of electric railway employees. These figures apply to enlistments only. Mr. Thornton states that, for replacements, men have been employed at the lowest rates in the schedule, and this has somewhat compensated for the loss in efficiency due to the inexperience of the newer men. He advances the interesting theory, however, that all of the railway employees have increased in efficiency since the beginning of the war. This is because there has been a universal tendency to take more interest in serious matters, and fortunately that attitude has been generally extended to the details of daily work.

STIMULATING AGRICULTURE

The movement on the part of the electric railways in the United States to assign unused land, especially that along the right of way, to employees for the purpose of cultivation has, as previously remarked, gained strength during the past week, and in other ways also the railway industry is exhibiting a very definite interest in the vitally-important matter of increasing our food production. The Pennsylvania Railroad has had a booklet printed under the title "Raise Potatoes and Help Win the War," and is about to distribute it to farmers and to residents in towns and suburbs along its line. The booklet, which is in vest-pocket size, is most interestingly arranged and illustrated. It is a condensation of a special bulletin on potato culture that has been issued by the department of agriculture of the commonwealth of Pennsylvania, and it sets forth the most approved methods followed by scientists and practical growers for successfully producing this crop.

In its introduction the booklet states: "Potatoes are eaten universally. They are healthful, sustaining and satisfying. They have the very great advantage that, if proper methods of cultivation are followed, enormous yields are obtainable from a given area of ground. From 300 bushels to 500 bushels can be raised from a single acre by care and skill. Potatoes are, therefore, particularly adapted to meeting the emergency created by the scarcity of food resultant upon the war. All Americans who can should raise potatoes this summer. Every potato produced before next fall will be more effective in the cause of the United States and her allies than a bullet."

The booklet is being distributed to station agents and to the freight traffic department of the Pennsylvania Railroad at Broad Street Station, Philadelphia, Pa.

Among the interurban railways of the Middle West, the St. Joseph Railway Light & Power Company, St. Joseph, Mo., has undertaken the plan of entering, itself, the business of raising garden truck. Recently the company began work with four teams and plows to prepare the soil on its Savannah interurban right-of-way for the planting of potatoes. About 50 acres will be available for cultivation on the length of the line, and the company may even rent an equal acreage, and plant

this also with potatoes. The crop will be sold to the employees of the company at the cost of labor and seed, the company itself handling all farming operations.

On the Waterloo, Cedar Falls and Northern Railway, the employees have been asked to make application to the superintendent for any of the company's land that they may desire to cultivate. This opportunity has been limited to the period prior to May 15, and employees are not allowed to request ground unless they or the immediate members of their families desire to use it. The practice of requesting ground and assigning it to another not an employee of the company, either with or without payment, is positively prohibited. The company also is sending to each employee a pamphlet on scientific gardening. This was furnished through the courtesy of W. L. Clark, vice-president, Illinois Central Railroad, who is greatly interested in the movement for increased food production and is doing everything in his power to accelerate it.

The Northern States Power Company of Faribault, Minn., has entered the movement by donating seed and several acres of land to employees. The company will do the plowing and otherwise aid the movement in every possible way. Similarly the Union Traction Company of Indiana, which holds a very considerable amount of land in Anderson in addition to its right-of-way, is strongly encouraging the movement and all of this ground is to be apportioned out at once to employees who wish to cultivate it. The company has also donated forty-four city lots, to which it holds title, to the Chamber of Commerce of the city of Anderson, and already nearly 100 citizens have made application for pieces of this ground for truck-gardening purposes.

Officials of the Tri-City Railway & Light Company, operating in one of the rich agricultural districts of the State of Iowa, estimate that the yield of potatoes from the sections of the right-of-way that are now under cultivation will be nearly 7000 bu. for the year. Practically all of the ground adjoining the tracks from Muscatine to Clinton, a stretch of approximately 70 miles, is to be utilized except where the tracks pass through towns or where crops cannot be raised.

About 100 employees of the Public Service Commission for the First District, New York, have leased 35 acres of land on Long Island, and each member of the group has volunteered to devote at least one week of his vacation period to the putting in and harvesting of the crops upon this farm.

REVIVES PLAN FOR HANDLING FREIGHT IN CITY STREETS

Managers of the various traction properties of the Cities Service Company have been instructed to investigate the possibility of hauling freight at night by electric railways as a means for reducing the cost of living. H. L. Doherty, president of the company, recently returned from extended visits to Toledo, Kansas City and other middle western points convinced of the feasibility of this plan. He considered that a primary move to make the idea a success would be the starting of an extensive educational advertising campaign in each city, which would tend to show the public the benefits of the innovation and consequently pave the way for legislation necessary to amend franchises not now permitting this form of traffic. A serious duplication of handling small loads and consequent waste exists in the facilities for handling food supplies, and it is believed that the hauling of freight at night on street car tracks will not only eliminate the congestion on city streets, but will carry the corporation out to the farmer so that it buys from him on the spot and so eliminate the intermediate toll of delay and waste.

Night freight hauling by electric lines need not be limited to food, according to Mr. Doherty, as it could also include such commodities as coal. In many instances coal dealers must haul coal from distant pockets to the consumer during the day, which increases traffic congestion on the streets. The location of coal pockets near the distributing centers would do much to eliminate this wasteful procedure, as the coal could then be served to consumers as needed in their immediate neighborhoods.

The public utility properties operated by the Doherty interests already have nearly 2000 acres of potatoes and other food products under cultivation, with the idea of selling the products to employees at cost. This, it is thought, will net a larger production than is necessary for the employees, and plans are now being drawn for the general marketing of the surplus products.

WOMEN CONDUCTORS SERIOUSLY CONSIDERED BY SEVERAL ROADS

Since the recent announcement of the Boston Elevated Railway that it was likely to make use of women conductors as a means for replacing the platform men who may be drafted into military service, no less than fifty women have applied for such positions. However, the company has no definite plans for hiring women conductors at present, and all that the road's employment office has done has been to take the names and addresses of the applicants, pending further developments in the situation. Most of the applications have come in by mail, but a few young women have applied personally.

Two roads have definitely announced that applications were desired from women to act as conductors. One of these is the Corning (N. Y.) & Painted Post Street Railway. One-man car operation was tried on this line recently but was discontinued owing to the opposition of the public. The company is now planning to secure women to serve as conductors upon four runs during off hours for the purpose of determining how the plan will work out in practice.

Another company which has definitely solicited applications from women is the Beaver Valley Traction Company, New Brighton, Pa. While it is not the intention to instal women immediately, the company has announced that the shortage of labor and the desire of the company to avoid a tie-up of the transportation facilities of the Beaver Valley have made it advisable to have applications from women for this service on file.

MISCELLANEOUS NOTES

In recent issues of *Electric Railway Service* and *The Electrogram*, published respectively by the Detroit United Railway and the Puget Sound Traction, Light & Power Company, there have appeared appeals for recruits for service with the colors. These include statements from local recruiting officers for the army, navy and the marine corps, calling attention to the opportunities offered in the way of adventure or advancement to be obtained in the various arms. In addition these publications printed an appeal from the Red Cross organization.

Plans for reinstatement of employees drafted into the army have been decided on by the Waterloo, Cedar Falls & Northern Railway, and have been published in the following bulletin: "All employees of this company who enlist voluntarily in the army or navy of the United States or are drafted under the selective conscription plan are assured by this company that their seniority as employees will be preserved. At the termination of the period of their governmental service and when they

are mustered out of such service they will be reinstated in their positions with this company, and their service with this company will be considered as continuous from the time they first entered its employment."

Owing to the imminent coal shortage that is faced by a number of electric railways, the recent establishment by the government of a national committee on coal production is of interest. F. S. Peabody, president Peabody Coal Company, Chicago, has been designated as chairman of the committee and has opened offices at the Interior Building at Eighteenth and F Streets in Washington, D. C.

Publication of bulletins outlining the work done by the steam railroads' special committee on national defense has been begun by the American Railway Association. The first bulletin describes how the railroads of the country will be operated during the war under the plan of pooling all railroad interests and placing the direction of the resulting continental railroad system in the hands of an executive committee composed of five railroad presidents, a member of the Council of National Defense and a member of the Interstate Commerce Commission. Fairfax Harrison of the Southern Railway System is chairman. This plan of operating the country's railroads covers all classes of service—that which is conducted on behalf of the public as well as that for the government.

Meeting of N. E. L. A. in New York

Electric Lighting and Power Men Hold Enthusiastic Gathering on Short Notice in Place of Usual Convention

THE National Electric Light Association held its fortieth annual convention in New York City on May 9 and 10. It has been customary to hold the meeting in June, but on the outbreak of the war it was decided not to hold a meeting of the usual type but promptly to convene for the discussion of the pressing problems of the day.

In accordance with the purpose of the meeting the time was all taken up with addresses of patriotic import and the routine business essential to the proper working of the association. It was decided that the papers and reports which had been prepared for presentation at the June convention should be admitted to the proceedings after they had been passed upon by a special committee consisting of Secretary T. C. Martin and the chairmen of the several sections. The section chairmen were continued in office for the coming year. A summary of the reports which are of special interest to electric railway men will be abstracted in a later issue of the *ELECTRIC RAILWAY JOURNAL*.

The election of officers and members of the executive committee resulted as follows: President, J. W. Lieb, New York Edison Company; first vice-president, W. F. Wells, Edison Electric Illuminating Company of Brooklyn; second vice-president, R. H. Ballard, Southern California Edison Company; third vice-president, Samuel Scovil, Cleveland Electric Illuminating Company; fourth vice-president, D. H. McDougall, Toronto Power Company; treasurer, W. H. Atkins, Edison Electric Illuminating Company of Boston; executive committee, Paul Spencer, United Gas Improvement Company; Walter Neumuller, New York Edison Company, and E. W. Lloyd, Commonwealth Edison Company of Chicago.

SPIRIT OF THE MEETINGS

The addresses by some of the most eminent men in the industry reflected a splendid patriotic spirit. They

showed that the men in the lighting and power field realize the responsibility resting upon them by virtue of their intimate relation to the every-day work of the nation. The addresses contained many statements to demonstrate that the companies are alive to the necessity for being ready to produce much greater outputs of reliable power, for placing their technical talent at the disposal of the government, and for furnishing their full quota of men at the front without unnecessary hardship to the employees' dependents. Typical of the spirit of the gathering were the remarks of one speaker who said: "The man who makes up his mind to lay down his life for his country wants all the encouragement to go to war that he can get. He goes because he considers it a duty to go, and I consider that every man who is allowed to stay at home should be thankful if he is in any way able to do anything, and he should consider it a great privilege that he is allowed to stay at home. Every man who is selected wants all the encouragement and enthusiasm put behind him that is possible, no matter how he is selected."

Traffic Notes from San Antonio

The San Antonio Traction Company has several methods for developing city traffic. One of these is the operation of a special car between the three railroad stations and the hotels in San Antonio. The crew has a schedule of train arrivals and meets as many trains as possible during the day. The car operating on this route is marked "Houston Street and All Hotels," and in this way considerable traffic is obtained which otherwise might go to the hotel buses or taxicabs. No guide is carried on this car, but the conductor is especially instructed to give out information concerning hotels, points of interest and the like. The conductor also carries a small guidebook on San Antonio which he gives out to anyone who appears interested or who looks like a tourist. This book describes the interesting points in and around the city and how they may be reached by electric car.

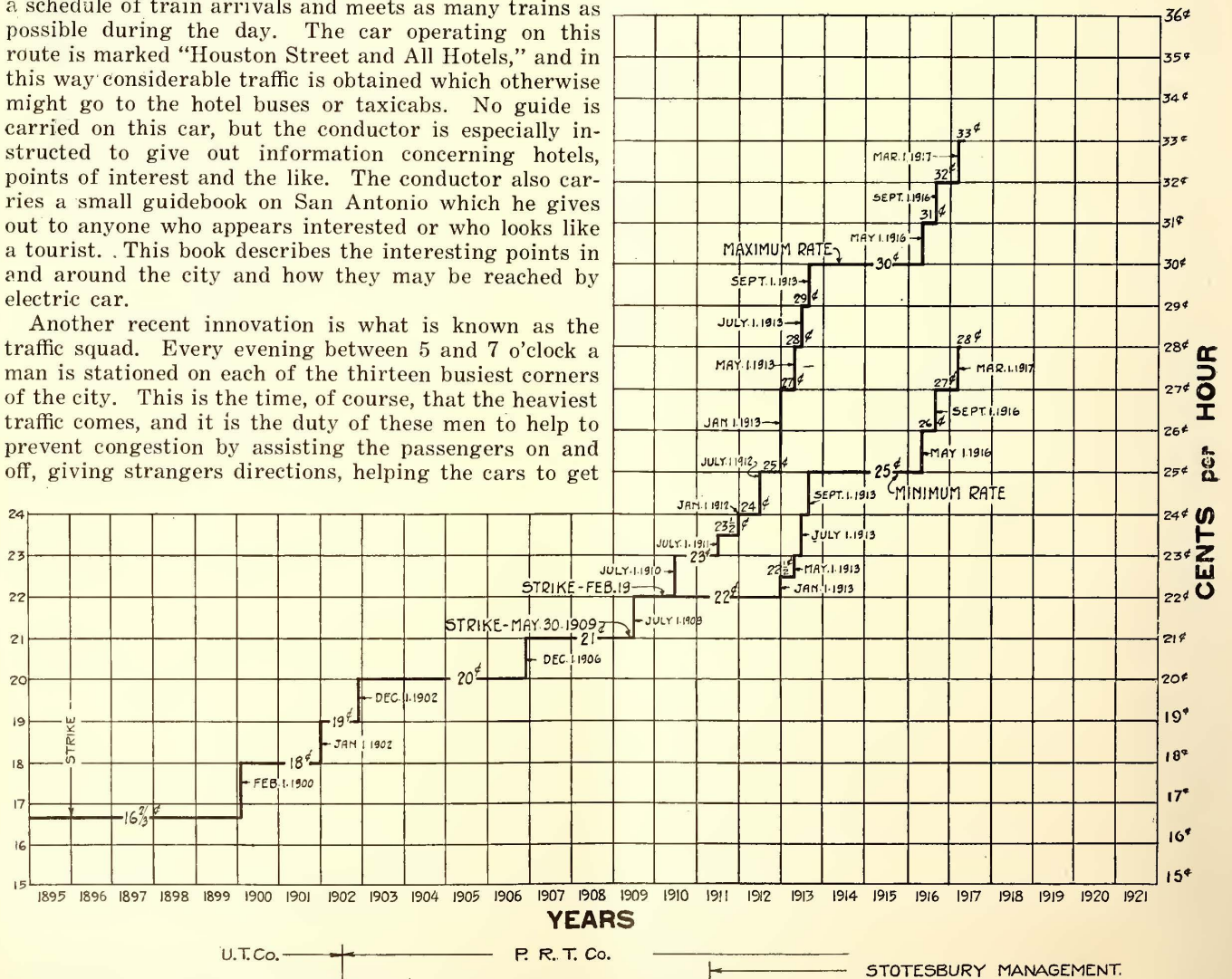
Another recent innovation is what is known as the traffic squad. Every evening between 5 and 7 o'clock a man is stationed on each of the thirteen busiest corners of the city. This is the time, of course, that the heaviest traffic comes, and it is the duty of these men to help to prevent congestion by assisting the passengers on and off, giving strangers directions, helping the cars to get

away, assisting in case of accident, etc. At certain places also where there are no electric switches these men turn the switches and thus speed up the line. The plan has met with much favor, both with the public and with the regular car crews.

Increasing Labor Costs

IN the ELECTRIC RAILWAY JOURNAL of April 7, page 643, there was presented an abstract of Director W. S. Twining's analysis of the Philadelphia Rapid Transit Company proposal for the operation of new city-built high-speed lines in Philadelphia. In connection with this analysis Mr. Twining presented various reasons why the city should exercise caution in guaranteeing a preferential to the Philadelphia Rapid Transit Company for a long period.

One reason cited was the diminishing profits in the street railway business. During the last fifteen years, Mr. Twining said, the cost of street railway service per passenger has increased greatly. Wages, for example, now constitute 62 per cent of the operating expenses, and future wage scales are of the greatest importance. To illustrate how wages had increased, he presented the accompanying chart, which shows in a striking way the rise in trainmen's wages in Philadelphia since 1895.



MAXIMUM AND MINIMUM WAGE SCALES OF PHILADELPHIA RAPID TRANSIT SYSTEM FROM 1895 (ELEVATED MOTORMEN 3 CENTS PER HOUR MORE THAN ON THE SURFACE LINES)

Extension of London Underground System

Subway Equipment with Unusual Features of Body Design and Electric Control Is Operated Over an 8-Mile Section of the London & North Western Railway Tracks to Give Through Service Between the Suburbs and the Center of the City

RECENTLY there has been placed in service an extension of the Bakerloo underground line in London, England, which will open up a large area of new countryside and residential districts, and will directly connect the northern suburbs with the central, west end and southeastern districts of the city. In part, the tracks of the London & North Western Railway are used, and this will give the passengers of this system a choice of some five terminal stations in town connecting with main-line railways. The new extension is about 8 miles in length. It runs above ground for this distance, although the cars to be used upon it are, of course, designed for subway service, since the remainder of the 20-mile route is underneath the surface. Power at 600 volts direct current will be supplied to the extension from the London & North Western power houses at Willesden.

CONTROL EQUIPMENT

As the route makes use, in part, of the tracks of different railway systems of which one employs an earth return while the other employs an insulated return consisting of a fourth rail, it has been necessary to modify the equipment of the motor cars accordingly. For this purpose two additional sets of shoes have been fitted on the motor trucks of the cars, one

set on either side. On the trailing truck of the motor car insufficient clearance exists below the body to fit shoes for the fourth rail, so that these have had to be arranged on the truck of the adjoining trail car, connection being made to the motor car by means of jumpers.

For the conversion from earth to insulated return negative switches and fuses to the main circuit and to each of the auxiliary circuits have been provided. In doing this, care was taken to reproduce the standard wiring arrangement of the road that uses insulated return, so that, electrically, the difference between the two types of rolling stock is confined to the control equipment.

The control, which is supplied by the British Thomson-Houston Company, is of the relay automatic type, the contactors being picked up in their correct sequence by the current-limiting relays when the controller handle is placed on the operating point. The principle underlying this method of control is that, after a contactor has been picked up, its coil is immediately transferred, by means of interlocks, to another wire. Thus there are essentially two operating wires, the pick-up wire and the retaining wire, although other wires are introduced for forward and reverse, circuit breaker setting, etc. There are no main bus lines



LONDON UNDERGROUND EXTENSION—FIVE-CAR SUBWAY TRAIN OPERATING OVER MAIN LINE RAILROAD TRACKS IN SUBURBS.



LONDON UNDERGROUND EXTENSION—GROUP OF WOMEN GUARDS, OR GATE WOMEN, WHO OPERATE THE NEW SERVICE AND ARE SUBORDINATES OF THE MASCULINE OFFICIAL APPEARING AT THE LEFT OF THE ILLUSTRATION

through the train, which is composed of a motor car at the front and rear and three trailers between them. Consequently a potential relay is fitted on each motor car, and this drops all contactors on that car when the shoes lose current. This is necessary because, when no current passes through the main coil of the current-limit relay, it ceases to exercise its control over the rate of picking up contactors.

The controller has four forward points and two reverse points, of which Nos. 2 and 4 are running points where all resistance is cut out. A useful provision in the control is that, if in the course of the automatic

notching-up the controller handle is brought back to the first or third notch, as the case may be, the automatic closing of contactors is stopped, but those already closed are kept up. Another feature is the operation of the safety button on the controller handle, which may be released except when at off position. But if the handle itself is let go it flies back to off position, instantly cutting off current and applying brakes throughout the train. Another safety device which is now a part of the standard London Electric Railway equipment is the control circuit governor. By interrupting the control circuit, this prevents the train from



LONDON UNDERGROUND EXTENSION—MOTOR CAR WITH CONTROL EQUIPMENT COMPARTMENT ELEVATED TO CLEAR MOTOR TRUCK

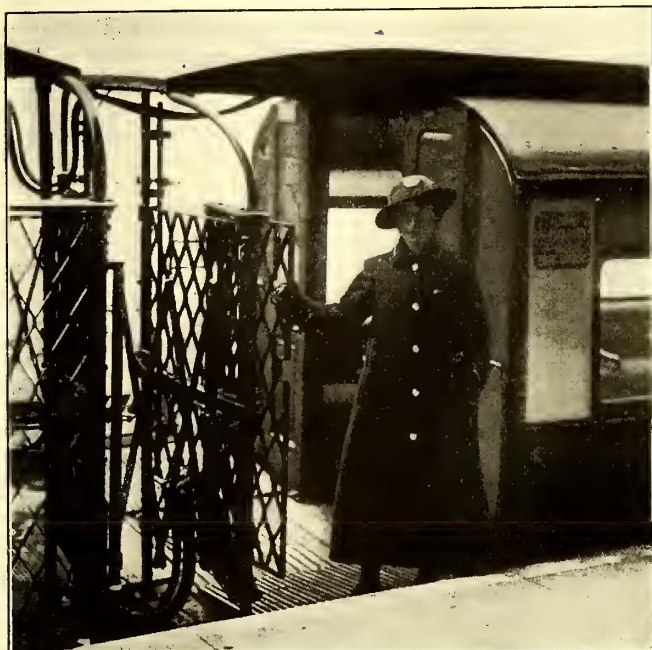
being moved forward unless the train pipe of the Westinghouse air brake is charged with air and the trip-cock is cut in.

Each motor car is fitted with two General Electric 212 motors of 240 hp., mounted on the same truck and geared for a free running speed of 35-40 m.p.h.

ROLLING STOCK

As mentioned above, each train consists of five cars, two motor cars and three trailers. The latter are standard London Electric Railway cars, while the motor cars were designed for a new extension over the Great Western Railway, whose opening has been postponed for the time being. The motor cars are provided with covered vestibules at the trailing ends, and they have center doors. They were described in the ELECTRIC RAILWAY JOURNAL for Feb. 7, 1914, page 298.

This is the first case wherein rolling stock designed for underground service has been run in passenger



LONDON UNDERGROUND EXTENSION—VIEW OF CAR PLATFORM AND GATE SHOWING RAMPS DESIGNED TO PROVIDE FOR VARIATIONS IN STATION PLATFORM HEIGHT

service on a main line railway, and provision has had to be made for passengers to get on or off at the stations on the London & North Western Railway, which have platforms of the standard main-line height—higher than that obtaining in the underground tubes. This has been accomplished on the trail cars by superimposing short ramps on either side of the existing platforms of these cars. It has been possible to do this without encroaching upon available headroom, owing to the open character of the gangways. But the closed vestibules on the motor cars have prevented any similar provision for this equipment.

The number of seats on each motor car is thirty-two, and on each trailer fifty-two. Third-class accommodations only are provided. The car bodies are constructed of steel, with some wood interior finish. Ventilation is provided by an air duct with perforations which runs for the whole length of the car, and is open to the atmosphere at the ends. The prominent feature of difference from common practice in the United States is the installation of control equipment in a raised section of the body over the motor truck. This is done to save height.

General dimensions and weights of the motor cars are as follows:

Length over all.....	47 ft. 9 in.
Width over body.....	9 ft. 8 in.
Total height from rail.....	9 ft. 3 in.
From center to center of truck.....	29 ft. 6 in.
Diameter of motor wheels.....	36 in.
Diameter trailing wheels.....	29 in.
Weight on motor truck wheels.....	47,500 lb.
Weight on trailer truck wheels.....	20,200 lb.
Total weight of car completely equipped.....	67,800 lb.

The total weight of a five-car train without passengers is approximately 246,000 lb., and the seating capacity is 220 passengers.

New Plan of Pennsylvania Railroad to Secure Help

Under a new plan for handling applications for work, which is now being put into effect by the Pennsylvania Railroad, every one of the 1500 station agents on the lines east of Pittsburgh and Erie will become an employment agent. In connection with this change, what will virtually be an employment clearing house is to be established in the general manager's department at Broad Street Station, Philadelphia. The purpose of the new plan is to encourage the entrance into the service of the Pennsylvania Railroad of men who live in the neighborhood of its lines and shops. It has always been the policy of the company as far as possible, to offer the first opportunities for work to people who are its neighbors. It is the belief of the management that a number of men in the country districts, as well as in the towns, villages and cities through which its lines pass, would welcome the chance to make railroading their career, but in many cases do not know where to apply. The new employment arrangements will make it easy for anyone to make an application and to ascertain what lines of service are open and in what localities work for which he is fitted may be obtained.

Notices will be posted conspicuously at various points along the railroad, directing all persons seeking employment to apply to the station agent. The agent will interview each applicant, learn his capabilities as fully as possible and direct him to the nearest shop foreman, supervisor, trainmaster or road foreman of engines, who may have vacancies at his disposal. If there are no vacancies on the division where the application is made, it will be forwarded to the office of the general manager in Broad Street Station, where it will be handled through the clearing house plan which is to be established there. Under the clearing house plan, each general superintendent will forward, once a week, to the general manager a list showing the number of vacancies on his grand division for shop laborers, car repairmen, car cleaners, engine cleaners, brakemen, firemen, freight handlers, trackmen, etc. By this means every applicant for work can be promptly directed to the nearest point where labor is needed, in case no opportunity exists near his home. This arrangement, it is thought, will greatly aid in equalizing the distribution of labor and the opportunities for work in the railroad service.

Cough Drop in the Fare Box

The following note was on the trip card for March 28 of one of the conductors of the San Francisco-Oakland Terminal Railways:

"Deducted 10 cents from cash, account Mrs. of No. . . . Avenue, who dropped a cough drop in fare box with her nickel. I took note of same, and the cough drop came through and registered 10 cents."

More Revenues Sought in New York

Third Avenue Railway Informally Suggests Transfer
Change to Commission—Other Companies
Considering Increases

RUMORS that the street railways in New York City were planning to increase their fares were confirmed on May 9 by the Public Service Commission for the First District. Although no formal application has yet been made, it appears that the Third Avenue Railway recently suggested to the commission in an informal way that owing to its need for increased revenues the commission might allow it to make a 1-cent charge for transfers.

None of the other companies in the Metropolitan district, it was said, had either formally or informally applied for a higher fare or a transfer charge. It is the opinion of commission representatives, however, that the question of securing larger revenues to meet increases in operating costs is "in the air" for all industries, and the other surface lines in the city will probably sooner or later apply for some form of financial relief. No increase would be granted, however, until the case had been threshed out in public hearings according to law, and until the regular procedure of the commission in rate cases had been followed.

THIRD AVENUE NEEDS MORE MONEY

The attitude of the Third Avenue Railway in regard to increased revenues is shown by a memorandum submitted to Chairman Straus on April 11 by E. A. Maher, Sr., president of the company. This memorandum followed a series of talks between Mr. Maher and members of the commission, in which Mr. Maher asserted that his system was not meeting its fixed charges and would have to find a means of increasing its revenues.

The memorandum, outlining in detail Mr. Maher's position on the subject, stated that there are four methods by which electric railways could hope to increase their income or, if present conditions continue, to prevent the accumulation of constantly increasing deficits. These are as follows: (1) Decreasing the cost of operation, (2) lowering the quality of service, (3) securing decreases in taxation and (4) securing additional allowances above the regular fare for transfers.

In Mr. Maher's opinion, it seemed impossible to make any substantial reduction in operating costs, in view of the increase in nearly all items connected with electric railway operation. Prices of all materials have shown enormous increases, labor has advanced materially and power costs have risen. In regard to lowering the quality of service, Mr. Maher said that there is no reason to suppose that any relief can be obtained in this way. The trend of public demand and of commission orders and recommendations is toward improved service. As for lower taxes, the tendency appears to be toward an increase rather than a decrease, and probably most forms of taxes, federal, state and municipal, will be made much heavier. One indirect form, the expense of paving renewals and replacements, might in all justice be reduced in large part, if not entirely suspended.

In discussing a transfer charge, which in the talks with the commission had been understood to be 1 cent, Mr. Maher said that under past conditions, in connection with service rendered, the 5-cent fare had been perhaps reasonable, but that the fare per passenger is no longer 5 cents. The transfer privilege has been extended so greatly that now the company is confronted with a situation whereby the carrying of more passengers means the loss of more money. Mr. Maher said that the Third Avenue Railway is facing a critical situation, being confronted as it is with constantly increasing costs of operation which it cannot control, and being unable

to increase its revenues. It must in the near future spend large amounts for reconstruction and repair work on tracks, and its gross earnings are expected to be reduced, temporarily at least, when the new subway and elevated extensions are opened. In his opinion, therefore, the only relief that can be hoped for is an increase in earnings through a rearrangement of the transfer privilege or a reduction in taxation through the abatement of paving charges.

REPLY OF THE COMMISSION

The attitude of the commission in regard to Mr. Maher's informal memorandum is shown in the following letter of April 26, sent to him by James Blaine Walker, secretary of the commission:

"I am directed to acknowledge the receipt of your letter of April 11 addressed to Chairman Straus, submitting a memorandum dated April 6 on the question of devising means for increasing the revenue of the Third Avenue system.

"On any such question the commission can, under the law, give consideration only to the question of a reasonable return. If consideration by the commission is desired an application should be made formally, setting forth the facts fully, the remedy desired and the reason for such application and the desired remedy. The commission will then consider the matter as set forth under the provision of law."

It is reported that the Third Avenue Railway, in accordance with the foregoing letter, has been preparing a formal application for relief, but no confirmation of this has been issued.

ATTITUDE OF OTHER COMPANIES

Theodore P. Shonts, president New York Railways, states that the officers of the company have discussed means of increasing the operating revenues, but have not reached a decision. Continuing, he is quoted as saying:

"We have considered a 6-cent fare, a 1-cent transfer and a 2-cent transfer, but it would be premature for me to discuss any of these at this time. A serious situation exists and will have to be met by some means. We have had prepared a list of the increases in operating costs this year and they range from 70 to 1100 per cent.

"We know, after the financial survey just completed, that the surface lines are in actual danger unless some means is quickly provided for their relief. The subway and elevated lines are not to be affected. In fact, the 'preferential clauses' in our contracts with the city remove them from any possible connection with the present situation. The directors of the New York Railways are keeping in touch with the situation, but we have not discussed the matter either formally or informally with the commission."

H. A. Bullock, assistant to President T. S. Williams, Brooklyn Rapid Transit Company, expressed the attitude of his company as follows:

"The same situation confronts transportation companies all over the country, and there has been much talk among railroad men of raising the usual fare from 5 to 6 cents. B. R. T. officials have participated in these discussions and have considered it seriously. They have not yet taken up the subject with the Public Service Commission, however, either formally or informally, and there is no certainty as to what they will do about it."

NEW YORK ASSOCIATION MEETS

As this paper went to press on May 11 a meeting was being held at the Hotel Astor of the New York Electric Railway Association to consider the best means of securing relief.

COMMUNICATIONS

The Arch-Bar Truck in City Service

PITTSBURGH RAILWAYS COMPANY

PITTSBURGH, PA., May 9, 1917.

To the Editors:

Referring to S. A. Bullock's article in your April 21 issue on the question of truck equalization, it seems that all are agreed that proper equalization is a desirable feature of truck construction. We are not familiar, of course, with the data from which Mr. Bullock makes the deduction that the well-known arch-bar type of truck produces discomfort to passengers or unusual hammering on the track. The contrary of this statement becomes readily apparent when one takes the time to ride in a car equipped with this type of truck and then immediately afterwards rides in a car which is equipped with any other type of truck having wheels of large diameter.

The contrary of Mr. Bullock's view is also very apparent to those who have taken the trouble to observe equalizer-bar trucks with large-diameter wheels negotiating special work at intersections, either at low or high speed, as compared with a car equipped with the so-called arch-bar type of truck.

With regard to the question of bolster equalization, it may be said that the same system of bolster suspension is used in the equalizer-bar type of truck and the arch-bar type of truck, so there remains no difference in construction between the two types of trucks in this particular.

We take issue with Mr. Bullock in his assumption that the arch-bar truck produces more noise, is less flexible and has more box play than the design with equalizer bars. Practical experience in the use of the arch-bar truck over a period of some seven years proves the contrary to be the case, and this same situation obtains with regard to Mr. Bullock's assumption that this type of truck produces greater distress to the track, truck and body.

With regard to the equalization feature of the side frame, we are in accord with Mr. Bullock's statement that "efficient equalization requires a spring base (or point of support) less than the wheelbase and an equalizer which acts as a lever." If it is essential that the spring base (or point of support) be less than the wheelbase, with the equalizer acting as a lever, the natural inference is that the closer this spring base (or point of support) approaches the center line of the side frame, the more effective equalization is obtained. A maximum of side-frame equalization would be obtained if the bolster was supported on the side frames on knife edges, or if the pivotal point lay at the center line of the truck bolster. As a matter of fact, the so-called arch-bar truck contains this feature through the transom connections. The transoms connecting the side frames are, when properly designed, capable of producing and sustaining without injury the slight torsional movement necessary to produce the required amount of side-frame equalization. It is apparent that Mr. Bullock has overlooked this feature of the arch-bar truck.

On the Pittsburgh Railways we have observed, in practical operation for nearly two years, arch-bar trucks of the type described (with swing-link bolster construction) in high-speed interurban service. In the same service there are trucks of the equalizer-bar type illustrated in Fig. 4 of Mr. Bullock's article. The former truck operates with less noise and discomfort to the passengers than the latter type, and since the former is

less than one-half the weight of the latter, it is reasonable to expect that the hammering on the rail joints because of the lighter weight will be less than that of the heavier type of truck.

F. R. PHILLIPS,
Superintendent of Equipment.

EAST LIVERPOOL TRACTION & LIGHT COMPANY

EAST LIVERPOOL, OHIO, May 4, 1917.

To the Editors:

In his article on trucks, which appeared in the *ELECTRIC RAILWAY JOURNAL* for April 21, S. A. Bullock says that "it is desirable that all trucks be equalized," and since the writer's experience is in support of this statement, the following comments are submitted, these being confined to trucks of the arch-bar construction.

It seems that the use of arch-bar trucks in electric traction was brought about by the light weight made possible with this construction and by their adaptability for low-floor cars, and it is in such service that we are using them.

With the rigid type of construction which involves journal boxes bolted to the truck frame, the axles are parallel to each other so long as track conditions are perfect; but every electric traction line has more or less bad track with its low joints and irregular surface. It is evident that the two axles of a truck cannot remain parallel to each other in passing over such irregular surfaces, for if the truck frame were rigid enough to keep the axles parallel under such conditions one of the wheels would leave the rail when passing over a depression such as a low joint. Since there is no provision for meeting these conditions in the arch-bar type of truck, the truck frame is subjected to constant strain and torsion in order to permit the wheels to follow irregularities in the track.

This constant twisting and strain, together with the vibration transmitted from the wheels because there are no springs over the journal boxes, results in bolts working loose and bolt holes wearing, which means increased cost of maintenance.

We have found that, where trucks have side-frame equalizers, there is practically no trouble with truck frames working loose or wear of bolt holes. The frames of such trucks remain true to the position in which they were erected and require little attention as the flexibility secured by the equalization of both bolster and side frames relieves the truck frame of many of the strains to which it would otherwise be subjected.

We are convinced, therefore, that trucks without proper equalization do not successfully meet the requirements of electric passenger car service.

C. N. PITTINGER, Master Mechanic.

Employees' Service Periods in Iowa

The Ottumwa (Iowa) Railway & Light Company has compiled some interesting statistics relative to the number of years employees have been connected with the company. These records show that out of a total of 116 employees seventy have been with the company five years or more. The complete tabulation is as follows: Two men employed twenty-five years and over, six men employed twenty to twenty-five years, nine men employed fifteen to twenty years, nine men employed ten to fifteen years, forty-four men employed five to ten years, thirty-two men employed one to five years, fourteen men employed less than one year.

A copy of President Wilson's proclamation, calling upon all citizens to "do their bit" in helping to win the war, will be placed in the hands of every one of the 250,000 employees of the Pennsylvania Railroad system.

Practical and Economical Solutions of Problems in EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Getting Rail-Head Contours

Home-made Scribing Machine for Recording Worn Rail Heads Proves Effective for Rapid Work

BY W. R. DUNHAM, JR.

Engineer Maintenance of Way The Connecticut Company,
New Haven, Conn.

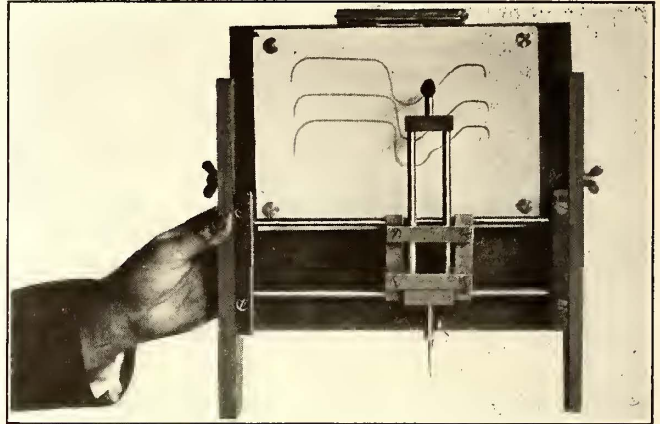
In connection with making scribings of rail heads in pavements to determine the average contour, the only method previously known to the writer before he had to cope with the problem was that of applying plaster of Paris. This seemed to be a slow method where scribings from a large number of rail heads were to be taken. He, therefore, designed and had built in the shops of the company a simple machine which worked out effectively and it seems as though this machine could be used to advantage by other members of the American Electric Railway Engineering Association in investigating not only rail heads but wheel contours.

Briefly, a piece of $\frac{1}{2}$ -in. board, 9 in. x 10 in., was used as a drawing board and set vertically with a spirit level on the top to insure the paralleling of the base of the rail and the base of the graph, on the assumption that the base of the rail was horizontal. On both edges were movable legs to permit the setting of the board with the top edge level across the rail to be scribed and to allow for variations in the pavement elevations on either side of the rail heads. At the base of the board two parallel brass rods were attached, these rods running lengthwise and placed $\frac{3}{8}$ in. from the face of the board. The purpose of these rods was to furnish a guide for a brass frame moving across the board parallel with the top edge.

This carrier has two brass rods, placed vertically at right angles with the horizontal rods and free to move up and down. At the bottom of these rods provision was made for a long needle point for tracing the contour. The top of the carrier was provided with a pencil point for transferring the outline of the traced surface to a paper attached to the board. The four brace rods and carrier provide for horizontal and vertical movements, permitting accurate contours to be made in one or two minutes each.

A pencil line drawn parallel with the top edge and another near the left vertical edge furnish reference lines for setting the paper. For reference in making the contour, the back edge of the rail can be determined to compare with the original section (as given in the manufacturer's catalog), and also the lip of the tram or groove can be used for a check.

If it is desired to use this device for determining the vertical wear on rail heads accurately it will be necessary to take up enough pavement to permit caliper-ing of the thickness of the head. However, on the rails which we scribed the wear on the trams was so slight that we assumed it to be negligible for our purpose. This was not to determine the amount of metal left in the head but only the form of the contour.



INSTRUMENT FOR TRACING RAIL CONTOURS

The cost of the machine described was trifling compared with the value of the time needed for taking contours with plaster of Paris. Although the writer has never seen an instrument of this kind before making this one, he has since seen a description of one made by Holt of Leeds, England. This, however, gives the section reversed and upside down, while the machine described gives the surface direct. In closing the writer wishes to give credit to his assistant, A. L. Donnelly, and James Dooley, master mechanic of the company, for their co-operation in developing this instrument.

Valuation of Track Special Work

The Author Advocates the Appraisal of Special Work by Elements Rather Than as a Whole

BY A. R. BAILEY

Assistant Professor Civil Engineering, University of Michigan

It has been the practice on many electric railway appraisals to handle all track special work by layouts—that is, by making an inventory of all the layouts of each type on the system and then applying a price per layout. This is a simple method but one that does not seem fair when considered from all possible viewpoints. For instance, if cost of reproduction-new less depreciation is wanted, then for the average property the method would not be fair, either to the public or to the company. This condition of unfairness is sure to result when a flat rate is applied to a layout, which in the great majority of cases is composed of units in varying stages of decrepitude.

Special work layouts are not always renewed in entirety but by piecemeal as the parts wear out. A new switch is installed, later a frog is replaced and so it goes until, if the layout is a large one, many new parts have been added. Originally or at some time perhaps, all the elements of the layout may have been installed at once but they do not wear uniformly; in fact, excessive wear may occur in one element and not in others, which

Railway Practices in Supplying Commercial Energy

Character of Load Connected and Construction Details of the Des Moines Inter-Urban Railway Commercial Substations Are Described

BY F. C. CHAMBERS

Electrical Engineer Inter-Urban Railway, Des Moines, Ia.

It is the policy of the Inter-Urban Railway to establish a commercial light and power business in conjunction with the operation of its 74-mile railway system. At present the commercial business is represented by approximately 4 per cent of the total output of the generating station of the Des Moines City Railway, from which the Inter-Urban buys its power, or approximately 14 per cent of the total power used by the Inter-Urban Company. Development of this business covers

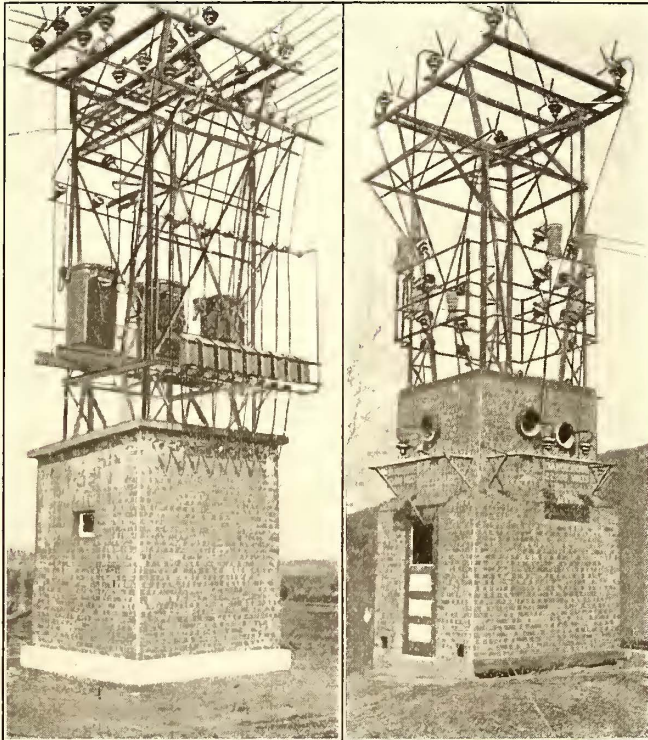


FIG. 1—TYPICAL OUTDOOR-TYPE SUBSTATION SERVING SMALL TOWNS ALONG RAILWAY ROUTE. FIG. 2—SPECIAL TOWER FOR INTER-CONNECTING FORT DODGE AND INTER-URBAN POWER SYSTEMS

a period of approximately three years, and it is safe to say that the business will more than double in the next three.

In so far as possible the lighting business is a wholesale one, the retail lighting representing but a small portion of the total. The power business, on the other hand, is thus far sold on a retail basis. To date, light and power are being furnished to six small towns either on the right-of-way or a short distance from it. The power business is confined at present to supplying several coal mines, a gravel pit and washer, and a large canning factory, each of which requires from 6000 to 25,000 kw.-hr. per month.

Three of the towns located on the line are supplied from outdoor substations with three-phase, 440-volt, 25-cycle energy. Three towns which are some distance from the right-of-way are supplied from similar stations with 4400-volt, three-phase current. In these cases an auxiliary 4400-volt line, owned and maintained by the consumer, carries the energy from the station on the

right-of-way to the town supplied. The coal mines and gravel pit are supplied from branches of the 22,000-volt transmission line paralleling the track, with substations in these cases located immediately adjacent to the mine or pit.

One of the substations in use is shown in Fig. 1. The tower is built of galvanized-steel angles and channels and iron pipe. The equipment was furnished entirely by the Delta-Star Electric Company, and was shipped knocked down to the point where it was to be erected. The high-tension entrance to the tower is at the top, through an air-break switch which is operated by a lever at a point approximately halfway between the base and the top of the tower. Lightning protection is provided through an ordinary horn gap and choke coil, the steelwork being solidly and permanently grounded. The tower is provided with three mast arms to facilitate the removal of transformers for repairs, etc. The steelwork at the base is set in concrete 4 ft. deep. This concrete provides a foundation as well as a floor for the small brick building at the base, which is built up of a single tier of red paving brick laid in cement mortar and plastered on the inside.

The roof is a 4-in. reinforced concrete slab. A clear wire-glass panel in the door and small frosted wire-glass windows provide plenty of light for the interior. Ventilation is secured through iron gratings in the front wall and cast-iron ventilator caps in the roof at the opposite side. This structure houses the metering and distribution panels and the necessary instrument transformers. The main panel supports an inverse time-limit overload relay, a three-phase Thomson watt-hour meter, and an oil-break switch. On the distribution panel are mounted three 100-amp., double-pole, single-throw knife switches for lighting service and one three-pole, single-throw knife switch for three-phase power distribution.

SUBSTATION CONSTRUCTION COST (FIG. 1)

One steel tower, f.o.b. cars Des Moines.....	\$400.00
Loading and hauling material.....	18.76
Foundation, labor and material.....	71.88
Erecting tower, labor.....	84.29
Connecting and cutting in.....	7.31
Finishing.....	42.98
Setting transformers.....	41.92
Brick structure, material and labor.....	150.00
Metering equipments, etc., installed.....	150.00
Transformers, three, 20 kva.....	500.00
Total.....	\$1,467.14

The above arrangement is characteristic of all the commercial substations along the line, except that in some cases the feeder panels are omitted. The load in these small towns usually includes a few small motors, but is lighting for the most part. In some cases a motor is used to pump the town's water supply, and there is usually a grain elevator requiring from 5 to 15 hp. The normal consumption at these places is from 1000 to 3000 kw.-hr. per month.

One of the coal mines having a lift of 335 ft. is equipped with a 225-hp. maximum, intermittent-duty, variable-speed hoisting motor, a 25-50-hp., two-speed fan motor, and several smaller pump motors. Electric locomotives for haulage and mining machinery are being installed. The capacity of the mine is 125 tons per hour, but it is operating at present at one-third capacity, with a consumption of between 10,000 and 12,000 kw.-hr. per month. Operating at full capacity, the load at this point will be more than trebled.

A gravel pit operating eight months per year at a capacity of forty cars of washed gravel per day with a power consumption of 25,000 kw.-hr. per month is undergoing changes which in the next year will increase

its output by one-third with a proportional increase in power consumption. This industry is reached by a spur from the main line of the Inter-Urban and thus affords valuable freight business.

The power consumption at the canning factory varies from 3000 to 15,000 kw.-hr. per month according to the season.

That the enterprise of supplying commercial energy is a growing one is evidenced by the fact that the commercial output has increased from 2800 kw.-hr. in May, 1914, to 73,200 in September, 1916.

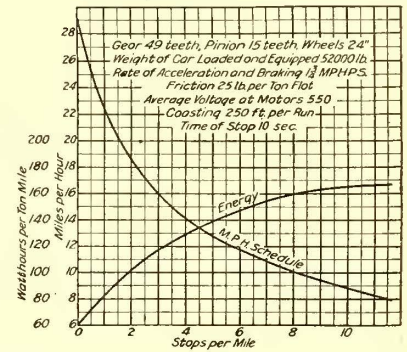
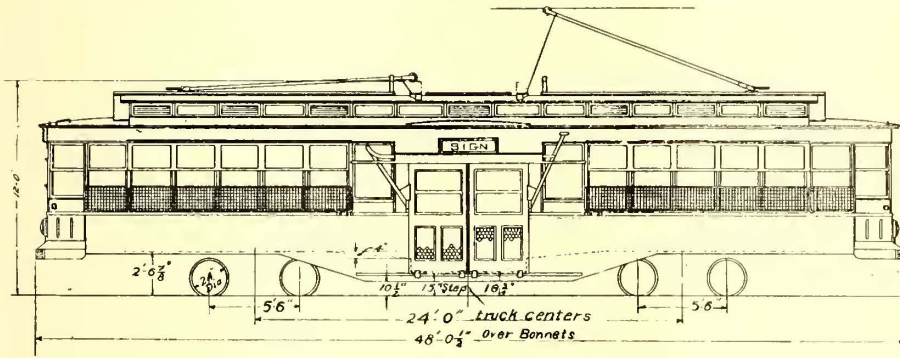
Fig. 2 shows a standard tower arranged to accommodate a 22,000-volt sectionalizing switch and metering and remote-control equipment. Through this station, power is either supplied to or taken from the transmission line of the Fort Dodge, Des Moines & Southern Railroad. The oil switch is operated by a solenoid remotely controlled from a substation 3 miles distant, power being supplied to the closing coil direct from the 600-volt trolley wire. It will be noted that the arrangement of this tower has been changed to accommodate both an incoming and outgoing line of high potential by eliminating the air-break switch at the top of the tower. Entrance is made to the building through choke coils and disconnecting switches mounted on insulators secured to pipe frame work, and thence

Low-Floor Multiple-Unit Cars for Boston

One hundred center-door motor cars are soon to be placed in service by the Boston Elevated Railway, and the designers have incorporated in the construction a number of interesting features, aside from the use of 24-in. wheels whose value has been demonstrated in Boston through their use with the trail cars purchased about one year ago for use in rush-hour service on several lines where operating conditions made this desirable.

For the car body the most prominent feature appears in the unusual arrangement of trolley poles, which reflects the experience obtained with the company's articulated cars. Contrary to the general custom, the active trolley pole serves the front end instead of the rear end of the car, the base being located ahead of the truck and the pole extending backward toward the center of the car. Thus control of the pole is placed conveniently in the hands of the conductor stationed in the central well, since the trolley rope is extended down through a hatch in the roof and is made fast inside of the car.

No doors are provided other than those at the center, and these are 6 ft. 6 in. wide. The sliding panels are pneumatically operated and are controlled through a valve which in turn is moved as desired by the con-



LOW-FLOOR CAR FOR BOSTON ELEVATED RAILWAY; SPEED-ENERGY DIAGRAM

through plate glass disks cemented into the 12-in. sewer pipe bell built into the walls. Lightning protection is afforded by the installation of horn gaps at the top of the tower.

The rate made to the small towns is based on a fixed charge plus a flat energy charge. Rates made to the industries are based on a demand charge plus a flat energy charge.

Home-Made Trolley Wheels on Key Route System

Owing in large measure to its distance from the Eastern markets, the San Francisco-Oakland Terminal Railway does much brass foundry work. This includes the manufacture of 5 1/2-in. diameter trolley wheels. These wheels are made up as follows: Copper, eighty-eight parts; tin, ten parts; zinc, two parts. To a 200-lb. bath of new metal, it is customary to add 100 old trolley wheels which average about 2 3/4 lb. each when discarded.

The formula mentioned was originally that of the company's bushings. As these bushings outwore the wheels, it was decided to try the same composition for the entire wheel. The average life of wheels, with a base tension of 18 lb. to 19 lb., is 9000 miles. One early wheel on exhibit in the office of George St. Pierre, superintendent of equipment, made 9411 miles before being scrapped.

ductor through a system of levers. The entrance step at the threshold is 15 in. high, and the center well is ramped toward the center to give a rise of 1 3/4 in. The step at either side of the entrance well is 10 in. high and there is a 4-in. ramp leading up to the main floor level, which is 30 7/8 in. above the rail.

High schedule speed is expected from the equipment; and in consequence four GE-247 motors, rating 40 hp. at 600 volts, have been installed, this type of motor weighing 1730 lb. complete with gear cover and gear. The service for which the car is designed includes an average number of stops per mile approximating five and one-half, with an average duration of stop of ten seconds, but it is expected that a schedule speed of 11.5 m.p.h. will be maintained, including layover time. The runs in question, it may be said, include about 3 1/2 miles of operation in tunnel and about 5 miles of operation on the surface for each round trip. One of the accompanying illustrations shows the theoretical possibilities in the way of schedule speeds that are the result of this propulsion equipment.

To carry out the plan of rapid car movement, automatic starting signals and automatic coupling of cars for train operation have been provided. The control is automatic, and by the use of the PC-5 control equipment, in which the contactors are mechanically operated by cams on a shaft, a definite frequency in contactor operation is insured and the complications of interlocking for automatic control have been avoided.

Cost of Erecting Overhead Work—VIII

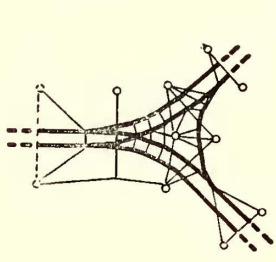
(From the records of a large Eastern company)

The following is the eighth group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in

the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; Feb. 24, page 355; March 10, page 447; March 31, page 606; and April 14, page 702. The remaining groups of this series will be published in later issues of this paper.

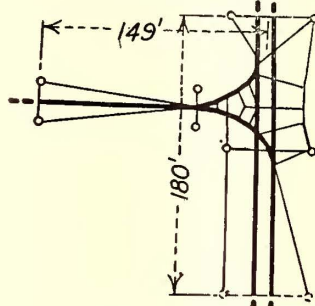
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track "Y" with single track connecting curve, angle 90 deg.



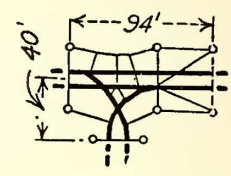
No.	LIGHT		ORDINARY		CONGESTED	
	Labor	Truck- ing	Labor	Truck- ing	Labor	Truck- ing
54*	\$54.45	\$39.60	\$63.53	\$46.20	\$72.60	\$52.80

Single track right-hand branch-off and single track left-hand branch-off, crossing single track and forming single track "Y" into single track branch line, angle 90 deg.



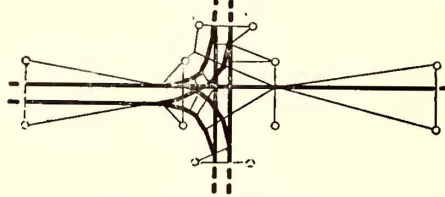
No.	LIGHT		ORDINARY		CONGESTED	
	Labor	Truck- ing	Labor	Truck- ing	Labor	Truck- ing
55*	\$45.38	\$33.00	\$54.45	\$39.60	\$63.53	\$46.20

Single track right-hand branch-off crossing single track and single track left-hand branch-off crossing right hand into double branch line, angle 90 deg.



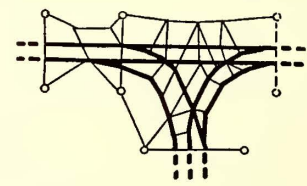
No.	LIGHT		ORDINARY		CONGESTED	
	Labor	Truck- ing	Labor	Truck- ing	Labor	Truck- ing
56	\$31.90	\$13.20	\$39.88	\$16.50	\$47.85	\$19.80

Double track three-part "Y" with single track through connection, angle 90 deg.



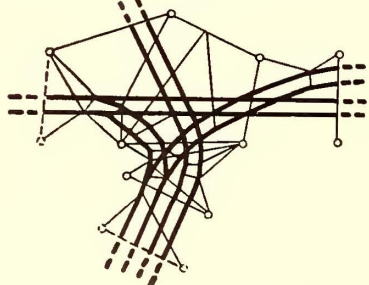
No.	LIGHT		ORDINARY		CONGESTED	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
57*	\$54.45	\$39.60	\$63.53	\$46.20	\$72.60	\$52.80

Double track three-part "Y", angle 90 deg.



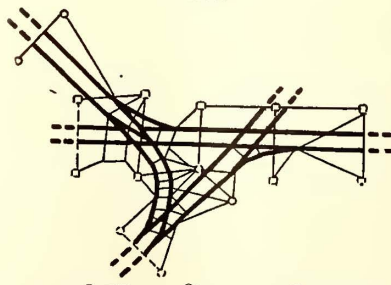
No.	LIGHT		ORDINARY		CONGESTED	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
58*	\$54.45	\$39.60	\$63.53	\$46.20	\$72.60	\$52.80

Special double track, three-part "Y" crossing a double track



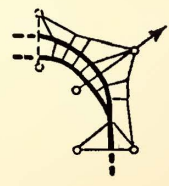
No.	LIGHT		ORDINARY		CONGESTED	
	Labor	Truck- ing	Labor	Truck- ing	Labor	Truck- ing
59*	\$72.60	\$52.80	\$90.75	\$66.00	\$108.90	\$79.20

Special double track three-part "Y" branch-off crossing double track combined with double track crossing with single track connecting curve.



No.	LIGHT		ORDINARY		CONGESTED	
	Labor	Truck- ing	Labor	Truck- ing	Labor	Truck- ing
60*	\$72.60	\$52.80	\$90.75	\$66.00	\$108.90	\$79.20

Single track plain curve with single track left-hand branch-off, angle 90 deg.



No.	LIGHT		ORDINARY		CONGESTED	
	Labor	Truck- ing	Labor	Truck- ing	Labor	Truck- ing
61	\$23.93	\$9.90	\$31.90	\$13.20	\$39.88	\$16.50

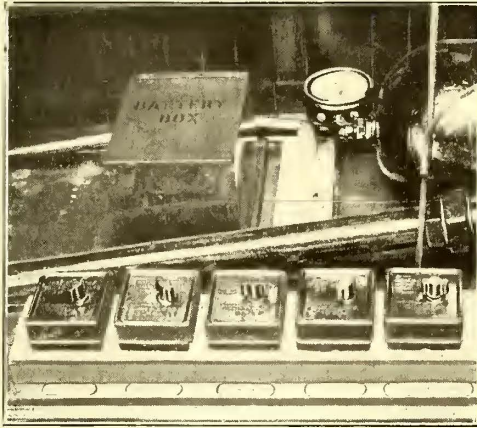
*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Marking Car Switches to Distinguish Circuits

BY C. L. KELLER

Assistant Master Mechanic Detroit United Railway

Owing to the fact that the General Electric snap switches controlling the lighting, signal, air compressor, etc., circuits installed in our cars are of the same type and identical in appearance, we have found it advantageous to designate what each switch controlled. Trainmen have frequently turned off the signal switch at the

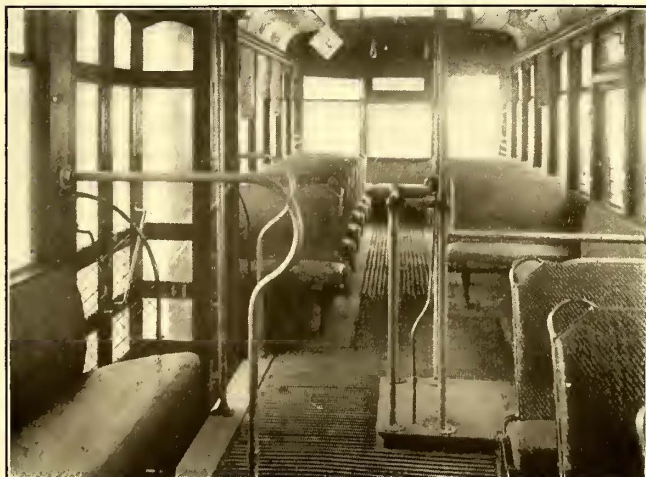


STENCIL MARKING OF CAR SWITCHES

same time they turned off the lights, and then because the signal between trailer and motor car would not operate, would turn the car in for defective signals. This has been eliminated by making a small nameplate which is tacked just below each switch. These are the same as are used in marking our foundry patterns so that the number will stand out on the casting, and the same stencil press is used so that very little expense is added. These stencils have been installed on all cars and have been appreciated by the trainmen.

Railings Aid Prepayment Fare Collection in Des Moines Car

The railings shown in the accompanying illustration were installed in the Des Moines (Iowa) City Railway low-floor cars after experience had demonstrated that the wire mesh guards at the end of the seat and adjacent to the door well were not sufficient during rush hours to prevent passengers from reaching their seats



RAILING INSTALLED TO PREVENT LOSS OF FARES

without paying their fares. It being found that while one passenger would be paying a fare and the conductor making change, another passenger would edge around behind the one paying and get past the conductor. The railing on the entering side extends far enough into the center of the car to prevent passengers from getting by the conductor without being noticed. The railing on the exit side of the door well was installed to give passengers a hand hold while waiting to get off, since there was some danger of their being pinched or bruised by the door if they took hold of the wire guard.

Portable Automatic Substation for Kansas City Railways

Simplified Diagram of Connections Is Shown by Which the Different Steps in the Operation Can Be Readily Followed

The Kansas City (Mo.) Railways has purchased a portable automatic substation which will be delivered in July. In describing the operation of this substation, the railways' company publication uses the diagrams shown herewith which are simplified to such an extent that the different steps in the operation can be followed without any difficulty.

When the potential on the d.c. bus falls below a predetermined amount, 450 or 500 volts, a contact-making

Sequence	Device Number																Remarks	
	1	4	6	7	10	13	14	16	18	19	19	19	20	21	31	36		37
1-Shut Down																		○ Controller Off
2-Low D.C. Voltage	○	○	○															○ Controller Starts
3-1st Controller Position	○	○	○	○														○ Oil Switch Closes
4-2nd Controller Position	○	○	○	○	○													○ Starting Tap
5-3rd Controller Position	○	○	○	○	○	○												○ Synchronous Speed
6-4th Controller Position	○	○	○	○	○	○	○											○ Polarity Fixed
7-5th Controller Position	○	○	○	○	○	○	○	○										○ Full Volta-Self Excited
8-6th Controller Position	○	○	○	○	○	○	○	○	○									○ All Resistance In
9-7th Controller Position	○	○	○	○	○	○	○	○	○	○								○ Part Resistance Out
10-8th Controller Position	○	○	○	○	○	○	○	○	○	○	○							○ All Resistance Out
11-9th Controller Position	○	○	○	○	○	○	○	○	○	○	○	○						○ Controller Stops Run
12-Light Overload Feeder "A"	○	○	○	○	○	○	○	○	○	○	○	○	○					} 19 B or 19 C Open On } Feeders B or C } Correspondingly
13-Medium Overload Feeder "A"	○	○	○	○	○	○	○	○	○	○	○	○	○					
14-Heavy Overload Feeder "A"	○	○	○	○	○	○	○	○	○	○	○	○	○					
15-Underload	○	○	○															○ Controller Starts
16-Shut Down																		○ Controller Stops Off

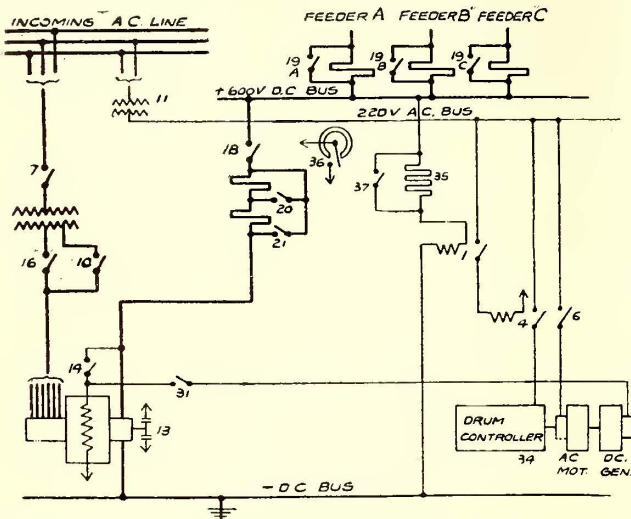
DIAGRAM SHOWING SIMPLIFIED CONNECTION OF POWER AND CONTROL APPARATUS OF AUTOMATIC SUBSTATION

voltmeter closes switches 1, 4 and 6. This starts the motor-driven drum controller which in turn actuates the operating switches of the substation. The first controller position closes the oil switch 7, on the incoming a.c. supply. The second position closes switch 10, which places the converter on the starting taps of the transformers. After synchronous speed has been reached the momentary closing of switch 31 places the field of the converter across the terminals of the d.c. exciter long enough to fix the correct polarity. The fifth controller position closes the field break-up switch 14, placing the shunt field of the converter directly across its armature, and 16 is also closed, putting full a.c. voltage on the converter. Switch 18 is next closed. This connects the positive terminal of the converter with the positive d.c. bus through two sets of resistances, which are notched out by the next two positions of the controller. The ninth and final controller position opens switch 6, which stops the controller driving motor.

Instead of using circuit breakers to protect the d.c. feeders, resistances A, B and C are provided. The resistance short-circuiting switches, 19A, 19B and 19C,

will operate on light overloads, medium overloads will open switch 21, which inserts an additional resistance, and on heavy overloads switch 20 will also be opened.

When the d.c. line voltage rises so that the current supplied by the substation falls below a predetermined minimum, switch 37 closes and through relays not shown in the diagram, and switch 6, starts the driving motor.



POSITIONS OF DRUM CONTROLLER FOR OPERATING AUTOMATIC SUBSTATION

of the controller. The latter then revolves to its original position, at the same time opening the necessary switches for shutting down the station.

These are in brief the operations of starting and stopping the automatic substation. There are additional relays for protection against short-circuits in the station, and thermostats are located in the bearings and windings of the converter so that if any overheating occurs relays will operate to shut down the station.

Cupping of Rails at Junctions with Special Work

An engineer connected with the way department of one of the large electric railway companies reports certain experience with the cupping of open-hearth rails at their junctions with the hard centers in special work. This company was having considerable trouble with the breaking of rail ends abutting hard centers in crossing frogs, and the gouging out of the rail heads on curved special work. This was attributed to the difference in wearing qualities of the manganese centers and the open-hearth steel in the rail. In several special work layouts heat-treated Mayari steel was specified for the centers, and these layouts have now been in successful use for two years or more.

In one case Mayari steel centers were specified in the four frogs of the single-track curved crossing formed by the outer curves of a double-track wye. The rails in the former crossing, which had the harder centers, had been gouged out after two and one-half years' service to such an extent as to make renewal imperative. After two years with the softer centers no gouging is evident and the centers are still in good condition, the maintenance expense being zero to date.

The explanation of this phenomenon of gouging is probably that as the abutting rail wears away faster than the hard center, there is a tendency for wheels to jump from the center to the rail, making a depression. Having been started such a condition tends to become worse as the wear increases.

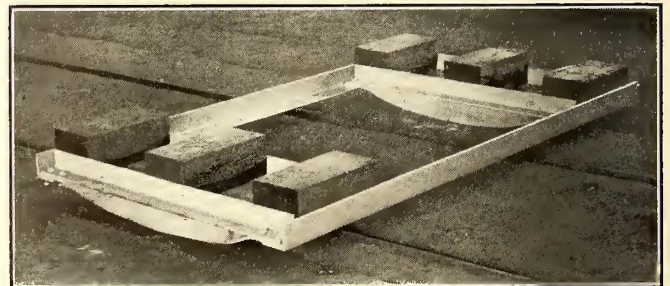
On this railway the same type of center was specified in a double-track 90-deg. crossing which was installed in the fall of 1914. Here the rail abutting on the centers does not as yet show any of the signs of pounding which, according to the company's engineers, is often found to occur with hard steel centers. Mayari steel was also specified in frogs of a double-track branch-off constructed in the fall of 1914 and this also shows very uniform wear.

Substitute Tie for Heavy Service

At the recent convention of the American Railway Engineering Association attention was called to the numerous attempts that have been made to produce a suitable substitute for wooden ties in steam railroad track. Many of these have proved unsatisfactory, apparently because of the difficulty of getting sufficient flexibility of track when the ties are composed altogether of steel and concrete.

To meet this difficulty the International Steel Tie Company, Cleveland, Ohio, has recently brought out a new form of substitute tie in which only a small amount of wood is used to give flexibility, and the requirement of timber is but a fraction of that obtaining when standard wooden ties are used. Thus there is offered an opportunity to relieve the excessive drain upon the timber resources of the United States that has been so much in evidence within past years. The tie is a modification of the well-known twin-steel tie, being built up of angles and warped plates $\frac{3}{8}$ in. in thickness, with creosoted wooden blocks to receive the rail. The plates are warped in from the two sides, which gives them vertical strength and forms a tamping pocket in the ballast underneath. Two angles spaced 12 in. back to back are riveted to each plate to form a pocket for receiving three 6-in. x 8-in. x 12-in. creosoted oak blocks. The rail is fastened to these blocks with cut spikes.

This combination of material forms a rugged tie that is perfectly insulated for track circuits. Long life of



COMPOSITE SUBSTITUTE TIE FOR USE IN OPEN TRACK OR IN LOCATIONS WHERE INSULATION IS DESIRED

track is insured by the thickness of the steel composing the tie, and when the wooden blocks fail mechanically renewal is simple. This tie replaces two wooden ties and furnishes 8 sq. ft. of bearing area on the ballast.

Various modifications of the design are furnished, including one to provide different lengths for the wooden blocks for supporting a third-rail insulator. Its special advantages are opportunity for use in street crossings where insulation between the rails is desired on account of the existence of signal circuits. It serves also as a substitute tie in open track, being installed under these circumstances with ballast tamped underneath just as if the track were supported in the customary manner. The tie, however, may be used in paved streets with a concrete base to give the rigidity that is necessary under these conditions to avoid destruction of the pavement by the working of the rails.

London Letter

Problem of Male Help More Pressing—Results of Shildon and Newport Electrification—Another Bakerloo Extension Opened

(From Our Regular Correspondent)

There are various indications that tramway managers are about to have further strains put upon them in the very near future in regard to employees. The list of certified occupations of Nov. 20, 1916, has been revised with a view to releasing more men for the army. The principal alteration in the new list is that the age limit for married men has been raised from twenty-five years to twenty-seven years. Men under the age limits who are classed in category B (1), *i.e.*, for garrison duty abroad, are no longer entitled to be treated as in a certified occupation, as they were in previous lists, and a further list is promised shortly in which the reservations will be reduced by a further raising of the age limits, and doubtless a further lowering of the categories. A significant sign of the times is the decision of the home office to authorize the London commissioner of police to license qualified women to be drivers of public vehicles, including tramcars. Reports are being received that women are giving satisfaction in spite of unfavorable climatic and dense traffic conditions. It is also alleged that no difficulties have been experienced at gradients nor has the operation of brakes had unfavorable results where women have been used as drivers. This testimony, as well as the action of the Metropolitan police, will necessarily influence the authorities, and managers may be faced with the alternative of curtailment of services or employment of women drivers.

The results of the Shildon and Newport electrification seem to have satisfied the board of the North Eastern Railway. The board financed this work out of revenue, in order to be on the safe side, but the experience of more than a year's operation has justified the placing of £100,000 of the expenditure to capital account, so the chairman informed the recent general meeting of the stockholders of the North Eastern Railway. Whence it may be reckoned that it promises to result in a revenue benefit of perhaps £6,000 to £8,000 per annum. The importance of the case is that it is the first instance in this country of the electrification of a line carrying goods and minerals on a large scale.

The Liverpool Overhead Railway, which was rather hard hit by tramway competition, had a record traffic for the year 1916. It was no less than 26 per cent better than in 1913, and is still growing.

The suggestion made a little time ago of the desirability of linking up Keighley with Bingley and the Bradford tramway system, inspired in all probability by the greater use now being made by the public of the tramway services, is still under consideration. Recently a friendly and informal conference of representatives of the Keighley Town Council and the Bingley District Council was held on the subject, and the matter will be talked over with the Keighley Rural District Council, in whose area the linking-up line would have to be made. At present the Keighley tramway system stops a little short of the bridge over the Aire at Stockbridge, and the bridge itself will have to be altered if a tramway is to cross it. The Bingley system also ends a short distance from the boundary at Morton Lane. Between is a gap of 2 miles. The completion of the Bingley line past Ryshworth Hall is held up until after the war.

At a meeting of the Chester Town Council it was decided, because of the shortage of labor and the urgent necessity of repairs, to stop the Sunday tramway service for the present. It was also agreed that the fares should be increased to a basis of 1d. a mile, but the 0.5d. fare for school children was retained.

The report of the Bristol Tramways & Carriage Company for 1916 states that the gross receipts amounted to £555,907, and the working and general expenses and renewals to £450,447, leaving, with the balance brought forward, a net revenue of £110,515. Of this, interest and dividends absorbed £57,754, and it is now proposed to pay a final dividend on ordinary shares at the rate of 7 per cent per annum, subject to tax, making 6 per cent for the year,

and to add to reserve for contingencies and renewals £30,000, leaving £9,635 to be carried forward.

At a meeting of the London County Council it was recommended that the question of expediting the repayment of the debt in respect of obsolete capital expenditure outstanding on the horse tramways be postponed for a further three years, unless any surplus be available earlier for the purpose after the reserve fund has been made up to the full amount necessary on the basis agreed to. The highways committee was reported to be of the opinion that in the present circumstances no useful purpose would be served in attempting to settle the basis of the provision to be made for renewals.

The report of the electric supply committee of the Birmingham City Council includes the detailed report made by Councilors Appleby and Beale on their inquiry into the causes of the recent interruptions of electric supply, which led to frequent stoppages of the tramway services of the city. They find that the failures were due primarily to an abnormal demand for current following the outbreak of war, which was greater than the committee could reasonably be expected to have foreseen. The increased demand came at a time when the department was least able to meet it, and the inability to meet the exceptional situation arose from causes which were not beyond the control of the committee. Following this report is a statement upon it by those members of the committee who have been members since November, 1911, and a statement by the city electrical engineer, who, Messrs. Appleby and Beale state, cannot be absolved from criticism in reference to certain delays. The report, the committee adds, concludes with an expression of grave apprehension as to the immediate future. The demand for current, however, is now being overtaken, but the spare plant is admittedly meager and new connections are constantly demanded. The committee is of the opinion that even now the permanent station should be proceeded with. Plans are in preparation, and in order to allay any anxiety that may be aroused by the observations contained in the report upon the disadvantages of the Nechells permanent site, the committee has asked C. P. Sparks, the president of the Institution of Electrical Engineers, to furnish it with a report.

Sir Albert Stanley, the president of the Board of Trade, has appointed a committee to consider and report on what steps should be taken, whether by legislation or otherwise, to insure that there shall be an adequate and economical supply of electric power for all classes of consumers in the United Kingdom, particularly industries which depend upon a cheap supply of power for their development. The committee is constituted as follows: The Right Hon. F. Huth-Jackson (chairman), H. Booth, James Devonshire, G. H. Hume, John Kemp, H. H. Law, M. I. C. E.; C. H. Merz, Sir Charles Parsons, K. C. B.; Sir John Snell, M. I. C. E.; Alderman C. F. Spencer and A. J. Walker, K. C.

The extension of the Bakerloo Railway from Willesden Junction to Watford has now been opened. This is the sixth extension of the railway since its inception in March, 1906. After coming to the surface at Queen's Park, the Bakerloo trains will run over the electric line of the London & North-Western system to Watford, via Willesden Junction New Station. The extension has increased the length of the Bakerloo run to more than 20 miles, and has added twelve stations to the line of route. It opens up a large area of new residential districts, and connects the northern suburbs with the central, west-end and south-eastern districts of London. In addition, it will give passengers using the London & North-Western system a choice of new terminal stations in London, connecting with main line railways, for the new line joins up Paddington (Great Western Railway), Marylebone (Great Central Railway) and Waterloo (London & South-Western Railway), with Willesden Junction and Watford. Other main-line railways can easily be reached by Bakerloo passengers. By changing at Oxford Circus they can travel to Liverpool Street (Great Eastern Railway); a change at Piccadilly Circus enables them to get to King's Cross (Great Northern Railway), and the Trafalgar Square station is only a minute's walk from Charing Cross (South Eastern & Chatham Railway).

A. C. S.

News of Electric Railways

Financial and Corporate

Traffic and Transportation

Personal Mention

Construction News

Decision in Tacoma Case

State Commission Refuses to Assume Power to Abrogate Franchise Provisions Considered Unreasonable by Tacoma Railway & Power Company

The State Public Service Commission at Olympia, Wash., on April 27, dismissed the case of the Tacoma Railway & Power Company against the city of Tacoma and refused to assume power or authority to abrogate franchise provisions or relieve a public utility of franchise obligations which have become burdensome, even though it may appear that compliance with those provisions will impair the capital of the company. The decision assures the city of Tacoma \$22,000 a year in gross earnings tax, about \$4,500 a year in street railway fares for city employees, and the cost of maintenance of paving between tracks and 1 ft. on each side, amounting to about \$20,000 a year. The decision of the commission was unanimous in holding the State Board has no power to interfere and grant relief, but each of the three commissioners wrote a separate opinion giving his views on the subject.

COMPLAINT FILED LAST OCTOBER

The complaint of the Tacoma Railway & Power Company was filed last October. In its prayer the company declared that its revenues were insufficient for it to comply with any of the provisions of the city franchise, except to render adequate and efficient service at a fair and reasonable rate. It asked to be relieved of paying its gross earnings obligations and for the maintenance of streets and bridges, and expressed a desire to be relieved of carrying city employees without charge. The company contended that through the "gratis franchise rights" to the jitney bus, the net earnings of the company had been reduced to a point where they were sufficient to do no more than to pay the interest on its indebtedness.

Counsel for the cities of Seattle, Spokane, Everett and Bellingham joined with City Attorney U. E. Harmon of Tacoma in writing the city's brief and in arguing the case before the Public Service Commission. Hugh M. Caldwell, corporation counsel of Seattle, and Walter F. Meier, assistant corporation counsel of Seattle, were among those entered as counsel. When the case was heard orally on Jan. 15, arguments were made by City Attorney Harmon of Tacoma and Mr. Meier. The case was taken under advisement at that time. In a previous case brought by the Puget Sound Electric Company, Seattle, similar release was sought, and in that case the commission held that it had jurisdiction, although there was an understanding that the question of jurisdiction might subsequently be raised.

MATTER IN QUESTION A JUDICIAL ONE

The decision, quoted as follows, covers the questions raised by the city attorney:

"The terms and conditions relating to paving and the bridge expense do not partake of the character of rate or service regulation, but on the contrary relate to adjustment of street paving and bridge construction and maintenance burdens. Whether or not the adjustment of street paving and bridge construction and maintenance burdens is a proper subject to be included in terms and conditions prescribed for the location and construction of a street railway, is a question for the courts to determine without previous action by the commission, for it is purely a judicial one.

"The terms and conditions relating to the gross earnings tax do not partake of the character of rate or service regulation, although such a tax may affect the rate or the ability of the company to render proper service in the same manner

that any other tax affects the rate or the ability of the company to render proper service. Whether the Legislature intended to delegate to the city power to levy a gross receipts tax when prescribing terms and conditions for the location and construction of a street railway, is also a judicial question for the courts to determine without action by the commission."

Commissioner Spinning held that the Public Service Commission's jurisdiction over street railways was closely to rate and service regulations, leaving franchise requirements as to paving, bridge construction costs and payment of earnings tax by the company to be determined in court without previous action by the commission. He held that the Legislature did not give the commission the power to grant franchises or prescribe terms and conditions upon which street railways should be operated and constructed, but conferred that power on cities. Such power, if judicially upheld, was authority of equal dignity with the power of the commission regarding tracks and service. Hence, when the city had acted within the scope of its franchise-granting power, it was not for the commission to determine whether the city had exercised its power wisely or unwisely.

Commissioner Lewis concurred in the dismissal on the ground that street railways were limited by law to charge 5 cents. He held that the commission was without power to eliminate any item of operating expense or maintenance of fixed charges of street railways.

Chairman Blaine, in his opinion, said:

"Under the public service act of this State any city or town may become a complainant and at its own instance the commission can proceed against a public service body, but to reverse this order and allow a utility to complain against a municipality would be a procedure which the statute does not seem to contemplate."

SIMILAR PRINCIPLES INVOLVED ELSEWHERE

The decision is regarded as extremely important by other cities, as similar principles are involved in the litigation between the city of Seattle and the company there. The Seattle petition was filed with the commission about two years ago, but it has been held in abeyance awaiting the completion by the commission of a physical valuation of the street railway properties there.

According to a statement of officials of the Puget Sound Traction, Light & Power Company, an appeal will be taken to the Thurston County Superior Court from the decision of the commission.

Following the commission's decision, Commissioner of Public Works Atkins of Tacoma immediately sent a letter to City Attorney U. E. Harmon, asking that he give formal notice to the company to repair the pavement between its tracks. According to Commissioner Atkins, the condition of the streets named presents a continual menace to life.

New York Legislature Adjourns

The New York Legislature adjourned on May 10. It seems likely, however, that a special session will be called to deal with the economic problems growing out of the war. The outstanding features of the session to the electric railways were the defeat of the Thompson bill to reorganize and consolidate the Public Service Commissions and the passage over the veto of Mayor Mitchel of the Ottinger bill giving the Public Service Commission for the First District of New York jurisdiction with the Board of Estimate of New York in relation to the pending contract between the city of New York and the New York Central Railroad for the proposed West Side improvement.

South Bend Men Still Out

Agreements Reached with Interurban Men and Employees in Elkhart and Michigan City, but South Bend Men Refuse Company's Offer

Following the mass meetings of labor unions at South Bend, Ind., to create public sympathy for the strike of the local men of the Chicago, South Bend & Northern Indiana Railway, which was called on April 29, as reported in the May 5 issue of this paper, page 839, strike sympathizers began rioting in the business district of the city about noon on May 2, compelling the company to withdraw all the cars which it was operating. No protection was afforded by the police of the city, and an appeal was made by General Manager F. I. Hardy to Mayor Keller for more adequate protection.

2 CENTS ADDITIONAL TO ELKHART, MICHIGAN CITY AND INTERURBAN MEN

On May 2 Mr. Hardy, in conference with a committee of the trainmen of the interurban lines who had not joined in the strike, effected a settlement of their differences, under which the men were granted an increase in wages of 2 cents an hour, the new scale ranging from 25 to 34 cents an hour for conductors, and 26 to 35 cents an hour for motormen. The demands of employees of the local lines of the company in Elkhart and Michigan City were also adjusted by a compromise between the company and the employees. These men were also granted an increase of 2 cents an hour.

On May 4 an offer of an increase of 2 cents an hour in wages was made to the striking employees at South Bend, but was refused by the men on account of provisions stipulating that the new agreement should be executed by the men as individual employees by 6 p. m. on May 5, and the refusal of the company to deal with the union. Rioting in the city grew worse on May 4, with the attitude of the police tending to aid rather than deter the acts of depredation. Eighteen arrests were made of persons stoning the crews of cars being operated. Mayor Keller issued a proclamation calling on citizens to refrain from gathering on the streets, and warning them to keep moving.

An appeal by the union to the Public Service Commission to act as a board of arbitration as in the case of the Indianapolis strike of 1913 was declined by the commission on account of the law passed by the Indiana Legislature in 1915 providing for an arbitration board to be appointed by the Governor in case of labor disputes and strikes.

After conferring with Governor Goodrich, Sheriff Bailey, of South Bend, assumed control of the situation at South Bend on May 5, and appointed fifty deputies to aid the police.

MEN APPEAL TO GOVERNOR

Governor Goodrich stated that he had received a telegraphic appeal from Claude F. Barnes and Edward Carr, South Bend, whom he inferred were officers of the local union, asking him to appoint an arbitration board under the act of 1915 to investigate and adjust the strike at South Bend. The Governor stated that he had decided to appoint such a board, but that he would not be ready to announce the names of the arbiters until he had been afforded an opportunity of selecting men desirable for such a service.

Mr. Hardy stated on Saturday night, May 5, that he was satisfied with conditions and that through the co-operation of Sheriff Bailey and his deputies full service on the South Bend city lines would be restored by Monday. He added that the striking motormen and conductors might consider themselves as discharged.

The strikers held their second mass meeting on Saturday night, May 5, but no trouble resulted. No arrests were made during the day, but seven persons were arrested at night on charges of throwing stones, inciting riot, etc.

On May 7, Governor Goodrich telegraphed to the officials of the railway and to representatives of the striking trainmen that he intended to appoint arbitrators at the earliest moment possible, and asked that some arrangement be made if possible to resume work pending the appointing of the arbitration board and its investigation of the difficulties—with the understanding that the settlement reached should date back to the appointment of the board.

\$46,862,972 Fixed as Portland Value

Public Service Commission Makes Ruling on Portland Railway, Light & Power Company, Portland, Ore.—Rate-Making Basis Set

The Public Service Commission of Oregon on April 30 handed down its valuation order as to the railway, electric utility and gas utility divisions of the Portland Railway, Light & Power Company, determining the value of the company's properties for rate-making purposes at \$46,862,971. This valuation is approximately \$14,000,000 less than the valuation found by the company's engineers. A set of preliminary findings was issued by the commission about a year ago. The total value of the properties is placed at \$55,307,474, as of Dec. 31, 1916. Of this amount the commission finds that \$8,444,502 represents non-utility property, leaving a total valuation of the property used and useful to the service of the public of \$46,862,971. The apportionment of this value is as follows:

Railway divisions—	
Portland Railway	\$18,233,372
Oregon Water Power & Railway.....	7,402,195
Mount Hood Power & Railway.....	1,523,454
Total railway	\$27,159,021
Electric utility divisions—	
Portland	\$17,689,980
Willamette Valley	1,177,005
Vancouver	625,168
Total electric utility.....	\$19,492,153
Salem gas utility.....	211,798
Total utility property.....	\$46,862,971

In giving its findings at length in the order, the commission estimates the utility will reasonably require in materials and supplies and cash or its equivalent, the sum of \$250,000 for the purposes of operation, including its maintenance of non-utility property, allowing \$1,110,000 as a working capital for successful operation.

The cost of financing is allowed to remain as it stood in a former order of the commission. At that time the question of an allowance of 1.65 per cent under the head "cost of obtaining money," was considered, but the specific amount was disallowed, the overhead figures adopted in the former findings being deemed sufficient to cover this feature.

An allowance of slightly more than 6 per cent was made to the utility for interest during construction. The commission altered its former findings as to reproduction cost of the underground distribution system, the reproduction cost new as now found on this underground system being placed at \$861,593 and the reproduction cost, less depreciation, at \$891,385. The commission refused to include park and resort property as utility operating property.

COST OF PROPERTY TO INVESTORS

The cost of the property to present investors up to Dec. 31 is fixed by the commission at \$51,001,147, there being added to the former finding \$100,666, while the original cost is placed at \$40,128,642. The amount and market value of the stocks and bonds of the company, as of Feb. 6, 1915, the latest date for which the record contains information on this point, were as follows:

	Par Value	Market Value
Portland Railway, Light & Power Company 5 per cent bonds, due 1942.....	\$17,064,000	\$14,419,080
Portland Railway, Light & Power Company, 5 per cent notes, due 1915.....	5,000,000	4,962,500
Portland Railway, Light & Power Company 5 per cent bonds, due 1930.....	8,523,000	8,448,424
Portland General Electric Company 5 per cent bonds, due 1935.....	8,000,000	7,900,000
City & Suburban Railway 6 per cent bonds, due 1916	87,000	87,000
City & Suburban Railway 4 per cent bonds, due 1930	1,290,000	1,120,300
Portland Railway, Light & Power Company common stock.....	25,000,000	6,250,000
Totals	\$64,964,000	\$43,186,304

In outlining the purposes for which the findings of value of the utility are made the commission says in part:

"It would appear that the Legislature, in drafting the act which clothes the commission with jurisdiction over railroads, . . . attempted to provide a means of perpetuating for all relevant purposes the various elements

which enter into the various concepts to which the term 'value' has been applied. It is equally clear that in drafting the public utility act the Legislature had in mind the finding of an ultimate figure of value, and since the commission exercises no jurisdiction over the issuance of stocks and bonds, nor questions of taxation, nor proceedings looking to the fixing of values for purposes of sale or exchange, it is evident the 'value' contemplated by the Legislature is the value for rate-making purposes. This value, the commission conceives to be an expression in dollars of the aggregate of many factors, and represents, on the one hand, the amount upon which the utility owner is entitled to base a claim for a return, and, on the other hand, the amount upon which, provided it requires the imposition of no unreasonable, unjust nor unjustly discriminatory rates, the ratepayer should pay a return."

Public Beginning to Appreciate

A recent issue of the St. Joseph (Mo.) *Gazette* contained an editorial entitled "How Do They Do It?" which called attention to the fact that in spite of the increased cost of practically everything which the public must buy, the prices of electric railway transportation and electric lighting have remained constant. The editorial commented on the fact that all items of expense incident to the production of these necessities of modern civilization, including wages, material, fuel, rent, etc., have greatly increased, and yet the local company continues to furnish these commodities at rates which are the lowest they have ever been in that community. It also goes on to say that the conditions existing in St. Joseph are to be noted in most American municipalities, although the editors have noticed that in a few cases the "cut-rate street car books" have been withdrawn. The editorial ends with this comment: "How do the public service corporations supplying these commodities manage to maintain the old prices when the ice man, the coal dealer, the dairy man, the doctor, lawyer, merchant and chief all are boosting the prices of their own wares?"

Washington Men File Brief

A committee representing the striking employees of the Washington Railway & Electric Company, Washington, D. C., has filed its brief with the Senate investigating committee which is inquiring into the conduct of the recent strike. The brief of the company had been submitted previously, as noted in the *ELECTRIC RAILWAY JOURNAL* of May 5, page 840. The representatives of the men charge that President King of the company was "guilty of bad faith." They review the attempts at arbitration, and charge that the company is endeavoring to deceive Congress and the public with "constant assertions and paid newspaper advertisements that we insist upon a closed shop and an agreement with the Amalgamated Association." The communication asks that a recommendation be made for compulsory arbitration of all such disputes in the District.

The Senate investigating committee arranged to begin its hearings on May 8. The committee planned to sit only in the mornings before the sessions of the Senate and possibly at night if necessary.

Dearth of Help at Cleveland

Many of the motormen and conductors on the Cleveland (Ohio) Railway are giving up their places to go into other work. While the force is as large now as it was at this time last year, more cars are operated. A. E. Duty, general superintendent of the company, said that no cause can be given for the men leaving the service except "the man and the opportunity." Some of the men are going into shops where high wages are paid, while others are taking advantage of the various other opportunities that are offered. Fielder Sanders, street railway commissioner, said the situation is becoming so serious that women may have to be employed as conductors. Mr. Sanders says that if women are employed they should receive the same wages as the men. Mr. Sanders said on April 4 that 217 half trips had been taken off the service during the rush hours,

because of the shortage of men. He also estimated that 650 motormen and conductors out of a total of 2500 are between the ages of twenty-one and twenty-seven years, first mentioned as the probable ages for conscription. This introduces still another danger to the service.

It is said that the conductors and motormen will ask the company for an increase in wages because of the abnormal increase in living expenses. Under their working contract the men received an increase of 1 cent an hour on May 1, but they say this will not be sufficient to meet the increase in the cost of food. They say now that the present abnormal conditions could not be foreseen when the contract was made and that the present wages are inadequate to their needs.

Council Approves Enabling Legislation

Power Required by Chicago in Order to Carry Out Traction and Subway Commission's Plans for Unified Transportation System Would Be Had by Passage of These Bills

After debate at which the Socialists and the advocates of immediate municipal ownership tried to influence the vote of the Aldermen by misinterpretation of the traction and subway commission's plans and a plea for no further franchises to utilities the Chicago City Council passed on four important bills for presentation at once to the State Legislature for consideration at the present session. These, if enacted into laws by the Assembly, will give the city the enabling legislation needed to proceed on a final solution of the local transportation problem. The four pieces of enabling legislation which have just been approved by the Council are as follows:

A bill restoring to the city the powers of home rule taken from it by the State public utilities act, and recently upheld by the State Supreme Court.

A bill authorizing the city to grant a thirty-year franchise to a new operating company formed by the merger of the elevated and surface lines.

A bill authorizing the city to construct and operate subways.

A bill authorizing the merger of the companies owning the surface and elevated lines, required because of their incorporation under different laws.

One of the principal reasons set forth by the immediate municipal ownership advocates as to why no new franchise grant should be given was the "rotten deal" the people had received as a result of the surface lines' operation under the 1907 ordinances. The sincerity of the Board of Supervising engineers was attacked. It was also asserted by the opponents of the legislative program that the members of the Board of Supervising Engineers were dominated by the traction interests.

District Valuations Announced

The Public Utilities Commission of the District of Columbia on May 2 announced complete valuations for rate-making purposes for the Potomac Electric Power Company, the Washington & Georgetown Gas Light Company and the Chesapeake & Potomac Telephone Company. The commission finds the value of the Potomac Electric Power Company, which is controlled by the Washington Railway & Electric Company, as of Dec. 31, 1916, to be \$11,231,170. The company had claimed a value of \$23,235,387 for its property.

Clarence P. King, president of the Potomac Electric Power Company, said on May 2 that he could not state what steps would be taken by the company until he had opportunity to go over the report. In announcing its findings the commission stated that it would hand down an opinion reviewing the problems presented in each case, within a few days.

This completes the valuation work, except for the properties of the Washington Railway & Electric Company and the Capital Traction Company now under investigation. Consideration of the rates charged for local utility service next is in order.

Chicago Men Seek Wage Increase

Present Contract Expires June 1, and Demand for 40 Per Cent Increase Will Shortly Be Made

The contract under which all elevated and surface trainmen in Chicago have been working expires on June 1. The unions have already prepared a demand for wage increases amounting to about 40 per cent, and also asking for shorter hours. The demand for wage increase will be for a raise from 36 cents an hour to 45 cents maximum during the first year of the agreement, and from 45 cents to 50 cents an hour during the second year. The wage scale at present is from 27 cents an hour to 36 cents distributed through four years.

The hours of work are to be determined on a basic eight-hour day, with a nine-hour maximum. Under the present agreement the men work under a basic ten-hour day. Night car runs are not to exceed six hours, and the men operating on them to receive \$3.50 a run. Any runs necessitating more than eight hours are to be paid for at the rate of time and one-half for overtime. The demands will also contain other items as to the detail working conditions.

While the demands of the union have not been formally presented to the companies, their substance is expected to be approximately as itemized above. These are expected to be practically the same for both elevated and surface employees, although definite information on the former has not yet been made public.

Increase in Wages in York.—The directors of the York (Pa.) Railways have authorized an increase in the wages of the 200 employees, varying from 1 cent to 2 cents an hour.

Increase in Wages Sought in Olympia.—A petition, signed by the trainmen in the employ of the Olympia Light & Power Company, Olympia, Wash., requesting an increase of 5 cents an hour in wages, has been presented to L. B. Faulkner, manager.

Negotiations Continue in East St. Louis.—The conferences between the officers of the East St. Louis & Suburban Railway, East St. Louis, Ill. and the trainmen of the company over the working conditions of a new contract to take the place of the one that expired on May 1 were still being held on May 10.

Employees of Suburban Line Strike.—The employees of the Cincinnati, Georgetown & Portsmouth Railroad, Cincinnati, Ohio, who are members of the Amalgamated Association went on strike on April 28 to enforce recognition of the union and the reinstatement of their president, whom they contend was discharged because of his activity in behalf of the union.

Dynamiter Denied New Trial.—William Pollard, leader in the strike of the employees of the Georgia Railway & Power Company, who was convicted in the Superior Court on a charge of subornation of perjury, has been refused a new trial. He was charged with having aided in manufacturing an alibi for a striker arraigned on a charge of dynamiting during the walkout attempt in Atlanta.

New Wage Contract Submitted at Providence.—The local division of the Amalgamated Association has presented to the officers of the Rhode Island Company, Providence, R. I., a new working agreement calling for an increase in wages, the new contract to replace the present one, which expires on May 31. The company has a week in which to consider the matter and forward its reply.

Seventh Annual Prize Contest of Indiana Company.—The Union Traction Company of Indiana, Anderson, Ind., has announced the seventh annual prize essay contest for its employees. The subject for discussion will be "How Does the Obedient and Orderly Man Promote Safety First?" Prizes of \$15, \$10 and \$5 in gold are offered by the company for the first, second and third best replies. The essays must be turned in before June 1.

Car-Full Jurisdiction Transferred.—The Assembly of New York has passed the bill of Senator Murphy of Brooklyn transferring from the local health authorities of New

York and Buffalo to the Public Service Commission the power to regulate overcrowding on street cars. The bill, originally passed by the Senate, applying only to New York, was amended in the House so as to apply to Buffalo also, and now goes back to the Senate for concurrence in the amendment.

Committee Kills Corporation Tax in Pennsylvania.—The ways and means committee of the Pennsylvania House voted on May 8 to negative the Wallace bill proposing to make the property of public service corporations subject for local taxation. Adverse action by the committee virtually means that the measure is dead, since 104 votes would be required to place it upon the calendar. Representatives of the public service companies contend that since they pay a State tax they should be exempted from local taxation.

Strike Threatened at McAlester.—Employees of the Pittsburg County Electric Railway, McAlester, Okla., have presented demands for an increase in wages of 4 cents an hour for all motormen and conductors, with threats of a strike if the demands are not met. The company, through W. H. Vorce, general manager, offered an increase of 2 cents an hour for trainmen on two-men cars and 4 cents an hour for trainmen on one-man cars. The men declined to accept the compromise proposal and declared they would strike.

New Members Appointed to Indiana Commission.—On May 1 Governor James P. Goodrich appointed Ernest I. Lewis, John W. McCardle and William J. Wood as members of the Public Service Commission of Indiana to succeed Thomas Duncan and James L. Clark, whose terms had expired, and Edwin M. Lee, who had been removed by the Governor early in January. The new commission has organized by electing Mr. Lewis as chairman, and Carl H. Mote secretary. The hold-over members of the commission are Edwin Corr and Charles A. Edwards.

Philadelphia Hearings on May 18.—The proponents and opponents of the rapid transit program planned for Philadelphia are aligning their forces. The hearings are to begin on May 18. The proponents will then state their case. The objectors will be heard on May 25. The situation has been discussed at length at recent conferences between representatives of the city and officials of the Philadelphia Rapid Transit Company. Mayor Smith has announced that it has been decided to thresh out the whole matter before the joint committees of Councils on street railways and finance.

Toledo Problem Goes Back to Mr. Doherty.—After conferring with Attorneys Thurston and Emery of the Toledo Street Railway Commission, for two days on the wording of important clauses in the proposed community plan for settling the street railway matter at Toledo, Ohio, Judge D. C. Bailey, representing Henry L. Doherty, chairman of the board of the Toledo Railway & Light Company, decided he had not the power to act in the matters brought up and they will once more be referred to Mr. Doherty himself. It is expected that Mr. Doherty will visit Toledo again within a short time.

Seattle Municipal Railway Piles Up \$105,120 Deficit.—According to figures filed by W. W. Clark and F. P. Mitten of the State Bureau of Inspection of Washington, the municipal street railway at Seattle shows a loss of \$98,382 in operation for two years and seven months, from June 1, 1914, to Dec. 21, 1916. These figures are identical with the annual report of A. L. Valentine, superintendent of public utilities of that city. The first three months of 1917 added \$6,738 to the loss, bringing the total to April 1 of this year to \$105,120. The property as now operated comprises 13.2 miles of line.

Further Conferences at Tacoma.—A. L. Kempster, manager of the Puget Sound Traction, Light & Power Company, at a further conference between the City Councilmen of Seattle, Wash., and officials of the company, announced that the company stood willing to construct the Avalon Way cut-off as a more direct route for the Fautleroy Avenue car line as soon as other questions now at issue between the city and company are settled. Mr. Kempster stated that industrial development in that district had reached a point to justify continuation of the present service to the heart of the district. The company is willing to grant the city common-user rights.

Progress on Oakland Indeterminate Franchise.—The committees which have been appointed by the Mayors of Oakland and Berkeley, Cal., to consider and pass upon the indeterminate franchise question, have organized and are working on a preliminary draft of the ordinance. The city of Alameda has organized under its new charter and the appointment of the committee is expected in the near future. The resettlement franchise bill which was unanimously passed by the State Legislature is now before the Governor for his approval. The settlements proposed to be made are with the San Francisco-Oakland Terminal Railways.

Increase in Wages in Portland.—An increase in wages of 3 cents an hour, amounting to more than \$90,000 a year, has been granted by the Portland Railway, Light & Power Company, Portland, Ore., to its 1200 trainmen. The increase will go into effect on a graduated basis, the first increase of 2 cents an hour being effective on May 1 and the second increase of 1 cent an hour being in effect on Aug. 1, 1917. The increase will make the sliding scale of wages 28 to 34 cents an hour. In the past it has been 25 to 31 cents an hour. The new scale was arranged in agreement with the Brotherhood of Electric Railway Employees of the company.

Wires Ordered Underground in Frankfort.—An ordinance has been passed by the City Council of Frankfort, Ky., requiring that the electric distribution systems along portions of Main and St. Clair Streets be buried and, in addition, provides that along these same streets the Kentucky Traction & Terminal Company shall replace its wooden poles with ornamental steel poles. It is provided that the improvements shall be completed by April 1, 1918. The telephone and lighting companies will oppose the fulfillment of this program, in view of the fact that carrying out the plan would involve trenching a mile through solid limestone rock at very heavy expense.

Changes on the Key System.—Effective as of May 1, the efficiency department of the San Francisco-Oakland Terminal Railways, Oakland, Cal., was abolished as such. Hereafter the coasting recorder statistics will be kept by the auditor. Operating matters in connection with coasting instruction, records and the like, will be handled, as heretofore, by the transportation department under the jurisdiction of J. P. Potter, superintendent of transportation. U. S. Sliter, former superintendent of the efficiency department, and H. T. Brobeck, chief clerk to G. H. Harris, general superintendent, have been appointed assistant superintendents of transportation.

Electrification Plans Progressing Slowly.—The annual report of the Pennsylvania Railroad for the year ended Dec. 31, 1916, contains the following reference to the proposed Allegheny electrification: "No work was undertaken during the year on the proposed electrification of your main line across the Allegheny Mountains between Altoona and Conemaugh, beyond designing and constructing the type of electric locomotives required, continuing the detailed surveys and obtaining the experience of other lines in the use of electric traction for heavy freight and passenger trains. Scarcity of labor and the high cost of construction materials also made it desirable not to urge this improvement."

Sunday Prays for Interborough Men.—May 2 was Interborough night at the Billy Sunday tabernacle. Several thousand employees of the elevated and subway lines and the families of the employees attended the service in a body. Many of the executive officers of the company and the subway band were in the delegation. Among the 1452 "trail hitters" who went forward were H. H. Vreeland, former president of the Metropolitan Street Railway, now in charge of the Interborough welfare work, and A. L. Merritt, superintendent of the Subway. Sunday said that he knew Theodore P. Shonts, president of the Interborough, when Mr. Shonts was railroading in Iowa years ago. In concluding his prayer Sunday said: "I pray for these men and women from the Interborough. Bless the boys of the band who have come out to-night in their white uniforms looking like big snowflakes."

Women Conductors to Be Tried.—Unable to secure sufficient men to operate its cars, the Corning & Painted Post Street Railway, Corning, N. Y., intends to employ women

as conductors on its Corning local lines. Last fall the men asked for a wage increase, with a minimum of 26 cents an hour. The company agreed to grant a wage increase based on seniority with a maximum wage of 26 cents an hour. The platform men agreed to accept this scale temporarily. Several weeks ago the company placed in operation a number of one-man cars on its Corning local lines, but the city authorities refused to allow the company to operate these cars. After a series of conferences between J. R. Empey, general superintendent of the company, and the city officials, the company announced it was not financially able further to increase the wages of the platform employees and signified its intention to try women conductors. Four women will be employed to serve on runs during off hours to determine how the plan works out.

Wage Increase at Colorado Springs.—The Colorado Springs (Col.) Interurban Railway increased the wages of its trainmen on May 1. The old rate was 25 cents an hour for the first two-year period, 27 cents for the third and fourth years, 28 cents for the fifth and 30 cents thereafter. Under the new rate the men will receive 25 cents an hour for the first year, 26 cents for the second year, 28 cents the third year, 30 cents the fourth year and 32 cents thereafter. An unusual circumstance in connection with this wage increase is the fact that the 136 trainmen now employed by the company are all maximum rate men, so that the wage rate for the entire force of trainmen will be 32 cents an hour. On June 1 the company will add to its force about twenty men who were laid off last fall after the tourist season closed. None of these men will be under two-year men. The earnings of the company did not justify the increase, but the company granted the raise voluntarily, because of the greatly increased cost of living.

Programs of Association Meetings

Iowa Electric Railway Association

At the meeting of the Iowa Electric Railway Association, at Des Moines, Ia., on May 24 and 25, the following program of papers will be presented:

"How Should the Electric Railway Manager Anticipate the Effects of the War?" by C. E. Fahrney, general manager of the Ottumwa Railway & Light Company.

"Is the A. E. R. A. Question Box Fulfilling Its Purpose?" by Scott H. Bluett, of the American Car & Foundry Company.

"Application of Automatic Substations to Interurban Operation," by W. A. Clough, of the General Electric Company, with discussion by F. C. Chambers, of the Des Moines City Railway.

"Safety Devices for One-Man Operation," by C. H. Beck, of the Westinghouse Traction Brake Company.

American Institute of Electrical Engineers

The annual convention of the American Institute of Electrical Engineers will be held at the Homestead Hotel, Hot Springs, Va., June 26 to 29. The convention will open on the afternoon of June 26 with President H. W. Buck's address, followed by the reports of the various technical committees. The two sessions on June 27 will be under the auspices of the transmission and distribution committee. The morning session of June 28 has been designated as the mining session. The fifth and last technical session will be held on June 29. The general subject of this session will be inductive interference between railway and telephone lines. The tentative list of convention papers for the first four sessions has been confirmed. The paper for the fifth session will be "Economical Combination of Water Power and Steam Plant and a Simple Method of Solution," by H. S. Putnam.

The annual business meeting of the institute will be held in the auditorium of the Engineering Societies Building on May 18. The board of directors will present its report for the fiscal year ended April 30, 1917. The seventh Edison medal, which was awarded to Nicola Tesla on Dec. 13, 1916, "for meritorious achievements in his early original work in polyphase and high-frequency electric currents," will be presented to Mr. Tesla at the annual meeting.

Financial and Corporate

Annual Reports

Public Service Corporation of New Jersey

The income statement of the Public Service Corporation of New Jersey, Newark, N. J., for the year ended Dec. 31, 1916, follows:

Operating revenue of subsidiary companies.....	\$42,548,775	
Operating expenses, including amortization charges and taxes	25,863,854	
Operating income	\$16,684,921	
Non-operating income	516,529	
Gross income	\$17,201,450	
Income deductions of subsidiary companies (bond interest, rentals and miscellaneous interest charges)	11,963,114	
Net income of subsidiary companies.....	\$5,238,336	
Public Service Corporation income from securities pledged (exclusive of dividends on stocks of operating companies) and from miscellaneous sources.....	\$1,965,421	
Less expenses and taxes.....	162,885	1,802,536
		\$7,040,872
Public Service Corporation income deductions:		
Interest charges	\$3,678,876	
Amortization of debt discount and expense	174,088	
Sinking fund for Public Service general mortgage 5 per cent bonds.....	209,500	
Other contractual deductions from income	36,540	4,099,005
Net income of Public Service Corporation and subsidiary companies	\$2,941,867	
Appropriation accounts of subsidiary companies:		
Amortization of new business expenditures prior to Jan. 1, 1911.....	\$40,330	
Adjustments of surplus account (credit)	118,984	78,654
		\$3,020,521
Appropriation accounts of Public Service Corporation (exclusive of dividends)		72,828
Net increase in surplus before payment of dividends		\$2,947,693

Dividends at the rate of 7 per cent per annum for the first quarter of the year, and at the rate of 8 per cent per annum for the last three-quarters of the year, aggregating \$1,937,500, were paid upon the capital stock of the corporation, amounting to \$25,000,000 at par.

The corporation shared in the general prosperity prevalent throughout the country. The total operating revenue of subsidiary companies amounted to \$42,548,775, an increase of \$5,077,546, or 13.6 per cent. The operating revenues for the three major subsidiaries and their affiliated companies for 1916, with the amount of increase and the percentage of increase over the previous year, are as follows:

	Operating Revenue	Amount of Increase Over Previous Year	Percentage of Increase
Public Service Railway.....	\$18,175,764	\$1,606,321	9.7
Public Service Electric Co....	12,814,597	2,388,745	22.9
Public Service Gas Company	11,558,413	1,082,479	10.3

The foregoing figures of increase, it is said, are highly satisfactory but are abnormal. All three of the companies shared in the prosperity, but the increase in the electric company's business is described as being little less than phenomenal.

The annual report states that during the last two years jitney operation undoubtedly diverted a very large revenue from the railway. That this industry can ever seriously impair the activities and future development of the railway, however, is not believed by those who have been closely watching the current of events during the last year. The revenues of the company were also seriously affected during the summer by the prevalence of the infantile paralysis epidemic, which closed many pleasure resorts and completely paralyzed juvenile riding. The operating people feel confident that the company lost a revenue of at least \$250,000 from this cause.

The revenue from transportation increased from 30.540 cents per car-mile to 31.412 cents per car-mile, or 0.872 cents per car-mile. Operating revenue deductions increased from

19.603 cents per car-mile to 20.354 cents per car-mile. The ratio of operating revenue deductions to operating revenue was 63.7 per cent. Car mileage increased 6.0 per cent. Other statistics follow:

	1916	1915
Revenue passengers	342,295,993	313,923,363
Transfers and passes.....	109,492,019	100,498,677
Total passengers	451,698,012	414,422,040
Percentage of passengers using transfers.....	21.8	21.5
Average fare per passenger (cents).....	3.82	3.82
Car mileage	54,964,708	51,873,660
Passenger receipts per car-mile (cents)...	31.37	30.49
Passenger receipts per car-hour (dollars)	2.92	2.84

The taxes for 1916 amounted to \$2,713,059, an increase of \$396,093, or more than 17 per cent. Fire insurance carried on Dec. 31, 1916, was \$32,951,036, an increase of \$2,731,357. The average rate in 1916 was 32.3 cents per \$100 of insurance as compared to 34 cents in 1915. The net addition to fixed capital during 1916 was \$7,236,259, of which \$2,303,837 was for the railway department.

The total expenditures of the welfare department for insurance, sick benefits, pensions and expenses for 1916 were \$88,368, an increase over the previous year of \$12,263. The cost of accidents arising under the workmen's compensation act was \$77,436, an increase of \$17,949 over the year preceding. The total was divided as follows: Payments as required by act, \$57,904; additional payments over and above those required by act, \$7,047, and expenses of department, \$12,484; total, \$77,436.

Washington Water Power Company

The income, profit and loss statement of the Washington Water Power Company, Spokane, Wash., for the year ended Dec. 31, 1916, follows:

Gross operating revenue.....	\$2,676,056
Interest on current balances.....	8,968
Total revenues	\$2,685,024
Operating expenses, including taxes.....	1,328,669
Net revenues	\$1,356,355
Interest on bonds.....	328,869
Interest on notes and loans.....	99,384
Premium on \$117,000 bonds bought for sinking fund....	259
Annual credit to amortization fund for discount on first refunding mortgage bonds.....	9,808
Interest on consumers' deposits, etc.....	1,035
Written off for replacement reserve.....	325,000
Uncollectible accounts, etc.....	5,037
Total	\$769,392
Net income	\$586,963
Surplus from 1915.....	986,945
	\$1,573,908
Dividends	658,325
	\$915,583
Credit adjustments prior to 1916.....	7,212
Surplus Dec. 31, 1916.....	\$922,795

No separate figures are given in this company's report for light and power and for railway earnings. It is stated, however, that jitney competition continued with little change from that in 1915. In that year the railway traffic fell off and the receipts decreased 13 per cent on account of jitney competition and the increasing number of private automobiles. In 1916 the total of passengers carried on the city lines declined still farther by 112,903 to 15,601,850, the smallest traffic total since 1907. During the last year, however, the car-miles run on all the lines rose from 3,612,993 to 3,666,944, and the car-hours showed an increase from 407,157 to 413,259.

The gross operating revenues of the company fell off \$67,820, or 2.5 per cent, while the net revenues decreased \$154,625, or 10.2 per cent. The total output of the light and power system for 1916 was 162,825,400 kw.-hr., a decrease of 1.86 per cent. Lighting and power revenues in the country districts increased 10 per cent, but reductions in rates brought down the Spokane total, and the power business in the Coeur d'Alene mining district showed a decrease of 8.4 per cent.

During 1916 the company expended \$27,212 for capital purposes on the railway system and \$293,670 on the lighting and power system. The book values of the two classes of property on Dec. 31, 1916, were as follows: Electric light and power, \$21,102,735; street railway (city and interurban), \$4,793,912.

Underground Electric Railways of London, Ltd.

The total income of the Underground Electric Railways of London, Ltd., London, England, for the calendar year 1916 totaled £653,361, as compared to £680,741 for 1915, a decrease of £27,380, or 4.02 per cent. The reduction in revenues from the subsidiary companies (for their report see ELECTRIC RAILWAY JOURNAL of March 17) may be seen from the following summary:

Revenue:	1916	1915
London Electric Railway.....	£147,804	£143,242
District Railway.....	36,619	40,950
City & South London Railway.....	31,809	14,832
London General Omnibus Company.....	128,038	192,058
Metropolitan Railway.....	151	177
London & Suburban Traction Company.....	5,889	6,586
Associated Equipment Company.....	143,000	170,000
Sundries (including income-tax returnable) ..	160,051	112,896
Total	£653,361	£680,741
Appropriations:		
Directors', etc., fees and expenses.....	£6,981	£11,813
Loss on foreign exchange.....	20,289	
Interest on 4½ per cent bonds.....	106,508	95,252
Interest on 4½ per cent 3-year secured notes	31,500	31,500
Central London guarantee.....	13,466	26,931
Interest on 6 per cent income stock.....	76,380	76,380
Interest on 6 per cent income bonds (1916, 5 per cent; 1915, 6 per cent).....	406,178	438,731
Change in balance forward.....	—£7,942	+£134

Besides the falling off in subsidiary revenues, there was, as above indicated, a large loss on foreign exchange and increased income tax. The income tax on the interest on the 4½ per cent bonds and the 6 per cent income bonds, together with the loss on foreign exchange in respect to coupons cashed abroad, was £134,015, an increase of £56,805, or 73.57 per cent.

At the annual meeting of the company it was stated that the greatest obstacle to the increased prosperity of the subsidiaries at the present time is the increased cost of operation. Last September the railways were obliged to grant an additional bonus to their employees. Coal has increased in price to more than double the pre-war level, and it is still rising. Under a recent order of the government in regard to the use of advertising posters, the display of posters is prohibited in many cases, and it is likely that there will be a loss of a large part of the £100,000 of revenue from the company's advertising in stations, cars, elevators and omnibuses. These factors, it was said, will probably compel the companies to consider a fare readjustment.

Toronto Railway

The comparative income statement of the Toronto (Ont.) Railway for the years ended Dec. 31, 1915 and 1916, follows:

	-1916-		-1915-	
	Amount	Per Cent	Amount	Per Cent
Gross earnings	\$5,973,161	100.0	\$5,694,136	100.0
Operating expenses	3,350,658	56.1	3,250,612	57.1
Net earnings	\$2,622,503	43.9	\$2,443,524	42.9
Interest on bonds.....	\$156,122	2.6	\$167,357	2.9
Percentage on earnings.....	909,881	15.2	808,254	15.2
Pavements, taxes	215,707	3.6	215,424	3.8
Total	\$1,281,710	21.4	\$1,251,035	21.9
Surplus earnings	\$1,340,793	22.5	\$1,192,489	21.0

Although the gross earnings of the company for the calendar year 1916 did not show a return to the high figures of \$6,127,096 in 1914 and \$6,099,018 in 1913, the net earnings showed a gain over those of \$2,597,550 in 1914, which was the highest record of net earnings since 1906, with the exception of \$2,925,710 in 1913. As compared to the preceding fiscal year, the increase in 1916 in passenger earnings amounted to \$270,208, or 4.7 per cent, while the increase in gross earnings was \$279,025, or 4.9 per cent. The operating expenses rose only \$100,046, or 3.7 per cent, so that the ratio of expenses to passenger earnings was 57 per cent in 1916, as compared to 57.9 per cent in 1915.

The net earnings for the last fiscal year showed a gain of \$178,979, or 7.3 per cent over those in 1915. The decreased interest charges on bonds were more than offset by the higher percentage payment on earnings, but the surplus earnings after payment of all expenses, interest, taxes, etc., showed an increase of \$148,304, or 12.4 per cent over those

for the preceding year. After adding the surplus at the beginning of the year and deducting the regular dividend of 8 per cent, the surplus carried forward at the end of the year totaled \$5,408,874, as compared to \$5,026,907 the year before.

The passengers carried in 1916 totaled 149,529,754, an increase of 7,468,496 over those in 1915, while the transfers numbered 61,342,673, a decrease of 1,055,875 from the 1915 figure. The number of passengers carried was greater than in any preceding year since 1906 with the exception of 1913 and 1914, when the totals were 151,236,925 and 152,966,153 respectively.

Almost at the close of the year the company suffered a loss by fire. On Dec. 28 a fire in the carhouse at St. Lawrence and King Streets completely destroyed the building and contents, including 168 cars.

Purchase Rumors Denied

The passage of the charter amendments of the Shore Line Electric Railway, referred to in the ELECTRIC RAILWAY JOURNAL of May 5, page 844, and the statements made in behalf of the New Haven Railroad in connection with the application of that company to issue preferred stock, have resulted in various rumors in regard to the final lodgment of the electric railway holdings of the New Haven under the agreement reached by that company some time ago with the Government for the disposition of its so-called outside holdings, among which are the Connecticut Company and the Rhode Island Company, operating the electric railways in Connecticut and Rhode Island respectively controlled by the New Haven. Coupled perhaps most frequently with these rumors has been the name of Morton F. Plant, New London, Conn., millionaire railroad operator and director of the Shore Line Electric Railway. Efforts made by the Providence *Tribune* to reach Mr. Plant regarding these rumors as concerned the Rhode Island Company have resulted in their denial by him. The *Tribune* quotes Mr. Plant as follows:

"I do not know anything about the report. If there was any foundation for the story I suppose I would know something about it."

Mr. Plant was then informed that it was reported that he was to purchase the Rhode Island Company as part of a general plan comprehending the taking over of all the electric railways between New York and Boston. To that he is reported to have replied:

"There is absolutely no foundation for this story."

American Cities Company, New York, N. Y.—The gross earnings from all sources of the combined constituent companies of the American Cities Company amounted in 1916 to \$15,464,361, as compared to \$14,145,442 in 1915, an increase for the last year of 9.3 per cent. This compares with a decrease of 4.3 per cent in 1915 and is the largest increase since 1907. Operating expenses and taxes rose from \$9,121,734 in 1915 to \$9,965,083 in 1916, so that the net earnings at \$5,499,278 represented a gain of 9.4 per cent. After deducting \$3,810,259 for interest, bond discount, amortization and miscellaneous, the amount applicable to stock dividends was \$1,689,019 in 1916 as compared to \$1,366,510 in 1915, an increase of \$322,509.

Birmingham (Ala.) Tidewater Railway.—First mortgage 5 per cent gold bonds of the Birmingham Tidewater Railway, the successor to the Birmingham, Ensley & Bessemer Railway, are being offered by Howard R. Taylor & Company, Baltimore, Md. The bonds are guaranteed as to principal and interest by the Birmingham Railway, Light & Power Company, which owns the stock of the Birmingham Tidewater Railway. The bonds are dated Jan. 1, 1916, and are due on Jan. 1, 1946. The amount authorized is \$4,000,000 and the amount issued \$1,500,000.

Boston & Worcester Street Railway, Boston, Mass.—The Boston & Worcester Street Railway has been authorized by the Massachusetts Public Service Commission to issue \$270,000 of additional preferred stock and \$40,000 of additional first mortgage bonds, which will make \$667,000 of stock and \$2,440,000 of bonds outstanding respectively.

Boston (Mass.) Elevated Railway.—The Senate committee on ways and means reported favorably on May 7 the report of the committee on metropolitan affairs recommending legislation to benefit the Boston Elevated Railway. The \$15,000 appropriation for a further investigation of the affairs of the Boston Elevated Railway was eliminated by the committee.

Central Park, North & East River Railroads, New York, N. Y.—Newton M. Hudson, who is auditor of the Second Avenue Railroad, has been appointed receiver of the Central Park, North & East River Railroad. The property of this company was sold under foreclosure in 1912 and is now owned by the Belt Line Railway Corporation, a subsidiary of the Third Avenue Railway. The organization of the Central Park, North & East River Railroad is maintained to wind up the affairs of the company.

Hagerstown & Frederick Railway, Frederick, Md.—A special meeting of the stockholders of the Hagerstown & Frederick Railway was called for May 7 to consider a plan for the reduction and readjustment of the company's capitalization. The plan provides for the retirement of the present outstanding \$1,225,000 of 5 per cent convertible adjustment bonds, the \$635,000 of 7 per cent cumulative preferred stock and the \$2,000,000 of common stock and the issuance in lieu thereof of \$600,000 of ten-year 6 per cent notes, \$842,500 of 6 per cent cumulative preferred stock and \$1,483,500 of new common stock. The plan provides for the conversion of a portion of the old preferred stock and the reduction of the common stockholdings to one-third the present amount.

Hudson Companies, New York, N. Y.—A plan for certain financial readjustments affecting the Hudson Companies has been advanced by Walter G. Oakman, president. The concern is a holding company. It owns a majority of the stock of the Hudson & Manhattan Railroad and also controls the Greeley Square Realty Company, the property of which is leased to Gimbel Brothers as a site for their store, and other buildings at Sixth Avenue and Thirty-third Street. It is pointed out to stockholders that the Hudson Companies owes \$1,950,000 which will mature during 1918. It is suggested that the Hudson Companies transfer its Greeley Company bonds and stocks and its interest in the Greeley Company first mortgage and any of that company's first refunding bonds to the Greeley-Hudson Securities Company, newly organized in an exchange plan set forth in detail by Mr. Oakman. After the consummation of the plan the Hudson Companies will still own its Hudson & Manhattan Railroad stocks and any of the \$2,000,000 of stock of the new company not sold with the notes. In regard to the effect of the plan Mr. Oakman said in part: "Your directors are assured that, if this plan becomes effective, the common stock of the Hudson Companies will be surrendered and canceled, whereupon it will be in order to reduce the preferred stock and distribute to the holders thereof such remainder of the capital stock of the new company, the Hudson Companies retaining the said railroad company holdings. To have this 'control' of the Hudson & Manhattan Railroad thus set free from all lien or debt and held together for future realization is obviously of great advantage."

Kanawha Traction & Electric Company, Parkersburg, W. Va.—The Fidelity Trust Company, Baltimore, Md., has issued a circular describing the first and refunding mortgage 5 per cent gold bonds, Series A, of the Kanawha Traction & Electric Company. These bonds are dated Aug. 1, 1916, and are due on Aug. 1, 1936. The proceeds of the bonds now sold will be used to retire \$150,000 of first mortgage 6 per cent bonds of the Marietta Electric Company, due April 1, 1917; \$1,100,000 of two-year 5 per cent notes due June 15, 1917, and for other corporate purposes. Reference to the filing of the mortgage securing the bonds was made in the *ELECTRIC RAILWAY JOURNAL* of Aug. 26, 1916, page 375.

Long Island Railroad, New York, N. Y.—According to its annual report for the calendar year 1916, the Long Island Railroad during the last year carried 45,802,722 passengers and 5,134,838 tons of freight, or 3,173,397 more passengers rode and 691,505 more tons of freight were hauled than in the preceding year. The heavy traffic of the year was reflected in the gross earnings from railroad operation, which amounted to \$14,971,838, an increase of 10 per cent.

Railway operating expenses also increased heavily, reaching a total of \$9,927,207, or \$800,285 greater than in 1915. The company earned as a result of the year's operation, a net income of \$241,735. This represented a return of 2 per cent on the outstanding capital stock, and compares with a deficit of \$161,083 incurred in 1915. Contracts made during the year for new equipment to be delivered in 1917 included forty-five steel passenger cars for electric service. In addition to these, out of equipment ordered for completion in 1916 there remained undelivered at the end of the year twenty-five steel passenger cars for electric service.

Orleans-Kenner Electric Railway, New Orleans, La.—Harry K. Johnson, promoter of the Orleans-Kenner Electric Railway, has issued the following statement in regard to the disposition of the property of the company: "On the strength of a statement by Francis T. Homer, of the firm of Bertron, Griscom & Company, New York, that he would allow the property owners of Jefferson to purchase the controlling interest in the Orleans-Kenner Electric Railway, which he had secured from Johnson & Company, Inc., builders and owners of the Orleans-Kenner Electric Railway, a syndicate was formed by Allen H. Johnness, president of the General Realty Company, for this purpose. I understand that the stock in the new company organized by Mr. Johnness has been considerably over-subscribed. Papers in connection with the deal have been signed and the new company is prepared to pay over the money. The amount involved is approximately \$500,000, exclusive of money for development, which, I understand, has been taken care of by the subscribers."

New York (N. Y.) Railways.—The Public Service Commission for the First District of New York has granted the application of the New York Railways for authority to purchase 6842 of the 9000 shares of the Bleecker Street & Fulton Ferry Railroad on which it had an option. The company will pay \$28.50 per share, and will give the same amount for the remaining shares if deposited within a reasonable time.

Philadelphia Company, Pittsburgh, Pa.—Ladenburg, Thalmann & Company, Blair & Company and Hayden, Stone & Company have announced to the holders of the first mortgage and collateral trust 5 per cent gold bonds of the Philadelphia Company, due March 1, 1949, and of the consolidated mortgage and collateral trust 5 per cent gold bonds due Nov. 1, 1951, that they have extended until May 31 the time within which deposits of these bonds may be made. More than 65 per cent of the first mortgage bonds and more than 70 per cent of the consolidated mortgage bonds had been deposited up to May 1. The deposit of these securities has been asked in connection with the sinking fund and redemption plan referred to briefly in the *ELECTRIC RAILWAY JOURNAL* of March 10, page 456.

Poughkeepsie City & Wappingers Falls Electric Railway, Poughkeepsie, N. Y.—The Poughkeepsie City & Wappingers Falls Electric Railway has increased its capital stock from \$750,000 to \$1,000,000.

Richmond Light & Railroad Company, Richmond, S. I., N. Y.—The application of the Richmond Light & Railroad Company and the Staten Island Midland Railway for permission to consolidate was refused on May 10 by the Public Service Commission for the First District of New York. The opinion of the commission was written by Commissioner Hervey. He said that no evidence had been submitted to show that the bonds to be refunded had been issued for capital purposes. He also said that it was incumbent upon the company to prove that the obligations proposed to be discharged or refunded were not only actual obligations but were issued for capital purposes.

Scranton (Pa.) Railway.—Newburger, Henderson & Loeb and Bioren & Company, Philadelphia, Pa., are offering at 94 and interest \$2,500,000 of first and refunding 5 per cent thirty-year gold bonds of the Scranton Railway, dated Feb. 1, 1917. The bonds are guaranteed as to principal and interest by indorsement by the American Railways. They are redeemable after Feb. 1, 1922, at 102½ and interest.

Second Avenue Railroad, New York, N. Y.—Andrew E. Kalbach has been named as receiver of the Second Avenue Railroad by Justice Giegerich, of the Supreme Court, in place of John Beaver, deceased.

Tidewater Power Company, Wilmington, N. C.—Hugh McRae, president of the Tidewater Power Company, has addressed a letter to the stockholders of the company, in which he advises them of the sale of his interest in the company to Brooks & Company, Scranton, Pa., noted in the *ELECTRIC RAILWAY JOURNAL* of April 21, page 754. The company has \$595,000 of 6 per cent preferred stock and \$600,000 of common stock outstanding. On the common dividends at the rate of 7 per cent are being paid. Mr. McRae says that holders of common stock may dispose of their interest to Brooks & Company at \$105 a share, payable in negotiable notes, one for one-half the purchase price payable on or before Nov. 16, 1919, and one for the balance of the purchase price payable on or before May 16, 1920, with interest on deferred payments at 6 per cent per annum. Mr. McRae says that in addition Brooks & Company further agree to transfer certain real estate now owned by the Tidewater Power Company to the present stockholders of the company as an additional payment on the stock.

Dividends Declared

Boston (Mass.) Elevated Railway, quarterly, 50 cents.
Cumberland County Power & Light Company, Portland, Maine, quarterly, 1½ per cent, preferred.
Lincoln (Neb.) Traction Company, quarterly, 1½ per cent, preferred.
Pacific Gas & Electric Company, San Francisco, Cal., quarterly, 1½ per cent, original preferred; quarterly, 1½ per cent, first preferred.

Electric Railway Monthly Earnings

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '17	\$163,197	\$123,232	\$39,965	\$36,036	\$3,929
1 " " '16	146,546	*102,400	44,146	36,511	7,635
3 " " '17	469,516	*352,564	116,952	107,447	9,505
3 " " '16	439,640	*301,277	138,363	109,698	28,665

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

1m., Mar., '17	\$87,360	*\$73,767	\$13,593	\$27,550	†\$13,900
1 " " '16	72,293	*66,603	5,690	22,304	†16,380
3 " " '17	245,482	*214,329	31,153	82,650	†51,208
3 " " '16	212,396	*194,471	17,925	66,935	†48,407

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m., Mar., '17	\$806,909	*\$613,297	\$193,612	\$96,782	†\$119,176
1 " " '16	751,504	*545,299	206,205	97,847	†130,775
3 " " '17	2,314,102	*1,847,562	466,540	287,846	†215,983
3 " " '16	2,134,382	*1,503,516	630,866	293,902	†404,765

KANSAS CITY (MO.) RAILWAYS

1m., Mar., '17	\$637,053	*\$412,659	\$224,394	\$129,760	**\$40,334
1 " " '16	585,754	*367,216	218,538	115,333	**51,659
9 " " '17	5,554,695	*3,688,268	1,866,427	1,171,100	**351,709
9 " " '16	††				

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

1m., Mar., '17	\$27,317	*\$35,078	†\$7,761	\$7,987	††\$15,704
1 " " '16	24,955	*22,691	2,264	7,979	††5,678
3 " " '17	77,310	*85,388	†8,078	23,961	††31,921
3 " " '16	71,420	*68,200	3,220	23,960	††20,624

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

1m., Mar., '17	\$45,164	*\$47,371	†\$2,207	\$6,179	††\$7,635
1 " " '16	39,834	*46,536	†6,702	\$5,997	††10,986
3 " " '17	130,528	*141,319	†10,791	\$22,863	††29,638
3 " " '16	118,018	*171,121	†53,103	\$22,170	††70,121

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m., Mar., '17	\$478,057	*\$389,422	\$88,635	\$119,285	††\$30,040
1 " " '16	451,308	*355,741	95,567	118,373	††21,828
3 " " '17	1,368,320	*1,127,865	240,455	357,508	††87,235
3 " " '16	1,290,381	*1,042,231	248,150	320,140	††42,611

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

1m., Mar., '17	\$18,849	*\$23,799	†\$4,950	\$2,018	††\$6,939
1 " " '16	17,997	*18,657	†660	1,748	††2,383
3 " " '17	50,411	*64,855	†14,444	6,055	††20,417
3 " " '16	52,618	*61,216	†8,598	5,196	††13,717

*Includes taxes. †Deficit. ††Includes non-operating income. ‡Excludes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad not credited to income of that company. **Includes addition of miscellaneous income, and deduction of Kansas City surplus reinvested in plant. ††During the fiscal year to Feb. 14, 1916, the property was operated by the receivers under the old securities, and the figures for this period, being without value in a comparative statement, are not shown here.

Traffic and Transportation

Atlantic City Ordinance Bars Jitneys Commission of That City Decides Against Their Operation on Principal Street and Fixes License Fee

At a hearing April 26 on the controversy between the Atlantic City & Shore Railroad, Atlantic City, N. J., and the local Association of Jitney Owners before the City Commissioners an ordinance was passed which prevents jitneys from operating on Atlantic Avenue, the principal business street. The commissioners passed also a companion bill which will compel jitneys to pay an annual license fee of \$50 instead of 5 per cent of their gross receipts. Officers of the jitney owners' association declared that the two measures, which became effective on May 7, sound the death-knell of independent transportation in Atlantic City.

Clarence L. Cole, receiver and counsel for the trolley company, urged the elimination of the jitney from Atlantic Avenue in order that the company could rehabilitate itself. He said that the company as well as its predecessors had realized no profit, but besides contributing to the welfare of the city had kept pace with its growth and development. He said that three of the local lines had been operated at a loss which amounted to \$50,000 the past year. Prior to the advent of jitney competition the company had 300 employees and paid \$184,000 annually in salaries. This amount was decreased \$20,000 last year through compulsory retrenchment. The company pays \$34,000 a year in State and city taxes on a total investment of \$500,000. Mr. Cole said further that the West Jersey & Seashore Railroad, which built the trolley line, paid \$150,000 annually for ten years for maintenance besides building its roadbed at a cost of \$300,000. These outlays, he maintained, placed the city under moral obligation to give the company exclusive transportation privileges for the same reason that the Public Utility Commission would refuse to franchise a competing line.

Attorney S. Cameron Hinkle, counsel for the jitney association, said that he believed the jitneys should be given due consideration in view of the great popularity of the cars. He urged that the public interest be considered and declared that elimination of the jitney would materially cripple the city's transportation facilities.

A delegation of the jitney men has since submitted to the commission 140 petitions bearing about 4700 names which asked for a referendum vote on the ordinance. The petitions were not accepted on account of an opinion issued by City Solicitor Wootton, which stated the ruling ordinance was passed pursuant to the provisions of a State-wide act not subject to referendum or recall. The jitney men intend to investigate the possible recourses left to them and take further action in the matter.

Chicago Surface Traffic Improved Police Enforce New Ordinances—Street Cars Attain an Unprecedented Schedule Speed

The new traffic ordinances now in effect in Chicago which define car "loading zones" and prohibit the parking of vehicles on the car-line streets in the loop district during rush hours greatly facilitate the movement of cars and vehicles in general. The marked increase in the speed of cars has caused much comment on the part of pedestrians and passengers of vehicles. Street cars are enabled to run on a schedule speed never before attained in this district. The ordinances became effective on May 1 and were quoted in the *ELECTRIC RAILWAY JOURNAL* for May 5, page 847. President Leonard A. Busby of the Chicago Surface Lines made the following statement commenting on the results of the new ordinances:

"Conditions in the loop during the evening rush hours are better than they have been for years. The congestion

is materially reduced. The cars are loaded more quickly and more safely. Instead of lines of cars standing idle or creeping into the loop as heretofore, the cars get into the loop promptly, are loaded quickly and proceed from the loop much quicker than usual. This means that the people get home more quickly and more comfortably. All of this is due to the prompt enforcement by the police of the new anti-parking and 'loading zone' ordinances.

"The conductors and motormen are more than pleased at the new conditions, which enable them to perform their duties much more satisfactorily to the public, and they take a keen interest in the enforcement of the ordinances. The improvement in conditions is so marked, and the benefit to the public so great, that I believe everyone will gladly continue to co-operate in this matter, and in time extend the reform still further."

Mr. Loree Suggests More Revenues

Believes Application for 6-Cent Fare Would Be Sympathetically Received by Commission

President L. F. Loree, speaking to stockholders of the Delaware & Hudson Company at the annual meeting on May 8, stated that the electric railway investments of his company seem to have passed through their worst period, but that the companies need additional compensation to cover the higher costs which they are being required to meet. He believed that a 6-cent fare application would be sympathetically received by the Public Service Commission for the Second District of New York.

Mr. Loree made four suggestions, some of which he hoped would be favorably received by the commission, whereby the electric lines may receive needed compensation for the higher costs which they have to meet. These suggestions are as follows:

1. Readjustment of present requirements for street paving. The cost to the United Traction Company on account of the rule that they must pave between the tracks and to a point 18 in. on either side has amounted to \$200,000 a year. Mr. Loree pointed out that this requirement is a heritage from horse-car days, when the traction companies did wear out the pavement; but that under present conditions there is no wear and tear on the pavement by the street railways.

2. A charge for a transfer. A 2-cent charge for a transfer, Mr. Loree said, would help the companies substantially.

3. A 10-cent fare for patrons of the line between midnight and 6 a.m. Night service is expensive to maintain, and while doubling of the fare would not aggregate much in total, it would be helpful.

4. A 6-cent fare. Wages on the Delaware & Hudson electric lines have advanced 40 per cent and materials 60 per cent in the last five years, while rates have remained stationary.

Seven-Cent Fare Unit Granted

City Officials and Representatives of the Public at the Hearing Approve Fare Increase

A general fare increase to 7 cents instead of the present 5-cent unit has been allowed by the Public Service Commission of Massachusetts in the case of the Norwood, Canton & Sharon Street Railway, Canton, Mass. The company is also authorized to sell ten tickets for 65 cents and sixteen for \$1. School tickets will be sold at the rate of ten tickets for 35 cents instead of 25 cents as formerly. The road is about 6.25 miles long, in two parts, which are separated by the Blue Hill Street Railway. During 1916 the operating revenue was \$10,874, while the operating expenses were \$13,432. During the first eleven years of operation and in 1916 the company failed to earn operating expenses, and no dividends have ever been paid. The hearing on this case was reviewed in the *ELECTRIC RAILWAY JOURNAL* for Feb. 17, page 322.

The commission found in its investigation that the company has been operating at a relatively low cost, and that no substantial saving can be made through increased economies in operation. The cost of power is relatively high, but

the company is obliged to buy its power and claims that no more advantageous arrangement can be made. Poor track and equipment are factors producing the high cost of power per car-mile. The commission held that a total expenditure of at least \$6,000 per year for the next three to five years should be made on the property. Later the annual maintenance charge would probably be about \$3,000, besides about \$3,000 to be allowed for depreciation. Joint service from Sharon Heights to Canton Junction over the Blue Hill Street Railway was suggested at the hearing as a means of increasing the company's net revenues, but the commission questioned its advisability. There is little prospect of lower labor and material costs or increased revenue through growth in population of the company's territory. The gross income statement for the last three years showed an annual decline. The company needs an increase of about \$7,300 in annual gross operating revenue, and it is estimated that the new rate will yield about \$3,300.

In the recent Blue Hill fare investigation the commission intimated that it was doubtful whether the establishment of an 8-cent fare in that case would not have constituted an unjust discrimination against the short-haul riders, and approved an increase in the number of fare zones instead. The board pointed out that a rearrangement of fare zones is also likely to result in unfairness to passengers who are obliged to travel just across zone lines and thus introduce complications which it is sought to avoid. On account of the separation of the Norwood, Canton & Sharon Street Railway into two unrelated parts, it was impracticable to rearrange the fare zones.

Safety Work Brings Results

The safety organization of the Puget Sound Traction, Light & Power Company, Seattle, Wash., according to *The Electrogram*, its publication, regards safety first as not merely a motto but a slogan to be constantly applied in practice. It is a co-operative organization enlisting all officials and employees of the company and was formed in Seattle in 1912, at that time the first street railway organization of the kind in the country. It is directed by a central committee and is divided into division safety committees representing the departments, as railway, power plant, steam plant, shops, electric transmission, etc. Meetings are held regularly in the carhouses where officials and men meet to discuss the different problems of safety work. A lecturer, who works in the public schools, has been maintained for six years and the results have been very encouraging. Accidents to children have been reduced from thirteen a month in 1912 to four a month in 1916.

The aim of the company is to reduce to a minimum the number of accidents that can be prevented by safety devices, rules and caution. The accompanying table gives the number of automobile and wagon accidents which involved

TABLE SHOWING ANNUAL NUMBER OF ACCIDENTS INVOLVING DIFFERENT CLASSES OF TRAFFIC

Year	Automobile	Wagon	Pedestrian
1912.....	475	509	149
1913.....	702	533	135
1914.....	864	333	116
1915.....	1,554	235	89
1916.....	1,699	276	79

street cars or occurred on streets near cars, and also the number of collisions with pedestrians which resulted in injuries for the years from 1912 to 1916. The automobile accidents are still on the increase, but the company places the burden of responsibility for these accidents upon automobile drivers since the cars cannot leave the tracks to avoid collisions.

Business Stimulated by Rehabilitation

The Wisconsin Railway, Light & Power Company, La Crosse, Wis., began in June, 1916, to improve its property and service in order to encourage travel on its cars. Seven new forty-passenger pay-as-you-enter cars were purchased. Fifteen cars were remodeled for pay-as-you-enter operation and so far as possible were made to conform with the standard of the new cars in features such as folding doors and steps, lifeguards instead of projecting fenders, etc.

In December, 1916, through routing of lines was inaugu-

rated which made it possible to reduce the number of lines from five to four, and to improve the schedule speed. A franchise arrangement is now before the local City Council, which will permit the further rearrangement of two lines and the reduction of the total number of lines to three. These will serve the city more efficiently and will provide for future growth through simple line extensions. Since this through routing has been established the number of transfers issued has been reduced more than 27,000 per month, and it is anticipated that the ultimate reduction will be more than 50 per cent.

The work of double-tracking four blocks on Main Street and six blocks on the south side line which is now in progress will, when completed, eliminate delays which now result from two lines operating over the same track. This will also make possible a five-minute headway for a distance of twenty blocks instead of a ten-minute headway as at present. The line voltage throughout the system has been raised also from 500 to 600 volts to increase the schedule speed. These various changes in service and equipment have materially effected economies and stimulated heavier riding.

Bus Line Established.—The Public Service Commission for the Second District of New York has granted a certificate of public convenience and necessity to Albert F. Warner for an auto-bus route between Watertown and Adams. No local passengers may be carried within the city of Watertown.

Fare Hearing Postponed.—The hearing before the Public Service Commission of New Hampshire on the petition of the Bay State Street Railway, Boston, Mass., for permission to increase its fares in Nashua, N. H., and to change the city fare limit in Hudson has been set for May 28 at Concord.

Dismissal of Fare Case Refused.—The Board of Public Utility Commissioners for New Jersey has denied a motion to dismiss the case of the city of Hoboken for a 3-cent fare on the Public Service Railway. The case has been pending for a long time now. Another hearing on the matter will be held in Jersey City on May 16.

Skip Stop Talked of in Washington.—The Capital Traction Company, Washington, D. C., is contemplating the adoption of skip-stop service for some cars during rush hours. A survey of the line has been made by representatives of two citizens' associations and the company. It is proposed to eliminate approximately one-third of the present stops.

Merchants Appreciate Electric Express.—The business men of Reading, Pa., are taking advantage of the freight service on the Reading Transit & Light Company, which was inaugurated about a year ago. The fast express service has proved to be a great convenience to shippers, and the business in Lancaster and vicinity has consequently increased to a marked degree.

Service Changes Planned for Cleveland.—The committee representing nineteen city organizations, which was appointed to suggest methods for eliminating traffic congestion in Cleveland, Ohio, has approved a plan and submitted it to officials of the Columbus Railway, Light & Power Company. According to the plan several lines would be re-routed and other routes would be changed so that cars on High Street would run a shorter distance than formerly.

Bay State to Reject Intoxicated Patrons.—The Bay State Street Railway, Boston, Mass., has promised the City Council its co-operation and support in keeping intoxicated persons from entering the city on its cars. A resolution to this effect, passed by the Council, has been posted in the carhouses of the company in Haverhill, Lawrence and Lowell. This movement is in line with similar actions taken by the Illinois Traction Company, Peoria, Ill., and the Philadelphia & West Chester Traction Company, Upper Darby, Pa., as noted recently in the *ELECTRIC RAILWAY JOURNAL*.

Auburn-Syracuse Fares to Be Raised.—The Auburn & Syracuse Electric Railroad, Syracuse, N. Y., has announced that beginning May 28 a rate of 2 cents a mile will be charged between Auburn and Syracuse. This will make the fare 52 cents instead of 45 cents and the round-trip fare will be increased from 85 cents to \$1. It is intended to leave some of the fares between intermediate points un-

changed while others are to be slightly reduced. The proposed increase is said to have resulted from the general increase in expenses and the increase in wages recently granted to the company's employees.

Through Freight Rates Established.—C. B. Stafford, manager of the traffic department of the Board of Trade of Louisville, Ky., has announced that through freight rates on the electric railways connecting with the Louisville-Indianapolis lines at Indianapolis will soon be published by those systems. This matter in various phases has been before the Interstate Commerce Commission on several occasions. Certain difficulties have been met and the tariff will be made out soon. The new tariff will give rates by way of the electric lines from Louisville to stations in southern Michigan and in Illinois, Indiana and Ohio, north of Indianapolis.

Commission Acts on Freight Advance.—The Public Service Commission for the Second District of New York has permitted the railroads to file tariffs covering the proposed 15 per cent increase in freight rates in the same simplified form as the Interstate Commerce Commission has provided in interstate rates. This is a modification of the commission's rules to avoid expense and delay in the preparation of the elaborate rate schedules. The commission will in all probability take no action until the interstate rates have been settled. It does not approve of the new rates at this time and they are, as usual, subject to complaint, investigation and correction if in conflict with the State laws.

Texas Dealers Prefer Electric Express.—Testimony received by the Interstate Commerce Commission, in the re-hearing of the Shreveport rate case at Dallas, Tex., disclosed the fact that jobbers and wholesale dealers of Dallas and other Texas towns reached by electric lines are shipping their freight by interurban express because the interurban express rates are considerably less than the rates by steam and because the interurban lines deliver shipments much more promptly than the steam lines. It was shown that the steam lines are operating under Fonda Tariff 2-B, while the interurban lines are employing the Texas Railroad Commission tariffs, which are considerably lower than the tariffs of the Fonda schedule.

Advance in Interurban Fares Proposed.—The Hagerstown & Frederick Railway, Frederick, Md., has filed with the Public Service Commission of that State a new tariff asking for an increase in interurban fares. The reasons given for the proposed advance are increased wages, higher prices for metal products and new equipment, and that the increase in transportation business is not sufficient to meet the increased operating expenses. Patrons had suggested that the usual summer service be furnished, which the company had intended to reduce, even at a slight advance in fares. It was decided to increase the interurban rates, which are now less than 2 cents per mile. The city fare of 5 cents and the commuter's rate will remain unchanged.

I. R. T. Traffic Record Shows Increase.—Figures just compiled by the Interborough Rapid Transit Company, New York, N. Y., show that during the month of April the subway carried 37,814,292 passengers, an increase of 3,662,514 or 10.7 per cent over the number carried in the same period last year. The elevated system carried 29,771,642 persons as compared with 27,942,079 for April, 1916, an increase of 1,829,563 or 6.5 per cent. These increases bring the total gain in passengers carried on the dual system during the last ten months of the fiscal year to 69,244,983. The total number of passengers carried in that period was 634,740,670. The total fares collected during last month amounted for the subway to \$1,888,586 and for the elevated \$1,487,549.

Disagreement on Smoking Privilege.—In response to a request by A. L. Valentine, superintendent of public utilities of Seattle, Wash., Hugh M. Caldwell, corporation counsel of that city, has issued an opinion stating that so far as the city is concerned passengers may smoke on street cars. Mr. Valentine had been requested to prohibit smoking on cars of the Puget Sound Traction, Light & Power Company running to and from the industrial plants. In a suit brought about two years ago by John M. Day, a prominent attorney,

Judge Everett Smith of the Superior Court issued an injunction which prohibited anyone from holding a lighted cigar, cigarette or pipe inside a car. Mr. Caldwell recognized that injunction but said it was not the city's duty to enforce it. Mr. Day cited ordinances to show that this is the duty of the superintendent of public utilities.

Better Service on Pacific Northwest.—The Seattle-Everett interurban service of the Pacific Northwest Traction Company, Seattle, Wash., has been increased according to a new schedule effective May 1. Six limited trains daily in each direction are now operated, instead of the two as formerly, and a special late-train service has been instituted. On Saturdays and Sundays the number of limited trains is increased to nine. During seven years of operation, the road has run 110,000 trains, carrying a total of 5,000,000 passengers, without a single serious accident involving passengers, and not a passenger has been injured. Records in the dispatcher's office show that more than 99½ per cent of all the trains have left their terminals on time, and less than 4 per cent have arrived late. K. K. Carrick is general traffic agent, and Donald C. Barnes is local manager of the company.

Night Express to Reduce Expenses.—In a recent address to employees of the Toledo Railways & Light Company, Toledo, Ohio, one of the H. L. Doherty properties, Mr. Doherty said that freight hauling at night by electric railways would be a great revenue producer and would also serve to eliminate excessive handling of merchandise. The managers of the Doherty electric railway properties have been requested to investigate the plan thoroughly with a view of adopting it if possible. The hauling of products from the farms to the railroad and from the city terminal to the city buyer is done by inefficient methods which are expensive to the farmer and the consumer. Hauling freight at night on street cars would also eliminate congestion on city streets. Moreover, it has been pointed out that the plan would enable a city to extend its territorial limits without following steam railroads.

Seattle to Use More One-Man Cars.—The Puget Sound Traction, Light & Power Company, Seattle, Wash., has been authorized by the Public Service Commission of that State to operate more one-man cars on its lines in Seattle, and also to rebuild its old-style single-truck cars to conform with what is known as the "Type 142." Cars of this type are now in use on the Bellevue-Summit line of this company. The commission hastened its decision in order that the company could save the additional expense referred to in a notice which stated that on May 1 the cars would advance in price from 20 to 25 per cent. Seventy-five cars of this type will be required for use in Seattle. They have been in service in Spokane, Tacoma and Bellingham, and reports show that they give more general satisfaction on short runs than the heavier cars which operate at a lower schedule speed.

Electric Road Competes for Freight.—The largest volume of freight business in the history of the company is being handled by the Louisville & Interurban Railroad, Louisville, Ky. Steam roads with which the electric lines are in competition through the territory which they serve have been glad, apparently, to leave the local shipping to the latter while they take the long-haul traffic. R. H. Wyatt, general freight and passenger agent of the company, is making the most of the opportunity, which he regards as offering the electric service a long-wanted chance to demonstrate its capabilities. If satisfactory service is furnished at a time when the steam roads are giving unsatisfactory service, Mr. Wyatt believes that later on, when conditions return more nearly to normal, the electric lines will be able to retain much of their present business. In order to give the best service possible Mr. Wyatt hopes to work the freight equipment to its capacity. A contract was made recently with the Kosmos Portland Cement Company, which has a plant southwest of the city, to bring from four to seven cars a day to Louisville. The demand for cars is so great that it has been necessary to require the shipper to promise to unload the cars promptly. The company informs the consignee by telephone of the exact time when a shipment will be at its destination and urges that arrangements be made for immediate unloading.

Personal Mention

Valentine Burley is superintendent of transportation of the Binghamton (N. Y.) Railway, having succeeded William G. Decker, resigned.

A. S. Nichols, formerly local manager of Stone & Webster properties in Fort Madison, Wis., has been appointed to succeed W. L. Weston in a similar capacity in Paducah, Ky.

John W. McCardle, a former member of the Indiana Board of Tax Commissioners, has been named a member of the Public Service Commission of Indiana.

W. G. Murrin, whose promotion was reported recently, is now assistant general manager of the British Columbia Electric Railway, Vancouver, B. C. Mr. Murrin was formerly general superintendent.

A. B. Paterson has resigned as general manager of the Meridian Light & Railway Company, Meridian, Miss., operated by H. L. Doherty & Company, to become bond department representative of the Doherty interests in New Orleans and vicinity.

William J. Wood, a special examiner for the Interstate Commerce Commission, has been appointed to fill a vacancy on the Public Service Commission of Indiana. Mr. Wood was formerly a member and chairman of the Railroad Commission of that State.

H. E. Brandli, formerly general manager of the Citizens' Gas, Electric & Heating Company, Mount Vernon, Ill., succeeds A. B. Patterson as general manager of the Meridian Light & Railway Company, Meridian, Miss. The two companies are operated by H. L. Doherty & Company.

M. S. Sloan has been relieved of certain operating details in the management of the New Orleans Railway & Light Company, New Orleans, La., following the appointment of N. H. Brown as general superintendent of transportation. Mr. Sloan will continue as general manager of the company.

Bert Greenway has been appointed superintendent of the Grand Forks (N. D.) Street Railway to succeed W. J. Brekke, who has entered private business in Grand Forks. Mr. Greenway for the past four years has been general foreman and assistant superintendent of the Regina (Sask.) Municipal Railway.

Walter Alexander, chairman of the Wisconsin Railroad Commission until May 1, has accepted the position of superintendent of motive power of the Chicago, Milwaukee & St. Paul Railroad. Mr. Alexander was master mechanic of that road before his appointment as a member of the commission two years ago.

Carl H. Mote has succeeded Joseph L. Reiley as secretary of the Public Service Commission of Indiana. Mr. Mote was formerly engaged in newspaper and magazine work and is a past editor of the Indianapolis *Sun*. He has also had a wide experience as a statistician for public service corporations. He is the author of "Industrial Arbitration" and joint author of "Learning to Earn," a book on the subject of vocational education.

Ernest I. Lewis, a special correspondent for the Indianapolis *News*, has been appointed a member of the Public Service Commission of Indiana. Mr. Lewis has traveled extensively here and abroad, and as a result of his studies has collected much valuable information on public service problems. He assisted in organizing the Citizens' Gas Company, Indianapolis, and largely to his initiative are credited the present low rates for gas in Indianapolis.

P. D. Kline, who resigned on April 1 from the position of general manager of the Ogden, Logan & Idaho Railway, Ogden, Utah, has accepted the position of manager of the La Crosse district of the Wisconsin-Minnesota Light & Power Company. This property is operated by the American Public Utilities Company of Grand Rapids, Mich. A biographical sketch of Mr. Kline appeared in the *ELECTRIC RAILWAY JOURNAL* for March 31, page 620.

J. Vipond Davies, chief engineer of the Hudson & Manhattan Railroad, New York, N. Y., has been elected vice-president and a director of the company to succeed the late Richard W. Meirs. Mr. Davies is a native of South Wales and was graduated from Wesleyan College and the University of London. He is widely known as a member of the firm Jacobs & Davies, consulting engineers, New York, Montreal and London, with which he became connected in 1894. He is also consulting engineer for the Brooklyn (N. Y.) Rapid Transit Company. Mr. Davies has had a wide experience as a designing and construction engineer of both railroads and tunnels in different parts of the United States. His firm, Jacobs & Davies, designed and built the tunnels under the Hudson River, into New York, Jersey City and Hoboken, for the Hudson & Manhattan Railroad. In 1914 the Tilford gold medal was awarded him by the Institution of Civil Engineers, London, England, for his paper "Extensions of the Hudson River Tunnels of the Hudson & Manhattan Railroad."



J. V. DAVIES

W. L. Weston, operating manager of the Paducah (Ky.) Traction Company and the Paducah Light & Power Company, has been transferred to Fort Madison, Wis., as manager of the Stone & Webster properties in that city. Mr. Weston has been in public service work since 1906, when he became purchasing agent for the Northern Texas Traction Company, Fort Worth, Tex. He was later appointed assistant to the general superintendent of that company and in 1910 became general manager of the Tampa & Sulphur Springs Railway, Tampa, Fla. Mr. Weston has been local manager of the Paducah properties since 1912.

U. S. Sliter, who since 1914 has been superintendent of the efficiency department of the San Francisco-Oakland Terminal Railways, Oakland, Cal., has been appointed assistant superintendent of transportation. Mr. Sliter's duties during the last three years were confined partly to the building up of higher operating standards through the use of the coasting recorder, and in this work he has been very successful. He has also handled much of the work pertaining to jitneys and other transportation problems. Mr. Sliter went to Oakland in 1912, largely to reroute and reschedule the system. Previous to that time he served with the British Columbia Electric Railway, Vancouver, B. C., the Detroit (Mich.) United Railway and the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. With the last-named company Mr. Sliter spent eight years, part of the time as superintendent of transportation.

A. R. Whaley, vice-president of the New York, New Haven & Hartford Railroad, in charge of operating, engineering, construction and maintenance, will resign from active service with the company on May 31, to rest for a few months. Mr. Whaley is a native of Rhode Island, and has been in railway service since 1877, when he was employed as a freight brakeman on the Providence & Worcester Railroad. This road became a part of the New Haven system and Mr. Whaley, after serving in different positions, finally was made division superintendent, first of the Worcester division, and then in charge of operation, of the road from New York to New Haven, and the Harlem River and New Haven terminals. In 1907 Mr. Whaley became general superintendent of its electric division and general manager of the New York terminal, with supervision over all trains of that company running into the city. He also had charge of certain details of the reconstruction of Grand Central Terminal. Mr. Whaley, through his long period of service, probably has a personal acquaintance with more New England railroad men than any other railroad official in the East.

Andrew E. Kalbach has been appointed receiver of the Second Avenue Railroad, New York, N. Y., to succeed the late John Beaver. He was formerly general manager and electrical engineer of the New York City Interborough Railway, now controlled by the Third Avenue Railway, of that city. Mr. Kalbach is a Naval Reserve officer, having been graduated from the Annapolis Naval School. He resigned from the navy in 1903 to become assistant engineer for the Rapid Transit Subway Construction Company, New York, and was afterward made general manager and engineer for the New York City Interborough Company, the majority of whose stock was then controlled by the Interborough Rapid Transit Company. In 1914 Mayor Mitchel of New York appointed Mr. Kalbach deputy commissioner of street cleaning of the Bronx.

O. R. Sturzinger, who has resigned as superintendent of the Northwestern Ohio Railway & Power Company, Toledo, Ohio, began electric railway work at the age of twenty-three, when he was employed in the construction of the Sandusky, Milan & Norwalk Electric Railway. Upon its completion he served as conductor for six years, and was later made assistant general manager. In 1899 the Sandusky & Interurban Railway was under construction from Sandusky to Lorain and Norwalk, and Mr. Sturzinger became foreman of overhead construction for this road. These two properties were consolidated with the Lake Shore Electric Railway, Cleveland, Ohio, and Mr. Sturzinger remained with the company as assistant to the superintendent of motive power. In 1903 he became connected with the Toledo, Port Clinton & Lakeside Railway, which was then being constructed, and was appointed master mechanic. Four years later he was promoted to the position of general superintendent and was retained as superintendent with the company's successor, the Northwestern Ohio Railway & Power Company, until the present time. Mr. Sturzinger traveled abroad in 1913 and witnessed electric railway operation and visited power plants in several foreign countries. He intends to remain in electric railway service.

H. E. Vordermark, who has been elected vice-president and treasurer of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., as noted recently in the



H. E. VORDERMARK

ELECTRIC RAILWAY JOURNAL, has spent virtually all of his business career in the local railway service in Fort Wayne. Soon after acquiring a high school education and a business training, he accepted a position as secretary to the general manager of the local company, then known as the Fort Wayne Electric Railway. In 1898 he was appointed auditor and retained this position when the company was consolidated with the Fort Wayne & Wabash Valley Traction Company. The Fort Wayne & Northern Indiana Traction Company later acquired this property and Mr. Vordermark was made auditor and secretary. He is still retained in the latter position. In the additional capacity of vice-president and treasurer he succeeds Henry C. Paul, who resigned in order to devote more time to other interests in Fort Wayne. Mr. Vordermark's duties as auditor are being assumed by his former assistant, Fred H. Schmidt.

Obituary

R. J. Jones, treasurer of the Tidewater Power Company, Wilmington, N. C., died at his home in that city on April 30 after a short illness. Mr. Jones was one of Wilmington's oldest and most prominent citizens. Until three weeks before his death he engaged actively in his duties in connection with the railway and other local interests with which he had been connected for a period covering nearly half a century.

Construction News

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

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

RECENT INCORPORATIONS

Billings Railway, Light & Power Company, Billings, Mont.—Incorporated to take over the property of the Billings Traction Company and electrify the line and also possibly to construct an interurban line to Laurel. Capital stock, \$300,000. It is planned to have electric cars in operation in Billings by Aug. 1.

***Catskill Mountain Railroad Corporation, Catskill, N. Y.**—Incorporated to construct a narrow-gage surface railway to be operated by steam, gasoline or electricity. Capital stock \$100,000. Incorporators: E. E. Olcott, A. V. S. Olcott and G. H. Beach, Catskill.

FRANCHISES

Globe, Ariz.—The Globe-Miami Railway has received a franchise from the City Council to construct a line in Globe. The company proposes to build an electric railway from Globe to Miami. Edgar Sultan, Globe, secretary. [April 28, '17.]

Alameda, Cal.—The San Francisco-Oakland Terminal Railways has asked the City Council of Alameda for a re-settlement franchise such as was recently voted by the citizens of Oakland.

Eagle Rock, Cal.—Bids will be received by the Board of Trustees of Eagle Rock until May 21 for a fifty-year franchise for an electric railway across Colorado Boulevard between Central Avenue and Rowland Avenue.

Rialto, Cal.—The Pacific Electric Railway has received a franchise from the City Council to operate an electric railway in Rialto.

Kansas City, Mo.—The Kansas City Railways has received franchises from the City Council to construct a double-track extension to the Twenty-seventh Street line from Chelsea to Denver Avenues and to double-track its line on Independence Avenue from Hardesty to Topping Avenues.

Bexley, Ohio.—The Ohio Electric Railway has received a franchise from the City Council to operate cars on East Main Street instead of in Mound Street, Bexley.

Windsor, Ont.—The Sandwich, Windsor & Amherstburg Railway has asked the City Councils of Sandwich, Windsor and Walkerville for an extension of its franchises to 1931.

Norfolk, Va.—The Virginia Railway & Power Company has abandoned its franchise in the Campostella section.

TRACK AND ROADWAY

Pacific Electric Railway, Los Angeles, Cal.—It is reported that the Pacific Electric Railway will construct an extension from Glendora to San Dimas.

***Wilmington, Del.**—James M. Satterfield, Dover, representing Lindes & Company, Franklin Bank Building, Philadelphia, has opened negotiations in the north part of Delaware for a trolley road which will extend from Wilmington to the lower boundary of the State, a distance of 90 miles. Such a road, if constructed, would parallel the Pennsylvania Railroad and would share in the freight and passenger traffic from this district. The consent of the Newcastle County authorities is being sought first and if that is obtained the company will be incorporated under the laws of the State of Delaware.

St. Petersburg & Gulf Railway, St. Petersburg, Fla.—Work will be begun at once by this company on the construction of a new bridge across Coffee Pot Bayou.

Springfield (Ill.) Consolidated Railway.—As a result of the State centennial plan to remove the tracks in Capitol Avenue, the Springfield Consolidated Railway has asked the

Legislature for permission to extend its tracks from Second and Monroe Streets to Second and Charles Streets.

Tri-City Railway Davenport, Iowa.—The Council of the city of Moline, Ill., will ask the Tri-City Railway to lay its track on Fifth Avenue in the center of the thoroughfare. In resolutions adopted by the Council the recommendation is made that with the widening of Fifth Avenue the Tri-City Railway shall put in double tracks from Seventeenth Street to Fifteenth Street, and that there be four curves at the intersection of Fifth Avenue and Fifteenth Street and single track in the center of the widened avenue from Fifteenth to Thirteenth Street. Owing to the scarcity of steel rails of the kind desired, the resolutions included recommendations of the Shanghai type of rails.

Des Moines (Iowa) City Railway.—This company contemplates the reconstruction of its University line this summer.

Kentucky Traction & Terminal Company, Lexington, Ky.—An ordinance has been adopted by the City Council of Frankfort requiring the Kentucky Traction & Terminal Company to replace the wooden poles now in use on parts of Main and St. Clair Streets with ornamental steel poles.

Salem & Pennsgrove Traction Company, Salem, N. J.—Citizens of Quinton have petitioned the Salem & Pennsgrove Traction Company to extend its trolley line from Salem to Quinton. Rights-of-way have been donated for the 3 miles.

New York & Queens County Railway, New York, N. Y.—The Public Service Commission for the First District of New York, on motion of Commissioner Travis H. Whitney, has sent to the Board of Estimate and Apportionment a letter urging that body to consider favorably the construction of a temporary extension by the New York & Queens County Railway from its Flushing line at Jackson Avenue through Shell Road, Peartree Street and Roosevelt Avenue to the Alburis Avenue station of the Corona rapid transit line. The proposed new extension will be approximately $\frac{3}{4}$ mile in length.

Schenectady (N. Y.) Railway.—A contract has been awarded by the Schenectady Railway to W. S. Rae, Pittsburgh, Pa., for the reconstruction of two 151-ft. spans of the Alplaus Bridge over the Mohawk River at about \$50,000, to provide the necessary clearances over the channels of the barge canal. Traffic will be maintained while the work is in progress. Work has been begun by the company removing the State Street bridge over the Erie Canal and filling in the canal to make a practically level grade of the street over the old canal.

Black River Traction Company, Watertown, N. Y.—This company is considering the construction of an extension to the Maxim munition plant in Water Street.

Tulsa (Okla.) Street Railway.—Construction has been begun by the Tulsa Street Railway on an extension to West Tulsa. An agreement has been reached between the company and the County Commissioners for the use of the new Arkansas River bridge, the company to pay a rental of \$150 a month. In crossing the bridge the company will use the common track with the Tulsa Traction Company.

Toronto, Barrie & Orillia Railway, Toronto, Ont.—The Ontario Legislature has refused to grant the application of the Toronto, Barrie & Orillia Railway for an amendment to its act of incorporation to extend the time within which the company's line was to be built. The company was originally incorporated in 1910 as the Monarch Railway, the title being changed in 1913. No construction work has been done. [Feb. 26, '16.]

Toronto (Ont.) Suburban Railway.—This company's extension from Lambton to Guelph, 48 miles, has recently been placed in operation.

Welland, Ont.—Surveys have been completed of the proposed line from Welland to Port Colborne to Bridgeburg, which is to be built by the Ontario Hydroelectric Commission at an approximate cost of \$10,000,000.

Klamath Falls (Ore.) Municipal Railway.—The only bid received by the City Council of Klamath Falls for the construction of a municipal railway from Klamath Falls to Dairy, 20 miles, was that from Robert E. Strahorn at \$300,-

000. Construction work will be begun within thirty days. [May 5, '17.]

Oregon Electric Railway, Portland, Ore.—This company plans to begin work shortly on the construction of a new draw span at the bridge across the Willamette River between Harrisburg and Junction City. Ten carloads of steel will be required in the construction of the span, which will be of the modern lift type and will permit the passage of the larger river boats should occasion demand it.

Southern Pacific Railway Company, Portland, Ore.—The plan of the Southern Pacific Company to discontinue street car service in Albany on April 30 has been postponed. Following the announcement of the company, a petition was circulated among business men of the city, asking the company to leave the cars in Albany and reconsider taking up the track. Business men have offered to co-operate with the company and assist in making the line pay.

Southern Pennsylvania Traction Company, Chester, Pa.—Contracts have been let by the Southern Pennsylvania Traction Company for the reconstruction of its line from Darby to Eddystone, 6 miles.

Reading Transit & Light Company, Reading, Pa.—Work has been begun by the Reading Transit & Light Company laying new tracks in Mount Penn from the eastern city line to Twenty-third Street. The work will be continued on Twenty-third Street to Friedensburg Road.

South Carolina Light, Power & Railways Company, Spartanburg, S. C.—This company will construct an extension to Whitney and will also reconstruct part of its Clifton line.

Cleburne (Tex.) Traction Company.—The City Council of Cleburne has authorized the removal of the physical property of the Cleburne Traction Company from the streets of Cleburne, and appointed W. W. Smith, J. W. Floore, Jr., and Murphy Pickle as an equalization board.

Dallas Northwestern Traction Company, Dallas, Tex.—Final surveys are being made for the right-of-way of the Dallas Northwestern Traction Company from Dallas to Slidell, via Denton. The first work will be done between Denton and Slidell and that part of the line will be placed in operation in a short time. The stockholders of the Standard Utilities Construction Company, which will build the line, have elected officers as follows: C. F. Hopkins, Tulsa, Okla., president; Ira E. Cornelius, Muskogee, Okla., secretary and treasurer; A. V. Demayo, New York, vice-president and general manager, and F. W. Hopkins, Jr., Springfield, Mo., assistant secretary and treasurer. [May 5, '17.]

Interstate Electric Corporation, San Angelo, Tex.—Plans are being made by the Interstate Electric Corporation to begin work within the next few weeks on its proposed system in San Angelo.

SHOPS AND BUILDINGS

Caldwell (Idaho) Traction Company.—It is reported that this company proposes the construction of a passenger station in Caldwell.

Fort Wayne & Northwestern Railway, Kendallville, Ind.—A new passenger and freight station will be built by the Fort Wayne & Northwestern Railway at Waterloo.

Waterville, Fairfield & Oakland Railway, Waterville, Me.—A new freight station will be built by this company at Waterville.

Ohio Electric Railway, Springfield, Ohio.—This company will construct a new passenger and freight station at Ottawa.

London & Port Stanley Railway, London, Ont.—It is reported that the London & Port Stanley Railway will erect a new building for offices and station purposes at Talbot Street, St. Thomas.

Reading Transit & Light Company, Reading, Pa.—This company will construct a large freight station to take the place of the present one at Penn and DeKalb Streets, Reading.

Virginia Railway & Power Company, Richmond, Va.—A contract has been awarded by this company to John T.

Wilson Company, Richmond, for the erection of a storage warehouse. The structure will be 27 ft. x 40 ft., of concrete, and will cost about \$5,300.

POWER HOUSES AND SUBSTATIONS

Kankakee (Ill.) Electric Railway.—A report from the Kankakee Electric Railway states that it has received a new 258-hp. boiler from the Erie City (Pa.) Iron Works, and will install same within the next thirty days.

Sioux City (Ia.) Service Company.—It is reported that the Sioux City Service Company contemplates the construction of a new power plant to cost about \$750,000.

United Railways & Electric Company, Baltimore, Md.—This company has awarded a contract to the West Construction Company, Baltimore, Md., for the erection of a new substation, 60 ft. x 90 ft., at Sollers Point.

New York Municipal Railway Corporation, Brooklyn, N. Y.—The Public Service Commission for the First District of New York has approved an award by the New York Municipal Railway Corporation to A. Pasquini, New York City, of a contract for the new Ridgewood substation to be used in connection with the furnishing of current for the operation of the Fourteenth Street-Eastern line and other new rapid-transit lines in Brooklyn. The contract price is \$59,990. The original low bidder was William Flanagan when bids were received by the Brooklyn company on April 9. Later Mr. Flanagan withdrew his offer and the company prevailed upon Mr. Pasquini, who had made a bid of \$64,080 for the work, to withdraw that bid and accept a contract at the figure at which Mr. Flanagan's bid had been made.

Oklahoma City, Okla.—E. P. Truett of New York and Wardis Arnold of Chicago have arrived at Ada, Okla., to begin work on a large electric power plant to be built on the Canadian River near Shawnee. The plant will cost \$500,000 and will supply electric current for several inter-urban lines out of Oklahoma City and other towns, and will also supply current for lighting and power to the cities of Shawnee, Ada and Oklahoma City.

Harrisburg (Pa.) Railways.—A report from the Harrisburg Railways states that during the next month the company will place a contract for one 500-volt rotary transformer. The company has ordered coal and ash conveying apparatus to be installed in its plant.

Reading Transit & Light Company, Reading, Pa.—Plans are being made by the Reading Transit & Light Company and the Metropolitan Electric Company to install underground wires in the existing conduit system in the business section of the city, including connections, etc., at a cost of approximately \$1,000,000.

Rutland Railway, Light & Power Company, Rutland, Vt.—Work has been begun by this company on the erection of a new transmission line from the Rutland substation to Mendon and from Rutland to West Rutland. This line will be operated temporarily at 13,000 volts, but has been insulated for 44,000 volts, which will later be used. A transmission line from West Rutland to Castleton, about 12 miles, has been authorized. Material has been ordered and work will soon be begun.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—It is reported that this company will begin work immediately on the erection of a 25,000-volt transmission line from Fern Hill to Olympia to connect with the service lines of the Olympia Light & Power Company. The cost is estimated at \$53,000.

Appalachian Power Company, Bluefield, W. Va.—This company plans to construct a \$1,000,000 steam-driven electric generating station on the New River, between the Virginian and Norfolk & Western Railways. The equipment will include an 18,750-kw. turbine, three 1200-hp. boilers, etc. The plant may furnish electricity for the proposed Virginian Railway electrification at Clarks Gap and for the proposed extension of the Norfolk & Western Railway electrification east of Bluefield. An 18,750-kw. turbine and boilers have been purchased for the plant, but other details may not be decided upon for some months.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent
 Rolling Stock Purchases Market Quotations Business Announcements

Reducing the Selling Cost

Office Hours for Salesmen a Help—Are Postcard Lists Effective?—Salesmen Make Too Many Trips

BY E. C. JOHNSTON

Purchasing Agent East St. Louis & Suburban Railway,
 East St. Louis, Ill.

I have read with interest the article by L. W. Horne in the *ELECTRIC RAILWAY JOURNAL* of April 14, and while I agree with his ideas in some respects, I have found that all his suggestions do not always work out.

The selling expense of an article is often a very large item. I realize also that we pay our proportion of this expense whether it costs the manufacturer anything additional in order to sell us a particular item, or not. The manufacturer's article is priced on a basis of manufacturing plus certain selling expense, which is averaged. Of this I may pay my average share without causing any actual expense, while the other purchaser pays the same share and demands continual solicitation.

If Mr. Horne could devise some means that would enable the buyer to have a knowledge of all articles for sale or that would enable the salesmen to know just when to call or the buyer, it might prove a help; but to my mind it is foolish to assume that any arrangement could be made whereby the salesman of each and every article could be repaid for his time and expense by receiving an order when he calls. The proper method is to anticipate one's wants in such quantities that it will not be necessary to demand impossible deliveries. This, in turn, will give the purchasing agent the necessary time to investigate competitive articles.

POSTCARD LISTS FAIL TO BRING RESULTS

In regard to the suggestion that a manufacturing company should send out postcards listing a number of items which it handles, I do not believe that such a method of soliciting orders would be very successful. I judge from my own case. I pay absolutely no attention to such notices unless I am particularly interested in some special item, but my case is probably different from that of some of the men on smaller railways. Our purchasing department has direct authority over the stores department, and it has been our aim in the past to maintain a supply of all staple stock used by our various departments. Usually we have quantities sufficient to cover a period of from three to four months. I will admit, however, that due to the present condition of markets and factories, we are not always able to carry this amount of surplus stock. I do not think it possible to have a stock or supply room managed by any other officer than the purchasing agent, as I have never yet found an operating head of any department who could or who would anticipate his wants on each and every article used by his department. Some roads have the storeroom under the jurisdiction of the master mechanic, which to my mind is wrong, as the master mechanic is interested in a single line of materials and is not always familiar with market and delivery conditions.

Mr. Horne says it is usually found that the more times a salesman calls on a buyer the better success he has. This may hold good in some cases, but I do not believe it would cover the majority. The truth of the matter is, the more trips a salesman makes to this office without some excuse for his presence, the less successful he will be. Such a salesman is not only wasting his employer's time and money, but mine. I would much prefer, in 99 per cent of the cases covering salesmen's calls to my office, to be allowed the privilege of inviting these calls rather than having the salesmen periodically drop in.

I am thoroughly in accord with one of Mr. Horne's remarks, that there are too many supply men personally soliciting business. I don't mean by this that I do not want competition, because I believe that is up to the purchasing agent himself to demand if he so wishes. So far as a salesman making three or four calls in order to close a comparatively small order is concerned, I believe that is the salesman's fault.

Mr. Horne further states that if the railway men would take a definite "yes" or "no" attitude it would save time and money for the supply men. The average supply man resents anyone taking this attitude unless, of course, it is "yes." It cannot be yes in all cases.

"NO" ATTITUDE SAVES THE SALESMAN'S TIME

I believe the majority of the purchasing agents refrain from using the "no" attitude in order to save the salesmen from making additional trips to know why. I have found, in quite a number of cases where I took this attitude, that it took me longer and the salesman called oftener and caused more expense to his employer than if I had let the order take its course and the "no" be found out later. Of course, Mr. Horne's viewpoint is opposite to mine in several cases, because he is the seller and I am the buyer.

I have established office hours for sales representatives in order to be able to do something in addition to entertaining, and I have found this quite profitable. There are times, of course, that we do not follow this rule strictly. For instance, when a man from out of the city calls, I always give him an interview.

Truck Deliveries Put at Six Months

Reasons Given for Two to Three Months' Longer Delivery if Special Products Are Demanded

"Our customers are not expecting deliveries of trucks, except in emergencies, earlier than six months." This statement recently made by the sales manager of one of the large truck builders expresses in a nutshell the delivery situation as it exists to-day. In response to an inquiry from the purchasing department of a large operating property several truck builders recently were questioned on the delivery situation for their standard and for special types of trucks. The views of the manufacturers, which practically coincide, are expressed by the following statement: "It is necessary in these days to make a special ruling to suit each case as it comes up. We try to ascertain the conditions and wishes of our prospective customers and meet these as nearly as possible." This, in fact, is the spirit which has pervaded the electric railway industry during the war period. From all accounts this spirit prevails in this industry more than in almost any other. Sacrifices, uncalled for by strict business rules, have been made by both buyers and sellers when it has been found that a much-needed favor could be rendered. And above all, the involved relations, so far as purchasing is concerned, have plainly been seen in the need for forehandedness in buying and adherence to standards.

AS ONE MAN VIEWS AN ORDER

The car and truck builders urge standardization as much in the interest of the purchaser as in their own interest. One manufacturer has the following comment to make apropos of the present delivery situation: "I wouldn't attempt to quote anybody a price unless I knew definitely what he was seeking. It is the rarest exception for us to get an inquiry on any type of cataloged truck, because almost invariably something special is required in the way of wheels, axles, journal boxes, bearings or some other

important part. And these items themselves usually are the limiting features for delivery. For example, a great many people want heat-treated axles and these are not obtainable in less than eight to ten months. Rolled steel wheels are hardly obtainable during the present year, except by accident, and I wouldn't want to offer or suggest off-hand as to when roller center or side bearings could be obtained."

STANDARDS SPEED DELIVERY

Just how much standards aid in making deliveries is plainly to be noted by one truck maker, who writes as follows regarding his production and delivery situation: "If standardized trucks of either city or interurban types, are ordered, and complete information is given us, we can make delivery in four months. As a matter of fact, however, it usually takes one month for completing the data. As the gears are liable to hold up delivery another month, the actual delivery period is about six months."

In discussing deliveries another manufacturer puts the saving at sixty to ninety days for a standard over a special truck. The reasonableness of the difference in delivery is easily seen and appreciated: "Standard designs, if used, not only reduce the work in the drafting room, but permit the use of present patterns and dies. They also avoid those troublesome shop-routine delays due to sidetracking of non-standard parts in a big busy shop."

Most of the slow truck deliveries of the last year have cost the truck builders more than their normal profits. The builders would have saved this if it had been humanly possible.

Contactors Signal Sales Analyzed

BY CARL P. NACHOD

President Nachod Signal Company, Louisville, Ky.

The refining process which trolley contactor control for automatic block signals has been undergoing during the last few years has greatly increased the field of usefulness and broadened the sales of this type of apparatus. It is now successfully used not only on single-track lines for both absolute and permissive signaling, but also on double-track lines for rear-end protection, and this at comparatively high speeds.

Contactor control has been applied to highway crossing bells for voltages as high as 1500 volts direct current, and it is well adapted for other uses, such as annunciators, headway recorders and for controlling station lights, etc. Our company brought out last year the first direct 1500-volt direct-current trolley contactor signals on the market. These are two-position absolute signals for single track and are provided with a preliminary at one end.

THE SALES ANALYZED

In an analysis of our business of the past year we find about 5 per cent of our sales were for double-track, rear-protection signaling, these being of the three-indication type and giving information two blocks in advance, some operating at train speeds of 50 m.p.h. with blocks averaging 0.4 mile long.

The type-CD signals are the most popular of our single-track signals, constituting 73 per cent of our total sales. These require two line wires and permit the utmost flexibility of car movements. About 10 per cent of our sales were the single-wire type-C signals—the original Nachod car-counting signal. The latter type does not permit as varied shifting movements as the type CD. About 10 per cent of our sales were of our type-MD signals. These have normally closed, hold-clear circuits and give a consecutive "answer back" or indication to the motorman.

Business in highway crossing signals has not yet attained the volume that we expect, but we are now furnishing various aspects, such as flashing lights and wigwags in combination with bells.

Our automatic headway recorder has been installed in many cities during the past year and the railway managements evidently think it of much value for checking schedules and locating service irregularities.

We were favored with an exceptional amount of business last year, and this year so far has been nearly equal to it.

We feel the difficulty of obtaining material, even at the greatly increased prices now prevalent, but our policy has been to keep prices as low as possible.

Woes of the Malleable Iron Users

Line Material Manufacturers Greatly Hampered by Long and Uncertain Delivery Situation in Malleable Iron Industry

With some overhead line material manufacturers the malleable casting situation is now the most important factor so far as deliveries are concerned. The high prices which the manufacturers are offering to the foundries, although large compared with anything paid in earlier years, seem to be of no avail in obtaining work promptly. The foundries are filled beyond capacity, and since the overhead line material castings are of a higher quality than the ordinary run of malleables, the line material manufacturers are forced to pay an extra premium for quality work and also are confronted with exceptionally slow deliveries.

TEN MONTH MALLEABLE DELIVERIES

To quote one sales manager: "The best delivery, as near as we are able to determine, promised to-day by any malleable iron foundry on such castings as are used in making up finished line material, and particularly molded trolley line material, is from eight to ten months. Therefore, unless the line material manufacturer has already placed his orders with the foundry, he now finds it necessary to wait that length of time before he can obtain his castings for any particularly large order. For example: If he had placed orders four months ago for the necessary castings to be used in making up trolley material, these castings would in all probability not be shipped until the end of the next four or five months."

Another manufacturer, referring to line material requirements, has stated that his company is in a position to make shipments on bronze fittings within a week or ten days from the receipt of the order, and on 75 per cent of the malleable fittings he can now make delivery direct from the storeroom, but on the other 25 per cent of his list of standard articles, delivery must be delayed anywhere from three to six months. These articles are such, however, that if urgently needed bronze castings can be substituted for the malleable castings. This situation refers particularly to overhead switches and crossings. This manufacturer also states that on special overhead materials not regularly listed it takes from four to eight weeks to execute the orders; that is, assuming that the production of the device has to go through the consulting, blueprint and pattern stages, as well as through the shop. On a large construction order, if the fittings were standard, this manager reports that his company could make fairly regular weekly shipments after a start of about three weeks, *i. e.*, he could supply enough material to keep several line gangs busy.

The purchasing agent will appreciate the manufacturer's situation when it is stated that the average time of delivery on new malleable orders now approaches a full year, and this does not contemplate any special work, but just the regular run of patterns. The quality requirements are partly responsible for the long delivery. During the past year several overhead line material manufacturers have placed their malleable patterns with a number of foundries which undertook for the first time to make the high-quality castings required. The results were not satisfactory, and now those foundries which have had experience with overhead line material patterns assert their inability to make satisfactory line material malleable castings for less than 5 cents a pound increase over the regular run of malleable castings of the same weight. Thus the restricted number of plants from which the line material manufacturers may order high-grade malleables has had much to do with hampering the line material producers in making deliveries.

With pig iron approaching \$50 a ton and asbestos, which is the largest ingredient in molded insulation, increasing from \$30 to \$80 a ton, it would seem difficult now for the line material manufacturers to make definite plans for the future, other than to urge purchasers to announce as early as possible any business which they intend to place.

Bound Catalog Finds Favor

Company Changes From Loose-Leaf to Bound Catalog—Recent Discussions on Standardizing Catalogs Effective

BY JAMES H. DREW

President Drew Manufacturing Company, Indianapolis, Ind.

This company began recently the compilation of a new catalog in the old standard bound-form style of the usual size. Since this discussion regarding a standard form of catalog has arisen, we have gone into the subject seriously, and are convinced that an 8½ in. x 11 in. size is the most practical to use. However, from past experience with our catalog in the hands of our customers and with the catalogs of people from whom we buy, in our hands, we know that a loose-leaf catalog is never kept up to date, and there are always either omissions of supplements or vague doubts as to whether the information contained in the catalog is down to the minute.

We have, therefore, changed our plans and will shortly issue a line material and railway specialties catalog in bound form 8½ in. x 11 in. in size. This will permit its being kept in vertical files, and if letter size circulars of special information or additional data are sent out referring to this catalog they can be filed in the catalog itself in the same manner that any other correspondence is filed. We believe this plan will be more convenient for purchasing agents and engineers. It will make the catalog readily accessible, and if any correspondence or bulletins relative to the matter contained therein are sent out, the greatest possibility of their being filed in the proper place will be obtained.

We have also discovered that illustrations, descriptive matter and list prices can be utilized to a greater advantage and at less expense than in the usual volume size of book. Another advantage is that an 8½ in. x 11 in. catalog, unless extremely bulky, will always remain flat when open.

Car Shortage Increases

According to the monthly statement of the American Railway Association, the net freight car shortage on April 1 was 143,059, the highest figure that has been reached in recent years. Since August, 1916, when there was a surplus of 9762 cars, the shortage has steadily increased, with the exception of the Jan. 1 report, which showed a reduction in the shortage amounting to 7130, bringing the shortage down to 62,247 on the first of the year. Railway officials continued to attribute the shortage to the abnormal amount of business and to the congestion in the East, due to lack of terminal facilities and of ocean tonnage to carry the freight away after it has arrived at the Atlantic seaboard.

There are about 2,300,000 freight cars in service in the United States. Thus a shortage of 143,059 cars represents over 6 per cent. In the fiscal year ended June 30, 1916, 2,336,291,000 tons of freight were carried on the railroads of the country, each ton being carried an average distance of 178 miles. The loss to the railroads through the car shortage will be appreciated when it is considered that the average amount received for transporting 1 ton of freight 1 mile in the year ended June 30, 1916, was 0.707 cent.

Ball Bearing Companies Merged

The S K F Administrative Company, 1 Wall Street, New York City, announces that hereafter it will direct the affairs of the S K F Ball Bearing Company and of the Hess-Bright Manufacturing Company. The board of directors of this company, which was recently incorporated in New York, consists of Frank A. Vanderlip, president of the National City Bank; Thatcher Brown of Brown Brothers; F. B. Kirkbride, S. Wingquist, Axel Carlander, Marcus Wallenberg, and B. G. Prytz, who was formerly president of the S K F Company, and who now will be the president of the new company. Budd D. Gray, formerly president of the Hess-Bright Company, will become technical adviser to the new company, which will thus have the benefit of his experience in its various interests. The new company is

extending the manufacturing facilities of both the Philadelphia and Hartford plants, in order to meet the demand for the company's products.

NEW YORK METAL MARKET PRICES

	March 31	May 10
Prime Lake, cents per lb.	35	31
Electrolytic, cents per lb.	35½	31
Copper wire base, cents per lb.	42	36
Lead, cents per lb.	9½	10½
Nickel, ingot, cents per lb.	50	50
Spelter, cents per lb.	10¾	9¾
Tin, Straits, cents per lb.	55¾	59¾
Aluminum, 98 to 99 per cent, cents per lb.	55	60

OLD METAL PRICES

	March 31	May 10
Heavy copper, cents per lb.	29	25
Light copper, cents per lb.	24¾	22
Red brass, cents per lb.	20	18½
Yellow brass, cents per lb.	19	17½
Lead, heavy, cents per lb.	8	8
Zinc, cents per lb.	8	7
Steel car axles, Chicago, per net ton.	\$38	\$41.50
Iron car wheels, Chicago, per gross ton.	\$22	\$24.25
Steel rail (scrap), Chicago, per gross ton.	\$27.50	\$31.50
Steel rail (relaying), Chicago, per gross ton.	\$34	\$39
Machine shop turnings, Chicago, per net ton.	\$9.50	\$11.00

CURRENT PRICES FOR MATERIALS

	March 31	May 10
Rubber-covered wire base, New York, cents per lb.	42	36½
No. 0000 feeder cable (bare), New York, cents per lb.	42	36½
No. 0000 feeder cable stranded, New York, cents per lb.	39¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	39½	33
No. 6 copper wire (bare), New York, cents per lb.	42	36
Rails, heavy, O. H., Pittsburgh, per gross ton.	\$40	\$40
Rails, heavy Bessemer, Pittsburgh, per gross ton.	\$38	\$38
Wire nails, Pittsburgh, per 100 lb.	\$3.20	\$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	\$3.65	\$3.85
Steel bars, Pittsburgh, per 100 lb.	\$3.75	\$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	\$4.85	\$6.35
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	\$6.55	\$7.55
I-beams over 15 in., Pittsburgh, cents per lb.	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	4.05	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.85	4.15
Cement (carload lots), New York, per bbl.	\$2.02	\$2.12
Cement (carload lots), Chicago, per bbl.	\$2.06	\$2.16
Cement (carload lots), Seattle, per bbl.	\$2.60	\$2.50
Linseed oil (raw, 5 bbl. lots), New York, per gal.	\$1.11	\$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	\$1.02	\$1.22
White lead (100 lb. keg), New York, cents per lb.	10¼	11¼
Turpentine (bbl. lots), New York, cents per gal.	45	50

ROLLING STOCK

Indianapolis & Louisville Traction Railway, Scottsburg, Ind., is in the market for one trailer box car and two flat cars.

Hutchinson (Kan.) Interurban Railway Company is remodeling and rebuilding a number of cars which will later be adapted for one-man operation. All cars remodeled will be equipped with National Pneumatic Company's door and step mechanism, Westinghouse 12-A motor equipments and Taylor electric trailer trucks.

El Paso (Tex.) Electric Railway has specified the following details of equipment for the ten double-end pay-as-you-enter safety motor cars which are now being built for this company by the American Car Company, St. Louis, Mo.:

Seating capacity	34	Designation signs	Hunter
Length over bumpers	27 ft. 9½ in.	Headlights	Golden Glow, S-M-95
Length over vestibule	26 ft. 9½ in.	Journal boxes	Brill
Width over all	8 ft. 0 in.	Motors	Two inside hung, make not specified
Rail to trolley base	12 ft. 6 in.	Sanders	Keystone air sanders
Body	Semi-steel	Sash fixtures	O. M. Edwards
Interior trim	Statuary bronze	Seats	Heywood Bros. & Wakefield
Headlining	None, rafter finish	Seating material	Mahogany, wood, steel and canvas lined rattan
Roof	Arch	Springs	Brill
Air brakes	Safety Car Devices Company	Step treads	Feralton
Axles	Brill	Trolley catchers	Keystone
Bumpers	American Car, channel iron	Trucks	Brill 78-M-1 special
Car trimmings	Brill	Ventilators	Utility Ventilator Company
Couplers	None, pull bars used	Wheels	24-in. diam, 2½ in. tread, ¾ in. flange
Curtain material	Pantasote	Special devices	Faraday high voltage push button system
Door mechanism	Safety Car Devices Co.—air operated		
Hand brakes	American Car, with Pittsburgh ratchet drop handle		

Union Light & Power Company, Fargo, N. D., expects to purchase fifteen new steel cars. They will be one-man pay-as-you-enter cars and will cost approximately \$75,000.

Houston (Tex.) Electric Company is having eighteen single-end pay-as-you-enter one-man safety cars built in St. Louis by the American Car Company. These cars will be equipped with Safety Car Devices Company's air brakes and safety control equipment.

United Railways & Electric Company, Baltimore, Md., will soon place an order for eighty semi-convertible double-truck pay-as-you-enter cars similar to the 100 cars recently purchased from The J. G. Brill Company. It is said the new cars will be of greater capacity than the ones in use at present on the lines of this company.

Seattle (Wash.) Electric Company, noted in the April 21 issue as being one of the companies for which Stone & Webster, Boston, Mass., ordered 119 cars from the American Car Company, has specified the following details for the twenty-five pay-as-you-enter one-man safety cars:

Number of cars ordered.....25	Hand brakes,
Type.....One-man safety cars	American Car with Pitts-
Seating capacity.....36	burg ratchet drop handle
Length over bumpers,	Headlights.....Golden Glow
27 ft. 9 1/2 in.	Journal boxes.....Brill
Length over vestibule,	Sanders..Keystone air sanders
26 ft. 9 1/2 in.	Sash fixtures....O. M. Edwards
Width over all.....8 ft. 0 in.	Seats, style,
Height, rail to trolley base,	Heywood Bros. & Wakefield
12 ft. 6 in.	Seating material
Body.....Semi-steel	Mahogany wood, steel and
Interior trim...Statuary bronze	canvas lined rattan
Headlining...None, rafter finish	Springs.....Brill
Roof.....Arch	Step treads.....Feralun
Air brakes,	Trolley catchers.....Keystone
Safety Car Device Company's	Trucks, type.....Brill 78-M-1
Axles.....Brill	Ventilators...Utility Ventilator
Bumpers,	Wheels,
American Car—Channel iron	24 in. Diam. x 2 1/2 in. tread
Car trimmings.....Brill	x 3/4 in. flange
Counters...None, pull bars used	Special devices,
Curtain material...Pantasote	Faraday high-voltage push
Designation signs.....Hunter	button system
Door mechanism,	
Safety Car Device Com-	
pany's air operated	

TRADE NOTES

Western Electric Company, Trenton, N. J., has filed notice of an increase in its capital from \$15,750,000 to \$30,750,000.

Okonite Company, New York, N. Y., has moved its offices to the seventh floor of the Astor Trust Building, 501 Fifth Avenue.

MacBeth-Evans Glass Company, Pittsburgh, Pa., announces that its general offices are to be in the new Chamber of Commerce Building, and will occupy the fourteenth floor.

Hyatt Roller Bearing Company, Newark, N. J., announces that due to advances in its costs of raw materials ranging from 10 to 50 per cent, it has been found necessary to increase its prices, effective May 15.

Tuco Products Corporation, New York, N. Y., has been incorporated for \$500,000. The company, which was organized by Henry G. Wenzel, William H. O'Neill and James Carty, will manufacture railway cars.

Dunn Wire-Cut Lug Brick Company, Conneaut, Ohio, announces that Guy Robert Ramsey, associate member, A. S. C. E. of Orlando, Fla., has joined the engineering staff of this company and will be division engineer for the Southern States, with headquarters at Atlanta, Ga.

Copeland-Ingles Shale Brick Company, Birmingham, Ala., of which Beattie A. Ingles is vice-president and treasurer and W. Lawton Ingles is secretary, has become a licensee of the Dunn Wire-Cut Lug Brick Company of Conneaut, Ohio, and will henceforth make wire-cut lug paving brick.

John C. Dolph Company, Newark, N. J., manufacturer of insulating and protective varnishes, announces the completion of additions to its plant which will double its capacity. These additions include new executive offices and a new enlarged insulating laboratory.

S K F Ball Bearing Company of California, Inc., San Francisco, Cal., has been organized in order to supply more readily the rapidly increasing demand for S K F ball bearings on the Pacific Coast. The main office of this company, under the direction of A. M. MacLaren, has opened in San Francisco at 341 Larkin Street, and at this office a large and assorted stock of bearings will be carried.

General Electric's New Sales Manager

As was announced in last week's issue of the *ELECTRIC RAILWAY JOURNAL*, John G. Barry has been appointed general sales manager of the General Electric Company. This appointment commends itself to his large circle of friends in the electric railway industry as most fitting and well deserved. Mr. Barry is a man who does things. He gets results. His forceful personality is an integral part of that industry. It is a pleasure to learn that he will continue his managership of the railway department along with the more general responsibilities of his new position.



JOHN G. BARRY

Men of Mr. Barry's type deserve to succeed, because they put first things first, "plug hard" at their work, and at the same time realize that good-fellowship is not inconsistent with hard work. Of course, these characteristics did not in themselves insure Mr. Barry's promotion, but they are cited as indications of the strong personality behind them. Promotion came in this case, as it does in others, because he was the best-fitted man available for the higher job, that's all. His consistent record of progress should be inspiring to all ambitious young men, especially those in the electric railway business field. Here it is: After a high school course, entered employ Thomson-Houston Company, Lynn, Mass., in production department; transferred to commercial department, Boston office; in 1894, two years after combination of company with Edison General Electric Company to form General Electric, transferred to Schenectady, soon thereafter being made assistant manager railway department and manager in 1907; promoted to be sales manager, May, 1917, at the age of 47.

Besides being useful to the General Electric Company, Mr. Barry takes a prominent part in the civic activities of Schenectady. He is a director of the Schenectady Trust Company, served on the school board for several years, and lives up to the duties of a good citizen in every possible way. In his business affairs he is frank in stating what he wants and why he wants it, but is considerate of the wishes of others. He has the knack of doing things expeditiously without sacrifice of accuracy. Everybody trusts him, everybody likes him. The *ELECTRIC RAILWAY JOURNAL* extends to him on behalf of the industry the best wishes of all for his continued and increasing success.

ADVERTISING LITERATURE

Van Dorn & Dutton Company, Cleveland, Ohio, has issued a bulletin illustrating its different types of gears.

National Lead Company, New York, N. Y., is distributing a booklet "Red Lead and How to Use It," by Prof. A. H. Sabin.

American Electrical Works, Philipsdale, R. I., has issued a bulletin announcing charges for reels and spools which indicate higher prices on several sizes made necessary by advances in the cost of raw materials and of manufacture.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued leaflet 3976 illustrating its outdoor metering equipments. These are adapted for use on transmission lines where the expense of a substation is not warranted.

Ohio Brass Company, Mansfield, Ohio, is distributing an attractive bulletin on its gas-weld rail bonding process. Applications of this type of bonding in paved streets, on open track and on the elevated are described and illustrated, showing that this process is suitable to all conditions. The method of testing rail bonds by the use of two millivoltmeters to determine the number of feet of rail equivalent to 1 ft. of joint is explained.