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ARE SPECIAL PEAK LOADS PROFITABLE?

The idea is widely held by the public that extraordinary peak loads are highly profitable to a modern urban electric railway system. Take the case of the recent World Series of baseball games and consider merely the traffic problem in the winning city of Boston. At first blush it would seem that the traffic to and from Braves' Field, about 3 miles from the center of the city and reached in part by a new and efficient subway line, would be a bonanza to the operating company. Forty thousand persons attended some of these individual games, but does this mean that the company profited to anything like the extent implied? Not a bit of it. This journal holds no commission from the Boston Elevated to minimize the value of such traffic, but let us consider a few pertinent points. In the first place, the company has invested something like \$50,000 in a pre-payment station bordering the ball grounds, in order that the traffic may be expeditiously moved and with minimum possible interference to the travel on the adjacent main lines traversing the district. The annual charges on such an investment at say 8 per cent consume the entire revenue of no less than 80,000 car-fares. These are covered in the course of a season probably several times over and need cause us little concern. The extra operating cost involved in the series, however, is quite another matter.

SPECIAL PEAK OPERATING EXPENSES

On account of the early travel to the field, it was necessary to inaugurate short-interval service on various lines early in the day and to hold many extra platform men for hours. It is possible that six hours' service might be required of say 300 men, and extra meals furnished by the company at a cost of perhaps \$100. Extra station labor involved perhaps thirty to thirty-five extra employees, including special officers. To these should be added say twenty inspectors on the street, and crews had to be stationed at different points to handle any trolley wire failures, switch troubles, etc. Without any exact detailed figures before us, it is clear that the extra cost of handling the extra cars required (much of the traffic being long-haul business) might run up to \$1,000 or more for a single game. To meet this outlay, 20,000 fares must be taken and the full total of such receipts applied to the extra cost, obviously an impracticable course. Furthermore, money must be expended on various minor car repairs after such a traffic peak, broken car windows being frequent, and the extra labor costs, it should be noted, include the expense of concentrating cars on temporary sidetracks near the grounds during the games. One more point

may be mentioned, and that is that if there was no game a large proportion of the traffic would be handled by the company twice during the day anyway, many patrons of the game going directly from office to grounds and thence homeward at the close of the contest, so that the railway receives extra pay for only one haul. It does not require any very exhaustive calculations to show that even a World Series group of games may actually cost a company like the Boston Elevated money instead of pouring the fat surplus into the treasury which the passenger himself pictures as a result of the crowded grandstand.

TAXING THE POOR MAN'S CAR

Several thinking members of the transportation committee of the Chicago City Council, according to newspaper reports, have come to the conclusion that in Chicago the car rider does not get the full value of his nickel in transportation, and that, in the words of a certain cartoonist, "it's all wrong." They see no reason why the passenger should pay for street pavements, street cleaning, snow removal and other municipal services, instead of having such items charged against general and special taxation as in the East. Their conclusion is that the poor and middle classes which use the street cars are being taxed for the benefit of the rich users of autos and taxis which benefit from these street improvements but bear little part of the cost. Aside from the fact that taxing methods as regards electric railway companies are not so different in the East and the West as the examination of the Chicago aldermen on their recent trip to the Atlantic Seaboard apparently led them to think, the conclusion of the aldermen is not far wrong. If city legislative bodies could get the idea firmly fixed in their heads that the payment of paving charges by electric railway companies means the taxation of the poor man's car for the benefit of the rich man's auto, there would probably be a much fairer distribution of the burden. As we have many times pointed out, these taxes have been retained largely because it was thought to be easy to raise them in that way, but when they are added to the present cost of labor and materials in electric railway operation, the margin in profit in transportation practically disappears in the case of most railway properties. This means that these burdens will have to be removed and placed where they belong or passengers on electric cars will have to pay a higher fare than they do now. Adjustment of this matter has been too long delayed, and the time has come when present conditions rather than the practice of forty years ago should control the allocation of these charges.

SERIES MOTORS AS GENERATORS

In connection with the description of the regenerative braking scheme used on the Chicago, Milwaukee & St. Paul locomotive, published in our issue of Oct. 21, a question has been raised as to the propriety of saying that the main motor fields are "super-excited" while the locomotive is regenerating. In connection with this query attention has been directed to the fact that in general when a series motor is used as a generator the field terminals are reversed with respect to their connection with the armature so that the field flux may remain in the same direction when the current reverses. In the St. Paul engines, however, the fundamental principle herein involved is complied with, without mechanical reversal of the field terminals, as is explained below. The applicability of the term "super-excitation" is evident from the following facts:

When emf. is applied to the terminals of a motor, the armature automatically attains such a speed that, neglecting the resistance drop in voltage, a counter emf. equal to the line emf. is generated. As the only effective elements here are the speed and the field flux it follows that in any constant potential motor there is a definite field flux corresponding to a given speed. If at this speed the field flux is increased by any means, a point will be reached at which there is an exact balance of line voltage and counter emf. and no current will flow. Of course, under these conditions it will be necessary to supply mechanical power from some source to keep up the speed. If now the field flux is still further increased and sufficient mechanical power is supplied, the machine becomes a generator. This justifies the use of the word "super-excitation," which simply expresses the fact that, at a given speed and line voltage, more field flux is required when a machine is operating as a generator than as a motor.

In the St. Paul locomotive it will be remembered that for regeneration the field flux is held, by means of a motor-driven exciter, in the same direction that it had when the locomotive was drawing power from the line. The connections of the main and exciter circuits were clearly shown in the diagrams on page 892 of the issue referred to. The exciter is provided with two field windings, a shunt winding and a series winding, which series winding carries all of the power current and opposes the exciter field as the regenerated current increases. The exciter is out of circuit except when the machine is regenerating. As the armature and line current must reverse when the machine changes from motor to generator it follows under the latter condition that, although still connected in series, the armatures and field windings have currents in opposite directions. The exciter armatures form, as it were, a by-pass for the line current, shunting it around the field windings and at the same time supplying exciting current to the fields. Essentially, this is the same as reversing the field terminals.

The exciter, of course, does a great deal more than maintain the flux in the proper direction, as it absolutely controls the braking operation. The automatic

control is adjusted to hold the exciter field current constant, and this with the reversed series ampere-turns of the exciter's field tends to give a constant braking effort at a given setting of the braking controller. The exciter further affords a most delicate manual control of the braking.

We have used a great many words to explain a simple matter, but as the equipment of the St. Paul locomotive is so unique and must, in future, be so frequently referred to as the pioneer application of d.c. regeneration on a large scale, the fundamental principles should be held clearly in mind.

MINIMIZING LINE TROUBLES

In the early days of interurban railroading the roads were short, and the question of transmission line troubles never bothered anybody very seriously. Today, with the network of transmission lines necessary for feeding the substations of a large traction system and for supplying energy in many instances to outlying communities, line troubles may be matters of serious importance, not only to the railway company, but to its pole line neighbors as well. Such troubles are highly "contagious," and unless proper precautions are taken and proper protection provided, trouble caused by a faulty insulator, an accidental ground or a local thunderstorm may spread quickly to other parts of the system network.

For the localization of disturbances, and thereby the minimization of trouble as far as the system as a whole is concerned, it was brought out in a discussion at the last convention of the American Institute of Electrical Engineers that the isolation transformer has been used with gratifying success. This transformer has a one-to-one or other low ratio of transformation, and its function is to insulate sections of a network from each other while linking them together electrically.

Alternating-current lines belonging either to the transmission network or to a lower voltage distributing circuit, while operating satisfactorily as far as the actual transmission or distribution of power is concerned, often give trouble by causing noises in neighboring telephone circuits. With the increasing tendency of many railway companies to supply power to neighboring communities, the number of cases of such trouble in which railway men are interested has naturally increased. In many instances these cases of inductive interference can be remedied by better insulation and proper transposition of the telephone circuits. In other cases, as, for instance, when two wires of a three-phase circuit are extended to furnish single-phase service, the electrostatic unbalance which results sometimes produces noise troubles which no reasonable amount of transposition will remedy, and the use of an isolation transformer at the end of the three-phase circuit often offers the cheapest and best solution of the problem. The isolation transformer is by no means a panacea for all the ills that beset railway transmission networks and their interlinked distributing circuits, but it is felt that in the past its advantages have not been sufficiently emphasized.

How Are Complaints Handled on Your Road?



Would Your Patron Be Surprised if Greeted Thus?

IS it a fact that complaints from your patrons are welcomed?

And when a complaint comes in do you investigate it and satisfy the man who made it?

Is it your attitude that every complainant is *per se* a Pesticiferous Person?

Or is it that **EVERY COMPLAINT IS AN OPPORTUNITY** to correct something that is wrong or to satisfy someone that the complaint is unjustified?

If the railway's attitude toward complaints is the right attitude—in other words, if it answers the last question in the affirmative—it should let people know that this is the fact, not to flaunt its virtues, but to encourage more complaints;

It should show the public that here is a road in connection with whose service it **IS** worth while to make a kick.

For about the most fatal thing for people to believe about any public institution is that complaints are ignored and that "it is no use to say anything."

This feeling has hurt all sorts of public utilities; it rankles in a man's mind to feel that he has been misused and is unable to secure redress.

A determination to get even some way is quite human.

On the other hand, **A COMPLAINT COURTEOUSLY RECEIVED AND PROMPTLY REDRESSED USUALLY MAKES A STAUNCH FRIEND.**

Complaints are so valuable that they should be advertised for; hotels and shops beg their patrons to complain when they are not satisfied; why shouldn't railroads do the same?

The man or men handling railway complaints and the Publicity Department should work so close together that no one can tell one from the other.

Without a publicity man a railroad doesn't know half of the time what's hurting it, and the other half of the time it doesn't care as much as it should about the public impressions that a publicity department will correct.

These Talks have discussed principally the general or common misunderstandings between the public and the utility company, and how to correct them.

Don't let thousands of individual grouches be added annually to the grievances, real or fancied, that the public holds as a group.

No railroad can afford to do this.

And for very much the same reasons no railroad can afford to be without a Publicity Department.

Such a department represents an investment in good will, from the lack of which railroads are suffering more than from any other one cause.

New Bonding Methods Developed for 150-lb. Third-Rail

Cast-Copper Bond and a Spot-Welded Joint with Copper Splice Bars Soldered to the Web of the Rail Are the Two Types of Bonds Used by the New York Municipal Railway Corporation

ALTHOUGH the total length of all bonds forms a small part of the length of the positive feeder layout of any railway system, still the bonds constitute one of the most important links of the power circuit, and a great deal of attention has been given them by the engineers engaged in the new rapid transit work in New York City. The purpose of this article is to describe the methods of installation of the two types of bonds which have been developed by the New York Municipal Railway Corporation and used by it for bonding the 150-lb. third-rail on its portion of the dual system of rapid transit.

The shape of the rail, together with the heavy current and severe traffic conditions, required the development of a method of bonding different from any previously used. The thickness of the web of the rail is $2\frac{3}{4}$ in., and it was decided that this would not permit the use of a compressed terminal bond. It was also decided that any bond which projected below the base of the rail was undesirable because it would necessitate a special spacing of rail joints to avoid interference with the third-rail insulators and anchors.

THE CAST-COPPER BOND

The first bond developed to meet these conditions was a cast-copper splice which has been used for the bonding of about 75 miles of third-rail. The bond consists of two copper lugs, 5 in. in length, which are cast on the web of the rail. The joint thus formed will stand a tensile stress of 30,000 lb. without deformation and 60,000 lb. before fracture occurs. The electrical conductance of the joint is equal to that of an equal length of the unbroken contact rail, the conductance of this rail being about one-seventh that of annealed copper.

The accompanying illustrations show the steps in the installation of this bond. The surfaces of the rail which

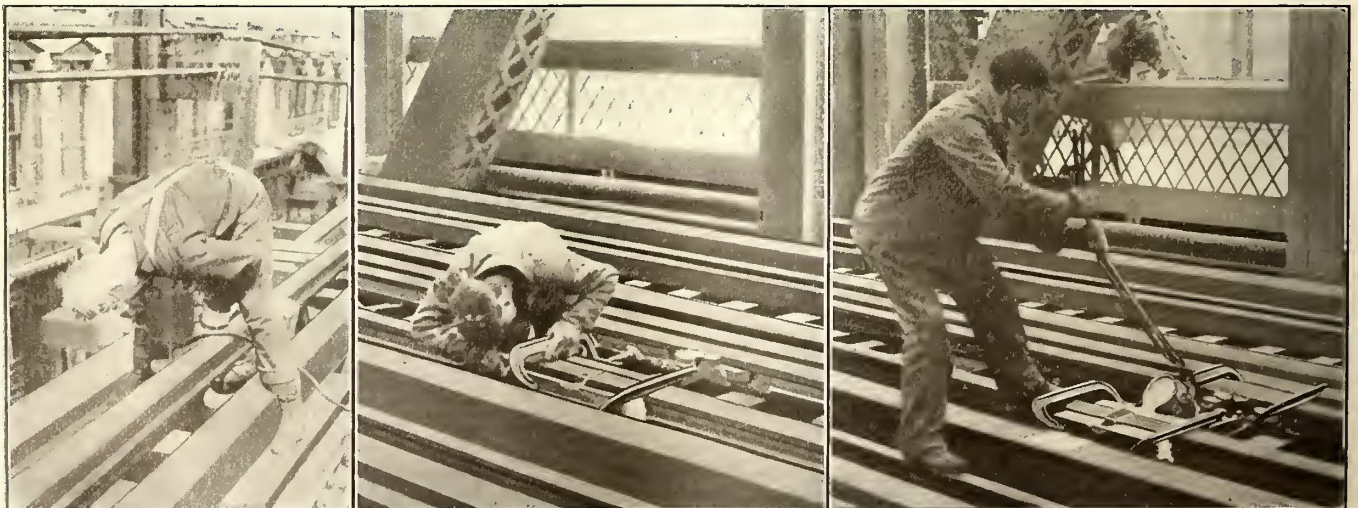
are to come in contact with the bond are first ground to remove the scale and rust and give a bright, clean contact surface. An electrically driven hand grinder is used for this purpose, the operation being done by one man in about twenty minutes. A carbon mold is then placed around the joint and held in position by two iron clamps, care being taken that the rails are in perfect alignment. After the mold has been placed, the cracks between it and the rail are filled with plaster of Paris. One man can place the mold and make it ready to receive the molten copper in about ten minutes. Instead of filling the cracks between the mold and the rail with

plaster of Paris, a later practice has been to use a sand mold having a carbon lining. As soon as the mold is ready, the copper which is melted by a special furnace is poured into the mold, and after it has cooled for a few minutes the clamps and the mold are removed. Heavy lugs on each side of the bond



THIRD-RAIL BONDING—COMPLETED CAST COPPER BOND

proper are cast simultaneously with the bond itself and are for the purpose of heating the rail sufficiently to insure a perfect weld between the copper and the rail. That this is obtained is shown by the presence of a considerable amount of iron in the bonds that have been removed. After the joints have cooled, these lugs and other superfluous metal are cleaned off, and the bond is trimmed to the proper dimensions. The in-



THIRD-RAIL BONDING—THREE OPERATIONS IN INSTALLATION OF CAST COPPER BOND: GRINDING THE RAIL, PLACING THE MOULDS, POURING THE COPPER



THIRD-RAIL BONDING—ELECTRIC FURNACES FOR HEATING COPPER ERECTED ON SPECIAL TRUCK HAVING THIRD-RAIL SHOE



THIRD-RAIL BONDING—ELECTRIC FURNACES FOR HEATING COPPER BEING OPERATED IN SUBWAY WHERE CLEARANCE IS SMALL

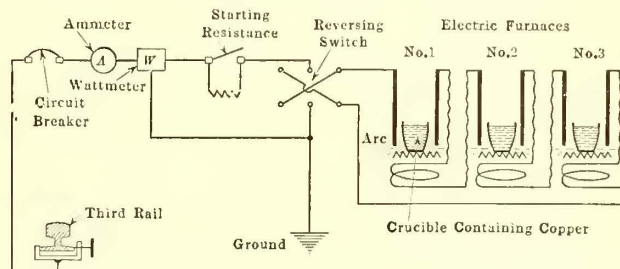
stallation of these bonds was made by the Electric Rail way Improvement Company, Cleveland, Ohio.

FURNACES FOR MELTING THE COPPER

The furnace which was first used for melting the copper burned kerosene for fuel. In this furnace combustion was secured by discharging the vaporized oil through a small nozzle at a velocity sufficient to generate an induced draft of air. For the operation of one furnace a small air pump, operated by hand in the manner of an ordinary blow-torch, was sufficient to supply the necessary pressure for the oil. It was found, however, that the efficiency of this furnace depends on the quality of the wall material, since the volume and direction of the induced draft of air was affected by the deterioration of the walls of the combustion chamber. The difficulty in maintaining a proper furnace lining was one of the reasons which led to the use of the electric furnaces.

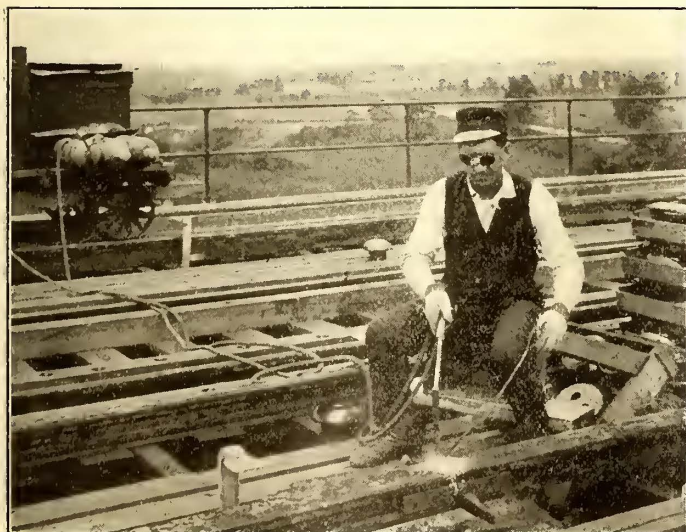
The electric furnaces are operated in batteries of three. One of the accompanying illustrations shows a battery of furnaces in operation in the subway where the space is limited. Another shows the furnaces and control apparatus installed on a flat car which is equipped with a shoe for taking the current from the third-rail. The method of wiring the furnaces is shown

in the design reproduced below. The current enters each furnace through a long vertical terminal which holds a carbon rod that can be raised and lowered by a ratchet attachment. An arc is maintained between this rod and a bed of granular carbon on the bottom of the furnace. The current passes through this

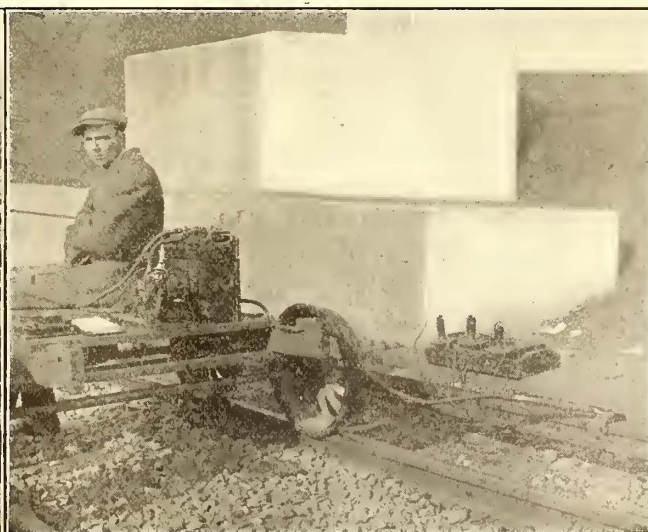


THIRD-RAIL BONDING—WIRING DIAGRAM OF ELECTRIC FURNACES

bed, through the second arc similar to the first and out by the long vertical terminal on the other side of the furnace. From here it passes through a coil around the base of the furnace, the object of the coil being to create a magnetic flux parallel to the arc for the purpose of steadying it. From this coil the current passes to the next furnace. The furnaces have an oval shape,



THIRD-RAIL BONDING—SPOT WELDING A JOINT WITH OXY-ACETYLENE WELDING TORCH



THIRD-RAIL BONDING—TESTING EQUIPMENT MOUNTED ON HAND CAR AND CONNECTED TO THIRD-RAIL

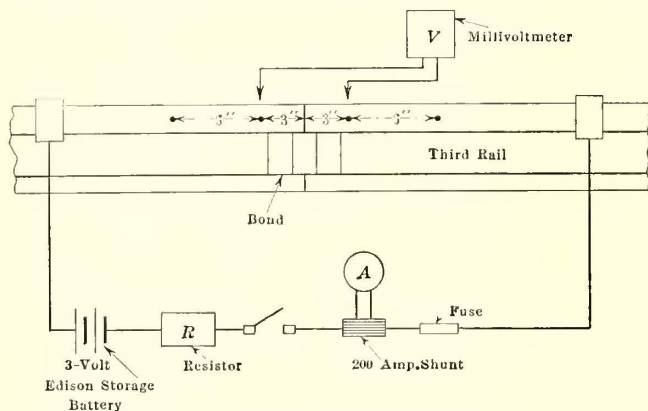
and the crucible containing the copper rests on the bottom between the two arcs.

The operation of the furnaces is as follows: Before the current is turned on, all the carbon terminals are lowered until contact is made with the granular carbon bed. The current is then applied through the starting resistance, and the arc terminals are raised until arcs of proper length are obtained. The length of the arc is judged by the drop in potential across the terminals of the furnace, a voltmeter being provided for this purpose. When the arcs are established the starting resistance is short-circuited. The three furnaces are connected in series across a 600-volt circuit, and an average current of about 200 amp. is used. Heats can be made every thirty minutes.

The difficulties in obtaining pure copper and in getting satisfactory deliveries owing to the market conditions caused by the European war led to the development of the second method of bonding.

THE SPOT-WELDED JOINT

In this method two copper splice bars bolted and soldered to the rail furnish the necessary conductance, while the required strength and stiffness is obtained by



THIRD-RAIL BONDING—WIRING DIAGRAM OF TESTING EQUIPMENT

welding the abutting ends of the rail together at the top and on the side of both of the bottom flanges. The mechanical strength of the bond is such that the rail can be raised 6 in. by a lever placed under the joint, and this operation can be repeated six or eight times without any sign of fracture appearing. The conductance obtained is greater than that of an equal length of unbroken rail. This method of bonding was described in the *ELECTRIC RAILWAY JOURNAL* for Aug. 12, page 282. Since that time it has been possible to obtain further details regarding the bonding process.

Before the welding operation is begun, the abutting ends of the rail are brought into alignment, and a temporary splice bar which fits the web tightly is clamped on each side of the rail. This holds the rails in alignment while the top weld is being made. After this weld is finished the clamps and the temporary splice bars are removed and the bottom flanges of the rail are welded. In making a weld, the operator first burns out the metal or cuts it away mechanically at the point where the weld is to be made and then fills up the space with Norwegian iron, which he melts off from a $\frac{1}{4}$ -in. rod.

The welds can be made with either an electric arc or an oxy-acetylene blow torch. In the electric arc welding a d.c. generator driven by a small gas engine supplies the necessary current. The positive terminal is connected to the third-rail, and the operator holds the negative terminal in his hand. The arc is started by merely touching the negative terminal to the third-rail. The rails can be welded at the three points in about fif-

teen minutes. For the oxy-acetylene welds the oxygen is taken from one tank at a time, the hose pressure being about 60 lb. per square inch. Owing to the fact that an exceptionally large tip is used on the welding torch, the rate at which the acetylene is used is greater than with ordinary welding. For this reason three acetylene cylinders are used at once to feed the torch, about 6-lb. hose pressure being used. About 19 cu. ft. of oxygen and 21 cu. ft. of acetylene are consumed for each joint.

APPLICATION OF THE COPPER BAR SPICE PLATES

After the rails have been welded together the next step is to apply the splice bars. These bars, which are the product of the American Steel & Wire Company, are made of copper, tinned with a heavy coating of hard solder. One of the bars for each joint is drilled in the shop and is used as a templet for drilling the rail and the other splice bar. Any rough projections that have been caused by the welding are cleaned off with a cold chisel, and the splice bars are placed on each side of the rail at the joint. They are held in position during drilling by two clamps. The drilling of the rail and one splice bar in a single operation while the other splice bar is used as a templet insures a true fitting of the bolt. The drilling of each hole requires about 20 minutes, a weak solution of soap and water being the only lubricant used.

The clamps and splice bars are then removed, and the surfaces of the joint which come in contact with the splice bars are ground until they are smooth and shiny. After being ground the abutting ends of the rail are heated until a bluish color appears by means of a kerosene blow torch having two burners. The splice bars are then heated while the rail is being tinned. This done, the bars are bolted in position with the heads of the bolts on the track side of the third-rail. Extra solder is applied through grooves in the splice bar provided for the purpose, and the bolts are tightened until the superfluous solder is forced out. About twenty minutes is required for the application of the splice plates. The splice and bond is then complete and ready for testing.

ELECTRICAL TESTS

The specifications require that the electrical resistance of the bond shall not be greater than an equivalent length of third-rail. The testing equipment comprises a two-cell Edison storage battery, a variable resistor made of carbon blocks, an ammeter with suitable shunt, and a line switch and fuse, all connected in series, and a millivoltmeter for measuring the drop in potential along the rail. By means of a wooden jig, punch marks are made on the side of the head of the rail 3 in. and 9 in. from the abutting ends. These punch marks are brightened up with a drill just before the test is made. The apparatus is then connected to the rail, and the current is adjusted to 200 amp. The drop of potential along 6 in. of rail including the bond is read and compared with the potential drop along the adjoining 6 in. of rail on either side of the bond.

The safety-first movement in Illinois is credited largely in the last year with having cut the number of accidental deaths by railways and electric lines 286, and the number of persons injured 1489. These figures are contained in the first annual report of the accident division of the engineering department of the State Public Utilities Commission. A comparison of the accidents on the electric railways for the years 1914 and 1915 shows a decrease from 188 killed and 2174 injured to 186 killed and 1246 injured.

The Public Relations of Public Utility Companies*

Honest Publicity Is a Sequel to Honest Action and Honest Purpose—The Proper Attitudes of the Utility and the Authorities Defined

BY JUSTUS I. WAKELEE

Associate General Solicitor Public Service Railway, Newark, N. J.

IN discussing the question of public relations, much has been said about publicity, and we are almost led to think that publicity is a remedy for all our ills. Of course, we want publicity, but it does not matter very much whether we want it or not, we get it, we live in it, we are surrounded by it. The very nature of the business brings it. This has always been so. In the past, when any utility corporation attempted to get away from it and conceal something, somebody was sure to let go a torpedo, and the dark place was opened. This is as it should be.

Honest publicity is certainly essential to proper public relations, but honesty of action and honesty of purpose are still more important. Therefore, publicity is not the beginning and end of our public relations. Utility companies, in addition to publicity, need more fully to develop a corporation character that, when known to the public by some proper scheme of publicity, will gain for them the public confidence to which they are entitled.

DIFFERENCES BETWEEN UTILITIES AND PRIVATE BUSINESS CORPORATIONS

Public utility corporations are different from private business corporations, although they have some of the attributes of the latter. Thus, they have stock privately owned. The stockholders elect the directors who manage the business. They own property which is just as much private property and entitled to the protection of law as the merchandise on the storekeeper's shelves or the furniture in your houses. The only difference is that the utility company has dedicated its property in the streets for public use, and it must be used within the undertaking. Right at this point is where many people go wrong. They think that because the property of the utility is in the street and is dedicated to the public use, somehow that property belongs to the public. This is not so. It belongs to the company, but it must be used in the street according to the undertaking of the company, and this brings us to the public side of these utilities. While they have some of the attributes of private business corporations, they also have some of the attributes of a public or municipal corporation. In furnishing transportation, gas and electric power to the people, they are rendering a service which is in a sense exactly the same as the city government renders in repairing the streets, maintaining markets and the like, except that the utility corporation usually does its work better and more economically and the utility cannot conceal bad management or increase the tax rates to make up for the losses. But the state has gone further than simply permitting these utilities to organize and do business. Many of the utilities have the power to condemn land in case the owner does not desire to sell. Then they have the right to use the public streets under certain conditions, and finally they are made practically monopolies.

The state, however, reserves to itself the power to compel the utility to carry out its agreement, to perform its undertakings and to furnish adequate, safe and proper service at reasonable rates. It also re-

serves to itself the right to say what is adequate service and what is a reasonable rate. Right here is another side track upon which many minds run. Many think that because the state has reserved the right to decide what is proper service and what is a reasonable rate, that the state has reserved the right actually to manage the property and dictate the use of the property, whether such is within the undertaking or not. My opinion is that because the state reserves to itself the right to decide upon the service and the rate, the state should recognize more fully than it apparently does the reciprocal duty to protect the corporation in the exercise of its legitimate functions. The companies because of their public character are entitled to such protection. As the companies have no right without a corresponding duty, they have no duty without a corresponding right.

THERE IS REALLY A UNITY OF INTEREST

I have pointed out the reciprocal rights and duties, and I have indicated the line-up—the directors and officers of the company on one side and the legislature, the public service commission and the municipal governments on the other. This is not a hostile line-up, however. The forces of the corporation are not going out to battle against the forces of the public, and the wise statesman will not lead the forces of the public against the forces of the corporation.

Let us go a step further and see whom the directors and the officers of the corporation represent, and whom the legislature, the commission and the municipal governments represent. On the side of the utility we find the owners of the stock and bonds of the company, all those who have money in the savings banks which invest in these stocks and bonds, all those who have policies of insurance in companies which invest in these securities. We find a great army of employees and their families and those depending upon them, and finally the customers of these utilities—those who take the gas or the electric current and who ride upon the cars.

On the side of the legislature and the municipal government, we find the very same people. Who are these people? In large measure they are those interested directly or indirectly in the securities of the public service companies. They are the employees and the families of these employees in public service companies. They are the patrons and users of these utilities. So, as we analyze the situation, the line between the corporation and the people fades away. It is one great army in which there are several officers, all of them having different duties.

WHAT IS THE PROPER ATTITUDE OF THE UTILITY TOWARD PUBLIC RELATIONS?

Now the question arises, if the utility companies carry out their part of the contract, properly perform their functions, what attitude should these utilities take upon the subject of public relations? The companies can control their own attitude upon this subject even if they cannot be influential in determining the attitude of the public. To bring about proper relations between the public and the company, I suggest two things: The first is for the utility acting through its officers and employees to do its full and complete duty, to fulfill its every obligation, and give the public adequate, safe and proper service at a reasonable rate. The second is for the utility fearlessly and publicly to demand its rights and insist that the other representatives of the people, namely, the legislature, the commission and the municipal governments recognize the

*Abstract of an address presented at the company section meeting at Newark, N. J., Nov. 16, 1916.

right of the utility and give to it the protection to which it is entitled.

When I said that the first requirement is for the utilities to do their duty, I do not mean that in any narrow sense. They should not wait until they are forced. I believe that utilities should, in a large way, take the lead in all matters along the lines of their particular business. They should develop. They should advance.

While the first requisite of public utility companies is to do their duty and fulfill their obligations, the second requisite is just as important. It is that the companies fearlessly and publicly demand their rights. The company should be firm and unafraid in putting forward its side of every question. When unfair demands are made, the reasons for refusing should be carefully and fully explained, but the unfair demands should be firmly refused. When bills are introduced in the legislature, as they are every year, the design or the effect of which would be to injure the utility, the companies would fail in their duty if they were not heard in protest and explanation. Whenever the interests of these companies are being discussed, they should be represented, whenever action is being taken which affects their welfare, whether in the courts, the legislature, the municipal councils or anywhere else, they should be heard. The people expect this and would not excuse failure brought about by lack of proper representation. It should not be overlooked, however, that the ability to carry out all this which I have called the second requirement depends upon the manner in which the companies carry out the first requirement. It is the fact that these companies are doing their duty which gives them the standing and the strength to demand their rights and protect themselves against attack.

Having in mind these contractual relations between the companies and the public and having described the parties to the contract and recognizing the necessity on the part of the company fully to perform their duty and fearlessly to demand their rights, I am ready to join the procession and advocate publicity as a final requisite to bring about proper public relations. In this country public opinion is the final authority. No institution can exist without the approval of the people nor can it long survive possible distrust.

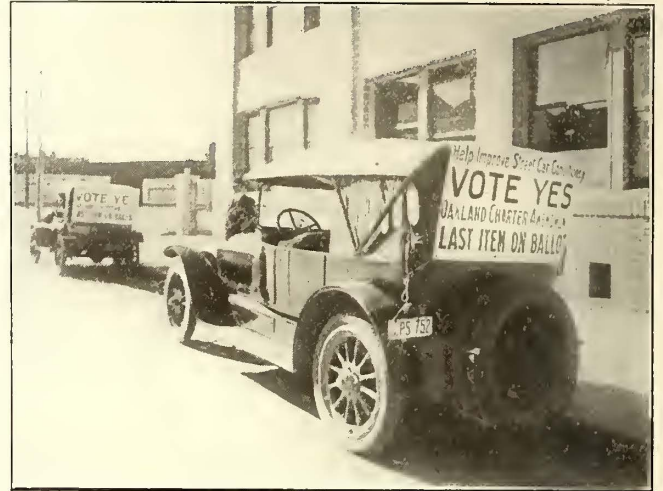
THE DUTIES OF THE OFFICERS AND EMPLOYEES

Now a word about ourselves, the officers and employees of these companies. What should our personal attitude be on these public questions? As I have met you men I have not seen any difference between you and the men employed in other occupations. Everybody I meet around here seems to be a normal human being. We spring from different races, we go to different churches, we belong to different political parties. This is as it should be. We are part of the people. Therefore, we should act as part of the people, and we should not permit ourselves to be put in a class by ourselves or to be treated as if our employment in these companies makes it impossible for us to act as other citizens. The best way to combat this idea is to let people know the facts. We can be the best publicity agents for our companies. We know these companies are honestly conducted, let us boldly stand up and say so. We know that these companies are not seeking a special favor of such advantage, let us not hesitate to make that plain to the people.

In conclusion, let us do our duty. Let us demand our rights. Let us take the public into our confidence. If we take this attitude fearlessly and maintain it we shall command the respect of the public, and, in addition, we shall respect ourselves and each other.

How the Public Helped

HOW the public responds generously when the problem of securing better public relations is well handled by an electric railway was clearly shown in connection with the recent adoption of charter amendments in Oakland and Berkeley, Cal., as noted in last week's issue. These amendments, in the nature of an enabling act making possible the adoption of a resettlement plan for the San Francisco-Oakland Terminal Railways, were passed by a three-to-one vote, largely owing to the interest of various civic clubs and the personal appeals made to the voters.



SIGNS ON PRIVATE AUTOMOBILES USED TO BRING OUT FRANCHISE VOTE IN OAKLAND AND BERKELEY

On election day friends of the amendments who owned automobiles were on hand to see that voters thought to be favorably inclined toward the measure were taken to the polls. Citizens wholly unknown to the company telephoned and offered the use of their automobiles. How some of these machines carried a message to the public is shown in the accompanying illustration.

Throughout the whole campaign the general public was on the side of the company, and this is believed to have been due to the publicity policy which the company followed in recent months. The public in operating and construction matters was taken into the company's confidence, and the result speaks for itself.

The National Research Council and the Bureau of Standards

The National Bureau of Standards has been asked to co-operate with the National Research Council in mobilizing the research facilities of the United States. This council was organized at the request of President Woodrow Wilson by the American Academy of Sciences, but Congress has made no appropriation to the Department of Commerce to enable the Bureau of Standards to participate in the work. The council comprises representatives of departments of the federal government, of engineering societies, of the research laboratories of industrial corporations and others. The aim is to make it possible for college and other laboratories to co-operate in the large research enterprises. In view of the increasing demand upon its facilities, as exemplified by the above, it is understood that the Department of Commerce will ask Congress at its next session for increased appropriations. Such an appropriation should receive the support of all who profit by the work of the Bureau of Standards.

Railway Commissioners Meet in Capital

Reports by New Public Utility Committees Overshadowed by Those Dealing with Question of Federal Versus State Regulation—Tendency Toward Centralized Control Attacked

ALTHOUGH the committee organization of the National Association of Railway Commissioners was expanded last year to provide for greater attention to problems affecting utilities other than steam railroads, the reports of the four new utility committees on rates, service, safety, and statistics and accounts which were presented at the annual convention in Washington, D. C., last week, occupied a quite subordinate position. Taken as a whole, they covered important points in utility regulation, but in most cases they were simply received and filed with little if any discussion. At practically all of the sessions, from Nov. 14 to Nov. 17 inclusive, the big topic of discussion was the inadvisability of exclusive federal control of interstate carriers and other utilities. The association was in general opposed to any abolition of the present dual system of regulation, and it favored legislation by Congress authorizing the courts to determine which is the reasonable rate in the case of conflict between federal and state commission orders.

PUBLIC UTILITY RATES

The first report of the other-than-steam railroad committee group dealt with rates. Although this specifically covered only electric, gas and water companies, it aimed to bring together in concise form the more important principles, theories and practices connected with utility rates. Starting with the fundamental statement that rates must be just and reasonable so as to produce a fair return on the fair value of used and useful property, the report stated that the total return should be such as to provide for the cost of economical and efficient operation, taxes, depreciation, a fair net return on the value of the property devoted to public use and a proper margin for the successful conduct of the business. The fair amount to be set aside for depreciation would vary with local conditions, and could be determined only by careful accounting for a long term of years. The composite life of the plant, determined from the probable length of life of its various parts, would give the percentage for a working basis, which should be subject to such modifications as experience required.

The fair rate of net return, the committee stated, would vary widely with local conditions. In general, the legal rate of interest might properly be taken as a standard of measure of the fair rate of net return to be distributed to the stockholders, but this might require modification to fit cases which were exceptional in the amount of risk connected with the investment. If a business was of a permanent and stable character, and free from irresponsible and destructive competition, the rate of net return might well approach that on bonds and savings-bank investments. On the other hand, when an exceptional element of risk pertained to the business, as in obsolescence of plant or obvious possibility of competition of other substitute service, a rate substantially above the legal rate of interest might fairly be allowed. The legal rate of interest is 5 per cent in three states, 6 per cent in thirty-one states, 7 per cent in eight states and 8 per cent in six states. The rate of net return allowed should be such that new capital would

be available for the extensions and improvements necessary for the proper development of the business.

The committee felt that some allowance should be made in the rate of return authorized as well as in the rate of dividends distributed when necessary in order that the business might become firmly established with a substantial surplus within a reasonable length of time. Exceptional efficiency of management should receive consideration and encouragement. It was deemed a sound business principle worthy of general adoption "that decreased costs and increased profits due to skillful and wise management shall be shared in lower prices to the public and higher dividends to the stockholders."

The report was signed by Thomas W. D. Worthen, New Hampshire, chairman; M. H. Aylesworth, Colorado; Robert C. Bacon, Vermont, and John J. Treacy, New Jersey.

The discussion of this report concerned, in the main, lighting rates. It was suggested by a utility representative that "value of service" as a rate basis might well be considered to a greater extent, but the commissioners did not see how the question of service value entered the case if they knew what the term meant. In regard to the advisability of basing rates for municipal service on the same principles as those for private service, Commissioner Walter A. Shaw, Illinois, thought the plan all right in theory, but mentioned various snags in the form of ordinances, tax limits, etc., that would make it difficult in practice. The report was simply received without adoption and ordered printed.

PUBLIC UTILITY SERVICE

In the opinion of the committee on public utility service, patrons of a public utility are more dependent upon the public service commission in the matter of correcting unsatisfactory service than they are in the matter of securing reasonable rates. The report described the general features of commission work in checking and regulating service, and then discussed in detail questions arising in connection with different classes of utility service.

Taking up the electric railway group, the committee stated that the obligation of a local carrier to render adequate service at a reasonable rate is fundamental. What is adequate service and what is a reasonable rate, as applied to the different classes of service, are questions which cannot be determined by standard rules applicable to all classes. As to service, the problem of a smaller locality is different from that of a larger. Whereas in a smaller community the riding population can adjust itself to the carrier's schedule of service, if it fairly meets their needs, the larger community demands that the carrier adjust itself mainly to the requirements of the riding public, including the shifting of tides of traffic. In metropolitan and interurban service, the questions of rush-hour and non-rush hour traffic are intricate and difficult, owing to the great difference between the demands in equipment, motive power and labor of each class. Even the differences existing between the more extended rush-hour period of the morning and the restricted, more congested rush-hour period of the evening are factors which increase

the difficulties. The use of the nickel as a fare unit, and the statutory provisions limiting the rates chargeable by railways, add other features to be considered.

In the opinion of the committee, the questions may be local in application, but they are extensive and country-wide in interest. The equipment used by street railways, both rolling and stationary, should at all times be in a safe operating condition. Nothing can excuse a disregard of this prime duty. The character of the equipment should be determined by capacity and traffic requirements. It is obvious that a fixed number of cars should not be prescribed without reference to the carrying capacity of those cars. In adopting a particular type of car, carriers should seek to provide additional seats rather than additional standing room.

The main elements in schedules of operation, the committee said, are (1) accommodation furnished by seats for passengers, (2) frequency of operation, and (3) limiting points of loading and traffic movement. The first two elements apply to service in all localities, the last element mainly to metropolitan operation. It is not sufficient to provide a comfortable riding place for each passenger boarding a street car, when he is obliged to wait for a car for so long a time as to result in inconvenience. Adequacy of service cannot be obtained where passengers have to wait an unreasonable length of time for cars. Of course, demands as to frequency of service may be unreasonable. Short of that, the public is entitled to liberal consideration, as encouraging more frequent use of facilities, assisting communal development and promoting the carrier's prosperity.

The rush-hour evil in large centers of population is one which, the committee thought, may not be easily eradicated. It may be minimized by routing and terminal facilities. Distribution of population through various routes and lines will relieve the pressure from particular lines. Avoidance of terminal congestion by methods of operation and trackage arrangement is also vital. Excess loading, however, is almost inevitable, but the degree of excess should be regulated. Carriers have sometimes asserted an absolute right to operate cars with a percentage of standees during rush-hour periods. Such a right does not exist. Excess loading can generally be prevented during non-rush hours, and if it cannot be avoided during rush hours it should be minimized.

Congestion at loading points, caused either by density of passenger traffic or by physical or track limitations, is a problem largely metropolitan. By providing a sufficient number of guards, controlling the course of ingress and egress, and using informative signals, a good deal of this trouble can be obviated. The adoption of traffic rules to regulate the movement of vehicles on streets is another means of relief.

Public service commissions are usually vested with authority to require reasonable extensions of mains or lines of various classes of utilities. Their powers with regard to street railway extensions, however, are limited on account of charter, franchise and property-owner rights. Yet, in the committee's opinion, the full benefits of regulation cannot be obtained without power in the commissions to require extensions of street railways in cases where the existing facilities do not go far enough. There need be no more apprehension as to whether this power would be exercised reasonably than there is now with reference to the power over gas, electric and water services.

In conclusion, the committee made the following general recommendations:

1. That the matter of regulating the service of public utilities, other than steam railroads, be vested (as is

now done by many of the states) in the public service commissions of the various states.

2. That each state commission establish standards of service for each class of public utilities within its jurisdiction.

3. That inasmuch as some kinds of public utilities are not confined to state boundaries, some uniformity of standards is desirable, to the end that a single enterprise, doing business in several contiguous states, may not be required to observe a different standard in each state.

4. That each state commission prescribe forms, upon which the various classes of public utilities shall be required to keep a record of the important factors that indicate the character of the service of each utility.

5. That each commission establish and maintain a service division to inspect and from time to time determine the quality and character of the service furnished by the various public utilities.

6. That each commission recognize at all times the importance of adequate service to the public, and that it take such steps as may from time to time be necessary to insure the furnishing of adequate and efficient service by public utilities.

The report was signed by Richard Yates, Illinois, chairman; John M. Kinkel, Kansas; H. B. Shaw, Missouri, and Travis H. Whitney, New York, First District. At the conclusion of the report it was moved that the recommendations be adopted by the association, and it was so voted.

SAFETY OF OPERATION OF PUBLIC UTILITIES

The committee on safety of operation of public utilities reported that the subject covered such an extensive field that it probably could not be dealt with satisfactorily from the standpoint of discussion or recommendation. In its opinion, probably the corporations which have made the greatest advances in improving the safety of operation are the electric railway and the electric light and power corporations. It was the view of the committee that commissions should have full power and authority to make orders covering operating matters affecting safety whenever they seemed to be required. There are so many opportunities for corporations, however, to benefit financially and otherwise by making their operating conditions as safe as possible that the committee felt that the matter might be safely left with the utilities primarily, and that the work of the commissions should be principally devoted to investigating operating conditions, from time to time giving advice to the corporations with reference to such operations and making recommendations concerning them whenever it seemed proper to do so. If the corporations understood this to be the attitude of the commissions, there was no reason why there should be any friction between the interested parties. The report was signed by James O. Carr, New York, Second District, chairman; C. F. Foley, Kansas; R. W. E. Donges, New Jersey, and S. S. Kendall, Colorado.

After presenting the report, Commissioner Carr read a dissenting opinion by H. D. Loveland, California. Commissioner Loveland was of the opinion that to secure uniformity in the operating methods of various classes of utilities, it was often necessary that the initiative be taken by somebody having authority. It would appear, therefore, that the commission having jurisdiction would be the proper source for the initiation and formulation of rules having as an object the safety of operation, and that the co-operation of the utilities should be expected and required. Tentative regulations should be drawn up, conferences held with the utilities, etc., to the end that the final determina-

tion might be incorporated in an order specifying definite rules which would be reasonable and effective.

As a last word on the report Commissioner Carr then made the following statement:

"From our experience we believe that by co-operation with the corporations, and by suggestions, and as Mr. Loveland says by conferences, operating conditions will in nearly every case be so carried out as to produce safety for all who are interested, the public, the employees of the corporation and the corporation itself. It is going too far to require the commission to undertake to prescribe rules and regulations for the corporations. From my individual standpoint the commission has no right to tell the corporation how it shall conduct its business. It has the right to make orders requiring the corporation to do certain things, but when it commences to prescribe rules and regulations for the conduct of its business as such, I think it is going too far. The same result is accomplished by the order of the commission, and then the corporation can make its rules and regulations as it sees fit.

"The corporations have much more incentive to study the question of safety than any of the commissions can possibly have, because the corporations are the ones directly affected through their pocketbooks; and what affects them through their pocketbooks is likely to obtain quite careful consideration. Another thing which is tending to cause great strides to be made in this direction is the formation of the national associations of the various classes of public utilities. These deal with the subject in a broad way, and as the result of investigation and consideration adopt certain standards, which in turn are almost uniformly adopted by the corporations. In the event that the local corporations do not comply with the rules for safety which have been adopted as national standards, the commissions are in a position to bring the matter to their attention and urge the adoption of the standard rules."

At the end of the discussion it was voted that the majority and minority reports should merely be received and printed.

STATISTICS AND ACCOUNTS OF PUBLIC UTILITIES

According to the report of the committee on statistics and accounts of public utilities, there are now only eleven states which have not provided for publicity of accounts of electric railways. Nearly all the delinquent states are essentially agricultural, with relatively small urban populations. Of the thirty-eight states in which reports are provided, the commission in thirty-two is authorized to prescribe accounts and in twenty-six accounting classifications have been adopted. The newest utility brought under supervision is the bus company. At least five state commissions exercise jurisdiction over this service, but none apparently has yet prescribed accounting classifications. The form of report devised for street railways is readily adapted to the city auto-bus company and has given entire satisfaction thus far in New York City, which has one large bus corporation. Outside the large cities bus operations are on a small scale and a very simple form of report is said to be all that is required.

About one-half of the thirty-eight states requiring detailed reports of electric railways use the Interstate Commerce Commission's form in consequence of statutory enactments designed to prevent conflicting accounting requirements for interstate carriers reporting to both federal and state authorities. The inclusion of electric railways under such laws, the committee stated, was a mistake which has been rectified by amendments of the statute in some of the states, as in New York. In New York City, which is in the midst of a program

of rapid transit extensions costing more than \$350,000,000, the expenditures are being classified in accordance with the accounting system promulgated by the New York commission in 1908, six years before the Interstate Commerce Commission adopted a uniform system of accounts for electric railways. In the opinion of the committee it is hardly to be expected that the New York commission will revise its accounting regulations for the sake of removing some differences between them and the rules subsequently prescribed by the federal body, which has jurisdiction over one or two of the New York City companies and a small number of interurban companies outside the city. The intent of Congress, as shown in recent laws, to leave electric railways subject to state regulation must be recognized.

Most of the remainder of the committee's report was devoted to the subject of depreciation. In fifteen states there are special enactments requiring the utilities to maintain depreciation reserves or conferring authority upon the supervisory body to make such requirements. Seven additional states have exercised such authority as a matter of accounting just as the Interstate Commerce Commission has done, without any other authority than to regulate accounting procedure. These twenty-two states embrace most of those that supervise the purely local utilities like gas, electric and water companies. In fifteen other states, telephone and electric railway companies are subject to the requirement, either under federal or state regulations, while only nine states (besides Delaware and Utah, which have no state commissions) have not taken action so far, namely, Connecticut, Georgia, Kansas, Nevada, North Carolina, Oklahoma, Vermont, West Virginia and Wyoming.

In most cases the statutes go beyond the mere requirement of a depreciation account in that they confer power on the commission to fix the rates of depreciation and require the company to spend the money reserved for depreciation under regulations prescribed by the commission. A review of the action taken by the commissions under these statutes indicates that they are proceeding with caution in establishing rates and regulations as to the use of depreciation funds. In nearly every state orders have been issued only after thorough investigation in individual cases involving the determination of rates or the approval of security issues. Both the straight-line method and the sinking-fund method of computing depreciation are used—the former in nearly all cases in which reproduction cost is used as a rate basis, and the latter in many cases in which investment is taken as the rate basis.

The report then went on to say that the public interest which requires public supervision of utility accounting necessarily requires public determination of rates of depreciation. The commissions were therefore urged to ascertain and prescribe depreciation rates of individual companies as soon as possible, and, until such individual investigations had been completed, to require utilities to make depreciation charges at some minimum rate, which might approximate 3 per cent on the entire fixed capital of manufactured gas companies and 3½ per cent in the case of electric companies. Such a requirement, it was thought, would secure some degree of uniformity in a field where there now exists perplexing diversities.

Lastly, the committee approved the idea of an association of statisticians and accountants of public utility commissions. The report was signed by A. F. Weber, statistician, New York, First District, chairman; Arthur A. Lewis, Washington; Joseph B. Eastman, Massachusetts; B. W. Waltermire, Ohio, and Henry S. Lyon, statistician, New Jersey.

The action of the association on this report was confined to referring to the executive committee the section dealing with the organization of a separate association of commission statisticians and accountants, and that dealing with the question of federal commission jurisdiction over local utilities incidentally engaged in interstate commerce, and also to merely receiving the remainder of the report without adoption. Thus the proposal for minimum depreciation rates for gas and electric utilities was dismissed with only a short discussion. Commissioner Thorne, Iowa, stated that it was time for definite uniform accounting forms to be developed for all commissions, but that he would hesitate to commit himself to such principles as that of having uniform depreciation rates as suggested. Able steam railroad experts had testified that they were taking care of depreciation of freight cars out of repairs and renewals, in which case an allowance for a depreciation reserve would constitute an absolute duplication. A company that rebuilt its cars, charging the cost to operating expenses, would keep them in service for a longer period. If such a company were allowed to set aside the same amount for depreciation as a company which did not rebuild its cars, but abandoned them for new equipment, the proper depreciation treatment would not be given in both cases. In his opinion, the policy of each company would have to be considered before a commission could prescribe the proper rate of depreciation. Commissioner Walter A. Shaw, Illinois, believed that the commission should not be bound in any of their findings by the adoption of the report.

FEDERAL VS. STATE REGULATION

The first indication of the attitude likely to be taken by the association in the matter of federal versus state regulation came at the very beginning of the convention, when R. C. Prentis, Virginia, president of the association, in his opening address opposed exclusive federal control of interstate carriers. President Prentis said that there was an organized movement having for its ultimate object nothing less than the absolute elimination of the state commissions from all jurisdiction over interstate rates, and that the movement was inspired and fostered by the railroads. If the movement should succeed the work of the last thirty years in building up state regulation would be lost. The most serious complaint now made against the present dual system of regulation was the lack of uniformity, but it would not be wise to destroy the very agencies through which such uniformity as did exist had, in great measure, been secured. The great work of the association, he asserted, had been in promoting and securing uniform laws and regulations, and if the state commissions were shorn of their powers the cause of regulation would be hindered. President Prentis stated that the state commissioners would in the future, as in the past, unite their efforts with those of the members of the Interstate Commerce Commission so to amend the commerce act as to enable the latter commission the better to perform the service which the country desired it to perform.

In welcoming the state commissioners, Balthasar H. Meyer, chairman Interstate Commerce Commission, took up the question of co-operation between federal and state regulatory bodies and referred particularly to a conflict of rates arising in the "Shreveport" cases. He suggested what he believed to be a promising step in the direction of progress in railway regulation, namely, in Shreveport cases to provide by law for the co-operation of the state commissions and the Interstate Commerce Commission and thus to give their joint and co-operative efforts a definite legal status.

Under such a plan the investigation would be conducted jointly by the state commissions and the Interstate Commerce Commission. Every state commission directly involved would be given an opportunity in accordance with law to participate in the deliberations and to assist in formulating the final conclusions upon a record jointly made. The one rate within the zone of reasonableness established through the joint efforts of the respective commissions would then apply to all business, state and interstate, and thereafter there could be no Shreveport case in that territory and with respect to that commodity.

The plea of Commissioner Meyer for co-operation in a matter where the courts have ruled the federal commission has the higher power, however, was not favorably acted upon by the association. Following a recommendation of the first of the general committees, the committee on state and federal legislation, the association adopted a resolution to the effect that for the settlement of disagreements between federal and state commissions, Congress should restore to the courts the power of saying what is a reasonable rate. The association almost without dissent favored the Sheppard bill, which provides that before a carrier may disregard a state rate in favor of a federal rate it must procure the decision of a court of competent jurisdiction holding the state rate to be unreasonable.

The committee on federal and state legislation, composed of L. B. Finn, Kentucky, chairman; Clifford Thorne, Iowa; H. F. Bartine, Nevada; P. W. Dougherty, South Dakota; H. T. Clarke, Jr., Nebraska; E. Northcott, West Virginia, and J. S. Harlan, Interstate Commerce Commission, made other recommendations, including one for the creation of subordinate regional commissions for the Interstate Commerce Commission. This was indorsed with a reservation of the right of appeal or review in proper cases. A proposal to amend the commerce act so as to give to the federal commission "the power to compel proper publicity as to the issuance of all securities made by interstate common carriers, however they may be authorized," was sent back to the committee.

CAPITALIZATION AND INTERCORPORATE RELATIONS

The elaborate report of the committee on capitalization and intercorporate relations, the second general report, which was somewhat in contradiction to the report of the committee on federal and state legislation, was read and simply received with little discussion. This report was signed by Edwin C. Edgerton, California, chairman; J. F. Shaughnessy, Nevada; W. C. Bliss, Rhode Island, and P. B. Trammell, Georgia. Judson C. Clements, Interstate Commerce Commission, concurred in the recommendation for federal control of the issuance of railway securities, and C. B. Aitchison, Oregon, concurred with the report in part and joined to bring it before the association. The full recommendations follow:

1. That the Interstate Commerce Commission have power to regulate the stocks and bonds of the interstate carriers.
2. That the Interstate Commerce Commission or some other federal agency be empowered to regulate the rates, practices, stocks and bonds of the interstate public utilities.
3. That Congress enact the necessary legislation to provide for a national incorporation act for interstate railroads and interstate public utilities.
4. That the Interstate Commerce Commission be empowered to exercise jurisdiction over mergers, consolidations and incumbrances of interstate railroads.
5. That the Interstate Commerce Commission have authority to exercise jurisdiction in receivership proceedings, preferably to the fullest extent, but at least over all matters relating to capitalization.
6. That federal and state statutes be amended, where

necessary, to permit the issuance by railroads and public utilities of a common stock without par value.

7. That the Interstate Commerce Commission and the state public utility commissions be permitted to invoke the aid of the Federal Trade Commission to determine the reasonableness of the cost of essential materials of railroad and public utility construction.

8. That adequate legislation be enacted, both national and state, to provide for voluntary wage agreements; methods of arbitration, and for federal and state intervention in emergencies, to adjust wage conditions in the railroad and public utility service; nothing contained in such legislation to require men to work against their will.

9. That such legislation as is consistent with the public interest be enacted for the enhancement of railroad credit and for the protection of American railroads against the competition in the American market for funds for private exploitation in foreign countries.

10. That a new committee be appointed to study the question of relationship between government and the railroads, to consider the possibilities of co-operation between the government and the railroads, and to report at the next annual meeting.

In connection with the last recommendation the committee cited the partnership agreements adopted in connection with electric railway resettlements as proper objects for study by the suggested committee.

VALUATION

The last important general report was that of the valuation committee. The attention of this committee had been entirely directed to the valuation of interstate carriers being made by the Interstate Commerce Commission, and to the various points in which the state commissions were particularly interested. In ultimate and legal effect, if not in nominal and immediate effect, the federal valuation was thought to be the touchstone whereby the lawfulness of all railroad rate systems, state or interstate, would be tested. When the principles applicable were determined, they would largely control analogous cases with respect to other public utilities, and the state commissions might find too late that the valuation principles were effectually settled for them in all matters relating to purely state commerce, and without their being heard except as they voiced their views in the present proceedings. The remainder of the report was taken up with a discussion of various points arising in connection with the federal valuation, the most important being that findings made under the valuation act are incomplete in so far as they fail to ascertain and report original cost to date as an element of value; that it is at least as practicable to estimate original cost, if company records are unavailable or unreliable, as it is for the engineer to estimate the present cost of reproduction (if anything within smaller limits of error), and that original cost should be the strongly controlling factor in the ultimate determination as to the weight to be accorded land values in a rate case. The report was signed by C. E. Elmquist, Minnesota, chairman; C. B. Aitchison, Oregon; Max Thelen, California; J. L. Bristow, Kansas; G. A. Henshaw, Oklahoma; E. C. Niles, New Hampshire, and W. A. Shaw, Illinois.

During the brief discussion on this report H. M. Edwards, New York Edison Company, one of the representatives of the National Electric Light Association, asked the co-operation of the association in formulating a glossary of valuation terms. The request was first ordered to be filed without printing but was later reconsidered and referred to the committee on valuation. The report was then approved and adopted.

SAFETY OF RAILROAD OPERATION

The committee reports in the steam railroad group numbered seven, but few contained points of interest to electric railways. The most important of these was the

report of the committee on safety of railroad operation. This was devoted partly to a review of some of the causes which contribute toward the failure of materials, while another section dealt with railway signals and the problems involved in their use. In connection with the latter subject, the report stated that although there had been a comparatively rapid increase in signaling in this country, good standards of construction and efficiency in maintenance had not been overlooked, and very few accidents caused by failures of the signal system had been reported. On many roads, less than one "false clear" failure, or failure to indicate stop when necessary, to 1,000,000 signal operations, was a common record, while a record of one failure to clear, thus improperly indicating stop, to 25,000 signal operations was one easily maintained.

The committee noted that the continued and fairly uniform introduction of the block system had been followed by a steady decrease in collisions, but that although there are nearly 260,000 miles of railroad line in the United States, less than 100,000 miles are operated by the block system. Accidents continued to take place even on well-signalized roads, the committee said, and it seemed evident that something else was required to prevent such disasters. Yet automatic control of trains was a serious problem requiring careful consideration and extensive study of conditions on any road where it was proposed. Many devices had been submitted to the Interstate Commerce Commission, most of which were utterly impracticable. Some were worthy of additional development, and a few merited tests under railroad operating conditions. It was felt, however, that further development must rest with the railroads. While in some quarters it was said that the automatic control of the trains was wrong, it seemed wise to the committee, considering the present state of affairs, that a practicable system should be developed, ready for extensive use should it be finally decided that such a system was necessary. In its opinion, the best possible signal system should be installed and properly operated before it could be said that an automatic track control system was necessary.

The report was signed by C. C. McChord, Interstate Commerce Commission, chairman; R. C. Dunn, Florida; O. L. Owen, New Mexico; D'Arcy Scott, Ontario; F. M. Sheppard, Mississippi; C. D. Jackson, Wisconsin, and W. D. B. Ainey, Pennsylvania.

The report of the committee on grade crossings and trespassing on railroads (Thomas Duncan, Indiana, chairman), which was printed without signatures, formally placed on record the recommendations made last June at a joint meeting of the association and the American Railway Association. The recommendations for standard crossing signs then adopted were published in the *ELECTRIC RAILWAY JOURNAL* of Aug. 12, page 270. The present committee emphasized the fact that the presence and the uniformity of warning signs are imperatively demanded if accidents are to decrease. The only specific against disasters, however, would be the separation of grades. Additional powers should be given to state commissions to establish new highways. As to trespassing, the enforcement of laws requiring fencing of right-of-way and forbidding trespassing would reduce accidents, but the growth of public opinion was deemed the best solvent of the problem.

The election of officers for the association resulted in the usual promotions. Max Thelen, California, was made president; Edward C. Niles, New Hampshire, first vice-president, and Charles E. Elmquist, Minnesota, second vice-president. W. H. Connolly, Interstate Commerce Commission, remains as secretary, and James Blaine Walker, New York, first district, as assistant secretary.

Conferences and Commission Rulings Following Boston Drawbridge Accident

Mayor of Boston Holds Conferences to Consider Safeguarding and Has Called Another for Nov. 27—Commission Orders Positive Stops at Drawbridges on Massachusetts Railways but Recommends No Automatic Devices at Present

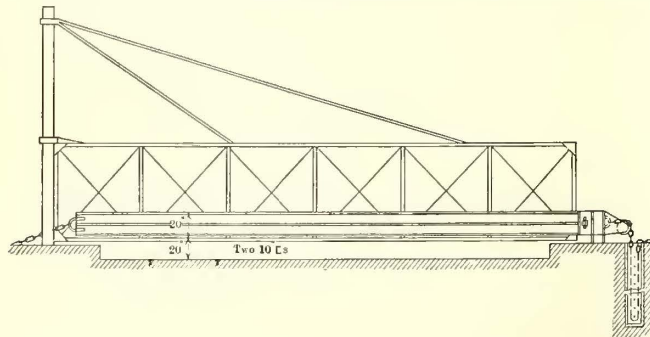
FOLLOWING the accident at the Summer Street drawbridge over the Fort Point Channel in Boston, on Nov. 7, in which a large number of street car passengers were drowned, the subject of safeguarding at drawbridges has been studiously considered by the city authorities, the Public Service Commission, the railway management and others more or less directly interested. The story of the accident was related in the issues of the *ELECTRIC RAILWAY JOURNAL* for Nov. 11, page 1034, and Nov. 18, page 1074. The situation was commented upon editorially in the latter issue, page 1048.

Mayor Curley's Conferences

At the invitation of Mayor Curley of Boston, Mass., a conference on drawbridge operation was held at the Boston City Hall on Nov. 16, the meeting being attended by George W. Bishop, head of the Inspection Department, Massachusetts Public Service Commission, President M. C. Brush of the Boston Elevated Railway, Henry E. Reynolds, assistant general manager of the Bay State Street Railway, Prof. C. M. Spofford of the Massachusetts Institute of Technology, Commissioner of Public Works Murphy, and about fifty engineers associated with local utilities, city service and private firms. In opening the meeting, Mayor Curley said that the primary object of the gathering was to consider methods of preventing accidents at drawbridges similar to that at Fort Point Channel on Nov. 7, when a surface car of the Boston Elevated Railway went through the gate and was precipitated into the harbor with heavy resulting loss of life.

DEVICES FOR PREVENTING DRAWBRIDGE ACCIDENTS

Various suggestions relative to accident prevention were outlined by the Mayor from communications received since the particular accident in question. These

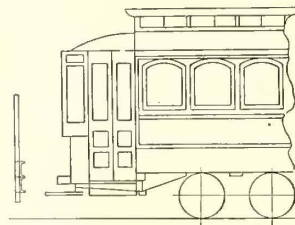


LINDALL'S SAFETY GATE WITH CHANNELS, CHAIN WELL AT RIGHT

included the installation of a trolley switch actuated from the drawtender's cabin and designed to cut off the current supply whenever the draw is open; a motor-driven girder designed to interpose a solid barrier whenever a gate is closed; increasing the distance between the edge of the draw from present low limits of 15 ft.

and 25 ft. to 75 ft. minimum; the use of sirens, gongs, and illuminated signals. Reference was also made to a rigid stop which has been in successful use against teams and automobiles on the Boston ferries during the last two years.

Following the Mayor's outline of the principles involved in the suggested safeguards, President Brush said that the Boston Elevated Railway is of the opinion that there should be eventually constructed at all drawbridges an absolutely positive barrier which will prevent street cars and all vehicles from reaching the edge of the draw; and that this barrier should be of a nature

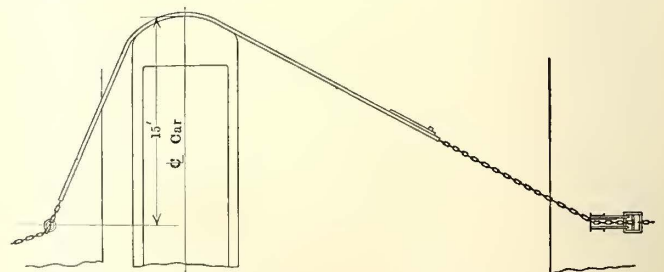


ANTI-CLIMBER AND GATE REINFORCEMENT

to stop vehicles with as little injury as possible to individuals and should be at a point not less than 75 ft. from the edge of the draw. Such a barrier must positively be so interlocked with the bridge mechanism that it is an impossibility to operate the draw until the barrier has been positively closed and locked. All the schemes outlined below should be installed pending the final construction of such a barrier, and should be applied with the latter.

SCHEME DEvised BY JOHN LINDALL

A car stop for drawbridges designed by John Lindall, superintendent of rolling stock and shops Boston Elevated Railway, and shown in the illustrations on this page, was then exhibited in working model form. This arrangement consists of reinforcing the drawbridge gate with two 10-in. channel irons to stiffen the gate and prevent climbing, the free end of the gate being provided with a heavy steel chain or cable carried around a pulley into a well sunk at one end of the gate. The chain is looped around a series of steel bolts in the well, the end finally being secured to a rigid attachment at the



LINDALL'S SAFETY GATE BENT UNDER THE IMPACT OF THE CAR

top of the well. When a car strikes the gate, the latter may bend as it receives the impact of the bumper, but if the car pushes the gate outward, shearing off the bolts in succession from the bottom of the well upward, the car will be brought to a gradual stop through the shock absorption thus secured.

Mr. Brush said that this stop had been designed by Mr. Lindall since the Fort Point channel accident and that the company has every reason to believe it will prove practical. Another gradual stop, a counterweighted flexible gate safety device, has been worked out by David Curtin, chief engineer maintenance of way Bay State Street Railway. To consider these designs and all other suggestions available, Mayor Curley appointed an engineering committee headed by Prof. Charles M. Spofford, and including representatives of the Boston Elevated Railway, the Boston Edison Company, the Bay State Street Railway and other organizations, which will report its conclusions at a general meeting to be held on Nov. 27. John Carty of the Public Works Department, 602 City Hall Annex, Boston, was named as secretary and was empowered to receive in writing all available suggestions.

PRESIDENT BRUSH'S RECOMMENDATIONS

Following the exhibition of the car stop designed by Mr. Lindall, Mr. Brush vigorously emphasized the danger inherent in the use of any rigid stop against which any vehicle is operated at high speed, pointing out that the passengers cannot be properly safeguarded by bringing a car with kinetic energy of more than 2,000,000 ft.-lb. to an instantaneous stop against a rigid body. A positive bumper is at present in service on the private right-of-way of the company's East Cambridge Viaduct, but the drawtender is not allowed to open the draw and raise the bumper until a car is standing within about 100 ft. of the bumper. On the Charlestown Bridge a third track for elevated trains is now being installed between the two running tracks north of the draw, and the switch leading to this track is interlocked with the draw so that a train cannot approach the bridge on the main line track southbound from City Square without being deflected upon the emergency track. The latter ends in a pebbly surface which will stop an eight-car train at a safe distance from the bridge opening. At the interlocking tower south of the Charlestown Bridge, the main line switches connected with the northbound bridge track have been interlocked with the bridge-operating mechanism so that the draw cannot be opened unless these switches are set to carry trains past the bridge track entrance whether such trains are coming from the North Station or the Atlantic Avenue elevated line.

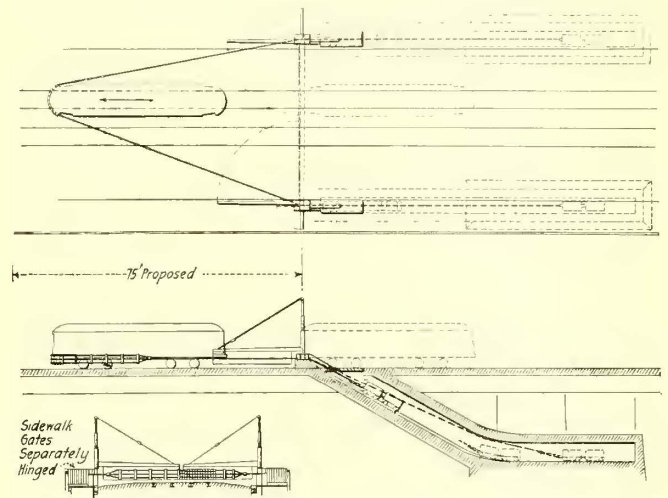
The company believes that pending the construction and installation of positive barriers immediate steps should be taken to paint the present gates of all bridges white with black stripes; that one or possibly two red lights with large lenses should be installed on all gates directly between the rails at an agreed-upon distance above the highway (such lights to be under the control of the drawtender); that there should be installed signs 100 ft. and 200 ft. respectively from the gate indicating "Slow" and "Stop," for the guidance of motormen, when the draw is open; that these signs should be not less than 36 in. long and 12 in. wide; that there should be immediately installed at each drawbridge a large gong, electrically operated, interlocked with the bridge mechanism so that it will be impossible for the drawtender to open the bridge until he has closed the switch which actuates the gong, the latter to ring as long as the bridge is open as a warning to all vehicles.

"The company further believes," said Mr. Brush, "that an ordinance should be passed prohibiting any vehicle standing on a track directly in front of a street car, while drawbridge gates are closed, in such a position as to obscure the view of the red light placed on the gate for the guidance of the motorman. None of these precautions other than the installation of the positive barrier itself will prevent vehicles dropping into

the draw in cases where the operator has lost control of his vehicle."

DAVID CURTIN'S SAFETY DEVICE

At a later meeting of the committee appointed by Mayor Curley to investigate practicable means of increasing safety of operation at drawbridges, David Curtin, engineer of maintenance of way, Bay State Street Railway, Boston, submitted drawings of a suggested flexible gate safety device as shown herewith. In brief, this device consists of a flexible gate connected to a system of counterweights in such a manner that a runaway car striking the gates automatically brings into action the operation of the counterweights. Across the front of the gate, facing the approaching car, steel cables are stretched, the space immediately before the track being provided with a heavy wire or cable mesh to prevent climbing or shearing of the car body. The first shock of the impact will be taken care of by the flexibility of the gate and cables. At each end of the gates a cable is carried past a suitable support to two or more counterweights



CURTIN'S STOP FOR SAFEGUARDING AT DRAWBRIDGE

located on a track at the bottom of a chamber below the street surface. A series of heavy springs attached to the cable ahead of the counterweight will further lessen the impact and retard the speed of the car, finally bringing the counterweight into action. The weight of the counterpoise and the gradient of the incline determine the rate of retardation and consequently the time and distance during which the car will be brought to a stop. After the counterweights have run a short distance upon the track it is intended to discontinue the latter and to allow the counterweights to slide forward and upward on two rails with narrow spacing laid in the center of the channel. A hydraulic plunger may be used in extreme cases, as in connection with drawbridges at the foot of grades.

Finding of the Commission

The Massachusetts Public Service Commission issued a finding on Nov. 21 relative to the accident following an exhaustive investigation of the circumstances by the inspection department of the board. In general, the condition of the car was found to be satisfactory and the commission devotes itself mainly to the discussion of preventive measures.

REPORT OF INSPECTION DEPARTMENT

George W. Bishop, chief of the inspection department, submitted an extended report to the board on Nov. 14 which is quoted in full in the finding. After

noting the departure of the car from the P Street car-house in South Boston and stating that nothing unusual in its operation was observed prior to the drawbridge approach, the report states that the motorman in charge suddenly discovered that the warning gates were across the street and the drawbridge open. The motorman claims to have immediately applied the brakes and reversed the current, but the car was so close to the gates, which were only 25 ft. from the opening, that the car crashed through the gates and went into the water. The motorman, who was saved, estimated the speed of the car at the gates to have been 8 m.p.h., while a passenger standing on the front right hand step at the time estimated the speed at 15 m.p.h. This person stated that he fell as he jumped from the car to the street, but soon recovered himself and assisted in removing a man from the water.

Many conflicting statements concerning the accident, undoubtedly made in good faith, have reached the department. In some cases these have proven helpful, in others not. The department has interviewed the conductor and motorman, as well as surviving passengers and persons who were near the scene of the accident when it occurred, and has secured all available information concerning it. The Boston Elevated Railway and the bridge department of the City of Boston have freely given all information requested concerning the operation of the railway and the drawbridge.

After the car had been raised from the channel all of its parts were thoroughly examined by Assistant Inspector Philip Scott. The following is an extract from his report concerning the condition of the car:

"After a careful inspection of control, trucks, sand boxes and brake rigging, I am of the opinion that the car was in good working condition up to the time of the accident and that all damages to the car and equipment occurred as the car went over the draw."

Inspector Scott also found that this car received a regular inspection on Oct. 31, 1916; that the brakes were adjusted during the afternoon of Nov. 7, and that this was the first trip thereafter. Mr. Bishop states that he is unable to learn from any source that the brakes were not in proper working condition; in fact, there is sufficient evidence to show that they were working and that the car skidded. The condition of the track approaching the draw opening was, soon after the accident, found to be favorable for the safe operation of cars. The track on the bridge and for a distance of 200 ft. easterly of it is a tangent and nearly level.

TESTIMONY OF THE CAR CREW

A stop sign, about 17 in. long and 4.5 in. wide, with letters, 2 in. x 3 in., suspended to a span wire 20 ft. above the rail, is located easterly about 175 ft. from the gates and 200 ft. from the draw opening. This sign was installed at this point, according to the company, for the purpose of bringing all cars to a full stop before reaching the drawbridge. Mr. Bishop is of the opinion that to have served this purpose effectively, a much more conspicuous sign, visible both by day and by night, should have been located not more than 50 ft. from the draw opening. The motorman states that he did not make the stop on this run; that he only slowed down sufficiently for a man to board the car and proceeded without receiving two bells from the conductor. This failure to stop was a violation of the rules, the observation of which might have prevented the catastrophe.

The statement of the conductor, who had been in the service of the company sixteen months, shows that he was in the car collecting fares from the time he left the Boston Edison plant in South Boston until the car

reached the bridge and did not notice anything unusual in its operation until it struck the gates, when he reached the rear door and jumped. The conductor was apparently unable to fix the rate of speed of the car or to state definitely whether or not the car made a stop at the stop sign above mentioned. A street arc light is located about 25 ft. easterly from the draw opening in the bridge, between the tracks, and nearly opposite the gates. This light, if kept burning at night, is of great assistance to the motorman in determining the position of the draw. The motorman in charge of the car claims that this light was not burning at the time of the accident. His statement is substantiated by a passenger on the car, as well as by a person riding in an automobile, who arrived immediately after. There is further evidence that later in the evening the light went off and came on again.

The channel drawbridge is maintained and operated by the city of Boston. Mr. Bishop says that he is unable to find any good reason why the gates should not have been placed 50 ft. or 75 ft. from the opening instead of 25 ft. to give persons using the street earlier warning when approaching danger. Such warning would have been valuable to the motorman operating the car involved. Measurements on five other drawbridges in Boston show that the distance of the gates varies from 23 ft. to 69 ft. from the opening, indicating a lack of uniformity, which is so much to be desired. The red lantern used on the gate at the place of the disaster is attached to the right hand gate on the side toward the channel, so that its iron work is somewhat obscured by the ironwork of the gate as one approaches. A better practice would be to provide two lanterns for these gates, the additional one to be placed over the street railway tracks and both to be hung on the side of the gates toward which persons are approaching rather than on the channel side. The motorman claims not to have seen the red light. The man in charge of the draw says it was in place at the time of the accident. Other conflicting evidence appears relative to this light, which may have been obscured by teams even if in its designated place.

SUGGESTIONS CONSIDERED BY INSPECTION DEPARTMENT

The seriousness and magnitude of this accident are such as to call for co-operation, due consideration and prompt action by all persons directly or indirectly responsible for the maintenance and operation of drawbridges and of street cars operated over them. Among others, four suggestions, none of recent origin, which have reached the Inspection Department, with the object of preventing a repetition of this accident are commented on by Mr. Bishop as follows:

1. *Reduction of Speed of Cars Approaching Drawbridges.* This method leaves the matter to the judgment of the motormen and conductors to estimate the rate of speed at which a car is moving, the results of which often prove unsatisfactory.

2. *The Installation of Automatic Electric Signals.* This method is both practicable and feasible. However, to be effectual, they must be connected with the drawbridge in a manner that will require the signals to be set in danger position before the draw is opened and remain in that position until the draw is closed. This requires the approval of municipalities and creates a joint responsibility in the maintenance and operation not altogether desirable.

3. *Installation of Derails.* This method is possible but in my opinion most undesirable in public ways. To make a derail effective it must be connected with the drawbridge and the signal to protect the derail must be placed a proper distance from it. This combination should be so connected that to open the draw the signal

must first be set at danger, when the derail may be set in position to throw a car from the track. After this, the draw may be opened. A reverse movement of draw, derails and signals will clear the track for traffic. I consider the derailing of a car in a public street dangerous. There is no assurance of the direction the car will move or the results it will produce. It is just as liable to do one thing as another. It may overturn; it may go upon the sidewalk; it may collide with pedestrians or teams using the street at the same time; and in either event something serious is liable to happen.

4. *Installation of Positive Stops.* This method may have some objections, but it is free from the complications mentioned in Nos. 2 and 3. The management of street railways may install positive stops along their lines whenever in its opinion public safety so requires. It is always safe to stop a car provided it is properly protected when at rest.

Mr. Bishop is of the opinion that the fourth method is preferable and that with proper supervision and discipline on the part of the management it is reasonably safe. It may be put into operation at once and without great expense. He therefore recommends that every street railway company in Massachusetts operating cars or trains over drawbridges shall at once install positive stops not more than 100 ft. nor less than 50 ft. from each draw to protect traffic going in either direction, and shall erect at each stopping place a stop sign visible by day and night, the type of sign and rules governing its use to be approved by the commission.

CONCLUSIONS OF THE COMMISSION

The suggestions in Mr. Bishop's report in regard to the location and illumination of highway gates used in the protection of drawbridge openings relate to matters over which the commission has no jurisdiction, for such gates are operated and maintained by the municipal authorities. The board has been informed, however, that the city of Boston is considering steps for the improvement of existing conditions. It is greatly to be hoped that equally prompt and effective consideration may be given to the subject by other municipalities controlling drawbridges. With the recommendation made by the inspection department in regard to street railway operation, the commission is more directly concerned. For many years the Massachusetts law has required street railway cars to make positive stops at steam railway grade crossings, and the statute imposes a penalty upon any motorman or company violating its provisions (Statutes 1906, Chap. 463, Part 3, Sec. 82). In the case of drawbridge openings no similar statute requires such a practice, nor, with certain exceptions, does it appear that it has been voluntarily adopted by the companies themselves. The rule of the Boston Elevated Railway in regard to safety stops makes no mention of drawbridges. While in the case under consideration it happened that such a stop had been established at an intersection street about 200 ft. from the drawbridge opening, no similar stop had been established upon the other side of the opening. Further, the stop sign was not well located nor particularly conspicuous, and there is little evidence that the company has ever attempted effectively to enforce the rule in question.

While a uniform rule that positive stops be established wherever drawbridges are located would to some extent interfere with the expeditious operation of cars, the commission is convinced that safety considerations far outweigh any embarrassment which the companies or the public might suffer from this cause. An order to this effect therefore has been issued. No such order, the commission declares, will accomplish the results desired unless the positive stop rule is rigorously enforced by the companies through adequate penalties for the

infraction of this rule by employees of the company.

It has frequently been suggested that some mechanical means should be adopted for bringing cars automatically to a stop at drawbridge openings, so that safe operation may not depend entirely upon the human element. The inspection department, however, after the careful study of this question, is unable at the present time to recommend to the commission any such device for use in surface car operation whose disadvantages are outweighed by its advantages. Many such devices, however, are in process of development, and it is possible that the department in the near future will find itself in a position to review its present findings and recommend the adoption of such an automatic stop. The subject will continue to receive the attention of both the department and the commission. For the immediate present the requirement that positive and habitual stops be made by the motorman at all drawbridge openings seems best to meet the needs of the situation.

The possibility of occasional infractions of this rule, however, seems to make it necessary to provide for additional safeguards. If in this case the gates had been installed a reasonable braking distance from the draw opening the accident would undoubtedly have been averted. The commission is therefore of the opinion that every street railway in the State should lay this matter before the proper municipal authorities and endeavor to secure the location or relocation of gates at a proper distance from such drawbridges. It is desirable, also, that such gates should be painted with alternate black and white stripes. These gates should also be provided at night with red lights, located at reasonable intervals along the upper portion of the gate, and should also be interlocked with the bridge machinery so that the latter cannot be operated unless all gates are closed. It is possible, however, that in some cases it may not be feasible to locate or relocate drawbridge gates in the manner indicated. In such cases the commission is of the opinion that the companies, with the necessary consent of the municipal authorities, should install and maintain at a suitable distance from each end of every drawbridge a smashboard signal or similar device so interlocked with the operating mechanism of the draw span as to make it impossible for the draw tender to open the draw before the smashboard is in proper position. The impact of this device upon the car body would arrest the attention of the motorman and convey the warning in season to avert an accident. The question as to whether the positive stop shall be retained after drawbridge gates or smashboard signals have been installed to the satisfaction of the commission is reserved for future consideration.

In the present instance there is no evidence that the accident was due in any way to defective brake equipment, or to the presence of passengers in the front vestibule of the car. On the contrary, the evidence indicates that the brakes, while of the hand-operated type, had recently been inspected and were in good working condition. While there is no reason to believe that air brakes would have averted this accident, the general superiority of air brakes to the hand-operated type, as applied to double-truck cars, is well established. It is also true that many companies have found it desirable to adopt a rule positively excluding passengers from the front vestibule. In order that every reasonable precaution may be taken to prevent accidents in the future, the commission will take up these two matters in the near future at public hearings, at which all companies may have an opportunity to express their views.

ORDERS RESULTING FROM THE INVESTIGATION

Every street railway in Massachusetts operating cars or trains over drawbridges on surface lines shall at once

establish positive stops at a reasonable braking distance from each drawbridge, subject to the approval of the commission, to protect traffic going in either direction, and shall erect at each stopping place a stop sign visible both by day and night, the type of sign and rules governing its use to be approved by the commission.

Every such company shall make reasonable application to the proper municipal authorities for the location or relocation by such authorities, at a reasonable braking distance from each end of each drawbridge, of suitable gates, painted with alternate white and black diagonal stripes and provided at night with red lights located at reasonable intervals on the upper portion,

such gates to be properly illuminated and interlocked with the bridge machinery so that the latter cannot be operated unless all the gates are closed.

Wherever, for any reason, it is found impracticable to secure such location or relocation of drawbridge gates, every such company, provided the necessary consent is obtained from the proper municipal authorities, shall install and maintain, at a reasonable braking distance from each end of each drawbridge, a smashboard signal or similar device so interlocked with the operating mechanism of the draw span as to make it impossible for the drawtender to open the draw before the smashboard is in proper position.

Labor Disputes and Public Utilities

Academy of Political Science Listens to Addresses on Government Mediation and Compulsory Arbitration—Labor Leaders Oppose Legislation to Secure Industrial Peace

ONE of the most pressing questions of the day has to do with the means that can be adopted in the United States to secure and maintain industrial peace. In view of this fact, it was very appropriate that the Academy of Political Science, at its annual meeting in New York City on Nov. 22-23, should have devoted its entire time to addresses and discussions on the general subject of public utility labor disputes.

As a perusal of the following abstracts will show, this main subject was attacked from the points of view of what has already been accomplished in this country and abroad in the line of governmental mediation and arbitration, and what the unions think of compulsory arbitration, or even of governmental investigation with mediation and conciliation. Some speakers felt that compulsory arbitration had been successful in foreign countries in restricting strikes, but were of the opinion that the time had not yet arrived for arbitration to be enforced here by legislative enactment. On the legal side it was thought that the restricting of the right to strike through criminal penalties was constitutional, but the union representatives frankly opposed the compulsory principle as a violation of the rights of labor under the Thirteenth Amendment, and asserted that compulsory arbitration could not be enforced. In general, there was a strong plea for machinery to fix standards for wages, hours and working conditions.

GOVERNMENT MEDIATION AND ARBITRATION

The first address at the opening session on Wednesday afternoon was by William L. Chambers, United States commissioner of mediation. Mr. Chambers stated that two factors have been responsible for anti-strike legislation and legislation for the orderly settlement of industrial disputes. One group of countries primarily had in mind the protection of the public against the injurious effects of industrial warfare in the railway and other public utility service. Such reasons were evidently responsible for the legislative enactments in Canada, France, Italy, Russia, Roumania, Spain and Portugal, and the attitude toward employees of the railway administration of Austria and Germany. On the other hand, the preservation of industrial peace and the advancement in economic welfare of certain industrial classes had been primarily considered in framing the legislation of Australasian countries, and the prevention of industrial conflicts in the railway service was incidental to these broader purposes.

Among the Australasian countries, Mr. Chambers continued, the general tendency of legislation has been

to place a limitation, and with practically one exception a prohibition upon the right to strike upon railway and practically all other classes of industrial workers. Another group of countries, on the other hand, such as Canada, the Transvaal, Spain and Portugal, have not denied absolutely the right to strike, but have made the exercise of this right contingent upon certain conditions—a notification to the government of the intention to strike or a governmental investigation and report. In the case of certain other European countries the right of utility employees to strike is absolutely prohibited, and no machinery is provided for ventilating grievances. Great Britain and the United States occupy the unique position of having no legislation abridging the right to strike. Both countries have provided official machinery for the adjustment of wage and other difficulties between the railroads and their operating forces. In the United States the mediation and arbitration of railway wage disputes is provided for by the so-called Newlands law. In the case of these two countries, Mr. Chambers asserted, where legal machinery has been provided for the settlement of grievances without any limitation upon the right to strike, the most pronounced success in dealing with disputes seems to have been attained.

Mr. Chambers said that in only one case had the efforts of the United States Board of Mediation and Conciliation to adjust a settlement by mediation failed and Congressional action been made necessary to deal with a situation for which there was no existing preventive remedy, *i.e.*, the threatened steam railroad strike this year. It remained to be seen, however, whether the attempt to settle an industrial dispute by special legislative action would prove as efficacious as mediation and voluntary adjustment. Mr. Chambers believed that the requirement of an investigation before a strike could be called, as in Canada, would be of real value only in offering further means for conciliation. In his opinion, the time has not yet arrived in this country when the principle of compulsory arbitration should be attempted by legislative enactment, and he was not convinced that the compulsory feature should be attached to any mediation movement, for the very idea of mediation depends on voluntary action.

CANADIAN AND AUSTRALASIAN PRACTICE

The next speaker was Victor S. Clark of the Carnegie Institution, Washington, D. C., who described the Canadian industrial disputes act. This act does not provide for compulsory arbitration; its purpose is limited to

forbidding lockouts and strikes that directly affect the public welfare until their causes have been authoritatively investigated and made known to the people who will suffer through them. The jurisdiction of the law extends only to industries that serve immediately the general public. These embrace railways and transportation lines, yard and wharf labor, telegraphs and telephones, power, light and traction companies, and mines. Changes in the labor conditions of these industries must not be made without thirty days' notice. If either employers or workers object to a proposed change they may apply to the federal minister of labor for a board of investigation and conciliation, showing that a lockout or strike will occur unless the points at issue are settled. Thereupon the minister, after assuring himself of these facts, appoints a board consisting of three members, one of whom is nominated by the workers and the other by the employers. These two select the third member, or chairman, or if they fail to agree the minister of labor appoints him. No person having a direct or indirect money interest in the business affected is eligible to membership.

Wide latitude is given the boards in their method of conducting an investigation. They have the powers of a court to summon witnesses, to require the production of books and papers, and to take testimony under oath. They may personally inspect works and factories. If the parties cannot come to terms, the board reports its findings, which need not be unanimous. These contain a statement of the grounds of the dispute, an opinion as to the justice of the respective claims presented, and recommendations for a settlement.

Pending the investigation a lockout or strike is prohibited under penalties ranging from \$100 to \$1,000 a day for lockouts, \$10 to \$50 a day for striking, and \$50 to \$1,000 for inciting or aiding an unlawful lockout or strike. After a board has reported, employers may lock out their employees, or workers may strike, if they wish to do so. The only exception to this rule is when both parties have previously signed a formal agreement to abide by the decision of the board.

According to Mr. Clark, in the more than nine years of operation 212 disputes had been referred to boards and twenty-one strikes had occurred. Probably the number of employees involved in strikes that have occurred in Canada either in violation of the act, or legally because workers refused to accept the findings, is larger than the number involved in disputes successfully adjusted. No great strike, however, has occurred in this time. The enforcement of penal features of the law has generally been left to the aggrieved parties, but the provisions have acted as a deterrent. In Mr. Clark's opinion, legislation in this direction is demanded in the United States by the interest of all the people.

The subject of compulsory arbitration in Australasia was discussed by Matthew B. Hammond, professor Ohio State University, Columbus, Ohio. Professor Hammond said that all of the Australasian states try to use mediation and conciliation before proceeding to compulsory arbitration, and the former means are usually successful. In New Zealand, for example, from Jan. 1, 1909, to March 31, 1915, 466 disputes out of 694 were settled by conciliation, while 130 were substantially settled and only ninety-eight were referred *in toto* to the arbitration courts. In his opinion, the compulsory feature led many to settle their disputes by agreement.

In Professor Hammond's opinion, if compulsory arbitration is to succeed in keeping strikes at a minimum, it must set up conditions of employment, and the system tends to guarantee reasonably high wages and good working conditions. Drastic penalties to prevent strikes are not approved by the public, although moder-

ate fines upon the workmen and heavier ones upon the labor leaders are favored. The best cure for strikes, however, is to provide conditions under which the men have no incentive to strike. Compulsory arbitration has greatly reduced the number of strikes, but from experience it is not a perfect preventive means.

In discussing the foregoing addresses, Peter J. Brady, secretary Allied Printing Trades Council, said that labor organizations in Canada and Colorado have voted for the repeal of compulsory investigation laws in these places. Labor is opposed to such laws because the investigation gives the employers time to prepare against strikes. In his opinion, there can be no law or interpretation of law by the courts that will compel men to keep at work under stated conditions of employment.

LABOR OBJECTIONS TO COMPULSORY ARBITRATION

At the evening session on Wednesday the first speaker was W. S. Carter, president Brotherhood of Locomotive Firemen and Enginemen, who stated the objections of organized labor to compulsory arbitration. Mr. Carter said that perhaps some objections were extreme and not founded on fact, but they were what workmen believed. Furthermore, they applied specifically to compulsory arbitration, and might or might not apply to the Canadian industrial disputes act and similar measures. The objections of organized labor were summarized by Mr. Carter in the following words:

1. It is but a scheme by which the employer hopes to gain a mastery over his employees:
 - (a) By making strikes illegal, and thus deprive working people of their only economic power.
 - (b) By suppressing labor organization, through depriving them of the power to effect their purpose.
 - (c) By creating conditions of labor through judicial process, which process the master class always has and always will greatly influence.
2. It is but the expression of a selfish desire of those who complain:
 - (a) To avoid the personal inconvenience incidental to all strikes, without regard to the injustice against which the workers are struggling.
 - (b) To avoid the financial loss to business interests engaged in production and transportation, regardless of the financial loss that may fall upon the workers.
3. It is but a symptom of the mental and moral degeneration, through which all great and prosperous nations have passed, when:
 - (a) Fundamental principles of individual liberty are forgotten.
 - (b) That for which the founders of liberty were honored becomes a social menace.
 - (c) The struggle for wealth overshadows all else, with consequent disregard for the rights of the working classes.
4. It is a deliberate effort to deprive working people of their economic power:
 - (a) Through guise of legislation to preserve public peace.
 - (b) Through an artificial public opinion, largely created by those who control the public press.
 - (c) Through a presumption that for public convenience the federal judiciary will find a method of depriving all working people of their constitutional rights against involuntary servitude except as punishment for crime.

In discussing Mr. Carter's remarks, Everett P. Wheeler, chairman committee on industrial arbitration, Reform Club, New York, N. Y., denied the existence of any master or servile class in this country. In his opinion there should be a tribunal to fix rates, on the one hand, and wages, hours, etc., on the other.

CONSTITUTIONALITY OF COMPULSORY ARBITRATION

Thomas I. Parkinson, Legislative Drafting Research Fund, Columbia University, in discussing the constitutional aspects of compulsory arbitration said that the courts have recognized the practical limitations upon the power to compel the performance of a contract for personal service. On the other hand, when the ques-

tion of service to the public was involved, he did not consider that it would be violative of the involuntary servitude clause of the Thirteenth Amendment if a law should be passed undertaking to restrict by means of criminal penalties the right to strike. The right to quit work is not the same as the right to strike, and every restriction of personal liberty does not involve involuntary servitude. The public ought not to take away from employees the right to strike, however, unless a substitute should be given in the form of legislative standards for wages, hours and working conditions so that mediators and the public would be able to judge the relative merits of opposing claims. While a compulsory arbitration law would probably be constitutional, Mr. Parkinson made the observation that not all constitutional things are desirable.

ADVISABILITY OF ARBITRATION BOARDS

A written discussion from Emerson McMillin, chairman of board American Light & Traction Company, New York, N. Y., was presented at this session. Mr. McMillin believed that the statutory right of boards to investigate disputes promptly, either before or after strikes or lockouts, would tend to create a desire on the part of both parties to settle controversies. The only absolute essential is that the parties shall meet and discuss the question, and if the state must use compulsion it should first be used in the direction of requiring such meetings to be held before a strike or a lockout shall be inaugurated; or, in lieu of such meetings, it should be obligatory upon each of the parties to see that the state board is notified of the impending trouble and have time to investigate.

Mr. McMillin said that the Amalgamated Association of Street & Electric Railway Employees of America is required, by its constitution, to offer to arbitrate questions before a strike can be legally begun. Of course, it would be possible to make such an offer to arbitrate in a way that would assure its rejection. That strikes by local sections of this organization do take place sometimes without the offer of arbitration first being made would not be disputed, Mr. McMillin presumed. The representatives of this same organization were known to be opposed to compulsory arbitration, and that, too, while advocating that compulsory requirements so far as employers were concerned should be provided for in local franchises.

Mr. McMillin believed that for states to compel the employee and the employer to live up to the terms of an industrial agreement—for a definite time and until sixty days' notice of either party of a desire to terminate—could hardly be classed as involuntary servitude, the agreement being one that each party was competent to enter into and one that could not be construed against public policy. Should the courts not accept the principle of enforceable time contracts for industrial cases, it is still conceivable that it might be applied to railroad systems and public utilities. Mr. McMillin thought that all trade agreements should be for definite periods, and, in addition, should provide for a further continuation until the expiration of sixty or ninety days after notice of one or both parties that a termination was desired.

Mr. McMillin suggested that arbitration boards should contain five persons, including one from employees and one from employers. These two should be the active mediators and investigators. The other three, to be chosen from members of the bar, should arbitrate only such questions as would be certified up to them by the first two. Under the usual system, with two members practically committed to the views of their respective parties, Mr. McMillin thought that it was asking too much of each of the contending parties

that the third man decide alone the momentous questions brought before him.

Some capable and active members of boards, Mr. McMillin said, are of the opinion that the present public desire is for the publicity of correct statistics, and that when this information is had, public sentiment will compel a reasonable solution. Agreeing that correct statistics should be given to the public, however, he did not think the information could, as a rule, be obtained in time to be of value in forming public opinion concerning the merits or demerits of an impending industrial disturbance. Nor did he believe that the public, during the period of such disturbances, would be more competent or more disposed to agree and amicably settle the question fairly than would the parties themselves. The great mass of the public would be guided largely by its sympathies and not by reason.

An address on "Arbitration of Street Railway Strikes" was scheduled for W. B. Fitzgerald, general organizer of the Amalgamated Association, but Mr. Fitzgerald was not present and no paper was submitted.

AIDS TO INDUSTRIAL PEACE

Three addresses were delivered at the opening meeting on Thursday upon various phases of work to secure industrial peace, as follows: "Federal Intervention in Labor Disputes Under Existing Laws," by David A. McCabe, professor Princeton University; "Mutual Aid Funds," by Miles M. Dawson, New York, N. Y., and "A League to Enforce Industrial Peace," by Judge J. H. Cohen, New York, N. Y.

Professor McCabe described the origin, passage and results of the Erdman and Newlands acts, and told how the threatened railroad strike this year found the country not fully prepared. The Adamson law, hastily passed, presents certain grave defects, in that Congress laid down terms without any inquiry into their merits and turned over a prejudiced case to a commission not possessing power to make recommendations which capital and labor can be called upon to accept and keep the peace.

Mr. Dawson described in general terms the mutual aid funds in this country which, although started on a narrow basis, have developed into real aids to industrial peace. In outlining the fundamental requirements of a sound aid fund, he laid particular emphasis upon the feature of joint contributions and management by employer and employees. He described a basis for computing the contribution of workers so as to carry the full measure of cost exclusive of the occupational hazard element. He did not consider that mutual aid funds would prevent strikes, but he believed that they would eliminate an inclination to strike for trivial reasons and that the mutual contact of employer and employees in administering such a fund would make for increased amity and respect.

The most elaborate and most constructive address of the session was that by Judge Cohen, whose remarks were listened to with special interest, because of his share in formulating the famous protocol that brought an unusually long period of peace to the unsettled garment-making trade in New York City. Judge Cohen stressed in particular the superior right of the public in labor disputes, and said that the law was ready for a better method of settling such disputes, but public opinion was lagging behind. He then proposed a definite league made up of all elements of society—the consumer, the neutral public, the worker and the employer (*i.e.*, the state itself)—founded upon the following propositions:

1. The clear recognition of the moral and legal right of men to organize.
2. The establishment of tribunals sanctioned by law.

whose membership shall be representative of all three parties (employees, employers and public).

3. The creation of fact-gathering machinery to enable such tribunals to determine what is in any given case a "fair and reasonable wage" and what are "fair and reasonable working conditions."

4. The clear recognition of the necessity for efficiency and discipline in all industrial organizations.

5. Opportunity to every worker to secure just redress from arbitrary or oppressive exercise of the employer's functions.

6. Opportunity to every employer to secure just redress from arbitrary or oppressive exercise of power by the men.

7. The right to appear by his chosen organization or spokesman before all sanctioned tribunals and in all dealings between employers and employees.

8. The registration of all collective agreements.

9. A national council, without whose sanction there shall be no concerted cessation of work or closing-down of plants, to which any interested party may apply for relief, as it may in public service matters to the Interstate Commerce Commission or the public service commissions, or, in trade matters, to the Federal Trade Commission.

10. Such national council to be constituted of members elected from groups of employers and groups of workers and representatives of the public.

11. In public utilities, clear recognition of the function of the state, as part of the regulation of the service and the rates, to determine what is a reasonable wage and what are reasonable working conditions.

12. Clear acceptance of the proposition that, adequate machinery being established for the redress of all just grievances, the right to coerce by concerted stoppage of work in all service affecting the public health, safety or convenience shall be made as obsolete as the duel or as illegal as lynching. (This principle to be applied if and when such machinery is established.)

In closing Judge Cohen said: "The basis of the great industrial compromise is here. The trade-unionist must yield in his opposition to governmental regulation of his organization; the employer must yield in his opposition to the organization of trade unions; the public must yield in its indifference to the conditions under which human work is done; the business man must yield in his opposition to 'social uplift' in industry, and the social reformer must yield in his indifference to efficiency and discipline in modern production. Upon such a compromise can be founded a program of preparedness for peace."

RATES SHOULD BE SUBORDINATE TO WAGES

At the last session, the annual dinner, Oscar S. Straus, chairman New York Public Service Commission, First District, said that the paramount question is how and to what extent should the power of the state be applied in order to compel the two industrial groups, operators and employees, to subordinate some of their group rights, just as the individual must subordinate some of his natural rights, to the general welfare. In order that public service monopolies may be at all times enabled to serve the public, the employees must also be made to recognize a duty to the public. They should not be permitted to appropriate the public necessities so as to compel public utilities, under threats, to concede their demands. In return, however, there should be accorded to and guaranteed to such employees exceptional wages and conditions of service. It has been suggested there should be in each state and in the nation a wage commission with power to regulate not only rates but also wages. In Commissioner Straus' opinion, the human element, wages and conditions of employment, should be paramount. Rates should be subordinate to wages and not wages, as now, subordinate to rates.

W. S. Carter, president of the Brotherhood of Locomotive Firemen and Enginemen, described the present wage system on steam railroads and gave two reasons for the refusal of arbitration by the men. These were,

first, that arbitration had not been satisfactory in the past and, second, that the steam railroads had asked to have some of the smaller railroads excluded from the arbitration. In principle, arbitration was anomalous because the award had to be administered by one of the parties to the dispute.

Frank Trumbull, chairman executives' advisory committee and president Chesapeake & Ohio Railroad, the next speaker, pointed out that the railroads were limited as regards rates and hence could not do all they would like to do in the way of wages to their men. He reviewed the history of the negotiations last summer and the circumstances which led up to the passage of the Adamson law. He believed that the railroads owed a duty to shippers, passengers, their other employees, other employers and to the holders of railroad securities not to grant increase of such magnitude until the reasonableness of it had been recommended after investigation by an impartial board.

Bainbridge Colby, the last speaker, believed that the right to strike on public utility companies ought to be subject to limitation but defended the action of Congress and the President in passing the Adamson law under the circumstances that then existed.

Some Problems of the Industry*

There Are Too Many Supervising Bodies—Reforms Are Also Needed in Taxation

BY F. W. COEN

Vice-President and General Manager Lake Shore Electric Railway

ON the property which I represent we have to deal with seventy-five different political bodies, all of which feel it their duty in some measure to tell us what we should do and when to do it. The county commissioners or the county road supervisor will say that the track is too high or too low along some portion of the roadway, the township trustees will complain about some crossing, the councilman from the tenth precinct wants more service, a director of public service says that the paving needs repairing, the Mayor tries the trainmen for speeding, and likely as not the Council and the Mayor combined want a lower rate of fare with more liberal transfer privileges. Somebody will file a complaint with the commission that the company is not performing all of the duty which it should perform or that its employees are not treating the public properly, etc. Then the tax commission tells us what we should pay in the way of taxes toward the support of all the various parts of our government. With this I would have no quarrel if the same rule held good with the manufacturer, farmer, or all others by whom taxes are or should be paid.

For example, the public utilities, such as electric railroads, electric lighting and others, are taxed generally on the basis of their net earnings; that is, gross income with the ordinary operating expenses deducted, and this sum capitalized on the basis of 10 per cent, represents the value of the property on which taxes should be paid. This method of valuing properties for taxation may be, and perhaps is all right, but if it is correct, why are not other industries taxed in the same manner? In a neighboring city there are three large and prosperous manufacturing industries whose net earnings for the past year amounted to approximately \$36,000,000. If these concerns had been taxed on the same basis as our companies, they would have paid on a tax value of \$360,000,000. But what is the fact? The

*Abstract of a paper read at the convention of the Central Electric Railway Association, Toledo, Ohio, Nov. 24, 1916.

tax value on these same companies was given to the public within the past week, and I find the tax value was fixed at about \$37,500,000 or \$1,500,000 in excess of their net income. In other words, the basis of taxation of the Lake Shore Electric Railway, if you please, is ten times greater than that of the manufacturing industries above referred to. This is only one instance of gross inequality; there are many others throughout the state and the entire country.

Then, in the matter of taxation, as you all know, we have the street paving, the sewer assessments, the sprinkling assessments, the street cleaning assessments, the general real estate tax, the personal property tax, the excise tax on gross earnings, the tax for the maintenance of the Public Utilities Commission, the federal income tax which has just recently been doubled, in some cases a franchise tax, in other cases a tax on gross receipts payable in some instances to the city, as well as numerous others. All of these items tend only in one way, and that is in the increase of operating expenses, without anything in return. It has always been my belief, and is now, that a number of these tax charges should not be made against the utility and that whatever benefit, if any, is derived therefrom, should be given to the utility if it needs it properly to maintain its property and return a proper income on investment and to a proper remuneration to its employees; and if there is anything then remaining, it should go to the benefit of the general riding public.

There is another thought which comes to my mind. The automobile industry has made wonderful strides during the past few years. We find the jitney, the auto truck, the auto bus operating between various communities, and the automobile used for almost all purposes. These conditions have made wonderful changes in the transportation industry and no doubt many changes will come in the near future. But I should like to have someone give me a good reason why the jitney, the auto truck and the auto bus should not be declared public carriers? Jitneys should be required to get a certificate of public necessity and the auto bus should have a license, and its rates and regulations should be prescribed the same as for any other public utility. Finally some action of the legislature compelling automobile drivers to stop before crossing any railway track is absolutely necessary to prevent enormous loss of life.

There is an old saying, that "man can serve but one master." In our predicament we have many masters, and it is my firm opinion—and when I say this I am expressing my opinion only—that there should be one central authority covering as many of these questions as is possible. For example, the matter of operation of our property should rest in one authority. The matter of granting franchises should rest in that same authority. The matter of the type of construction of our properties and the service given by them, should likewise rest in this same authority. The charges which we should be permitted to make should be subject to review and revision by the same authority to determine if the rates and charges are fair, just and equitable, as between all parties interested. In other words, I believe that in this state the Utilities Commission, if you please, should have authority on a showing of necessity, to grant this company or any other company, a franchise to operate a railway and that such permission should be without limit as to time so long as such utility gives reasonable service at reasonable rates and performs the function delegated to it to be performed. This same commission should have authority, if necessary, to require additional service or reduce the service as changing conditions require. It should have authority to

order, if necessary, additional equipment, the rebuilding of tracks, the installation of additional power, or in fact anything going into the operation and maintenance of the utility. The commission should likewise have authority to protect the utility in the matter of earnings and of unnecessary requirements of extensions or street improvements, and it should be in position to guarantee beyond question to an investor, that a reasonable return could and would always be earned, barring, of course, calamities such as no one can foresee. Even in case of a calamity, a company should be allowed to earn sufficient to take care of such a contingency. This commission should be composed of men eminently fitted for the work, men in whose judgment every one would have confidence, and their compensation should be such as would properly pay them for their service.

Furthermore, I do not believe that earnings should be limited to any such rate of interest as 6 per cent on investment. The business of the electric railway has in days gone by changed so rapidly that the risk is too great for any such return. Furthermore I believe it would be advantageous to everybody concerned, if there was a premium on economy and efficiency in the operation of the property.

I hope that each and all of you will become, if you are not already, personally acquainted with every member of the legislature in your territory, so that you can go to him and explain in detail if necessary, why this bill or that bill will be a benefit or a detriment to the property which you represent. I believe that a great many bills become law simply because the whole truth about them is not known to the lawmakers. Give them the real facts and all of the facts, place yourself in such a position that you can go to your representatives and discuss with them freely any matters in which you are interested, to the end that they may have full and complete information before they are asked to pass upon important questions. If you will do this you will have done much for your property and the community.

Safety Work in Electric Railway Operation*

Results in Columbus, Ohio, Have Justified the Efforts Expended During the Past Two Years

BY HAROLD W. CLAPP

General Superintendent The Columbus Railway, Power & Light Company, Columbus, Ohio.

AT the present time man lives with scarcely a thought of the necessity of giving attention to his personal safety. The general trend of a curve representing the amount of man's thought for personal safety has been downward until it almost reached the zero point. This was about the time when the influence of such organizations as the National Safety Council began to be manifested. A better sentiment had already begun to take form in the systematic and persistent organized safety work undertaken by the Chicago & Northwestern Railroad and other corporations. It was gradually augmented from time to time by the entrance of industrial companies into the field until the formation of the National Safety Council in September, 1913.

The scope of safety work includes every phase of life, every avenue of human endeavor. It is good for us at play-time and in our home life. It embraces the fields of fire prevention, sanitation and conservation of health, as well as the prevention of accidents of all kinds, at all places, at all times.

In our own organization at Columbus at about the

*Abstract of a paper read at the convention of the Central Electric Railway Association, Toledo, Ohio, Nov. 23, 1916.

close of the year 1914 we began to realize that the amount of money being expended for lost time and physicians' fees in connection with employee accidents, and for damages in public accidents was excessive. We decided that organized safety work would afford us relief, and launched our movement on Jan. 4, 1915. Our first year's work produced a reduction in employee accidents of 10.2 per cent. We are receiving the hearty co-operation of our employees and are still making progress.

The plan of the public side has been very simple. I shall outline briefly what we are doing.

First, we are maintaining equipment in good operating condition and are requiring our men to live up strictly to the rules. We post weekly on special bulletin boards attractive literature dealing with the subject. In order to keep up interest in August, 1915, we commenced a special contest between car houses to reduce collisions between cars and vehicles. No reward was offered for good work; we relied upon the competitive spirit of the men to bring results. On July 1, 1916, however, we began a second contest and set aside the sum of \$1,000 to be divided among the men of the two car houses making the best showing as compared with the record of a year previous. We announce the scores made each month by means of specially prepared cartoon bulletins. This contest has awakened much interest and has reduced these accidents.

We have acquainted the public each month with the results accomplished through a series of car window posters giving only the records of collisions between cars and automobiles, and between cars and wagons, and accidents in boarding and leaving moving cars. These posters have been the means of securing much co-operation from car riders.

In common with other cities we have been experiencing an increase in the number of collisions between cars and automobiles, but our increase is smaller than that in the majority of cities of our size and traffic conditions. In this connection we mailed last week 11,000 circular letters to all automobile owners in Franklin County explaining the principal ways in which accidents occur between cars and automobiles, and requesting co-operation. The result has been very satisfactory.

Our company has now been engaged in organized safety work for nearly two years. A statement concerning the four classes of accidents above referred to will indicate whether or not the work has been worth while. The average number of boarding-moving-car accidents for the first ten months of 1914 was 8.5 per 1,000,000 passengers as compared with 7.2 for the same period of 1916, a decrease of 15.3 per cent. The average number of leaving-moving-car accidents for ten months of 1914 was 12.1 per 1,000,000, while for ten months of 1916 it was 4.06, a decrease of 66.4 per cent. The average number of collisions between cars and wagons for ten months of 1914 was 64 per 1,000,000 car-miles, and for 1916 it was 38.8, a decrease of 39.4 per cent. In collisions between cars and automobiles we had 51 per 1,000,000 car-miles for ten months of 1914 as against 67.4 for this year, an increase of 32.1 per cent, but even this 32 per cent is a good showing, when it is considered that there are 83 per cent more machines on the streets than there were two years ago. In addition this year has seen three times as many new men employed in the transportation department in the first nine months as during the entire year 1915, due to peculiar labor conditions.

There are two undeniable reasons why safety work should be undertaken; first, the humanitarian reason, and, second, the sociological. Safety work has proved that accidents can be very largely eliminated. At one

time in our railroad history we were inclined to think that schedules and speed should be maintained and humanity allowed to take care of itself, but now it is different. The public conscience will not stand for it, and that very same public conscience has been influenced in very large measure by the humanitarian spirit of the men back of our corporations, which were once considered heartless.

Along with the humanitarian phase of safety work is the efficiency and financial phase. Such work teaches cleanliness, alertness and thoughtfulness, and these make for efficiency and economy in all branches of industry, whether private or public. The influence which this work has in causing the platform men to study operation more closely makes a very appreciable showing in maintenance costs. In addition, I might add that our claim department settlements during the first year of safety work were reduced 45 per cent.

On the sociological side it may be said that the pauperizing of individuals and families resulting from the annual loss of life and reduction of effectiveness together with the attendant loss of opportunity for education and physical and mental development, has had a close relationship to crime. Hand in hand with safety work, however, have gone employees' welfare work; the establishment of works hospitals, community centers and playgrounds; the enforcement of sanitary regulations, etc., the whole tendency being to influence employees so that there will be a smaller number of accidents. The cost of all of this has been very much less than the cost of accidents. The entire plan has had the effect of bringing employees and management closer together.

In conclusion we may raise the question, Will safety work pay, does it pay? I reply that it does pay and in two ways: First, in the satisfaction of so operating a property that there shall be at the end of the year a shorter list of maimed and killed, and this is the greatest part of the pay; second, in the less number of dollars that have to be paid out each year as a partial recompense for losses that can never be adequately offset, even with cash.

Railroad Investment Must Be Attractive

Speaking before the Boston (Mass.) City Club on Nov. 13, Ivy L. Lee, formerly assistant to the president of the Pennsylvania Railroad, stated that the steam railroads are now doing all the business they can possibly handle, but the facilities are woefully inadequate and the disparity between facilities available and traffic presented is becoming greater every day. In his opinion the attitude investors have taken is very clearly to be gathered from the fact that during 1916 not \$1 of new railroad stock has been listed on the New York Stock Exchange to provide money for new railroad building.

Mr. Lee believes that the solution of the present railroad problem lies in developing without any delay a system of railroad regulation which shall not be controlled by political animus or prejudice, and which will frankly recognize this fundamental fact. If the country is to obtain the railroad facilities absolutely necessary to move the national trade, it must be willing to pay the bill. That means that it must permit railroads to earn sufficient profits to attract the necessary private capital. Otherwise private capital will put its money elsewhere, and government ownership, with all its inevitable blight upon the national life, with all its red tape, waste and cost to the people, will be the only recourse.

Truss-Side Construction for Railway Cars*

The Author Outlines the Reasons for the Development of Truss-Side Designs for Steel Cars and Discusses the Action of Car Framing in Severe Collisions, Reaching the Conclusion That Increased Strength of Superstructure Is Essential

By L. B. STILLWELL

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STATISTICALLY considered, a car is simply a covered bridge supported near its ends. Designers have developed three types: (a) That in which the load, including the sides, ends and top of the car, is supported by the underframe. (b) The type in which the load is supported by the underframe assisted by a light plate girder on each side of the car, the depth of which is equal to the distance from the upper edge of the belt rail to the lower face of the sills. (c) The high side frame, or truss construction, in which the load is carried on the sides of the car constructed as truss girders.

It appears obvious that, if an engineer were called upon to design a covered bridge equal in length to a 70-ft. car, he would use the side-truss construction, and the question arises as to why has this type not been adopted generally. The difficulties in the way are those incident to designing the truss girders that constitute the sides so as to leave proper spaces for the windows. These difficulties call for careful proportioning of the members, but are by no means insuperable. In fact, the problem has been solved satisfactorily, as is evidenced by several hundreds of cars now in use, of which many have been subjected to exceptionally severe service for a number of years. An answer to the question, therefore, is to be sought in the history of the evolution of the steel passenger car, and this at once gives the key.

For many years cars were made of wood, a material the characteristics of which are such that it is not practicable to construct the sides of cars as trusses, with appropriate spaces for windows, owing to the practical impossibility of securing necessary strength in tension and compression at the joints between the members. Consequently, wooden cars have been so designed that the underframe, reinforced by steel truss rods as tension members, carries the load, including the superstructure.

The next stop in the evolution of the modern passenger car was the complete substitution of steel for wood in the underframe, the superstructure still being constructed of wood. The depth of the sills being limited by considerations of necessary clearance, the distance between points of support of the center sill made it necessary to employ a comparatively large section, which, of course, involved great weight.

The third step was the substitution of a steel superstructure for its wooden predecessor. In a great majority of cases this has been done without modification of the structural scheme of the car framing.

The first steel car for electric railways in the United States, if we are informed correctly, was built for the subway in New York, and in this instance the steel underframe was assisted in carrying the load by a girder on each side of the car. The upper member of this girder was the belt rail, the lower member the

side sill, while a 1/8-in. web, riveted to the upper and lower members, completed the girder construction. The side sills constituted the tension members of the plate girders, and the latter carried the load, the center sills being comparatively shallow. This design has not been adopted extensively by steam railroads, although it is largely used in electric railway service.

The next step (and from a structural standpoint it would seem to be necessarily the final step) in the evolution of a steel passenger car of maximum strength and minimum weight was the development of the high side frame, or truss, construction, in which the entire height of the side frame of the car, from side sill to roof, was developed as a supporting girder. It is obvious that, when the members comprising the entire side of the car are fully developed as a truss, the load is supported by a framework some 7 ft. in height, as compared with a girder about 3 ft. in height when the members below the window line of the car form the girder, and as compared with the insignificant depth of the underframe when this alone is utilized to support the weight. The high side frame employs a side plate at the top and a side sill at the bottom. These are about equal in section and are connected by side posts specially designed to resist bending, and thoroughly braced and stiffened by the side sheets and the so-called "letter board." This structure is stiffened against horizontal deflection at the top by the deck, which may be considered aptly as a horizontal flange for the high side girder. Such a design produces a car wall of exceptional stiffness which is practically as strong at the roof as at the floor.

The high side frame, or truss system possesses not only great carrying power, as compared with the contrasted types of car framing, but its natural and logical development is a co-ordinated car structure characterized not only by great load-sustaining power, but also by exceptional capacity to resist collision impact. Moreover, this distribution of material, which takes metal from the underframe and utilizes a part of it in strengthening the sides and roof of the car not only secures a car of great stiffness and load-carrying capacity, but also tends to prevent collapse of the superstructure in case of derailment.

In severe collisions the side walls sometimes are torn from the underframe, and at other times are spread apart at the roof line. These failures obviously point to the desirability of a strong side frame and an end frame which will secure the side walls from spreading either at top or at bottom. They also point to the necessity of a thorough development of all joints of the structure.

In that type of side-frame construction which employs the members of the side walls below the window-sill line to carry the principal load, the side posts and side plate at the roof line are usually very light and, consequently, incapable of withstanding any great

*Abstract of a paper presented before the Central Electric Railway Association at its Toledo, Ohio, meeting, Nov. 23-24, 1916.

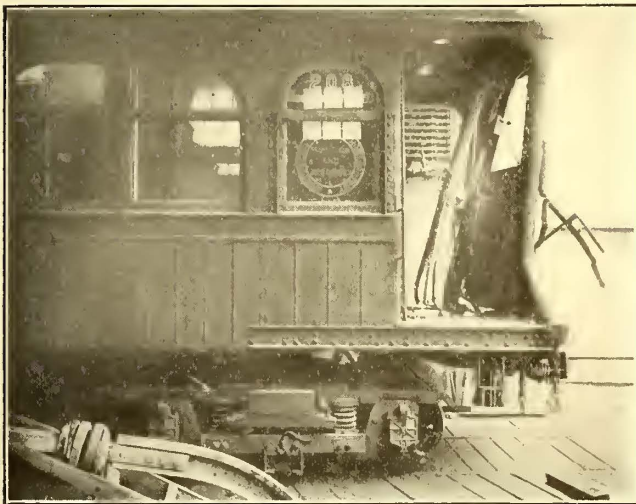
stress if the collision impact is applied above the window-sill line. The high side frame, however, affords a far better opportunity to minimize the effects of such stress, for the reason, as has been shown, that the side walls are of great stiffness and practically as strong at the roof as at the floor.

Generally speaking, in the case of violent collision observation shows that the underframe of one car is raised by the shock of impact sufficiently to clear the underframe of an adjacent car, and that in this position the latter, as we say, is telescoped. Before one car can enter the other, however, the body end-posts of the latter must be torn from their fastenings, and, as usually constructed, these members offer but little resistance. The high side-frame construction, however, provides in itself a comparatively very stiff structure at the roof line.

It may be pointed out here that the vestibule construction now in such general use can be utilized to good effect to cushion the shock of collision, as con-

the underframe are factors which contribute materially toward increasing the damage when one car overrides another. Obviously, devices for preventing the over-riding of cars, by maintaining the underframes in line, are of great value in so far as they can be made effective, but it is very difficult, if not impracticable, to construct such devices so as to prevent over-riding in case of violent collision or derailment, when the underframe of a car is frequently forced against the superstructure of another.

As regards depreciation of steel cars in normal service, about the only conclusion which can be deduced with certainty from examination of wreck photographs is the fact that, as usually constructed, the riveting of associated members does not fully develop the strength of those members; in other words, that the line of rivets is the line of weakness. It requires no argument, however, to prove that the life of an all-steel passenger car is practically the same as that of its weakest essential joints. If riveting is inadequate, either because



TRUSS-SIDE CARS—EFFECT OF COLLISION ON CAR WITH TRUSS-SIDE FRAMING



TRUSS-SIDE CARS—EFFECT OF COLLISION ON CAR WITH LIGHT SUPERSTRUCTURE

siderable energy is absorbed in the distortion or destruction of the vestibule. It is obvious that, if the car body proper has a side frame capable of resisting the shock at the roof line as well as in the under body, the effect of the collision will be concentrated—if the term may be used—upon the vestibule. This function of the vestibule as a buffer in case of collision has frequently been pointed out.

An examination of photographs of train wrecks and a study of many wrecked cars apparently justifies the following conclusions: 1. It is seldom that any serious damage is caused by the failure of the underframe. 2. In cases of collision the most serious damage usually results from the underframe of one car over-riding that of a neighboring car and destroying the superstructure of the latter by separating the side walls a distance sufficient to permit the entrance of the penetrating car body. 3. Failure of a structure occurs through a disruption of joints; members are seldom completely fractured between joints, the riveting usually proving inadequate to develop the full strength of the associated members. 4. Vestibules cushion the shock of collision with good effect, a large amount of energy being absorbed in the crushing of the vestibule members before penetration of the car body occurs.

To minimize loss of life and injuries to passengers in case of collision, the strength of the superstructure should be increased, if possible, and particularly in respect of its ability to resist telescoping or crushing, by end shock. Also the great weight and strength of

the number and size of rivets are insufficient or because the holes punched in two connected plates are not accurately aligned before riveting, the strains to which the superstructure is subjected, even in normal service and assuming no accidents, may be expected to result in a more or less serious movement of one member with reference to the other. Unless great vigilance is exercised in keeping all joints painted, this movement will result in more or less corrosion of plates and rivets. Here, again, it seems obvious that the high side-frame construction possesses marked advantages over either of the contrasted types of framing, and particularly over that type in which the underframe supports the entire load.

When a car passes around a curve, the outer rail of which is elevated, the outer side bearing on the front truck tends to lift the car body, the lifting force being exerted vertically at a distance of approximately 2 ft. 6 in. from the center line of the car, and if the superstructure is lightly constructed it may be subjected to excessive torsional or twisting strains. So far as the effect of this lifting effort is concerned the center sill, no matter how heavy, cannot prevent the strains upon the superstructure. Under similar circumstances the high side-frame construction, which makes of the superstructure a strong steel box with heavy end walls, is affected far less seriously, since every element of the superstructure can be so constructed as to oppose to the strains incident to the superelevation of the outer rail ample resisting strength.

Consideration of car design involves, naturally, the subject of truck construction and brake equipment. In 1911 we were called upon to design a special truck for steel cars 72 ft. in overall length. As it was, of course, desirable that the total weight of the car should be kept down, special attention was given to the framing of the truck to minimize its weight while retaining all possible elements of strength and to secure an easy-riding vehicle. The truck was designed and built without equalizer bars, helical springs being placed directly between the journal boxes and the truck frame. The side frame of the truck was built up of rolled members, and was of the deep side-truss, or arched bar, type of construction. The transoms were especially deep and well connected to the side frames of the truck. Extra long elliptic springs were permitted by this deep side-frame construction. In use this truck has proved very satisfactory. It is light, easy running, and its riding qualities are exceptionally good. Favorable comment by the patrons of the road, who noted particularly the easy riding qualities of the equipment, has led to the adoption by this line of the name "The Road of Ease."

Comfort of passengers is not the only consideration through which a road benefits by easy-riding rolling stock. Unquestionably the minimizing of vibration affects favorably the maintenance of rolling stock, and the power required to move an easy-running car is less than that required by a hard-riding car. Moreover, the effect upon track and roadbed is in the direction of decreased maintenance.

It may be said that the motor trucks of these cars were provided with clasp brakes—the first to be applied in electric railway service—because the weight of the cars was such that very high brake-shoe pressures had to be used. Experience extending over several years has demonstrated that the brake shoe wear is 15 per cent less on the motor trucks fitted with clasp brakes than on the trailer trucks of the same car which are fitted with single brakes, due allowance being made for the work of retardation effected by the two trucks. This is due to the lower temperature and consequent higher coefficient of friction in the case of the clasp brake equipment. It has been found, also, that the reliability in service of trucks fitted with clasp brakes is materially increased, owing to the fact that journals run cooler and the bearing surface of the journal is not disturbed in its position under the brass by an unbalanced brake-shoe pressure such as occurs when the single brake shoe is used. However, the improper application of two brake shoes per wheel may easily produce conditions worse than those which now occur with a well hung, single brake shoe.

COMMUNICATIONS

Finding the Defect in Car Axles

UNION TRACTION COMPANY OF INDIANA
ANDERSON, IND., Nov. 15, 1916.

To the Editors:

You might be interested to know that since your publication of my article on "Finding Defects in Car Axles" we have found a defective car axle of large dimensions—one of our very large type with a diameter of 7 17/32 in. at the gear seats. The axle was cracked about half-way around. This no doubt would have proved to be a very serious matter if we had not been able to find it through the process which I described, as the flaw was not visible to the eye after the gear was pushed off. In this case it was necessary to remove the

gear to renew it, and our standing order is that when a gear is removed, both wheels must also be removed and the axle tested.

Needless to say, I am extremely thankful that this defect was found as it was under one of our heavy interurban cars which operates at high speed.

R. N. HEMMING,
Superintendent of Motive Power.

Demand for the One-Man or "Light Safety" Car

ST. LOUIS CAR COMPANY

ST. LOUIS, Mo., Nov. 20, 1916.

To the Editors:

Apropos of the several suggested names for the type of small rolling-stock units known as one-man cars, we have been urging the use of the name "light safety" cars. That name would assist in their introduction, and it certainly signifies the aims of their designers and users. In agitating the use of these cars and setting before the industry the benefits to accrue from their use, the ELECTRIC RAILWAY JOURNAL is doing a work that will redound to the benefit of railways and manufacturers alike. We are trying to do our part by building "light safety" cars in advance for stock.

We have recently contracted with the city of Monroe, La., for three "light safety" cars, with all safety control features for double-end operation; with the Wichita Falls (Tex.) Traction Company for five cars with all safety control features for single-end operation, and have received a duplicate order from the Aberdeen (S. D.) Street Railway Company for "light safety" cars.

The future of the "light safety" car seems assured. Reports coming from Fort Worth are so glowing that we can discount them and still claim that the "light safety" type is the best proposition for economy. We have in our files hundreds of letters showing an intense interest in this class of equipment and are actually figuring with some twenty-five roads for orders. It would appear that the further one goes into this question the more he becomes convinced of its merit. So strongly imbued are we with its future that, as mentioned above, we are building some for stock. I estimate that within the first six months of next year at least 300 of these equipments will be ordered, and in making this estimate feel that I am conservative.

NIC LE GRAND.

First Multiple-Unit Electric Locomotives?

NEW YORK, Nov. 21, 1916.

To the Editors:

There is a statement in the paper by Frank J. Sprague, appearing in your issue of Oct. 14, 1916, which I should like to see elucidated. On page 774 it is stated that the original New York Central locomotives "were the first to be equipped with the multiple-unit control so that two or more could be operated together." To the best of my recollection, the first of these locomotives was completed in October, 1904, and put into experimental operation on the experimental track at Schenectady. It was announced in the technical papers that the order for these locomotives had been placed in November, 1903.

About August, 1903, the B. & O. Railroad received (from the same builders) four eight-wheeled units, each unit or half locomotive weighing 80 tons, built for slow heavy-freight service on the Belt Line. These lo-

comotives were designated as General Electric Type L.R. 654 and came equipped with the type M control, Form C, and from the start were operated two together, by the Sprague-General Electric multiple-unit control system. They are still in service, and are operated three units together, because of the much heavier trains being hauled nowadays. I am quite positive about that control, I saw the locomotives the day they arrived and rode on them many times subsequently. Mr. Sprague states that the New York Central locomotives were the first to be so equipped. Was their apparatus manufactured a year or so before the order for the locomotives was placed? Or did Mr. Sprague overlook the B. & O. locomotives in preparing his paper? If so, does not this make them the first ones so equipped? I ask the question as a matter of historical interest.

H. J. KENNEDY, M.E.,

Electrical Engineer and Engineer of Construction.

[NOTE. The above letter was brought to Mr. Sprague's attention and he stated that he was pleased to have the circumstances surrounding the early application of the multiple-unit system to heavy traction set forth in this way. He was not directly in touch with the B. & O. installation and was not aware of the exact date of the delivery of locomotives to this railroad.—EDS.]

Improvements in the Work of the Engineering Association

PITTSBURGH, PA., Nov. 23, 1916.

To the Editors:

We are grateful for the steps taken by the ELECTRIC RAILWAY JOURNAL to arouse keener interest in association affairs. It may interest you to know that the executive committee of the Engineering Association, realizing the weaknesses pointed out in the editorials appearing in your issue for Nov. 18, have adopted a new plan which we hope will be productive of much improvement in the work lying before us. Arrangements have been made whereby the starting of committee work is made possible immediately at the close of the convention. This coming year the committee on subjects will have concluded its investigation and report prior to the convention. The incoming president will have in his hands sufficient information concerning the qualifications of candidates for committee membership that it will be possible for him on the closing day of the convention to announce the full committee organizations and the subjects which the committees are to study.

There are other needed reforms which we believe will be put into effect in the very near future, particularly with regard to the Convention Proceedings. There is a surfeit of detailed material in committee reports which is essential for committees to consider but which need not be dwelt upon in the Proceedings. We might profitably dispense with the reading and discussion of much of the extraneous matter, which has heretofore been presented to the convention, utilizing the time assigned to the meetings to the discussion of the broader aspects of the several subjects. This should tend to stimulate greater interest in the meetings.

Referring to the association and its mission I believe that the electric railway engineer bears a responsibility not only to the company by which he is employed but also to the industry as a whole. This is true because whatever progress is made in the art of transportation, and whatever developments the future may bring forth, must come only as a result of the activities of the engineer. Without a medium of exchange of thought, and organized concerted effort to produce the desired re-

sults, much time and money are bound to be lost. In this regard the electric railway engineer finds right at hand an association designed and organized for the very purposes which conduce to economy and stimulate progress in the art. It is therefore the duty of every electric railway engineer to become an enthusiastic, active member of this association.

F. R. PHILLIPS,

Superintendent of Equipment Pittsburgh Railways,
President American Electric Railway Engineering Association.

AMERICAN ASSOCIATION NEWS

T. & T. Committee Appointments

Secretary Burritt has announced the following committee appointments. Lists of other association committees will be printed in later issues as completed.

Construction of schedules and time-tables—Edward Dana, Boston, Mass., chairman; R. T. Sullivan, Youngstown, Ohio, vice-chairman; C. F. Flocker, New Orleans, La.; Howard F. Fritch, Boston, Mass.; Alexander Jackson, Newark, N. J.; J. A. Stoll, Baltimore, Md.

Fares and transfers—C. S. Ching, Boston, Mass., chairman; E. E. Strong, Rochester, N. Y., vice-chairman; G. S. Brush, Portland, Me.; Charles Currie, Akron, Ohio; W. C. Harrington, Kansas City, Mo.; J. T. Moffett, Washington, D. C.

Passenger traffic—Chairman (appointment to be announced); E. M. Walker, Dubuque, Iowa, vice-chairman; C. R. Gowen, Syracuse, N. Y.; I. H. Pound, Benton Harbor, Mich.; R. M. Sparks, Boston, Mass.; C. F. W. Wetterer, Boston, Mass.

Rules—J. E. Duffy, Syracuse, N. Y., chairman; F. H. Hill, Elmira, N. Y., vice-chairman; H. L. Beach, Salt Lake City, Utah; A. Benham, Springfield, Ohio; Harold W. Clapp, Columbus, Ohio; S. W. Greenland, Fort Wayne, Ind.; W. M. Kessler, Tippecanoe City, Ohio.

Subjects—H. C. Donecker, Newark, N. J., chairman; F. W. Coen, Cleveland, Ohio; James E. Gibson, Kansas City, Mo.; R. P. Stevens, Youngstown, Ohio.

Training of transportation employees—Chairman (to be announced); C. W. Kellogg, Keokuk, Iowa, vice-chairman; W. A. Carson, Evansville, Ind.; L. H. Conklin, Scranton, Pa.; H. B. Flower, Baltimore, Md.

JOINT COMMITTEES

Block signals for electric railways—Transportation & Traffic—J. W. Brown, Newark, N. J., vice-chairman; J. J. Brennan, Fort Wayne, Ind.; J. J. Doyle, Baltimore, Md.; G. K. Jeffries, Indianapolis, Ind.; (Engineering Association members not yet announced.)

Claims—Transportation—Transportation & Traffic—H. A. Bullock, Brooklyn, N. Y., chairman; A. Gaboury, Montreal, Que.; E. E. Soules, Peoria, Ill.; (Claims Association members not yet appointed).

Transportation—Accounting—Transportation & Traffic—A. E. Reynolds, Glens Falls, N. Y., chairman; N. H. Brown, Buffalo, N. Y.; J. H. Van Brunt, St. Joseph, Mo.; (Accounting Association members not yet appointed).

Transportation - Engineering — Transportation & Traffic—G. H. Clifford, Fort Worth, Texas, co-chairman; F. W. Coen, Cleveland, Ohio; F. W. Hild, Denver, Col.; (Engineering Association members not yet announced).

Some Recent Advances in EQUIPMENT AND ITS MAINTENANCE

United Traction Company, Albany, N. Y., Finds Air Tamper Useful for Breaking Concrete, Cleaning Rusty Steel, Drilling, Pocketing Brick, Etc., as Well as Tamping—Virginia Railway & Power Company Finds Automatic Stop Entirely Practicable—Lehigh Traction Reclaims Worn Motor-Axle Bearings—English Railway Official Discusses Gear Case Maintenance as Practised in Great Britain

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

Reclaiming Motor-Axle Bearings

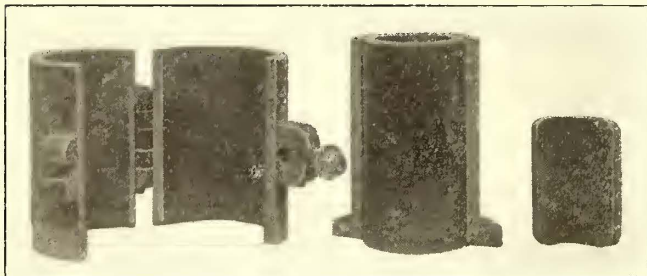
Babbitting Jig Effects a Saving of \$80 Per Car on an Interurban Road

BY JAMES W. BROWN

Superintendent of Shops Wilkes-Barre & Hazleton Railway and
Lehigh Traction Company, Hazleton, Pa.

Remarkable economies have been obtained on the Wilkes-Barre & Hazleton Railway and the Lehigh Traction Company by the use of babbitting jigs in reclaiming motor-axle bearings. One of the many jigs used in the shops of this company is that for a GE-69-C motor-axle bearing shown in the illustration herewith. The bearing can be re-lined or re-babbitted by means of this jig, which was designed to hold either half of the bearing.

The bearing is first placed in a special split chuck, which was described in the *ELECTRIC RAILWAY JOURNAL* of May 13, page 913, and bored out $9/64$ in. larger than the diameter of the axle. The collar of the bearing is



JIG FOR RECLAIMING MOTOR-AXLE BEARINGS

faced off to $7/16$ in. thickness, and the bearing is then taken out and each half of the old collar is drilled for riveting a new brass collar on to its face. This new brass collar is cast in a solid ring, faced on one side and then drilled to take $3/8$ -in. diameter copper rivets, which are made from scrap copper wire. The new brass collar is then sawed in two and riveted to each half of the old motor-axle collar. The bearing is then placed in the jig and the outside brass collars faced to the original diameter. After the collars are faced to the proper distance between the hubs, the bearings are taken to the babbitting room, tinned and placed in the jig (shown at the left of the illustration) and babbitted.

This device eliminates clamps and bolts, and no clay is necessary to hold the bearing while it is being set up in the foundry. A small riser is cast on the end of the bearing which permits the gas to escape from the top and insures a clean bearing free from blowholes. The fins are trimmed off the bearing and it is then placed in a boring jig in the lathe and bored out 0.0014 in. larger than the axle. There are four $5/8$ -in. dowel pin holes drilled in each motor-axle bearing, hence there are no rights or lefts. Again, in re-babbitting these bearings, the good dowel pin holes are utilized. The

bearing is, therefore, placed on the opposite side from which it was used before being re-babbitted.

The total cost of the bearing, including the labor, the brass collars and the babbit metal, is approximately \$5. These bearings have made from 50,000 to 75,000 miles on the Wilkes-Barre & Hazleton cars, which weigh 90,000 lb. and are operated at 40 m.p.h. on grades up to 3 per cent. The original cost of these bearings averages \$15 each, and as scrap babbit metal was used, the results show a net saving of about \$80 per car.

Gear Case Maintenance Experience

Troubles Due to Design of Gear Cases and Conditions of Track and Roadbed

BY "VULCAN"

A.M.I.C.E., A.M.I.E.E., England

The amount of trouble attributable to motor gear cases varies considerably on different electric railways. For instance, on one system well known to the author there are over 300 electric cars, and the number of gear cases purchased per annum has not exceeded half a dozen, whereas on another system of about the same size the number purchased and used during the year was over thirty times as large, and in addition to this a great many gear cases were repaired for further service.

The latter is probably an extreme case, but was fully accounted for by the extremely bad condition of the track, which set up excessive vibration and subjected the different parts of the equipment to unusually severe shocks and jolts. The conditions, however, were favorable to comparing the different methods of construction embodied in the various types of surface car gear cases. These different types of construction are described in this article, and the result of the author's experience in the use of gear cases under widely different conditions is given.

The gear case of an electric railway motor must of necessity be rigidly supported and overhung from the end of the motor. The brackets or lugs which carry it and also the parts of the gear case to which the latter are attached are therefore subjected to severe shocks and stresses when the car is continually jolting over bad rail joints and special work. The severity of these conditions is the determining factor in the life of the gear cases, and if the track conditions are abnormally bad great care must necessarily be used in selecting a suitable type.

Probably the most common type of gear case has its two halves made of malleable iron, the lugs forming part of the upper half casting. The ribs or webs connecting the feet to the side spread the stresses over a considerable area of the main casting and form strong supports. This class of gear case has undoubtedly given general satisfaction, and the only objection urged against it is its weight, which is somewhat excessive as compared with other types now to be obtained.

The first attempts of any importance made to reduce the weight of gear cases consisted in making them of sheet steel in many sections, joined together by rivets. These were very soon found to be unsatisfactory, for even on good track the riveted joints, particularly those between the feet and case, shook loose and were generally troublesome and noisy. A more substantial job was made by the electrical spot-welding process. The spot welds between each rivet had a stiffening effect, and thus considerably increased the life of the gear case.

Another method which has been employed for joining the parts of sheet steel gear cases together is the oxy-acetylene process, which has the advantage of low first cost. These cases have been experimentally tried on many systems and have given a certain amount of satisfaction under the favorable conditions of good permanent way, but the trial records show that they are not capable of successfully withstanding the excessive vibration and shocks which bad track produces. Under the latter conditions the life of oxy-acetylene welded gear cases is generally a short one, the joints being as a rule the first parts to give way. The trouble seems to be due to the difficulty in getting a metal to form the joints and fillets, which after being applied by the oxy-acetylene blowpipe will still retain its original ductility. A considerable improvement was effected by the introduction of the pressed steel type of gear case, the top and bottom halves being pressed from a single sheet of steel.

With the object of producing a gear case of light weight many designs employing different kinds of wood have been tried. These generally had wrought-iron feet and were stiffened by sheet steel plates and corner pieces, some having this material for the whole peripheral face. This type of gear case may have been successful when used on good track, but all which have as yet been tried have proved unsatisfactory for extreme conditions of service.

LUGS CAUSE TROUBLE

The lugs of the earlier patterns of pressed steel cases were also of sheet steel riveted on the vertical face, and later also to fasten the peripheral face of the top half of the case. After considerable experience it was found that the lugs, due to the additional strains, soon worked loose at the rivets and broke. A broken supporting lug proved to be a difficult thing to replace, because on account of its special pressed shape new ones could not be made in the shops, but had to be purchased from the original suppliers. It was also almost impossible to fit a second lug properly because of the difficulty of matching and fitting new rivets into the distorted holes in the gear case.

Many instances have occurred where the pressed steel lugs have been fractured even when the rivets have remained firm. This has come as a surprise to many a rolling stock superintendent in view of the fact that under exactly similar conditions the cast lugs on old type gear cases were giving no trouble whatever. When a pressed steel lug has broken in the way described an examination of the material round the fracture showed that the shocks and vibration have caused a complete change in the structure of the material, and instead of being ductile it was granular and brittle.

After experiencing scores of such fractures, and with the results obtained with other types in mind, one realizes that for purposes of severe service the pressed steel type lug, no matter how fixed to the gear case, is not satisfactory. Some manufacturers now use steel castings for the lugs in place of the pressed pattern. They are fixed to the gear case by riveting and spot

welding. Such lugs have now been thoroughly tested, and they have proved their superiority over the preceding types.

Gear cases are usually fixed to the motor by either two or three bolts passing through the lugs which project from the top half of the case. If these bolts are allowed to get loose the gear case will drop out of alignment and stresses due to vibration and jolting will then be greatly intensified.

The method adopted on certain modern motors of providing for carrying the gear case on lugs centrally situated on the case, *i.e.*, in line with the middle of the gear teeth constitutes the greatest improvement on the more general arrangement that has up to now been tried. In this type the lugs on the gear case have to withstand direct pressures only, whereas on the older types they are subjected to heavy bending moments also, due to the center of gravity being outside the supporting faces. An additional clamp consisting of a horizontal bolt fixed near the top is also provided in many cases and serves to complete a first-class job. In a few instances a horizontal bolt support is provided for on the old type of gear case, but even where it did not originally exist, the author has found it advantageous to adopt the arrangement by fixing an angle iron bracket to the motor casing and a simple fixture on the gear case. The addition is effective in steadying and prolonging the life of the gear case.

Too small a clearance between the gear and the side of the gear case often causes severe rubbing of the gear against the case due to wearing of the vertical faces of the motor suspension bearings. This soon destroys the gear case and, moreover, is objectionally noisy in the process. Practically all equipments will allow of the use of sufficiently wide gear cases to give at least 5/16 in. side clearance.

Convenient Lamp for Tunnel Inspections

BY G. R. THAYER
Catenary Engineer

An inspection lamp for tunnel and emergency work which has proved indispensable in inspection work on one property is shown in an accompanying illustration. The outfit consists of an automobile lamp, a piece of



PORTABLE LAMPS IN USE BY
TUNNEL INSPECTOR

1/4-in. rubber hose about 6 ft. long and a small tank of Prestolite such as is used on motorcycles or automobiles. Holes were drilled into the top and sides of the automobile lamp and two handles were attached to it. In addition a leather case for the tank was made and fitted with a strap to go over the inspector's shoulder.

This is a very convenient equipment to carry, and by means of the strong white beam, a tunnel inspector can locate cracked insulators or other defects before actual breakdown occurs. The equipment of a 3000-ft. tunnel is inspected twice each day with the aid of this outfit, so there is small chance for an insulator at any one of the forty stations failing without such failure being quickly detected. The total weight of this equipment is 17 lb., and at the present

rate of inspection one tank charge will last about two weeks. These emergency lights have proved useful in several directions as they can be used at night in making temporary repairs on the line and in inspection work.

Varied Uses of a Pneumatic Tamping Outfit

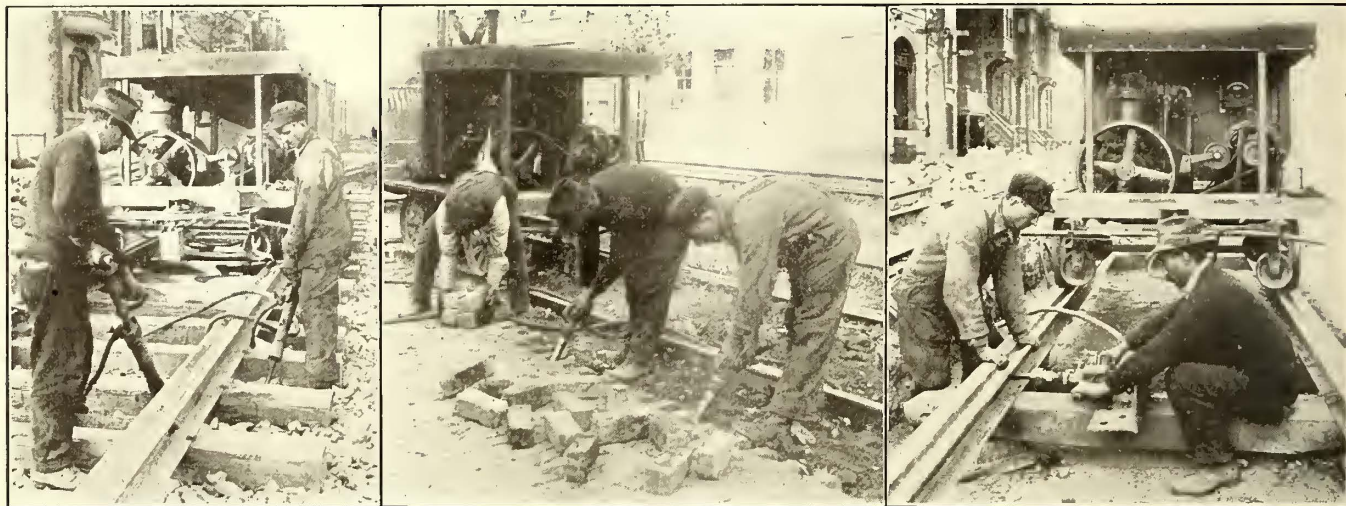
BY CHARLES BRENNAN

Engineer Maintenance of Way, United Traction Company, Albany, N. Y.

The acuteness of the labor situation in 1915 necessitated a substitute for track laborers, and as the larger steam roads in the East during the seasons of 1914 and 1915 were using pneumatic outfits with excellent results in ballasting track, this company turned its attention to the tamping question. After going into the situation thoroughly it was decided to try out the pneumatic type of tamper. An order was accordingly placed for equipment for a trial test, and upon the com-

to handle than one equipped to run over tracks, since it weighs in the neighborhood of 4500 lb. Where track is being reconstructed without traffic operating over it, the latter outfit can be placed on the tracks and can follow up the work, the operator moving the machine along as required. The present outfit is operated at a working pressure of from 70 lb. to 80 lb. without objectionable noise.

Under continuous traffic conditions, the average cost of hand tamping 6 in. to 10 in. of crushed stone ballast is approximately 15 cents per foot of track. This cost, however, is increased where a second tamping due to settlement is necessary or where the ties are not absolutely on a solid bearing, as cracks in the concrete base will appear where concrete is poured under traffic. This condition is minimized when the track is tamped by the pneumatic outfit, as the stone underneath the ties is very compact. Also, indifferent tamping by hand is eliminated. As the tamping guns work at any angle this outfit is especially efficient in tamping ties in special



USES OF A PNEUMATIC TAMPING OUTFIT: AS A TAMPER; FOR TOOTHING OUT POCKETS IN BRICKS; AS A DRILL FOR TIE RODS AND BOLTS

pletion of this test, which was highly satisfactory, an order was placed for a gasoline-engine-driven pneumatic tamping outfit. The following description shows to what varied uses such an outfit can be put, and the economies which are effected thereby.

The first outfit obtained was gasoline-engine driven and it was purchased in 1915. With this equipment 12,714 ft. of track was tamped between Oct. 1 and Dec. 2, 1915, in addition to miscellaneous jobs completed. In the spring of 1916, a 10-hp. motor-driven outfit was put into service as being more economical for an electric railway, although it had to be towed, whereas the gasoline outfit was self-propelled. Both outfits came from the Ingersoll Rand Company.

At present a test, namely, that of using four guns instead of two, by the substitution of a 15-hp. motor for a 10-hp. motor and by changing to a larger pulley, which an Eastern railway property is trying out, is being watched with considerable interest. If the test proves successful, it is the intention of this company to remodel its outfit accordingly, as it now operates but two tamping guns. A compressor outfit mounted on a wagon that will operate from four to six guns will be built in the United Traction Company's shops during the coming winter.

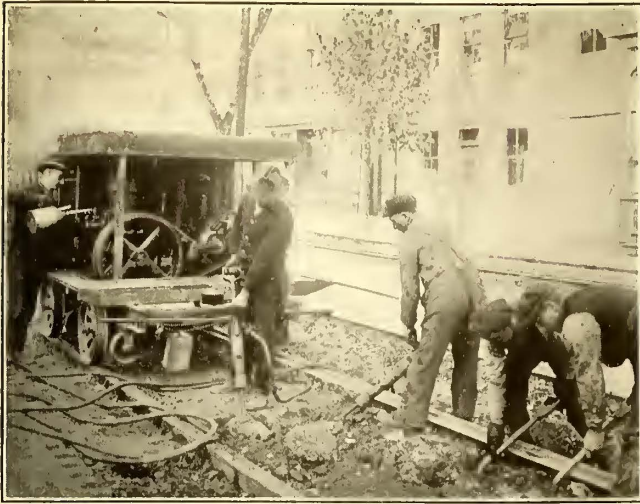
In reballasting, where tracks are being reconstructed in connection with improvement of streets, and where traffic is being carried on continuously, on both tracks, an outfit mounted on a wagon with wide tires is easier

work and in corners where a tamping pick or tamping bar would be useless.

The average cost per day of tamping in 1915 by the pneumatic outfit was as follows:

DISTRIBUTION OF TIE TAMPING COSTS	
Operator	\$2.75
Two tampers	4.20
One ballast distributor	2.00
74.6 kw.-hr. at 1 cent per kilowatt-hour	0.746
0.3 gal. compressor oil.....	0.075
0.5 lb. Polarine cup grease.....	0.045
Overhead, charges based upon a life of ten years, at 6 cents per tie (180 ties considered a day's work).....	1.08
Total cost per day.....	\$10.896
Cost per tie.....	0.065

This tamping outfit cost about \$1,300, the two tamping guns \$100 each, and the tamping bars \$1.75 each. As the pneumatic outfit is still engaged on tamping track, the average cost for 1916 has not been compiled, but undoubtedly will be higher, due to increased wages paid this year to all classes of labor. These figures serve to show a saving of approximately 56 per cent. A true comparison is the net result at the end of the season, and to keep the actual cost a job order is assigned to cover the operation of the tie tamper for the season in connection with a job order issued to cover the particular reconstruction job. At the completion of each job the cost of ballasting can be readily obtained. Another factor to be considered is the increasing number



THE PNEUMATIC TAMPING OUTFIT AS A DRILL FOR CUTTING OUT CONCRETE

of laborers required on reconstruction work. The tamping outfit will take the place of at least ten laborers, and these laborers can then be used to good advantage ahead in tearing up and reconstructing tracks. Laborers were needed very badly during the past summer, and as most way engineers know there was not a job this year that had half its quota of men.

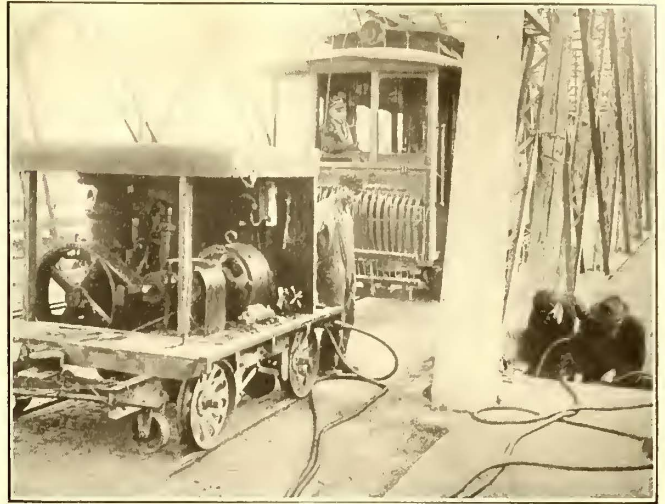
The municipal engineers of the several communities through which this road operates were so well pleased with the work of the pneumatic tamper that they requested that it be used on certain jobs, and having only one outfit we were kept busy moving it to the various municipalities when we could do so consistently.

Excellent results in the breaking up of concrete base have been obtained by the following procedure. Rather than work continuously off the face of the concrete, as it has been our experience, the base can be removed more quickly by a series of trenches and cross trenches, and the slab between can be pried up and broken off with sledge hammers. The laborers operate guns with dull pointed bars at an angle of 45 deg. and at about 2 in. or 3 in. from the face, at the same time using the gun as a lever to pry up the concrete slabs. If they try to take off too much the drill will stick. In order to effect an economy it is necessary to let the men cutting trenches in the concrete get a good start so that the laborers breaking and loading the concrete will not be delayed.

In order to clean bridge rollers and seats from rust successfully it is necessary to remove the guns and cut down the opening in the hose to a small size, as the compressor will not build up or hold the required working pressure with a $\frac{3}{4}$ -in. hose connection. This scheme was used on one of the big bridges and better results were obtained by using one line of hose instead of two. In removing rust one laborer uses a sharp instrument to break up scales, dirt, etc., and the air blast will take care of the rest.

For drilling holes up to $1\frac{1}{4}$ in. in diameter two Thor air drills are used to operate in connection with the pneumatic outfit and the results so far to date have been very satisfactory. It is proposed by this company to use the outfit for drilling bolts and tie-rod holes in the short pieces of rail which are cut during the winter months as soon as the tamping work is completed. This will not only effect a saving but it will speed up the replacement of broken rails.

Anyone who ever attempted to pocket out half bricks preparatory to laying new blocks knows what a tedious and unsatisfactory job it is. As a rule, the whole brick



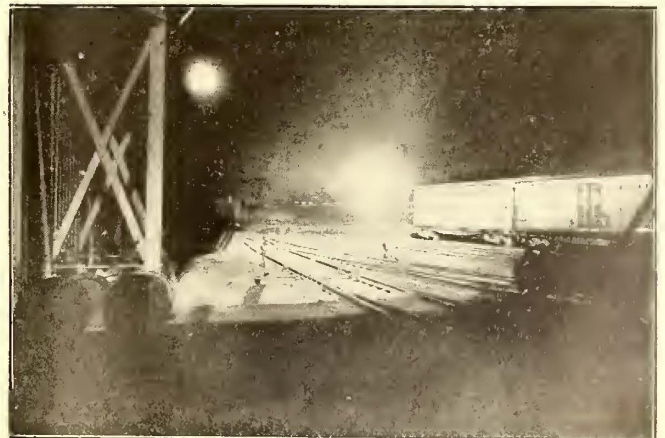
THE PNEUMATIC TAMPING OUTFIT AS A BLOWER FOR REMOVING RUST FROM STRUCTURAL WORK

adjacent breaks off, which requires that it come out also. By using a chipping hammer a series of sharp blows does the work without breaking the adjacent block. In order, however, to secure a good bond in the toothed portion it is necessary thoroughly to clean the cement out of the groove of the old block. In cleaning the old block the brick is placed against the edge of the curb, and a dozen bricks can be cleaned, as against one by the hand method. Not much cleaning of brick has been done on the street, the tamping requiring the machine almost constantly. The old bricks are hauled to the storage yard, and when the outfit is not in use it will be used to clean this old brick.

These examples show how an outfit of this type can be used, and it is necessary for every way engineer to be on the lookout for all labor-saving devices if an indication of the rising labor market is to be taken as a criterion.

Flood-Lighting Railroad Yards

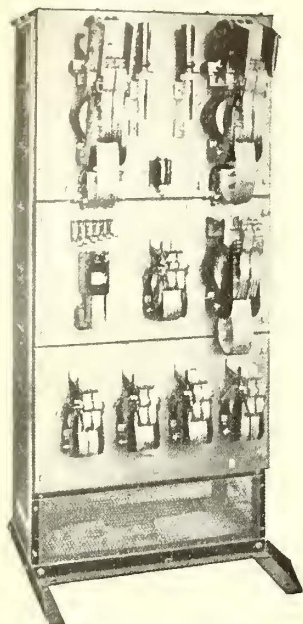
The accompanying halftone shows the appearance of a railroad terminal illuminated with Western Electric-Davis flood lamps which do not throw out a defined and concentrated beam, but rather tend to spread the light uniformly over the section on which they are directed. This system was demonstrated at the recent convention of the American Electric Railway Association at Atlantic City, where the railway men in attendance manifested much interest in it.



RAILROAD YARD ILLUMINATED BY FLOOD-LIGHTING SYSTEM

A Large Automatic Controller

The controller shown in the accompanying illustration is a recent development of the Industrial Controller Company of Milwaukee, Wis., intended for use with



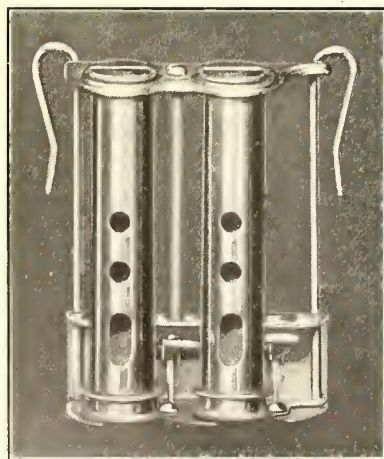
AUTOMATIC CONTROLLER FOR
LARGE D.-C. MOTORS

large direct-current motors. This controller combines both current limit and time limit acceleration, thereby securing protection not only to the motor by means of the current-limit acceleration, but preventing too rapid acceleration of the motor under light loads. The controller consists of a number of large magnetic contactors, the first of which is equipped with a powerful blowout and arcing shields. The acceleration is accomplished by means of a master solenoid at the left of the panel, which upon closing energizes the coil of the large magnetic contactors successively, thereby closing the switches and bringing the motor up to speed. The acceleration of the master solenoid is retarded

by means of an air dash pot, and in addition by a braking magnet, which in turn is controlled by a current limit relay at the center of the panel. When the current in the motor exceeds a predetermined amount, the master solenoid is prevented from operating until the current is reduced to the amount for which it is set. On the controller illustrated, magnetic switches with blowouts are provided for both sides of the line and each are equipped with overload relays.

Metal Tickets for Registration of All Classes of Fares

The metal ticket is a recent refinement in the registering fare box system of fare collection. When it is used in conjunction with the familiar clock register,

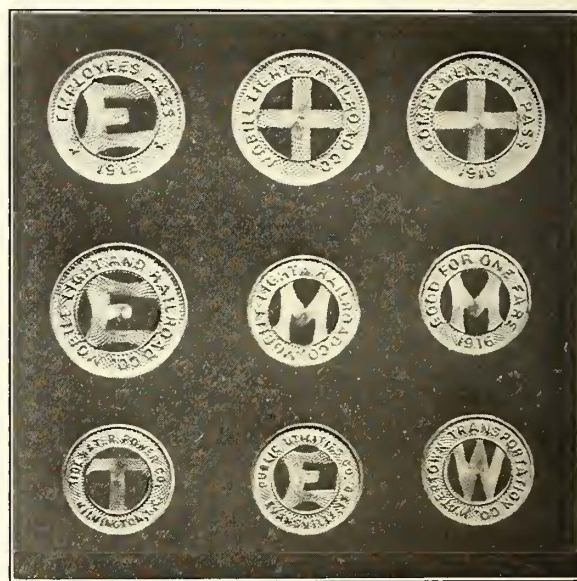


TWO-BARREL METAL TICKET CHANGE
CARRIER

this system plus the metal ticket makes possible the complete application of the double-check system, which has been quite generally accepted as an efficient one on a large number of important properties. On those properties where the ticket fares represent a large proportion of the total, in certain instances as high as 86 per cent and even 96 per cent, the registering of tickets is a very important consideration since this, and the release of tickets for re-sale by the conductors, accomplished pronounced economies in the accounting department and place an additional safeguard around each fare.

The new metal tickets of the Johnson Fare Box Company for use in conjunction with its standard fare box equipped with two extra cyclometers (described in the Jan. 15, 1916, issue of *ELECTRIC RAILWAY JOURNAL*, page 136) provide a means of registering all classes of fares. These tickets are made of German silver in such form as to make counterfeiting difficult. A letter in the middle is used to indicate the name of the town, to prevent broadcast counterfeiting, and the letters may also be varied for different classes of fares in one city. As planned for Mobile, Ala., the small six-for-a-quarter ticket has an "M" in the center, the employees' pass (a metal ticket of the larger size) has an "E"; and the passes for mail carriers, policemen, etc., a cross. These are shown in an accompanying illustration.

The tokens are punched out around the letter in the center to distinguish them from coins, and they are made in two sizes, one slightly smaller than the dime and one slightly smaller than the nickel. Tickets of the same value are made of the same size, although they may have different classifications, as noted above. The lettering and geometric lines on the tickets, and their high intrinsic value, all conduce to make counterfeiting costly. The smaller tickets will cost from



METAL TICKETS FOR USE IN CONNECTION WITH
REGISTERING FARE BOX

\$10 to \$12 a thousand and the larger ones \$12 to \$14. They can be used almost indefinitely.

The system of collection advocated by this company in conjunction with the metal tickets provides a registration for every passenger, regardless of the class of fare paid, and a double check on all cash and ticket fares. The passenger drops his dime, nickel, pennies or metal ticket into the fare box, and at the same time the conductor "rings up" the fare on the clock register inside the car. Transfers are registered on a separate dial of the clock register. After the platform has been cleared the conductor grinds the coins and tickets through the fare box, registering them and releasing them for use in change or for resale. The four dials on the box register separately the three classes of coins and tickets of two denominations, and give the total of all fares in number of fares. The box registration plus the transfers indicated on the car register corresponds with the total of both sides of the car register, giving the double-check—the manual registration against the mechanical recording of cash and ticket fares. This possibility of registering the metal tickets as well as coins eliminates the principal objection to

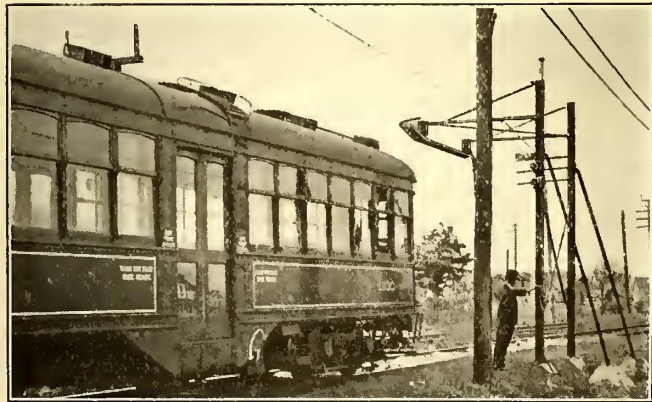
tickets and precludes the possibility of substitution of one class of fare for another.

The sale and handling of the metal tickets by the conductor is facilitated by the use of a metal ticket change carrier just put out by the same company. This is a simple two-barrel holder which the conductor wears on his vest, so constructed that a pressure of the lever drops six tickets into his hand to be given in exchange for a quarter. When two sizes of tickets are used, these carriers are made with two sizes of barrels to accommodate them.

Car Stop for Highway and Grade Crossings

Virginia Railway & Power Company Provides Automatic Protection on the Ocean View and Bay Shore Division by the Use of This Safety Device

For the past two years the Virginia Railway & Power Company has had in use on its Ocean View and Bay Shore Divisions an automatic car stop invented and patented by A. Taurman, superintendent of rolling stock of the company. The stop is said to have proved very successful. The principle involved is as follows: On each side of a crossing there are two contact de-



CAR PASSING OVERHEAD STEEL STRUCTURE, SHOWING DETAIL OF SPRING CONTACT ON TOP OF CAR AND INVERTED CHANNEL

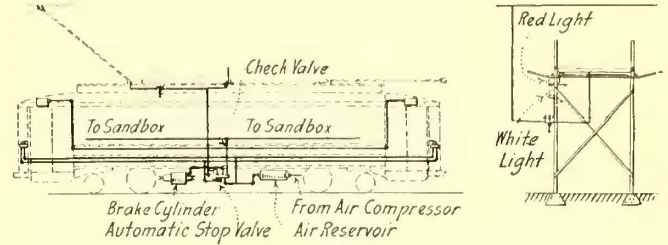
VICES which unless de-energized manually will bring a car to a sudden stop through the agency of a contact spring mounted on top of the car and connected in circuit with an electro-pneumatic valve.

In applying the stop, two steel overhead structures were erected on each side of the crossing, each carrying an inverted steel channel. These were located 150 ft. and 400 ft. respectively from the grade or highway crossing. The channels are energized from the trolley line through switches which close automatically, and are de-energized by the manual operation of the switches. At the outer or distant stop the automatic closing switch is placed on the steel structure. The switch controlling the energizing and de-energizing of the channel at the inner stop is located on the far side of the crossing so that it is necessary for the platform man to cross the crossing in order to de-energize this channel.

By means of the electro-pneumatic valve on the car provision is made for supplying air to sand the track, for supplying air to a small cylinder on the circuit breaker which cuts off the current, and for supplying air to the brake cylinder to apply the brakes. In addition to the operation of the valve through the spring contact on the top of the car, it can also be brought into action

by means of a pull switch operated by a cord extending the length of the car. By means of this cord, the conductor can easily cause the car to make an emergency stop. When operated from either source the magnet will operate the valve in 1/18 second. The cycle of operations in passing a crossing is as follows:

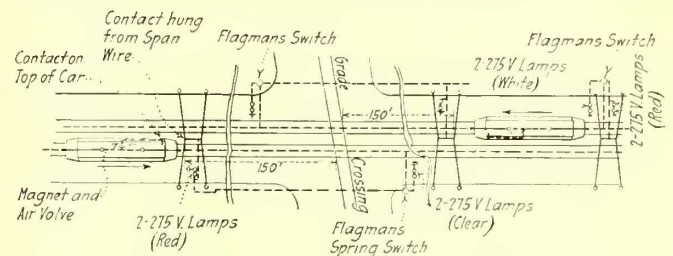
On approaching within 400 ft. of a grade crossing the car encounters a danger signal at the first stop, and



ELEVATION OF CAR AND OVERHEAD STEEL STRUCTURE SHOWING ARRANGEMENT OF AUTOMATIC CAR STOP

the motorman brings his car to a stop in the usual manner. The conductor then goes ahead to operate the switch which cuts out the danger signal, de-energizes the stationary contact and displays the clear signal, after which the motorman proceeds. On reaching the stop nearest the crossing the motorman brings his car again to a stop. The conductor then crosses the grade crossing, after properly flagging it, operates the switch in the same manner as described before, cutting out the danger signal and displaying the white signal for the motorman to proceed. If the motorman fails to bring his car to a stop, in approaching the grade crossing, then the spring contact on top of the car, engaging the channel, energizes the magnet of the electro-pneumatic valve, causing it to produce an emergency stop. The conductor or motorman must then alight from the car and reset the valve before the car can proceed, as power cannot be restored to the car nor can the brakes be released until this electro-pneumatic valve has been reset by hand. This valve is purposely so located that it is necessary to get off the car to perform this operation.

Mr. Taurman has recently arranged for the development and marketing of this device by the Consolidated



RAILROAD CROSSING SHOWING INSTALLATION OF AUTOMATIC CAR STOP

Car Heating Company, Albany, N. Y., which furnished the equipment for the Virginia Railway & Power Company.

Local engineers are conducting a research regarding the return circuit conditions on the property of the Omaha & Council Bluffs Street Railway with a view to possible improvement in the distribution system. The United States Bureau of Standards will take the results of this work, which are understood to be practically ready for the purpose, and will work them up into a complete report.

NEWS OF ELECTRIC RAILWAYS

Traffic and Transportation

Financial and Corporate

Personal Mention

Construction News

P. R. T. COMPANY RENEWS PROPOSAL TO CITY

Further Conferences Proposed With Prospects Reported Good for Settlement Soon

Ellis Ames Ballard, chief counsel for the Philadelphia (Pa.) Rapid Transit Company, announced at the public hearing on Nov. 17 before City Councils' joint committee on street railways and finance that the company was willing to enter an agreement with the city for the operation of high-speed lines, with the 1914 Taylor tentative agreement as a basis. The statement made by Mr. Ballard follows:

"The company appreciates the opportunity of stating to you and through you to the public its attitude in respect to the equipment and operation of the city high-speed lines.

"In May, 1914, as a result of conferences held between representatives of the company and Mr. Taylor, who was then director of city transit, a basis for a suggested agreement was prepared, which was dependent, however, upon the rapid transit company securing financial aid from the Union Traction Company. The essential features of this tentative agreement were:

"1. The program at that time was limited to Frankford, stopping at Bridge Street; Broad Street Subway, stopping at Pike Street, with branches and a delivery loop, and Darby. It was estimated by the director of city transit that the contribution of the company for equipment of these lines would be slightly less than \$12,000,000.

"2. Exchange tickets were to be abolished in order that the two systems could be operated as one. The company was to receive a partial consideration for this concession. A year later Director Taylor suggested some changes in this consideration which you will find in his official report for the year 1915.

"3. In so far as the competition of city-built lines depleted the current net earnings of the company's own system (except net earnings from exchange tickets) that loss was to be made up to it by a preferential payment out of the earnings of the city's lines. That is to say, those earnings were to be applied (1) toward paying 6 per cent upon the cost of equipment furnished by the transit company; (2) toward making up any loss in its said current net earnings which the company had experienced from this competition; (3) toward meeting the interest and sinking fund charges on city bonds, and (4) the balance of earnings to be divided between the parties in proportion to their contribution to the city lines.

"Two and a half years have elapsed since these conferences, and the situation has changed materially in many respects. First, the Union Traction Company has not up to the present time agreed to furnish the necessary financial assistance. Second, since the suggested agreement the city has provided for extensions and additions to the original Taylor plans which materially increase the commitment of the operator and alter the financial results to be fairly expected. Third, the cost of all items of construction and equipment are much greater than the original estimates, so that the company now estimates that to equip even the lines originally included in the 1914 plan will take from \$17,000,000, as against \$12,000,000 then estimated.

"However, I wish to say on behalf of the company that it stands ready to enter into a contract with the city of Philadelphia incorporating the spirit of the 1914 plan, with the 1915 amendment as to exchange tickets, and that it will go just as far in this matter as its credit will permit. It will be necessary, however, to make such financial arrangements as may be required to enable the company to secure the money not only for the equipment of city-built lines, but for its own current needs for refunding and extensions. The problem does not seem to us to be insurmountable, but is one which will require careful thought and conces-

sions on both sides. The understandings which have been reached between the company and the city's representatives are not to be confounded with the form of contract which has been submitted to you by his honor, the Mayor. That is a draft in the preparation of which the rapid transit company representatives have had no voice. As already stated, however, we stand ready to carry out the understandings of 1914 and 1915 to the extent of our ability, and for that purpose will be glad to join with the city in the preparation of a contract which shall fairly protect both parties."

Chairman Gaffney, of the finance committee of Councils, has invited officials of the Philadelphia Rapid Transit Company, the Union Traction Company and the Market Street Elevated Railway to confer on details of the future contract with himself, the Mayor and Chairman Seger, of the street railway committee.

At the meeting of the directors of the Philadelphia Rapid Transit Company held on Nov. 20, E. T. Stotesbury and T. E. Mitten were appointed a special committee of the board to negotiate with the representatives of the city in connection with the proposed agreement between the city of Philadelphia and the company for the operation of the city-built high-speed lines.

DALLAS NEGOTIATIONS CONCLUDED

The proposed franchises to be granted by the city of Dallas, Tex., to the consolidated street railway and the new lighting company to be organized by J. F. Strickland and C. W. Hobson were approved at a conference on Nov. 19 between city officials and the Strickland-Hobson interests. There remains the taking of the straw vote by which the citizens of Dallas will pass on the proposed valuation of \$8,500,000 for the street railway properties. The vote will be taken within the next few weeks, and if the valuation of \$8,500,000 is approved instead of the valuation of \$7,100,000 as fixed by E. W. Bemis after a survey of the properties, the settlement will become a reality.

The lease by which the Strickland-Hobson interests will take over the operation of the Oak Cliff lines expires in 1935, and will give the new traction company control of all properties of the Northern Texas Traction Company within the corporate limits of Dallas. The lease gives Mr. Hobson the option to purchase the leased properties when the mortgages of the traction company are discharged. The Northern Texas Traction Company maintains the right to operate its interurban railway into the city. This company also agrees to complete the viaduct across the Trinity River. Rent to be paid by the Hobson company is based upon the sliding scale, beginning with \$115,000 a year and increasing in the seventh year to \$150,000.

The valuation agreed upon by the city and the utilities interests for the Oak Cliff lines is \$1,665,760, as of Sept. 30, 1915. Since that date approximately \$120,000 has been spent in betterments. If the Hobson company buys the traction company's properties it must pay \$2,000,000, or if the city should take over the lines it will have to pay the 1915 valuation figures plus expenditures made up to the time of purchase.

The actual cost of the interurban terminal up to Sept. 30 is given at \$1,301,516. With other bills to be paid and costs for other real estate to be taken in for the use of cars not having been transferred to the terminal company, the total cost of the terminals will be brought up to a figure estimated at \$1,500,000. Additional property to be used for parking of cars, across Wood Street from the rear of the terminals, is to be acquired.

Arrangements are being made to place before the voters in pamphlet form all the details of the settlement, including a review of the negotiations and the new contracts and proposed franchises in full.

CHICAGO ALDERMEN RETURN FROM INSPECTION
Alderman Capitain, Chairman of the Local Transportation
Committee, Gives Impressions of Ten Days'
Study in Eastern Cities

The sixteen Chicago aldermen, members of the local transportation committee of the City Council, have returned to Chicago after their ten-day trip through the East to study city railway conditions. In an interview in Chicago with a representative of the *ELECTRIC RAILWAY JOURNAL*, Alderman Capitain, chairman of the committee, gave the principal impressions which the aldermen received as the result of their study. He said that the aldermen noted particularly the co-operation between the companies and the municipalities. Apparently the public could have anything it wanted in the way of transportation so long as it was willing to shoulder its proper part of the cost. The committee was impressed particularly with the progress which has been made in the electrification of steam railroads around New York City, and with the plans under way by the New York Central Railroad for the complete electrification of the West Side yards.

Mr. Capitain thought that Chicago was particularly fortunate in that conditions in the East gave to Chicago a greater incentive to better its transportation facilities, and afforded that city an opportunity to profit by experience. As an example of this, he said that Chicago had formerly considered a subway for surface lines only, while now it was evident that with a unification of the surface and elevated lines, the subway would need to be so constructed as to take care of the through service rapid transit of the elevated system as well. The delay in the Chicago work and study has also shown the necessity of laying out the subway system so that it could ultimately be expanded to make a comprehensive system. In Boston, conditions some time ago were such that it became necessary for the city to handle the constructing of its subways. This had necessitated the building of additional subway lines later at extremely high cost.

The committee was inclined to believe that the Boston situation came nearer than any other to the work that it will be necessary to carry out for Chicago. The members of the Chicago party were very much interested in the Cambridge station of the Boston subway because of the very efficient system of separating the routes of people leaving and entering the system. The Chicago situation in general would be simpler to solve than that in Boston, because the layout of Chicago required less transferring of passengers.

Alderman Capitain thought that Chicago had also been particularly fortunate in the 1907 settlement. He believed that the 1907 ordinances had worked out very satisfactorily and had been a good financial arrangement, except that some charges were made against the nickel which should not be made. In these unwarranted charges he included an item of some \$8,000,000 which the companies had been forced to spend in paving. This was capitalized into the physical valuation of the property. He said that when one considered that the street railways increased property value from 100 to 1000 per cent, it did not look reasonable that the car riders should pay this paving bill. If that amount of money had been allowed to go into service to the direct benefit of the riders, it would have meant a great deal to them. The Chicago companies were also forced to repair this pavement, which they did not wear out, and this had also run to several millions of dollars since the 1907 ordinance. They were also required under the 1907 grants to clean 16 ft. of the street and were now paying between \$300,000 and \$400,000 a year for this. The outlying district and the real estate dealers had been so insistent in having the city take advantage of the ordinance provision for a certain amount of extensions each year that the car riders had paid the price and the property owners reaped the benefit.

The feature of the Chicago ordinances which allowed the companies to earn a certain percentage on their capitalization and after that to divide the net profits with the city Mr. Capitain thought to be a good one, as it furnished an incentive to the companies to scrutinize expenditures carefully. He contrasted this with the Cleveland arrangement, guaranteeing a return of 6 per cent to the railway.

The franchise situations in the cities visited were discussed freely with the various companies and the municipal boards. From these discussions the committee got the general impression that the indeterminate form of franchise was probably best suited to modern conditions. This form of franchise can be written to provide for regulation by a competent commission with some freedom in the exercise of its supervision, but recognizing the underlying principle that a sufficient return on the capital investment as determined by experts must be allowed.

In speaking of the municipal regulation of transportation companies, Mr. Capitain remarked that one of the difficulties had been that the operating company would secure a very high-grade man paying him a salary of \$25,000 or \$30,000, while the city would retain a man at \$6,500 or \$7,000 a year to supervise the work of the railway. He thought that the only successful way to meet this situation was for the city to retain as its representative a man fully as capable as any in the employ of the railway. He also remarked that the farther such regulatory bodies could be removed from politics, the better would be the results obtained.

The trip was considered to be a very successful one. Mr. Capitain remarked that everyone who met the committee went out of his way to give the members every opportunity for inquiring into the methods of the various systems, and that the city of Chicago ought to be grateful for these courtesies. He is of the opinion that as a result of the trip, the committee is very much better prepared to receive the report the Chicago Traction and Subway Commission and to recommend more intelligently than before to the City Council as to what ought to be done.

CLEVELAND POWER HEARING CONTINUED

Warren Bicknell Substituted for Joseph Alexander as Arbitrator on Account of Accident—New Bid from Municipal Plant

The hearing on the power contract between the Cleveland (Ohio) Railway and the Cleveland Electric Illuminating Company was held up for some days last week because of an accident to Joseph Alexander, one of the arbitrators, which resulted in a fractured knee. On Nov. 16, however, the hearing was resumed with Warren Bicknell, president of the Cleveland Construction Company, in Mr. Alexander's place.

Peter Junkersfeld, vice-president of the Commonwealth Edison Company, Chicago, was the principal witness that day. He said he considered the contract proposed as very advantageous to the railway because of the low rate. So far as the municipal light plant's bid was concerned, Mr. Junkersfeld said it was a desirable one from the standpoint of price, but there seemed to be no assurance that the municipal plant could give continuous and dependable service. His own company could not take a contract at the prices made to the railway in Cleveland. In his opinion the Cedar Avenue power house of the railway should be dismantled.

F. W. Ballard, former light commissioner of Cleveland, was the witness on Nov. 20. He estimated that the Illuminating Company would have an investment of \$1,985,000 in equipment to take care of the contract. On this he declared the company would make a profit of \$202,442 a year above the 7 per cent that should be allowed on the investment. Mr. Ballard said the contract was also advantageous to the Illuminating Company because it would reduce the unit cost of production, and because the railway agrees to pay the extra cost of coal above \$2.25 per ton. He considered that \$2.40 a ton would be a good average price for coal for the next five years.

The Cleveland municipal light plant submitted a second bid for the power contract of the Cleveland Railway to Street Railway Commissioner Sanders on Nov. 20. Light Commissioner Davis said that it is at the rate of 5.02 mills per kilowatt-hour. He said he had figured the rate at 12½ per cent above the cost of production. If the plant received the contract, Mr. Davis said he would recommend the purchase of two 15,000-kw. turbo-generators at once, and if it did not secure the business, one such generator should be purchased any way to take care of the increased domestic business that is awaiting.

TOLEDO COMMITTEE RESUMES SESSIONS

Franchise Allowances, Fares, the Purchase Fund and Hauling Freight All Considered Before the Street Railway Commission

Henry L. Doherty, chairman of the board of directors of the Toledo Railways & Light Company, Toledo, Ohio, met with the street railway commission of that city on Nov. 16 to continue the discussion on the proposal to establish a community company to take over the railway property. The proposed rate of fare was the first question taken up. Mr. Doherty said it would be possible to have a low fare, if that was the supreme object of the city. The aim of the present company had been to furnish good service. One way to reduce the fare was to cut out stops. In Cleveland 1200 stops had been eliminated. Mr. Doherty suggested that if fares were to be reduced, a start should be made with the present fare as a basis. The next step in revision downward could be seven tickets for a quarter, with a 1-cent charge for transfers. In case a further reduction was decided upon, the charge for transfers could be removed.

Mr. Doherty opposed the idea of a stated allowance per car-mile for operation and maintenance. He said that the management would be more efficient if left to operate as cheaply as possible. He also objected to the clause in the proposed franchise making it impossible to sell bonds. If three-fourths of the stockholders favored an issue of bonds, their sale should be allowed.

On the following day the clause fixing a maximum fare at 5 cents was taken up. Mr. Doherty told the commission that the matter should be left open, so that 10 cents could be charged on owl cars. He argued that it might eventually be advisable to adopt the zone system of fares. With such a provision in the contract, this change would be impossible.

Another question was the manner in which the proposed purchase fund should be disposed of, in case the city decided not to take over the road. John Usher, president of the street railway commission, contended that it should go toward amortizing the debt of the company or become the property of the city. Mr. Doherty suggested that it be turned over to the equalization fund and the company allowed to operate at a lower rate of fare for a time.

Judge Emery, in discussing the question of operating freight cars over the city tracks, said he believed that a lower fare could be established through a more economical handling of freight over the tracks. Mr. Usher thought people would object. Mr. Doherty suggested that food prices in the city would be reduced if freight could be hauled over the city tracks by electric power.

On Nov. 20 an agreement was reached between the commission and Mr. Doherty that an equalization fund shall be accumulated automatically in case the rate of fare produces a greater income than is required for operating, maintenance and other expenses, and 6 per cent dividends to the stockholders. When the fund gets below \$100,000 the company may increase the fare to the next higher rate and when it exceeds \$200,000, Council may order the next lower rate on the proposed schedule put into effect.

It was agreed that the matter of hauling freight should be left to the City Council. The clause limiting the fare to a maximum of 5 cents was discussed, but was left unchanged for the present. It seems that members of the commission do not expect the zone system to be introduced for some time. Commissioner Cochran said that, in the case of men working at night, it would not be right to charge them a fare higher than those who work in the daytime. Mr. Doherty argued that the fare on owl cars should be 10 cents and that employers would help to pay the fare of men who work at night.

Mr. Doherty objected to a clause which would allow the city to grant a franchise to another company in a prescribed territory. Commissioner Cochran supported him in this and said a city had about as much use for two street railways as for two telephone companies. Two companies operating the same kind of service in a community were a nuisance.

As to an amortization clause, Mr. Doherty said he would accept the one used in the Cleveland contract, but believed a clause a little more favorable to the city could be drafted. He was asked to prepare one.

FULL SERVICE IN INDIANAPOLIS

Governor Ralston, Holding Out Little Hope to Union Men, Presents Modified Demands to Company, Which Rejects Them

A committee representing the union street car men who quit work in Indianapolis, Ind., refusing to sign the company's individual working agreement, appeared before Governor Ralston on Nov. 16. They left with him a copy of a proposed working agreement which they wished him to present to Robert I. Todd, president of the Indianapolis Traction & Terminal Company, in an effort to resume negotiations between themselves and Mr. Todd. The modified agreement differed from their original demands which caused the company to break off negotiations, principally in that it did not provide for a closed shop. The rate of wages asked for originally also was reduced.

The Governor discussed the matter informally with the committee of union street car men and business agents of labor organizations. He said he would present the matter to Mr. Todd and they could return for an answer the following day. He held out no hope of being able to accomplish anything for them. During the discussion, the fact that the Governor called out the State militia during the street railway strike in 1913 was mentioned. The Governor then advised the committee that the administration intended to stand for law and order at all times, and that in the case mentioned he had brought the militia to the city entirely on his own responsibility.

Upon the matter being submitted to him in a letter from the Governor, Mr. Todd immediately wrote to Governor Ralston. His letter set forth the situation fully. Mr. Todd said in part:

"This company now has a full complement of employees, who are working under conditions and wage contracts satisfactory to them and to the company. All employees of this company engaged in car service are employed under a uniform agreement covering wages and working conditions. Less than 20 per cent of the car service men in the employ of the company prior to Nov. 9 refused to accept the terms of employment agreed to by more than 80 per cent of their fellows, and left the company. Some of this minority abandoned their cars and passengers in the public streets. They were invited and urged to remain in our service on the very terms accepted by an overwhelming majority of the men. They refused. Although in numbers a small minority, they were determined to dictate terms for a majority, and to force the company to discharge that majority if it did not accede to their demands. It should be very evident to all that the present contracts cannot be set aside or ignored. They are signed by all present employees engaged in car service. Both the men and the company recognize them as valid and binding upon them. It would be intolerable discrimination to have more than one form of contract among our men.

"We manifestly could not for one moment consider the replacing of any of the loyal, efficient and reliable men who are now operating the cars, in order to make places for men who have so little regard for their fellows and the public service that they first demanded the discharge of 80 per cent of the motormen and conductors unless the company forced them into their union, and when they failed in that, deserted their cars, and in some cases left carloads of passengers stranded in the streets. Therefore, as we now have a full force of employees, who by their loyal and faithful service have earned the runs they now hold, and the working agreement with car service men has now been signed by every man engaged in car operation, nothing practical could be expected to result from such a meeting as has been proposed by these former employees."

Otto Ray, president of the Central Labor Union, complained to Mayor Bell of the activities of the police. The Mayor said: "The duty of the police force is to maintain law and order. I do not intend again to permit conditions such as occurred three years ago. The police force will be used to protect the rights of all citizens."

On Nov. 18 at a night meeting of the former employees a strike vote was taken, but the purpose of this vote or the result of same was not announced by the labor leaders until Nov. 20, when printed cards were circulated, stating that a

"street car strike" would be in effect at 11 o'clock that night. A mass meeting was held at Labor Hall, at which it is reported those who attended were incited by radical speakers to go out on the streets and damage the cars of the company, to be at the carhouses early in the morning and prevent men from taking out their cars. The excellent organization of the police department, however, prevented even the assembling of groups of labor sympathizers on the streets, and the company maintained all its schedules without any interruption or disorder.

The action of Amalgamated Association officials in calling a "strike" of men who had ceased all relations with the company ten days previously, and the reported inciting of these men to interfere with the cars in violation of an injunction of the United States court, was taken the same day that a committee of the American Federation of Labor, in session at Baltimore, reported that "we, therefore, recommend that any injunctions dealing with the relationship of employer and employee, and based on the dictum, 'labor is property,' be wholly and absolutely regarded as usurpation, and disregarded, let the consequences be what they may."

RAILWAY HELPS TO DEFEAT BRIDGE

A bridge proposition was defeated in Pottawattamie County, Iowa, at the general election on Nov. 7 by a vote of two to one.

The proposition involved a bond issue of \$200,000 by Pottawattamie County, Iowa, to aid in the construction of a free bridge between Omaha, Neb., and Council Bluffs, Iowa. The promoters of the project asked Pottawattamie County, Iowa, to pay \$200,000 and Douglas County, Neb., to pay \$600,000.

Douglas County, Neb., was not to vote on the question until next year, on or before June 1, 1917, but inasmuch as the plan failed to carry in Pottawattamie County, Iowa, it is improbable that the question will be voted on in that county.

The project was opposed by the Omaha & Council Bluffs Street Railway. The campaign of the company in opposition to the project consisted of the distribution of cars on the Iowa division of a series of short "talks" to the voters. Each "talk" remained on the cars two days. The company also published these talks and other matter in the newspapers of Council Bluffs, and did considerable advertising, in the form of readers, in the country papers throughout the county. It also arranged with an organization, formed to protest against the bridge bond measure, to mail to every voter in the county a letter giving reasons why taxpayers should defeat the bonds.

The free bridge committee also conducted a campaign. The committee took space in the papers, sent out circular letters and posted cards, and had workers at the polls.

LIBERAL POLICY REWARDED

A decision has been handed down by the Railroad Commission of California establishing rates for the San Diego Consolidated Gas & Electric Company, a subsidiary of Standard Gas & Electric Company, controlled by H. M. Byllesby & Company, Chicago. Existing rates for both gas and electric current were left practically unchanged, but the minimum monthly charge for electric service was reduced from \$1 to 75 cents. Minor reductions were made in various rates, but these had been voluntarily offered by the company in submitting its case to the commission, which, in making the decision, upheld the principle of centralized management in public-utility operation. The commission, in handing down the decision, said:

"The testimony shows that the San Diego Company's policy towards its customers has been praiseworthy. The company has voluntarily made reductions in rates from time to time, has been liberal in the construction of extensions at its own expense, and has exerted itself at all times to give to its customers good service. The number of informal complaints against the company which have come to the commission has been relatively very small. A public utility which pursues such a fair and reasonable policy towards the public is entitled to consideration from the public authorities charged with the duty of supervising and regulating public utilities."

CO-OPERATIVE CONFERENCE BETWEEN OFFICIALS AND UNION

Following the signing of the working agreement between the Bay State Street Railway and the local branches of the Amalgamated Association, noted in the *ELECTRIC RAILWAY JOURNAL* of Nov. 18, page 1072, a conference was held between officials of the company and union representatives at the Quincy House, Boston, Mass., on Nov. 18 to promote mutual understanding. Twenty-nine days were included in the period which the negotiations leading to the signing of the agreement required. At the meeting last week nearly ninety men were present, including many heads of departments in the company, with delegations from each of the local unions on the system from Nashua, N. H., to Newport, R. I.

R. S. Goff, who is vice-president and general manager of the company, presided. Mr. Goff said that the agreement was regarded by both parties as one of the best possible. He believed that the negotiations which led to its conclusion were preferable by far to arbitration, and paid a tribute to the excellent spirit developed during the conferences. J. H. Reardon, for the union, said that the agreement was, in his opinion, the best thus far reached, and that the interests of the parties were identical. He hoped that the members of the union would prove that a contract with the union was as good as any other security on earth. President Sullivan of the company, who was also present, informally discussed the ways in which his hearers could assist in disciplining themselves and the members of their organization, and emphasized the need of rules and regulations in the conduct of a railway system.

INCREASE IN WAGES IN KANSAS CITY

P. J. Kealy, president of the Kansas City (Mo.) Railways, announced to the men during the first public concert by the company band that an increase of wages for trainmen averaging 7 per cent would go into effect on Nov. 16. The new schedule is as follows: First six months, 22 cents an hour; second six months, 23 cents; second year, 24 cents, and so on up to the eleventh year, when the rate is 30 cents. The minimum monthly wage is increased from \$45 to \$55. The advance for the newer men in the service is 1 cent, while the advances for most of the older men are 2 cents an hour. Men in the street sweeper service are to receive 32 cents an hour. Operators of one-man cars are to receive 2 cents an hour above the standard rate. Previous wage advances on the Kansas City Railways were as follows: April 12, 1907, 1 cent; May 16, 1910, 1 cent; Aug. 7, 1913, 1 cent, and immediately after the granting of the new franchise, on July 29, 1914, 1 cent.

In his address to the men, Mr. Kealy said that the wage increase was one of the items on his announced program of several months ago. He hoped to see the people connected with the company molded into one big family, the men owning their own homes, and permanently located in Kansas City and in their jobs. He said the company desired to see that the employees got a just and equitable part of the earnings, that the investors received a just and equitable return of their investment, and that the people of Kansas City got fair and reasonable service. With reference to safety work, Mr. Kealy said that as the claims against the company for accidents were reduced below a certain average normal figure, the wages would be increased above normal.

The increase of 5 per cent in the earnings of the company since April 1 is attributed partly to the co-operation of the employees, as a result of the welfare and similar work. The welfare program so far worked out includes the *Railwayman*, the monthly magazine; the jubilee, a great gathering at which 11,000 employees and members of their families were present; the organization of the band, whose first concert was the occasion for the wage-increase announcement; the free legal-aid bureau; the loan bureau, and the encouragement of athletics. Parts of the program now under way include the establishment of a savings and building loan fund, and the encouragement of the men to buy or build suitable homes; a pension system, and centralization of car headquarters.

WAGE REQUEST WITHDRAWN

Wage differences which have been a subject of discussion for several weeks between transportation department employees and the Denver (Col.) Tramway have been settled satisfactorily. The men have agreed to postpone their request for an increase. Herbert W. Joslin, chairman of the committee representing the men, is quoted as having said:

"The company has shown us its position in this matter, so that we believe in fairness the request for raise in wages should be postponed. While the present high cost of living would have made a raise more than welcome, we can see from the showing made by the company that we are not the only ones who have increased expenses to meet. There will be no further demand unless conditions change."

It is understood that investigations made by the men have brought out that Denver conductors and motormen are getting about the same wages that similar employees in other cities of the same size are getting, and with conditions as they are in Denver at present they have decided to let well enough alone. It is also stated by employees of the company that the excellent treatment of the men in other matters besides wages has had a great bearing on the amicable settlement of the question. At the meetings at which the matter was taken up tramway officials invited all the men in to see the figures on their side, and the committee presenting the request received every consideration.

ADDITIONAL GENERATING CAPACITY FOR TOLEDO

Henry L. Doherty, of H. L. Doherty & Company, who operate the Toledo Railways & Light Company, Toledo, Ohio, under contract, announced at Toledo on Nov. 20 that plans are being completed for a new central station for that city, which may have a capacity of 120,000 kw. and cost about \$6,000,000. He said that such a plant will be capable of taking care of an increase of 100,000 in population. It is possible that it will be located on the old rolling mill property on the East Side, which is owned by Mr. Doherty, but if it proves that this property is too high for the purpose, the plant may be placed outside the city limits.

It is not the intention to abandon the Water Street plant, the capacity of which has been gradually increased to 80,000 kw. In all probability the city railway lines will depend upon the company for power, however they may be owned. In any event, the interurban roads will need additional power, and both the power and light business in the city is growing rapidly.

Mr. Doherty said he had asked M. R. Bump, chief engineer of the Doherty properties, to come to Toledo with all his plans, and thereafter the two will hold daily sessions until they are fully completed.

Mr. Morse Named as Pittsburgh Transit Inspector.—Edwin K. Morse was named as Transit Commissioner by Mayor Joseph G. Armstrong of Pittsburgh, Pa., on Nov. 6. The Council has confirmed the nomination.

Covington Dismissals Upheld.—Both the company and the men have announced that they will abide by the findings of the arbitration commission, filed in Covington, Ky., upholding the South Covington & Cincinnati Street Railway, Covington, Ky., in its right to discharge six employees charged with drinking while on duty.

Bay State Street Railway to Sell Parks.—The Public Service Commission of Massachusetts set Nov. 24 as the date for hearing a petition of the Bay State Street Railway for authority to sell amusement parks in Freetown, Dighton, Westwood, Methuen, Tyngsboro and Gloucester. In its recent decision in the company's 6-cent fare case, the commission intimated that such parks were not a source of profit to the company and suggested that they be disposed of by the management.

Petition for Abandonment Withdrawn.—In the *ELECTRIC RAILWAY JOURNAL* for Oct. 7, page 747, mention was made of the fact that Ansel M. Easton had applied to the Railroad Commission of California for permission to abandon the Burlingame Railway. The day before the time set by the commission to hear the application, Mr. Easton withdrew the application, having decided to continue the operation of the line. It is more than likely now that new equipment will be installed at an early date.

Shawnee Strike Ended.—After having been idle since Nov. 1 on account of a strike of motormen and conductors, the Shawnee-Tecumseh Traction Company on Nov. 18 resumed operation of its local cars and the interurban line from Shawnee to Tecumseh. An agreement was reached between strikers and the company through State Labor Commissioner Ashton and Mayor Stearns of Shawnee as a board of mediation. The agreement is a compromise.

Suggests Municipal Ownership for Cincinnati.—Carl Brannin, the manager of the People's Power League, sent a communication to the Rapid Transit Commission of Cincinnati, Ohio, and the conference committee of the Council committee on street railways on Nov. 17, in which he advocated the municipal ownership and operation of the proposed rapid transit loop and the surface lines. Mr. Brannin had been invited to make an address, but sent the communication instead.

Rehearing Asked in Valuation Case.—The Portland Railway, Light & Power Company, Portland, Ore., has filed with Public Service Commission of Oregon a petition asking for a rehearing in the case recently decided by the commission, fixing the valuation of the company's properties. Reconsideration is desired by the company particularly on the findings of the commission fixing the value of the company's working capital, reproduction costs, franchise, water powers, original cost and depreciation annuity.

Amalgamated Organizer Thorpe Dead.—John J. Thorpe, first vice-president of the Amalgamated Association, who conducted the Pittsburgh strike of a year ago and the unsuccessful strike of the Harrisburg (Pa.) Railways last summer, died at Hot Springs, Ark., on Nov. 19 from heart trouble and dropsy. He was forty-three years old, and is survived by his widow. By his tactics at Harrisburg Thorpe drew down upon himself the wrath of Mayor Meals of that city, who characterized him as "a mighty bad man."

Expediting Adamson Law Case.—The Adamson eight-hour law was held on Nov. 22 to be unconstitutional by Judge William C. Hook in the United States District Court at Kansas City, Mo. The court made it plain that the decision was not based on mature consideration of the merits of the case, but on expediency desired by all parties at interest because of the necessity of a final decision by the Supreme Court of the United States before Jan. 1, when the law goes into effect. Electric railways are specifically exempted from the provisions of the measure.

Horses in New York Until April.—The New York (N. Y.) Railways has informed the Public Service Commission for the First District of New York that it has been impossible to secure the storage-battery cars for the Madison Street and Avenue C line as rapidly as the company had expected because of the condition of the car-manufacturing trade, but deliveries would begin early next month at the rate of three to five cars a week. This will enable the company to equip the line with the new cars by April 1, 1917, and by that date the last of the horse cars to be operated on Manhattan Island will be retired. The commission accordingly granted an extension from Dec. 1 to provide such equipment.

Conference on Mill Tax in St. Louis.—City officials of St. Louis, Mo., and officers of the United Railways plan to confer on the subject of the mill tax and the duration of the underlying corporation's franchises. Richard McCulloch, president and general manager, Murray Carleton and A. L. Shapleigh, directors, will represent the railway. It is expected that the discussions of the company's proposals and the city's counter propositions will require several weeks before a bill embodying any compromise that may be reached is introduced before the Board of Aldermen. In a letter written several weeks ago to City Counsellor Daues, H. S. Priest, general counsel for the railway, declared that the company could not pay the mill tax, meet its obligations to bondholders and make improvements.

Springfield Company Appeals for Revision of Excise Tax.—The Springfield (Mass.) Street Railway has petitioned the Public Service Commission of Massachusetts for a revision of its payments to local municipalities under the excise tax law. The company contends that the average annual amounts paid in the last three years as an excise tax under the Acts of 1909, Chap. 490, are in excess of the average

annual cost to each city and town named of the work done by it under the provisions of this act during the three years. Under the law the money received by the municipality is to be used in track construction and maintenance and in the removal of snow and ice. Fourteen towns are listed, the track mileage ranging from 0.85 to 22.11 and the taxes from \$271 to \$7,064. The commission will hear the petition on Dec. 4 at Boston. This is the first case of its kind to come before the board.

Legitimacy of Pay Roll and Business.—W. D. B. Dodson, executive secretary of the Portland (Ore.) Chamber of Commerce, addressed members of that body recently on "Legitimacy of Pay Roll and Business." The chamber is endeavoring to show that a part of the depression in the Pacific Northwest is due to lack of support of the community to legitimate business. In concluding his remarks Mr. Dodson said that the Chamber of Commerce was going to try to change public sentiment to an appreciation of the necessity of getting the payroll firmly fixed and not allowing irresponsible elements to come in and attack it with impunity. In this work the members of the Chamber of Commerce and the community as a whole must co-operate, and the success in the plan of encouraging the upbuilding of the payroll depended very largely upon the response to the appeal. The speech was considered very significant, coming as it did on top of the granting of the open shop on the river front at Portland, where the members of the longshoremen's union, when their strike fell through, were compelled to return to work on the same basis as paid by other coast cities and with an open shop, something new to Portland for the first time in many years.

PROGRAM OF ASSOCIATION MEETING

Safety First Federation of America

The convention of the Safety First Federation of America in Baltimore, Md., on Dec. 7, 8 and 9, referred to previously in the *ELECTRIC RAILWAY JOURNAL*, will be the second annual gathering of the federation, and will be under the auspices of the Safety First Society of Baltimore with headquarters in the Hotel Emerson. Darwin P. Kingsley, president of the federation, will preside at all sessions. The afternoon session on Dec. 7 is to be devoted to street traffic and will be as follows:

Report of the street traffic committee on the standard code of traffic regulations, headlight glare and code of signals. This report will be presented by John Gillespie, chairman of the committee, who is ex-commissioner of police of Detroit, Mich.

Address, "The Necessity of Examining and Licensing All Operators of Motor Vehicles," by Arthur Woods, commissioner of police of New York.

Address, "Baltimore's Recent Contribution to Street Traffic Regulation," by Robert D. Carter, marshal of police of Baltimore.

Address, "The Work of the Traffic Court," by Joseph Satch, judge of the superior court of Cook County, Chicago, Ill.

Address, "The Necessity of Distinct Examination for Operators of Different Types of Cars," by E. Austin Gaughman, automobile commissioner of Baltimore, Md.

Address, "Co-operation on Behalf of Automobile Manufacturers," by J. Walter Drake, chairman of the safety first committee of the National Automobile Chamber of Commerce.

Address, "The Pedestrian's View of Traffic," by H. W. Rowe, president of the American Automobile Association.

The morning of Dec. 8 will be devoted to discussions of the trespass problem and the question of reducing accidents upon the right-of-way of railroads. The afternoon session on Dec. 8 will be given over to a discussion of fire prevention.

A number of miscellaneous matters will be considered at the closing session on Dec. 9. At that session, C. Loomis Allen, Syracuse, N. Y., ex-president of the American Electric Railway Association, will report for the committee on city and interurban railways and William A. House, president of the United Railways & Electric Company, Baltimore, will discuss "Safety First Movement from the Street Railway Point of View."

Financial and Corporate

UTILITY ISSUES AS COLLATERAL

Utility Bonds Constitute More Than One Quarter of Number of Issues Deposited Against British Loan

The list of securities serving as collateral for the recent \$300,000,000 of 5½ per cent British government gold loan covers two distinct groups of securities aggregating in value \$180,000,000 each. One group is made up of bonds and other obligations of the governments of Australia, South Africa, New Zealand, Argentina, Chile, Cuba, Japan, Egypt and India, together with \$25,000,000 of British railroad securities. The other group consists of Canadian government bonds and at least \$100,000,000 of American securities.

The American securities include 127 stock issues and 615 bond issues. The stock group is divided into fifty-four steam railroad issues, sixteen utility issues and fifty-seven industrial and miscellaneous issues. American Light & Traction preferred, California Railway & Power prior preference, Detroit United Railway and Twin City Rapid Transit common and preferred are among the stocks deposited from abroad. The bond group comprises 437 steam railroad issues, 120 public utility issues (including fifty-two electric railway issues) and fifty-eight industrial and miscellaneous issues. The electric railway bonds follow:

Albany Ry. general M. 5s, 1947.	Lynn & Boston RR. 1st M. 5s, 1924.
American Cities 8-year 5-6% col. tr. 1919.	Milwaukee Elec. Ry. & Lt. cons. M. 5s, 1926.
American Pwr. & Lt. 10-yr. 6s, 1921.	Minneapolis St. Ry. & St. Paul City Ry. cons. M. 5s, 1928.
Auburn & Syracuse Elec. RR. 1st & ref. M. 5s, 1942.	Nashville Ry. & Lt. ref. & ext. 5s, 1958.
Broadway & Seventh Ave. RR. 1st cons. M. 5s, 1943.	Nassau Electric RR. 1st cons. M. 4s, 1951.
Brooklyn Rapid Transit—Secured 5% notes, 1918. 1st & ref. M. 4s, 2002. 5s, 1945.	New Orleans Ry. & Lt. gen. 4½s, 1935.
Brooklyn Union Elev. 1st M. 5s, 1950.	Newport News & Hampton Ry., Gas & Electric 1st & ref. M. 5s, 1944.
Central Illinois Pub. Serv. 1st & ref. M. 5s, 1952.	Northwestern Elev. Ry. 1st M. 5s, 1941.
Chicago City Ry. 1st M. 5s, 1927.	Pennsylvania & Mahoning Valley Ry. 1st & ref. M. 5s, 1922.
Chicago Rys. 1st M. 5s, 1927.	Portland Ry. 1st & ref. M. 5s, 1930.
Connecticut Ry. & Lt. 1st ref. M. 4½s, 1951.	Portland Ry., Lt. & Pwr. 1st ref. 5s, 1942, series A.
Dallas Electric 1st. M. collat. tr. 5s, 1922.	Puget Sound Trac., Lt. & Pow. 6s, 1919.
Detroit United Rys. 1st cons. 4½s, 1932.	Rochester Ry. M. 5s, 1930.
Duluth Street Ry. 1st M. 5s, 4½s, 1932.	St. Louis, Springfield & Peoria RR. 1st & ref. 5s, 1939.
Gen. M. 5s, 1930.	St. Paul City Ry. cons. cable 5s, 1937.
Eastern Penna. Rys. 1st M. 5s, 1936.	San Joaquin Lt. & Pwr. Corp. 1st & ref. 5s, 1950, "B."
Eastern Power & Light Corp. convert. 5s, 1918.	Spokane & Inland Empire RR. 1st ref. M. 5s, 1926.
Federal Lt. & Trac. 1st lien s. f. 5s, 1942.	Third Ave. RR. 1st M. 5s, 1937. 1st ref. 4s, 1960.
Georgia Lt. Pow. & Rys. 1st lien 5s, 1941.	Adjust. M. 5s, 1960.
Hudson & Manhattan RR. 1st lien & ref. M. 5s, "A," 1957.	Tri-City Ry. & Lt. 1st ref. 5s, 1930.
Indiana Ry. 1st M. 5s, 1930.	United Light & Rys. 1st & ref. M. 5s, 1932.
Int.-Met. collat. tr. 4½s, 1956.	United Ry. & Elec. 1st cons. 4s, 1949.
Interborough Rapid Transit—1st M. 5s, 1966. 1st M. 5s, 1966, reg.	United Rys. Investment 1st lien collat. tr. 5s, 1926.
Kings County Elev. RR. 1st M. 4s, 1949.	Washington Wtr. Pwr. 1st ref. M. 5s, 1939.
Lexington Ave. & Pav. Ferry 1st M. 5s, 1933.	
Manhattan Ry. cons. 4s, 1990.	

TRUST COMPANY WANTS BETTER TERMS

The Mercantile Trust & Deposit Company, Baltimore, Md., has addressed the holders of the 4 per cent gold bonds of the United Railroads, San Francisco, Cal., in part as follows:

"As owners of and the representatives of owners of a substantial amount of bonds of the above issue, we have studied the proposed plan of reorganization of the United Railroads of San Francisco.

"It is our opinion, after a careful examination of the financial condition of the company, that a reorganization can be effected which, while fair and just to the holders of the junior securities, insures to the holders of the 4 per cent bonds a more advantageous settlement than that proposed in the present plan. To effect such a reorganization will require concerted action on the part of a large number of holders.

"We are advised that only \$6,000,000 of the total of \$23,000,000 of bonds have been deposited as consenting to the proposed plan.

"If the holders of sufficient bonds co-operate with us, arrangements will at once be made looking to the appointment by the holders of a committee who will actively endeavor to obtain more advantageous terms for these bonds in the re-organization."

ANNUAL REPORT

Eastern Pennsylvania Railways

The comparative income statement of the Eastern Pennsylvania Railways, Pottsville, Pa., for the years ended June 30, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Gross earnings	\$901,490	100.0	\$825,455	100.0
Operating expenses	529,195	58.7	469,083	56.8
Net earnings from operation	\$372,295	41.3	\$356,372	43.2
Taxes	20,452	2.3	17,487	2.1
Net earnings from taxes	\$351,843	39.0	\$338,885	41.1
Deductions—underlying companies	47,453	5.3	47,132	5.8
Balance	\$304,390	33.7	\$291,753	35.3
Deductions—Eastern Pennsylvania Railways	184,682	20.4	180,651	21.9
Balance	\$119,708	13.3	\$111,102	13.4

During the last year the gross earnings increased \$76,034 or 9.2 per cent and totaled the largest in the company's history. Of this increase only \$9,942 was derived from the purchase of new properties operated only a few months. The operating expenses, however, increased \$60,111 or 12.8 per cent, so that the increase in net earnings was \$15,923, an increase of 4.5 per cent. The increase in operating expenses was chiefly caused by the cost of more power to take care of increased business, a larger expenditure for replacements and renewals, workmen's compensation expenses, increased wages and increased cost of materials and supplies. Taxes increased \$2,965 or 16.9 per cent. The balance available for depreciation, amortization and dividends, however, showed an increase of \$8,605 or 7.7 per cent after all charges were paid.

MAJORITY STOCKHOLDERS GUARDIANS OF MINORITY INTERESTS

If a decision just handed down by Justice Giegerich of the New York Supreme Court is not reversed, the Delaware, Lackawanna & Western Railroad will have to give up the lease of a little railroad which it absorbed in 1911. This road is the Syracuse, Binghamton & New York Railroad, which has been plying between the two first named cities since it was organized in October, 1850. The road is only eighty-one miles long. It had been paying for many years around 25 per cent dividends on its capitalization of \$2,500,000, except in 1912, when it paid 37½ per cent.

Prior to Aug. 19, 1907, the Delaware, Lackawanna & Western Railroad owned 19,389 shares of this stock, and the Public Service Commission of the Second District gave it permission to gather in the remainder of the 25,000 shares if it could. The road could get hold of only 21,301 of the shares. On Dec. 6, 1911, the board of directors ratified a lease of the little railway to the Lackawanna company. One of the provisions was that the rate of interest paid to the stockholders of the small road would be 12 per cent, to be paid quarterly, beginning Feb. 1, 1913.

The small group of minority stockholders protested against the lease, and suit was begun for an annulment and an accounting. In his opinion Justice Giegerich pointed out that practically every provision of the lease was in favor of the big line. "The case presented," continued the court, "seems so plainly to be one where all the risk of loss is thrown upon the lessor and all chance of gain given to the lessee, that the intervention of the court is required in the interest of the minority stockholders."

Counsel for the complainants explain that one of the important points covered by the court was in deciding that majority stockholders are in a measure the guardians of the interests of the minority stockholders. Any action taken by the majority to the detriment of the minority is, therefore, in the nature of a breach of trust.

Elkins (W. Va.) Electric Railway — J. C. McSpadden, Rockwood, Pa., president of the Elkins Electric Railway, is reported to have sold the road to M. H. Frank, a junk dealer of Pittsburgh. The sale included four cars, all the rails, machinery, copper and other material. Mr. McSpadden retains the franchise within the city and certain real estate of the company.

Fort Dodge, Des Moines & Southern Railway, Boone, Iowa.—On Nov. 1 the Fort Dodge, Des Moines & Southern Railway paid a dividend of 1½ per cent on its common stock. A like amount was paid on Aug. 1. The company has paid dividends on the preferred stock since February, 1916, 1¼ per cent each quarter.

Georgia Railway & Power Company, Atlanta, Ga.—All the interests of the Franklin Light & Power Company, the Broad River Power Company and the J. B. McCrary Company, Hartwell, Ga., have been acquired by the Georgia Railway & Power Company.

Interborough Rapid Transit Company, New York, N. Y.—The last of \$160,585,000 of first and refunding mortgage 5 per cent bonds issued by the Interborough Rapid Transit Company to finance the improvement and construction program worked out with the city have been sold, and it is expected that the underwriting syndicate, which was organized four and one-half years ago to handle the issue, will shortly be dissolved. Prior to its inception the largest single issue of corporate securities attempted in this country was \$100,000,000. When the syndicate was formed, in April, 1912, an international syndicate with 280 participants was assembled, the members of which will shortly be relieved of their commitments. A selling syndicate was formed by Lee, Higginson & Company, Harris, Forbes & Company and Kissel, Kinnicutt & Company, which recently took over from the original syndicate \$24,458,000 of the bonds, which they offered at 98¾. At the same time they took an option on \$12,229,000 of the bonds remaining, which they will now exercise. J. P. Morgan & Company have called upon all of the participants to return any unsold bonds which they may have, so that the entire transaction may be wound up.

Northern Ohio Electric Corporation, Akron, Ohio.—The syndicate that offered the preferred and common stock of the Northern Ohio Electric Corporation has been closed and applications have been made to list the stock on the Cleveland, Cincinnati, Columbus and Louisville Stock Exchanges. The Northern Ohio Electric Corporation controls the Northern Ohio Traction & Light Company through stock ownership.

Pottsville (Pa.) Union Traction Company.—The Pottsville Union Traction Company has notified the Pennsylvania Public Service Commission that it proposes to issue additional bonds to the amount of \$150,000 to the Eastern Pennsylvania Railways in payment of funds advanced by that company to the Pottsville company and advanced in turn to the Pottsville & St. Clair Electric Railway for use in building the line of the latter company. The Pottsville & St. Clair Electric Railway proposes to issue \$150,000 of bonds to be delivered to the Pottsville Union Traction Company in repayment of funds advanced by that company and expended in constructing the road of the Pottsville & St. Clair Electric Railway.

Seattle (Wash.) Municipal Railway.—According to information supplied by the Public Utilities Department of Seattle, Wash., of which A. L. Valentine is superintendent, Seattle's two municipal car lines were operated during the month of October at a loss of \$1,985. Division A showed an operating loss of \$218, with an interest charge of \$1,593, making the total loss for that division \$1,812. The revenues of this line for the month amounted to \$1,701. The cost of operation was \$1,920. Division C, known as Lake Burien line, was operated at a loss of \$172. The revenues of the line were \$2,264, and the cost of operation \$2,436. The city began the operation of these two car lines June 1, 1914, and the loss each month has averaged more than \$2,000. As no provision is made in the annual tax budget for these losses, they become a direct charge against the general fund, the lighting fund sharing in the loss to some extent by furnishing electricity at a rate below the actual cost of the delivery of current.

DIVIDENDS DECLARED

American Railways, Philadelphia, Pa., \$1, common.
 Central Mississippi Valley Electric Properties, Keokuk, Iowa, quarterly, 1½ per cent, preferred.
 Norfolk Railway & Light Company, Norfolk, Va., 75 cents.
 Northern Texas Electric Company, Fort Worth, Tex., quarterly, 1 per cent, common.

United Light & Railways Company, Grand Rapids, Mich., quarterly, 1½ per cent, first preferred; quarterly, 1 per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

BATON ROUGE (LA.) ELECTRIC COMPANY

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$17,285	*\$8,352	\$8,933	\$3,527	\$5,406
1 " " '15	16,446	*8,686	7,760	2,192	5,568
12 " " '16	208,123	*103,899	104,224	38,958	65,266
12 " " '15	185,469	*109,269	76,200	25,527	50,673

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$12,496	*\$9,569	\$2,927	\$1,102	\$1,825
1 " " '15	12,040	*8,537	3,503	1,103	2,400
12 " " '16	120,778	*104,790	15,988	13,240	2,748
12 " " '15	115,735	*98,381	17,354	13,600	3,754

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

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$33,804	*\$18,190	\$15,614	\$6,568	\$9,046
1 " " '15	33,639	*18,184	15,455	6,594	8,861
12 " " '16	385,443	*225,937	159,506	78,507	80,999
12 " " '15	344,372	*207,270	137,102	79,196	57,906

COLUMBUS (GA.) ELECTRIC COMPANY

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$77,658	*\$30,491	\$47,167	\$28,630	\$18,537
1 " " '15	61,827	*28,479	33,348	28,679	4,669
12 " " '16	829,894	*341,144	488,750	344,041	144,709
12 " " '15	703,586	*324,010	379,576	344,888	34,688

DALLAS (TEX.) ELECTRIC COMPANY

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$157,977	*\$95,551	\$62,426	\$36,538	†\$28,031
1 " " '15	148,153	*92,680	55,473	33,459	22,014
12 " " '16	1,913,020	*1,184,003	729,017	433,441	†314,918
12 " " '15	1,880,820	*1,112,888	767,932	400,844	367,088

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$2,387	*\$37,777	\$34,610	\$8,753	\$25,857
1 " " '15	68,914	*33,426	35,488	8,710	26,778
12 " " '16	817,376	*332,879	384,497	106,292	278,205
12 " " '15	679,441	*379,186	300,255	104,940	195,315

EL PASO (TEX.) ELECTRIC COMPANY

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$92,264	*\$60,949	\$31,315	\$5,120	\$26,195
1 " " '15	78,367	*42,044	36,323	4,197	32,126
12 " " '16	1,068,260	*622,131	446,129	55,807	390,322
12 " " '15	971,204	*520,935	450,269	50,355	399,914

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$159,844	*\$102,747	\$57,097	\$36,587	\$20,510
1 " " '15	163,018	*90,393	72,625	36,042	36,583
12 " " '16	1,932,169	*1,228,006	704,163	437,883	266,280
12 " " '15	2,007,724	*1,202,492	805,232	433,046	372,186

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$26,730	*\$15,175	\$11,555	\$5,240	\$6,315
1 " " '15	23,388	*11,799	11,590	5,523	6,067
12 " " '16	317,341	*179,209	138,132	64,760	73,372
12 " " '15	266,195	*160,828	105,367	66,764	38,603

JACKSONVILLE (FLA.) TRACTION COMPANY

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$50,147	*\$35,316	\$14,831	\$15,400	†\$569
1 " " '15	46,942	*31,302	15,640	14,685	955
12 " " '16	621,079	*423,758	197,321	181,606	15,715
12 " " '15	623,129	*435,080	188,049	172,502	15,547

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$161,044	*\$94,256	\$66,788	\$29,416	\$37,372
1 " " '15	142,737	*86,351	56,386	27,675	28,711
12 " " '16	1,862,691	*1,139,551	723,140	343,587	379,553
12 " " '15	1,733,222	*1,035,929	697,293	328,969	368,324

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

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$690,475	*\$412,714	\$277,761	\$184,760	\$93,001
1 " " '15	609,782	*387,576	222,206	182,823	39,383
12 " " '16	7,855,965	*5,013,664	2,842,301	2,206,485	635,816
12 " " '15	7,690,014	*4,775,166	2,914,848	2,165,431	749,417

SAVANNAH (GA.) ELECTRIC COMPANY

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$70,466	*\$48,070	\$22,396	\$23,570	†\$1,174
1 " " '15	64,017	*42,693	21,324	23,126	1,802
12 " " '16	802,270	*540,849	261,421	280,956	19,535
12 " " '15	799,977	*520,752	279,225	278,357	868

TAMPA (FLA.) ELECTRIC COMPANY

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Sept., '16	\$79,285	*\$43,303	\$35,982	\$4,255	\$31,727
1 " " '15	78,755	*39,265	39,490	4,370	35,120
12 " " '16	966,673	*526,254	440,419	52,217	398,202
12 " " '15	976,210	*498,553	477,657	52,751	424,906

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

Traffic and Transportation

TOILETS ON INTERURBANS OPPOSED

Conference on Subject Before Pennsylvania Commission Brings Out Large Attendance in Opposition

At a conference at the State Capitol in Harrisburg, Pa., on Nov. 17, between Public Service Commissioner John S. Rilling, Herbert F. Snow, chief engineer of the commission, and representatives of electric railways in Pennsylvania, a proposed general order compelling the installation of toilet facilities on interurban electric railway cars was opposed by the railroad representatives present. Commissioner Rilling explained that complaints had been filed against several interurban lines because no toilet facilities were afforded the passengers. He stated that the conference was called merely to obtain the viewpoint of the railways and not with an idea of deciding off-hand what shall be done in the matter.

C. L. S. Tingley, representing the Southern Pennsylvania Traction Company, the Scranton Railway, the Altoona & Logan Valley Electric Railway and the Pennsylvania Street Railway Association, summed up the attitude of the association in the first address of the afternoon. Mr. Tingley pointed out that the Pennsylvania Street Railway Association included more than 60 per cent of the companies operating in Pennsylvania, controlling more than 90 per cent of the interurban as well as urban lines in the State. He declared that such a proposed general order was opposed because most of the interurban cars were run on urban as well as interurban lines; that the use of toilet facilities would be impracticable for much of the distance over which the cars operated; that the installation of toilets in the front and rear of cars would narrow the aisles, retard the loading and unloading of passengers and slow up traffic; that such facilities would work a financial hardship on all companies; that electric railway toilets were seldom used; that townships and boroughs would not tolerate the indiscriminate placing of sewage on their streets and highways, and that such sewage disposal would be a menace to public health and decency. In short, toilets on electric railway cars would be a menace to the general public and a source of great annoyance to the traveling public rather than a convenience.

Mr. Tingley ended with a plea that no general order be issued, but that each case of complaint be dealt with separately by the commission. He also pointed out that the installation of toilet facilities would be almost an engineering impossibility on most cars, because sections of the floor of the car covered intricate machinery used in operation. Mr. Tingley said that he believed most companies would be glad to provide facilities at terminal points, but he opposed comfort stations at points where janitors were not employed.

T. B. Donnelly, claim agent of the West Penn Railways, declared that the toilets on that company's cars were not used more than once a day. The company kept the doors of the toilets locked to prevent their use at points where such usage would be objectionable and to offstay their misuse. Such misuse he declared to be quite common.

Charles H. Bergner, representing the Valley Railways, operating between Harrisburg and points in Cumberland and Perry Counties, pointed out that struggling companies compelled to reconstruct their rolling stock, would be forced to raise the rates of fare to meet the increased capital invested and would then come into competition with the unregulated jitneys operating throughout the State.

W. I. Schaffer, representing the Philadelphia & Westchester Traction Company, pleaded for individual orders covering individual cases as opposed to any general order.

C. B. Fairchild, Jr., executive assistant of the Philadelphia Rapid Transit Company, pointed out how toilets in the cars would hamper loading and unloading, and slow up traffic during the rush hours when the interurban cars were in the city. He pleaded for the greatest convenience for the greatest number.

Ralph Baker, of the Mahoning & Shenango Railway & Light Company, declared that electric railway toilets would be distinctly unsanitary from the viewpoint of public health.

J. L. Adams, general manager of the Philadelphia & Western Railway, stated that after an investigation covering three months' time, it was found that the toilets in the cars on the lines of that company were used only once in 1562 miles, or about once in every five days.

H. Bingaman, of the Pittsburgh Railways, said that less than 10 per cent of all interurban travel was of the long haul variety, and therefore more than 90 per cent of the traveling public would seldom if ever want such facilities.

J. H. McClure, general superintendent of the Citizens' Traction Company, Oil City, declared that never in the history of the company had there been a complaint because of lack of toilet facilities.

R. D. Sefton, general manager of the Chambersburg, Greencastle & Waynesboro Street Railway, said his company has not received a complaint since it began operations in 1903.

C. A. Emerson, Jr., chief sanitary engineer of the State Health Department, declared that the dumping of sewage on watersheds of the State streams was prohibited by law because often such indiscriminate sewage disposal lead to epidemics of such diseases as typhoid. He stated that no container had yet been invented which was not offensive, especially in the summer time.

Among the railway representatives who attended, other than those already mentioned, were: C. H. Bishop, of the Valley Railways; A. W. Day, of the North Branch Transit Company; Gordon Campbell, of the York Railways; H. H. Aitkens, of the Philadelphia & West Chester Traction Company; R. R. Hull, of the Conestoga Traction, Lancaster; Charles L. Baily, Jr., of the Harrisburg Railways; I. W. Welsh, of the Pittsburgh Railways; E. W. Samuels, of the Shamokin & Mt. Carmel Transit Company; W. R. Adair, of the Pittsburgh & Butler Railway; L. H. Palmer, of the Eastern Pennsylvania Railways, and H. M. Stine, secretary of the Pennsylvania Street Railway Association.

PORTLAND JITNEY ORDINANCE IN EFFECT

Fifty-five jitney drivers were arrested in Portland, Ore., on Nov. 16, charged with failing to take out franchises as prescribed in an ordinance which went into effect on Nov. 15 at midnight. Their automobiles were held as security, and lined the streets for blocks in the neighborhood of the Police Court. The drivers claim the ordinance is prohibitory and plan to fight it.

At a meeting of the City Council on Nov. 15 the jitney franchise ordinance, which the men arrested on Nov. 16 were charged with violating, was approved by a majority vote of the Council, and Mayor Albee was instructed to clamp down the lid on all jitney operators who refused to abide by the regulation. All the members of the Council voted for the action, except Commissioner Daly.

The Chamber of Commerce recently went on record in favor of placing jitneys on the same basis as street railway transportation, and the Chamber adopted a resolution commending the City Council for its position that any public utility using or proposing to use streets for revenue purposes shall be required to operate under franchises which impose responsibilities and service requirement equal to those on other or established utilities enjoying like privileges on public streets. The resolution also urged that the police power of the city be used to prohibit the use of the city streets by carriers which attempt to operate in defiance of ordinances regulating franchises.

The regulations embodied in the franchise approved by the Council provide for service into all well-settled districts; payment of bridge tolls, granting of transfers and furnishing of bond of \$400 for each bus in service for protection of persons suffering personal injuries.

Before final action was taken on the ordinance, C. W. Hodson, representing the Chamber of Commerce and business men of the city, urged the Council to afford some measure of relief to the Portland Railway, Light & Power Company from unfair competition. A. I. Moulton, the attorney representing the jitney interests, said: "It will be impossible for the jitney men to continue in business under the regulation ordered. We intend to fight the enforcement of

the order of the Council. Jitneys cannot survive on the routes outlined in the ordinance, and they will not be able to provide a transfer system. The franchise ordinance was framed deliberately so that we could not accept it."

Judge Arthur Langguth in the municipal court on Nov. 16 upheld the city ordinance requiring that jitneys shall operate under franchise, when he found guilty W. R. Funk, charged with having violated the ordinance. It was a test case and notice of appeal was given. The other drivers, however, it is reported, agreed not to operate further as jitneys pending determination of the Funk case in the higher court. Some of them declared they would operate their cars as taxicabs.

Mr. Moulton, the attorney for the jitney union, states the contention of the jitney men is that they have paid their license to Dec. 31, and should be permitted to operate under the license, as the license ordinance has not been repealed nor has the Council passed an ordinance to refund license money for the unexpired term. City Attorney Stadter holds that the franchise ordinance for jitneys was passed on July 19 to take effect on Nov. 15, and that the franchise ordinance replaced the old license ordinance.

DES MOINES TO START SAFETY-FIRST WORK

Claim Agent of Des Moines City Railway Outlines Safety Campaign to Start Jan. 1

Dan M. Finch is mapping out the work for the safety first bureau which will be established by the Des Moines (Iowa) City Railway on Jan. 1, 1917. Mr. Finch has been claim agent for the Des Moines street railway system for more than thirty years, and is using his statistics on street accidents as data on which to work for safety first. In discussing the establishment of the new bureau with the representative of the ELECTRIC RAILWAY JOURNAL in Des Moines, Mr. Finch said:

"Our plan is to start on Jan. 1 with educational meetings of our men in all the different departments of the service. Every city railway employee will be instructed along lines best fitted to bring out a maximum of safety for the public.

"One of the most important features of the general educational work with the public will be the production of 1000 ft. of moving picture film to show how accidents happen and how they may be prevented. These will be for display in the theatres and schools of Des Moines and also in cities and towns of Iowa outside of Des Moines whether or not they have street railway systems.

"We are interested in educating the public outside of Des Moines because we find that 20 per cent of all of our accidents involve automobiles from outside of Des Moines. Our records show that we have as much or more grief with out-of-town auto drivers as with our home people. Of recent years we have experienced an increase in automobile accidents with a decrease at the same time in every other class of accidents.

"The moving pictures will be supplemented by instructive lectures to all of the school children of the city by representatives of this department. We shall at the same time appeal to the general public through safety first advertising copy in the columns of the daily newspapers.

"We shall also work for closer co-operation with the city government to bring about a more rigid enforcement of the city traffic ordinances. We shall seek a revision of some ordinances for the sake of uniformity and greater safety to the public. Pedestrians, and especially 'jay-walkers,' give us as much trouble as do automobiles, and we wish to co-operate with the city to suppress the 'jay-walking' evil.

"The city has recently established a traffic bureau with one head, and we are now co-operating with that bureau to secure uniformity of signals at busy corners and other uniform regulations which will tend to decrease confusion at rush hours in the down-town district. This work is to be augmented under the new plans of the safety bureau. Other features of our campaign will be the use of advertising placards throughout the city and the general dissemination of the safety first idea in every possible way. The work will be under the direction of Judge W. H. McHenry, who becomes general counsel for the Des Moines City Railway on Jan. 1, and who will have supervision of the accident and claim department as well."

TRENTON FARE CASE ARGUED

Argument has been heard by the Supreme Court of New Jersey in the case in which the Trenton & Mercer County Traction Corporation, Trenton, is seeking to sustain its right to discontinue the sale of strip tickets. The company, under a writ of certiorari, brought up for review the order of the Board of Public Utility Commissioners of the State requiring the company not to suspend the six-for-a-quarter tickets. The company contended that the rights granted to the company and its predecessors constituted inviolable contracts by which the rate of fare for each passenger more than five years of age was made 5 cents; that the contracts were impaired contrary to the constitution by the passage of the public utility act and the assumption of power by the utility board; that the proposed ticket withdrawal was not an increase or an alteration of an existing classification, as held by the board, and that the order of the board would have the effect of depriving the company of property without due process of law. The city contended that the Board of Public Utility Commissioners has jurisdiction; that the ordinance requiring the sale of tickets superseded previous contracts, if any existed; that the ordinance of Oct. 22, 1909, compelling the sale of tickets, was valid as an ordinance, if not as a contract; that the company's valuation of its property was excessive; that the company has no right to allowance for franchise value; that the present earnings are ample to provide a reasonable return on the value of property and that the discontinuance of tickets is an increase of fare.

SAFETY DISCUSSED AT PENNSYLVANIA CONFERENCE

At the fourth annual Pennsylvania Welfare and Efficiency Conference held at the State Capitol in Harrisburg on Nov. 21, 22 and 23 the accident problem on electric railways was discussed by Samuel B. Hare, claim agent of the Altoona & Logan Valley Electric Railway, Altoona, Pa., and by P. J. McGrath, financial secretary of Division No. 85 of the Amalgamated Association at Pittsburgh.

Mr. Hare declared that most accidents on electric railways were preventable, and were caused by carelessness, bad habits and thoughtlessness. He declared that the company's part in promoting safety was in selecting good men as employees and then retaining them in the service. All employees should be instructed in safety measures by a competent official. An employee should not be blamed for an accident unless the accident was caused by culpable carelessness. Mr. Hare said that the public should be cautioned against carelessness. Many people were unjustly prejudiced against the railways and would not take advice for their own safety. Promptness in settling grievances between the company and the public would go a long way toward improving the attitude of the public toward the corporation. Statistics showed that the number of accidents since the prepayment type of car was used was only one in every 444,380 passengers hauled, while the ratio was one in every 137,000 hauled on the old-type cars. Mr. Hare said that the public demanded protection from the railways, but was loath to protect itself.

A feature of Mr. Hare's address was his criticism of the State in granting automobile licenses to people without the necessary qualifications. He pointed out that many accidents were the result of incompetent driving of automobiles. Thousands of persons were licensed by the State to run autos that no self-respecting railway would think of employing as motormen. He urged the enactment of a law to prohibit from obtaining licenses those physically or mentally unfit to operate cars. Mr. Hare ended his address with a plea for the teaching of safety first in all of the public schools.

Mr. McGrath said that all street railway employees were interested in the public welfare and tried in every way possible to avoid injuring pedestrian or passenger. Their biggest difficulty lay in the fact that people would not assist them by looking out for their own safety. Mr. McGrath urged, as a measure of safety, that the railways see to it that the men in their employ obtained periods of rest similar to those deemed by employers in other lines to be essential to the highest efficiency.

NEW JERSEY JITNEY LAW UPHELD

The Supreme Court of New Jersey has rendered a decision upholding the constitutionality of the Kates law to regulate the operation of jitneys in municipalities. This measure was passed last winter by the New Jersey Legislature over the protest of the jitney men and their friends that it was a move to put the jitneys out of business. Objection was made particularly to a bonding feature and the payment of part of the earnings of each jitney to the municipality in which it operated, but these provisions were incorporated into the law.

The case just decided was a test suit brought by Joseph West and other jitney owners against the city of Asbury Park. The Supreme Court held that the power of the Legislature to authorize municipal corporations to regulate the use of streets by vehicles even to the extent of excluding vehicular traffic is established in New Jersey. The court also ruled against the contention of the jitney men that the act deprived them of the equal protection under the law. It held that the city was within its rights under the law in prescribing an ordinance regulating the operation of jitneys.

A summary of the provisions of the bill was published in the issue of the ELECTRIC RAILWAY JOURNAL of April 1, 1916, page 670.

New Cars and New Fare System in Bangor.—The Bangor Railway & Electric Company, Bangor, Me., has placed in operation the first of three center-entrance cars of the Laconia Car Company, mounted on Philadelphia Holding Company radial trucks. The railway has also announced its decision to adopt the Rooke system of fare collection. The company operates 65 miles of electric railway in Bangor and vicinity, including among others the towns of Brewer, Old Town, Orono, Milford, Kenduskeag and Corinth.

St. Louis Transfers Burdensome.—In an editorial contained in the last issue of the *United Railways Bulletin*, signed by Richard McCulloch, president of the United Railways, St. Louis, Mo., he intimated it may be necessary to withdraw some of the transfer privileges because of an unequal expansion of the use of transfers in proportion to the increase of revenue. Mr. McCulloch declared that street railway costs were soaring, and that comparing the year 1915 with the year 1901 the total of revenue passengers increased 75 per cent, while free transfer passengers increased 171 per cent. City Counsellor Daues says the present transfer privileges were guaranteed to the citizens of St. Louis in a Circuit Court decision several years ago.

New London Folders.—The ELECTRIC RAILWAY JOURNAL has just received through the courtesy of the Underground Electric Railways of London, Eng., four more recent specimens of posters similar to the ones which this paper displayed in the interest of the railway at the recent convention of the American Electric Railway Association in Atlantic City. All are the design of E. A. Cox. At the bottom of each poster is a legend such as "Edgeware by Tram," "Hampton Court by Tram," "Watford" and "Kings-ton by Tram." Other than the design this is the only printing they contain. The affiliated company, the General Omnibus Company, has issued a four-page folder 10 in. by 6¼ in. entitled "Ten Little Nigger Boys," in the interest of safety first for children. The folder is in black and red and is illustrated.

Springfield Trolley Mail Pay Increased.—The Springfield (Mass.) Street Railway is to receive 4 cents a mile from Nov. 20 for carrying mail between Springfield and East Longmeadow. This is an increase of 1 cent a mile over the former rate. Improved service will be assured through the co-operation of the company with the postal authorities. Until a few weeks ago East Longmeadow enjoyed two mails a day, but changes in the local steam railroad timetable reduced the service to one mail a day. Numerous complaints were presented to Postmaster Costello of Springfield, who negotiated with the street railway to dispatch a mail-carrying car from Springfield at 11 a. m. at the 4-cent rate. The first mail will be carried by the steam railroad, but the second mail will be followed by a return trolley mail service from East Longmeadow to Springfield at mid-day. It is stated that the increased rate will yield the Springfield company \$3,000 a year compared with a former income from mail carriage of about \$2,200.

Personal Mention

B. P. Newton, formerly storekeeper of the Cleveland, Southwestern & Columbus Railway, Elyria, Ohio, has been promoted to the position of traveling auditor of the company.

W. S. Avery, formerly clerk in the auditor's office of the Cleveland, Southwestern & Columbus Railway, Elyria, Ohio, has been promoted to the position of storekeeper of the company.

George Alexander, formerly chief engineer of the Atlantic Shore Railway's generating station at Kittery Point, Me., has been appointed chief engineer of the Worcester (Mass.) Electric Light Company.

S. H. Dailey, Binghamton, N. Y., has been appointed general manager of the Kentucky Traction & Terminal Company, operating the Lexington, Ky., city lines and the inter-urban lines out of that city. This is a new position with the company. Mr. Dailey's appointment will not in any way affect the present organization.

Joseph Stewart, formerly general and joint agent at Pueblo, Col., for the Denver & Rio Grande Railroad, the Chicago, Rock Island & Pacific Railroad the Santa Fé Railroad and the Colorado & Southern Railroad, has been appointed general manager of the Grand Junction Electric, Gas & Manufacturing Company and the Grand River Valley Railway, with headquarters at Grand Junction.

G. K. Jeffries, general superintendent of the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., was operated on for appendicitis on Nov. 22. The attack was very sudden and canceled his plans to join the special car party to the Toledo convention of the Central Electric Railway Association on Nov. 24. Word was received at the convention Thursday afternoon that he was doing well and that no complications were expected.

Simon Bamberger, formerly president of the Salt Lake & Ogden Railroad, Salt Lake City, Utah, was elected Governor of the State on the Democratic State ticket at the recent election. He is the first Democrat and the first non-Mormon to be elected Governor of Utah. Mr. Bamberger has for many years been prominent in business and civic affairs in Utah. He served two terms on the Salt Lake Board of Education and four years as State Senator. An extended sketch of Mr. Bamberger was published in the second issue of the *ELECTRIC RAILWAY JOURNAL* Convention Daily at the recent convention of the American Electric Railway Association in Atlantic City.

John Leisenring, signal engineer of the Illinois Traction System, Peoria, Ill., has just been appointed by the American Railway Engineering Association and the Railway Signal Association, two steam railroad organizations, a member of the joint signal committee of these associations. This joint committee is known as committee No. 1, or that on signaling practice, of the Railway Signal Association, and No. 10 of the American Railway Engineering Association. The appointment of an official of an electric railway to this important committee is an excellent testimonial of the opinion of these two associations of the signal practice of the Illinois Traction System, as well as of the engineer in charge, Mr. Leisenring.

David A. Munro, who has been assistant to the auditor of the Second Avenue Railroad, New York, N. Y., and in addition has had charge of the purchasing of the company, has resigned, and on Dec. 1 will enter the sales department of the J. N. Johns Manufacturing Company, New York. Mr. Munro was born in Scotland. He entered the service of Messrs. Joline and Robinson, receivers of the Metropolitan Street Railway, New York, in the auditor's office of that company on Oct. 8, 1907. On Nov. 20, 1908, he resigned from the Metropolitan Street Railway to enter the service of the late George W. Lynch, receiver of the Second Avenue Railroad, as assistant to the auditor. In addition to his work as assistant to the auditor of that company, Mr. Munro later took charge of the purchasing of the company.

L. O. Gordon, who has been appointed general manager of the Jackson Light & Traction Company, Jackson, Miss., entered the power and mining department of the Chicago office of the General Electric Company in 1902, and four years later was sent to the Schenectady works of the latter company. After spending a year in Schenectady, he was transferred to the Minneapolis office, where he remained in the apparatus and motor departments for five years. In the fall of 1912 Mr. Gordon left the General Electric Company to take the position as general manager of the Valparaiso (Ind.) Lighting Company, operating a combination gas and electric property. The property at Valparaiso is owned by the American Public Utilities Company, Grand Rapids, Mich., which also controls the Jackson Light & Traction Company.

Judge W. H. McHenry will become general counsel and head of the claim department for the Des Moines (Iowa) City Railway on Jan. 1, 1917. Judge McHenry is one of the most able and best known lawyers of Iowa. He was born in Des Moines and was admitted to the bar in that city. After nearly a score of years of exceptionally successful practice he was elevated to the district bench in his home city and served there for fourteen years. Following his recent retirement from his judicial duties came the announcement that he is to take up the important legal work of the Des Moines street railway system. He is fifty-five years old, and as the result of his long experience in the practice of law and on the bench he is regarded as admirably fitted for the work he is about to begin. The safety-first campaign of the company, referred to at length elsewhere in this issue, will be under the direction of Judge McHenry, with Dan M. Finch, claim agent of the company, in direct charge of the work.

William A. Driscoll has been appointed general claim agent of the Bay State Street Railway, with headquarters at Boston. Mr. Driscoll was born in Lawrence, Mass., in 1884, and was educated in the public and high schools of Lowell, Mass. At the age of twenty-one he entered the employ of the Boston & Northern Street Railway, being located at the Middlesex Street shops in Lowell. After two years' experience in the shops and in the local supply department at Lowell he went to Boston and for two and one-half years was in the office of the company's purchasing agent. For the last seven and one-half years Mr. Driscoll has been claim agent of the Bay State company in charge of the lines centering in Lowell, and in general extending from Nashua, N. H., to Boston. About 250 miles of track are included in this district. In his new work, Mr. Driscoll will have charge of claims on the whole system, which now comprises about 1000 miles of track. He is a member of the New England Street Railway Club. His appointment as general claim agent dates from Nov. 1.

B. C. Cobb, vice-president of Hodenpyl, Hardy & Company, investment bankers, New York, N. Y., has been elected president of the Northern Ohio Traction & Light Company, Akron, Ohio, to succeed Henry A. Everett, as noted briefly in the *ELECTRIC RAILWAY JOURNAL* of Nov. 18. Mr. Cobb was born in Boston, Mass., on Aug. 13, 1870. He attended the Boston Latin School and later on went to Andover. Mr. Cobb has been in public utility work for about twenty years. He began his career in the office of the Grand Rapids (Mich.) Gas Company in 1894. He rose rapidly in the firm and in 1898 became general superintendent of the Detroit (Mich.) Gas Company. Three years later he left Detroit to become vice-president and general manager of the Saginaw-Bay City Railway & Lighting Company. In 1906 he became a member of Hodenpyl, Hardy & Company, with headquarters in New York City. At the present time Mr. Cobb is president of the following companies: Michigan Railway, Jackson, Mich.; Consumers Power Company of Michigan; Michigan Lighting Company; Northern Ohio Traction & Light Company, Akron, Ohio; Rockford & Interurban Railway, Rockford, Ill.; Central Illinois Lighting Company, Peoria, Ill.; Evansville Railway & Light Company, Evansville, Ind.; Springfield Light, Heat & Power Company, Springfield, Ohio; Springfield Railway & Light Company, Springfield, Ill. He is also vice-president of the Grand Rapids (Mich.) Railway Company, and a director in the Commonwealth Power, Railway & Light Company, Jackson, Mich., and in the Tennessee Railway & Light Company, Chattanooga, Tenn.

OBITUARY

Edward H. Gagne, storekeeper of the Bay State Street Railway at Fall River, Mass., is dead. He succumbed to an attack of pneumonia after a few days' illness. Mr. Gagne was thirty-two years old. He was unmarried.

David MacKeen, formerly president of the Halifax (N. S.) Electric Tramway, died on Nov. 13, aged seventy-seven years. At the time of his death Mr. MacKeen was Lieutenant-Governor of the Province of Nova Scotia. He was born in the Province and was identified with many commercial, industrial, banking and electrical interests.

John W. Barnes, who for many years was connected with the Buffalo (N. Y.) Street Railway, now included in the International Railway, and later was general superintendent of the Western New York & Pennsylvania Traction Company, Olean, N. Y., was instantly killed by an Erie Railroad express train at Friendship, N. Y. His wife, who was with him, was also killed.

Charles H. Guckel, formerly general manager of the Springfield (Mo.) Traction Company, is dead. Mr. Guckel retired from the company in Springfield in April, 1915. He had been connected with public utility companies for more than eighteen years. Before going to Springfield Mr. Guckel was engaged in public utility work at Boise City, Idaho. He was also at one time connected with the Swan Falls Power Company and with the Swan Falls Interurban Railroad.

Lawton T. Hemans, chairman of the Railroad Commission of Michigan, died at Battle Creek, Mich., on Nov. 17, in the sixty-third year of his age. Mr. Hemans was born in Collamer, Onondaga County, N. Y., and went to Michigan in early life. He was educated in the high schools, and in 1887-1888 was a student in the University of Michigan Law School, and admitted to the bar in 1888, and practiced law at Mason. In 1892 and for five subsequent terms he was Mayor of Mason; in 1901-1903 he was a member of the Michigan House of Representatives, and in 1907 was a member of the State Constitutional Convention. In 1908 and 1910 he was nominated for Governor by the Democrats, and was defeated. He was appointed a member of the Railroad Commission of Michigan in 1911.

James H. Whitaker, assistant superintendent of distribution of the Puget Sound Traction, Light & Power Company, Seattle, Wash., is dead at the age of sixty-three. Mr. Whitaker was born in Illinois on Feb. 19, 1853. In 1895 he went to St. Paul as manager of the Northwest Engineering Company. He remained in St. Paul for fourteen years. He then joined the electrical engineering forces of the Northern Pacific Railroad, which connection brought him to the Pacific coast. He resigned from the Northern Pacific Railroad to become city electrician of Tacoma and later entered the employ of the Seattle-Tacoma Power Company, with which company he was connected at the time of its absorption by the Puget Sound Traction, Light & Power Company. He is survived by two sons and a daughter.

FRONTIERSMEN WELCOME ELECTRIC TRAIN

The Chicago, Milwaukee & St. Paul Railway is now electrified for a distance of 440 miles in Montana, over two mountain ranges from Harlowton, Mont., to Avery, Idaho. Through Missoula, near the western terminus of the electrified section, all regular freight and passenger trains are being drawn by electric locomotives and nearly all the extra trains are so handled also. A so-called "steamer" shows up once in a while, however, as the Chicago, Milwaukee & St. Paul has not received all of its electric engines from the General Electric Company.

When the first passenger train drawn into Missoula over the Milwaukee arrived there was a good-sized crowd at the station. In that crowd were Granville Stuart, who discovered gold in Montana; E. S. Paxton, famous throughout the country as an Indian artist, and formerly an Indian fighter; Major Catlin, one of the leaders in the Indian wars, and Judge F. H. Woody, who arrived in what is now Missoula in 1856. All of this quartet came into Montana with bull teams, and each marveled at the progress of the age when he saw the first electric locomotive slide out from Hellgate Canyon, pulling its long line of steel coaches.

Construction News

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

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

RECENT INCORPORATIONS

Panama Traction Company, Jamestown, N. Y.—Incorporated to construct and operate railroads. Capital stock, \$60,000. Directors: B. L. Davis, Lakewood; N. M. Sanderson and C. C. Farnham, Buffalo. [Nov. 4, 16.]

***Cheyenne Railroad, Strong City, Okla.**—Incorporated to construct a line from Strong City to Cheyenne, 7 miles. Capital stock, \$10,000. Incorporators: J. C. Mytinger, L. T. Cranberry and J. R. Jones, Wichita Falls, Tex.; W. S. Haid and T. A. Cushman, Clinton, Okla.

Waupaca Electric Service & Railway Company, Waupaca, Wis.—Incorporated to take over the holdings of the Waupaca Electric Light & Railway Company, operating the light plant in Waupaca and 5.4 miles of railway.

FRANCHISES

Eureka, Cal.—The Humboldt Transit Company will voluntarily forfeit its franchise for operating cars on T Street. The company discontinued operation owing to lack of patronage.

Evanston, Ill.—The Chicago, Fox Lake & Northern Electric Railway has asked the Council of Evanston for a fifty-year franchise to construct a line in Evanston. [Nov. 4, '16.]

Rochester, N. Y.—The New York State Railways has asked the Council for a franchise to construct a line to connect with the existing double tracks at Clarissa and Exchange Streets, thence through Clarissa Street to Plymouth Avenue and in Plymouth Avenue, connecting with existing double tracks in Clarissa Street and Caledonia Avenue near the bridge over the Western New York & Pennsylvania Railroad.

Elyria, Ohio.—Mayor Rolph has vetoed the franchise recently granted the Cleveland, Southwestern & Columbus Railway by the Council of Elyria.

Philadelphia, Pa.—W. S. Twining, director Department of City Transit, has forwarded to the Public Service Commission in Harrisburg a formal application for a certificate of public convenience for the construction of a double-track surface passenger railway, beginning at Frankford and Oxford Avenues and extending along Oxford Avenue to Castor Road, Bustleton Avenue to Verree Road and thence through private property along a proposed extension of Verree Road to Byberry Road, Worthington Road, Southampton Road, to Byberry and Bensalem Pikes.

TRACK AND ROADWAY

Springfield (Ill.) Consolidated Railway.—Work will be begun on the extension of the Bergen car line as soon as the State Public Utilities Commission of Illinois acts on a petition of convenience and necessity filed by the company. The proposed route will be on Capitol Avenue, east along Cressey Avenue, to Monroe Street, thence east to Eastdale Avenue to the southern line of Washington Street, and thence along Bergen Park. The extension will be about a mile long, of single track, and it is estimated will cost \$13,000.

Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind.—The General Railway Signal Company has just completed the installation of 11 miles of automatic signaling apparatus on this company's line.

Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich.—Plans are being considered by the Grand Rapids, Grand Haven & Muskegon Railway for double-tracking its line. It is proposed to construct about 10 miles during the coming year and add about 3 miles each year until the entire line is double-tracked.

Fallon (Nev.) Electric Railroad.—This company reports that its line from Fallon to Sand Springs has not yet been completed, but it is expected that the line will be ready for operation next spring. [March 25, '16.]

Albany Southern Railroad, Albany, N. Y.—James E. Hewes, general manager of the Albany Southern Railroad, has notified Mayor Burns of Troy that the company has decided to construct an extension to Troy.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—The Dunkirk City Council has asked the Buffalo & Lake Erie Traction Company to raise its tracks through Doughty Street, which is being repaved.

New York & Queens County Railway, Long Island City, N. Y.—Operation has been begun on this company's new line from Corona to Flushing via Peartree Avenue, Pell Street and Shell Road.

New York (N. Y.) Connecting Railroad.—An order has been placed by the New York Connecting Railroad with the Westinghouse Electric & Manufacturing Company for all the catenary hangers to be used in its construction work.

Ohio Electric Railway, Cincinnati, Ohio.—It is reported that this company will soon extend its North Fourth Street car line in Newark to take in the northwestern part of the city. The line would be extended on Maple Avenue to Channell Street and then to the Mount Vernon road to the new extension of Sixteenth Street to Church Street, where it would connect with the Church Street line at the carhouse.

Oklahoma & Interstate Railway, Oklahoma City, Okla.—It is reported that work will be begun on this company's proposed line from Columbus to Commerce within sixty days. John R. Rose, Oklahoma City, president. [Sept. 2, '16.]

Sand Springs Railway, Tulsa, Okla.—It is announced that the Sand Springs Railway will build an extension of its line from Sand Springs to Pawhuska, about 50 miles. Construction work is expected to begin about Jan. 1.

Tulsa (Okla.) Traction Company.—This company, which is preparing to build an interurban line from Tulsa to Sapulpa, has begun condemnation proceedings in the district court of Tulsa County for the acquisition of a right-of-way through the western half of Tulsa. The proposed interurban line will be built during the coming year, it is announced. It will enter Tulsa over the new concrete bridge spanning the Arkansas River, which is being built by the county at a cost of \$200,000.

Toronto (Ont.) Street Railway.—The Ontario Railway & Municipal Board on Nov. 13 gave its decision in the Pape Avenue extension matter, which has been under consideration for many months. An order was issued directing the city to construct and the Toronto Street Railway to equip and operate a line along Wilton Avenue to Broadview, north on Broadview to Gerrard, along Gerrard to Carlaw to Guelph and Pape and north on Pape to Danforth Avenue.

Toronto (Ont.) Suburban Street Railway.—A report from this company states that it has now under construction 46 miles of new track.

Philadelphia, Pa.—Bids will be received by William S. Twining, director Department of City Transit, 754 Bourse Building, until Dec. 7 for the construction of a section of the Broad Street subway about 300 ft. long and 106 ft. wide, embracing four tracks with two station platforms, and including the underpinning of the west side of City Hall and also the Market Street subway.

Montreal Tramways & Power Company, Montreal, Que.—This company will construct an extension on Park Avenue, Montreal.

Carolina Rapid Transit Company, Clinton, S. C.—Surveys of this company's proposed electric railway from Spartanburg to Clinton have been completed by Reid Tull, chief engineer, Spartanburg. [July 8, '16.]

Ogden, Logan & Idaho Railway, Ogden, Utah.—It is reported that the Ogden, Logan & Idaho Railway will construct an extension from Logan through the canyon to Bear Lake.

Salt Lake & Ogden Railway, Salt Lake City, Utah.—This company reports that it expects to double-track its line between Clearfield and Layton, 4 miles.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—It is reported that this company proposes to construct a line from Salt Lake City into the Sanpete Valley at a cost of \$1,000,000.

***Richmond, Va.**—Plans are being contemplated for the construction of an electric railway from Richmond to Forest Hill to Bon Air, 7 miles. It is reported that T. S. Wheelwright, president, Virginia Railway & Power Company, is interested.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—It is reported that this company contemplates an expenditure of \$1,250,000 for reconstruction and extensions.

***Morgantown (W. Va.) Interurban Railway.**—This company plans to construct a line from Morgantown, W. Va., to Port Marion, Pa., 20 miles. J. McDermott, Price Building, Morgantown, is reported interested.

Wisconsin Valley Electric Company, Wausau, Wis.—It is reported that this company will construct an extension to Stevens Point, and possibly to Grand Rapids.

SHOPS AND BUILDINGS

Kansas City (Mo.) Railways.—It is reported that the Kansas City Railways will construct five new carhouses, and will provide gymnasiums and shower baths. The company will also erect a number of dwellings for its employees.

London & Port Stanley Railway, London, Ont.—This company reports that the construction of a one-story addition to the office section of its shops and a 65-ft. addition to the shops are almost completed. The cost will be about \$20,000. The company is building a bathhouse at Port Stanley at a cost of \$25,000.

Valley Railways, Lemoyne, Pa.—It is reported that the Commonwealth Trust Company of Harrisburg has taken title to the properties on the block bounded by Walnut, River, Fahnestock and Strawberry Streets for the Valley Railways, to be used as the site for a large terminal and waiting station.

Philadelphia, Pa.—W. S. Twining, director Department of City Transit, has filed an application for a certificate of convenience to permit the construction of a station on the Frankford Elevated line at Huntingdon Street and Kensington Avenue. This station will be midway between the stations at Dauphin and York Streets and the Somerset Street Station.

Wheeling (W. Va.) Traction Company.—Installation of new machinery in the machine shop and the laying of new switches, to cost several thousand dollars, will be made by the Wheeling Traction Company at its island shops.

POWER HOUSES AND SUBSTATIONS

Iowa Railway & Light Company, Cedar Rapids, Iowa.—A hydroelectric power plant is being built by the Iowa Railway & Light Company at First Street, East Avenue and River, to cost about \$90,000. The Fargo Engineering Company, Jackson, Mich., are engineers.

Albany (N. Y.) Southern Railway.—It is reported that this company contemplates the extension of its electric power lines from Hudson, N. Y., to Pittsfield, Mass.

Columbus Railway, Power & Light Company, Columbus, Ohio.—This company will extend its transmission lines to Centerburg.

Toledo Railways & Light Company, Toledo, Ohio.—Announcement has been made by Henry L. Doherty that plans are being completed for a new central station for Toledo which may have a capacity of 120,000 kw. It is possible that it will be located on the old rolling mill property on the East Side, but if this is too high for the purpose, the station may be placed outside the city limits. The Water Street plant will be used to supplement the new plant. The cost will be about \$6,000,000.

Monongahela Valley Traction Company, Fairmont, W. Va.—This company has purchased the property of the Consumers Light Company, and plans to construct 7 miles of high-tension transmission line to permit utilization of power from its central power plant and abandoned present power plant at Mannington. The company will also rebuild and rearrange its distribution lines and change transformers to permit distribution at 2300 volts instead of 1100 volts.

INDUSTRIAL NEWS

Review of Trade and Market Conditions

Rolling Stock Purchases

Business Changes

Trade Literature

WHO SHOULD CARRY THE REPAIR PARTS STOCK, THE RAILWAY OR THE MANUFACTURER?

Small Roads Most Greatly Concerned—Manufacturers Give Opinions—Several Argue for Standardization

It has been pointed out that "the average railway buyer thinks the manufacturer is not fulfilling his obligation to the railway if he sells something to it and then does not always carry in stock, ready for immediate shipment, all parts of that particular device which are subject to wear and breakage." "In fact," a manufacturer of heavy machinery writes, "most of the buyers feel that it is an imposition on the railway to expect it to carry a reasonable stock of repair parts. This feeling is, no doubt, based on the ground that if the manufacturer was really anxious to give service to the road he would carry repair parts so that they could be shipped out on short notice. If the roads' wishes in this respect were fully met, the overhead charges would shortly put the manufacturers out of business."

This question is a problem surrounded by special conditions and, of course, cannot be answered definitely, but there should be some uniform underlying premises which will help decide individual situations. What now seems reasonable to most railways apparently is viewed as an imposition by some manufacturers.

To direct thought to the repair-part-stock subject, this paper addressed a number of manufacturers, asking them how far they thought a manufacturer should go in tying up capital in repair parts. The answers cannot be summarized because conditions vary so greatly in different lines of manufacture. However, the thought prevails that the manufacturer should be prepared to take care of his customers' requirements by furnishing repair parts, but the railway should see to it that enough local stock is carried to avoid the necessity of rush orders for repair parts, particularly those parts which are subject to periodic renewal because of wear. The following statements are abstracts of the replies received:

NIC LE GRAND, ST. LOUIS CAR COMPANY, SAYS REMEDY LIES WITH MANAGER AND STOREKEEPER

"The sale of a product carries with it the implied promise on the part of the manufacturer to take care of his customer's needs for repair parts. However, the railway company must co-operate, and if co-operation is lacking results can only be unsatisfactory. What is said here on this subject refers to the smaller properties only. The large ones take care of themselves. They have their own patterns, and on account of the big volume needed are in position to contract for their yearly requirements. This the smaller companies cannot do.

"In order to 'keep things going' it is necessary to carry some stock of wearing parts. Car and truck parts are here particularly referred to, and our views are based on an experience of fifteen years in 'watching' supply orders. For the manufacturer to carry a large stock of brakeshoes, brake heads, brasses, brake hangers, center plates, side bearings, springs, wheels, axles, etc., is expecting too much. To do this would require an immense investment. And yet in normal times some of us come very near overstocking. On the other hand, to lay in an emergency stock of wearing parts calls for only a small outlay on the part of the railway company. It has been demonstrated that regardless of the investment, this pays. Delays in getting much-needed parts are vexatious and costly; cars are out of service; earning capacity is lost. The public complains about service, or rather the lack of it. The manager has a talk with the superintendent. He 'calls' the master mechanic, who in turn 'takes it up' with the purchasing agent, and the latter may

possibly call up the storekeeper. It may turn out that orders were issued 'not to buy a darn thing 'til needed.' In tabloid form the history of the case may be presented like this:

"A two-cent stamp = Telegrams;

"Freight charges = Expressage;

"Efficiency = Passing the buck.

"This is by no means a new discovery. It is only emphasized at this time on account of the unusual conditions.

"Drawing further upon our experience and taking one manufacturer as an example: This one has more than 13,000 patterns for gray iron, malleable, steel and bronze castings, all accumulated during some twenty years. Many of these were provided in the first place to meet the views of the purchaser, when some standard pattern could have been used. And of these 13,000 patterns about 10,000 are alive, being used to fill repair orders. The cost of keeping up these patterns (most foundry work is rough) is considerable. Surely it is hardly fair to expect the manufacturer to carry a stock of all these parts.

"The remedy lies with the railway company's management and the alertness of the storekeeper. The management should permit the carrying of stock, and the storekeeper should be watchful in guarding the best interests of his company. Particularly should intelligent attention be devoted to malleable and steel castings. Two helpful methods suggest themselves. The first is that when new cars and trucks are purchased, a small stock of all wearing parts should be ordered to be shipped with the new equipment. The second is that needs for at least six months should be anticipated and deliveries stipulated as required. This will insure having parts when needed, avoid much delay and expense and often prevent unpleasantness.

"In this day of boasted efficiency and of carefully-kept minute records, master mechanics know what is needed and should be permitted to requisition in advance. This may be done with safety. Permit me to cite one species of fault peculiar to railway buying: The salesman calls on the purchasing agent and runs through the list of his wares. 'Nothing doing to-day.' He calls on the master mechanic. 'Nothing doing to-day.' The storekeeper is called up. 'Nothing doing to-day.' A week, perhaps ten days, later, a telegram comes in pleading for immediate shipment of parts, which must be made, and shipment is wanted by express. Isn't the point obvious?

"This very experience has been mine, not once but more than a hundred times, and it often has happened with properties of considerable size and importance, properties which were wisely and ably managed in all other directions.

"The manufacturer has parts to sell, is concerned about increasing his sales and is doing his level best to make prompt shipments, and it is up to the buyer to co-operate intelligently with him by placing orders ahead and not waiting until cars are pulled into the barn. He should be doing it for his own protection, benefit and advantage."

DEMAND SHOULD DETERMINE STOCK TO BE CARRIED

S. M. Wilson, of The J. G. Brill Company, says that the subject of how far a manufacturer should go in keeping in stock renewal parts for service repairs to his product is an important one and one to which his company has given a great deal of attention, particularly with regard to trucks. He also says:

"The larger railroads, of course, keep on hand supplies of renewal parts, but it is a hardship for the smaller railroads to do so, and as equipment awaiting repair parts is often out of commission during that period, it is highly important to the small system that in buying vital parts of operating equipment, such as car trucks, due consideration should be given to the matter of future replacement of worn

or broken parts and a standard product be purchased which will insure this.

"The question of just how far we should go in keeping renewal parts actually in stock is determined by the demand for such parts, and this means experience covering a long period. We have a well-organized supply department which makes a study of all such matters and sees to it that stocks of parts that may be called for will be promptly supplied. We believe that the service end of this business is immensely important to the lasting success of any of our products."

STANDARDIZATION AND COSTS WILL BE REDUCED

S. A. Bullock, of the Baldwin Locomotive Works, is of the opinion that the manufacturer should not be called upon to carry finished repair parts in stock, but only such raw material as will enable him quickly to fabricate the parts desired. He also says:

"Should manufacturers add to the first cost the burden of holding in stock parts for periods of time ranging from one to ten years, then the purchaser might as well buy outright such parts and have them for immediate replacement.

"It has been our aim to standardize electric trucks, but the continual changes, due to the improvements in the art and requisition changes on the part of the customer, have radically modified the design of a few years ago. Formerly we carried in stock certain truck parts, and now we have most of this material on our hands. In explanation, we can only assume that the parts were not needed by the customer or that he bought elsewhere.

"We welcome the time when trucks shall be standardized as in the automobile industry, and when this time comes the manufacturer will gladly keep a full stock of renewal parts for service repairs."

HEATING EQUIPMENT STOCK AVAILABLE BUT DELIVERY UNCERTAIN

Elmer J. Smith of the Peter Smith Heater Company says that the heater repair business is always heaviest in the fall. According to Mr. Smith:

"It is simply impossible to carry all the parts needed, owing to the difficulty in gaging the requirements. However, we endeavor to increase our stock to a considerable extent at the time of the year when these parts are most needed and as a rule we are able to make very prompt deliveries.

"When abnormal business conditions exist, such as at present, we are unable to contract for our wants and get the material as fast as we would like to, even though we try to anticipate our wants. We don't think that it is necessary for the railway companies to carry a large stock of heater repair parts, but if they want real service and don't want to hold up their cars, the safest way is to have repair parts in their bins and to anticipate their wants, the same as we aim to do.

"An electric railway is taking great chances these days if it doesn't carry these repairs in stock, for the freight deliveries at this time are unreliable and the purchaser takes all the chances as to when he will get the goods, even though prompt shipment is made."

DEMANDS SMALL FOR STOKER REPAIR PART

The manufacturer of a widely-used type of stoker states that repair parts for non-standard equipment are not carried in stock, but that full stocks of standard parts are carried; first, because the customer is entitled to the service and second, because it is good business to sell the parts. Every standard part can be shipped on the day the order is received. Repair parts are kept in stock in proportion to the total number of stokers in operation. Consequently the amount tied up is growing large.

CRANE MANUFACTURERS ADVISE CUSTOMERS TO CARRY REPAIR PARTS

Three manufacturers of overhead traveling cranes and allied equipment discussed this subject. One says that customers fail to realize the amount of money that is tied up in spare parts of cranes and hoists of different types and voltages. Another crane manufacturer says, "We have made it a point to offer the suggestion to users of our

cranes that they carry certain parts in stock, and we supply them with a list showing the parts that under ordinary service will at times require renewal."

Another large manufacturer of cranes writes in part as follows: "While the general design is standardized, practically no two cranes are of the same size, lift, etc. This makes it very difficult to carry spare parts covering every part of the machine, but we do endeavor to carry spare parts of those portions of the machine which are standardized. We have a storeroom devoted especially to that purpose.

"Nevertheless, our advice would be that the customer carry spares for his cranes. Many times, as in the past summer, those who furnish us with castings are unable to supply them as fast as wanted. Sometimes strikes interfere with the supply of this material, and the demand absorbs our available stock before we can replace it. Sometimes, as it happened repeatedly during the past season, makers of electric motors have been unable to furnish us spare parts for their motors as fast as wanted, owing to a scant supply of copper. We, of course, endeavor to anticipate these troubles as much as possible, but in spite of all efforts some delays have been encountered which would have been avoided had the customers anticipated their requirements and carried a stock of standard spare parts.

"The question is a very interesting one. We have gone so far as to send out circular letters to users of our product calling attention to the fact that unavoidable delays are to be expected under the present unusual conditions. Very few customers pay any attention to these letters. Those who pay the least attention to them are usually the first to complain if there is any delay in spare-part service on our part."

STANDARDIZED PARTS SIMPLIFY PROBLEM

Referring to the products of the Stow Manufacturing Company, which have largely been standardized, D. Walker Wear says:

"It is our practice to carry in stock for immediate shipment all repair parts necessary to renew Stow flexible shafts. Whenever possible, however, the customer should return the tool to our laboratory where men familiar with the work can properly assemble and test it before return. We agree with the average railway buyer that he should be able to get from the manufacturer, immediately on telegraphic orders, necessary repairs for his equipment. It is the business of the manufacturer to carry repair parts, as the railway storehouses are filled with all classes of supplies for making repairs, some of which rapidly deteriorate from lack of proper storage facilities. If the manufacturer carries a stock and furnishes it fresh and clean to the railway, it is then up to the mechanical department to apply it. In most cases this will give better service. With standardized products we cannot see where the manufacturer should object to tying up capital in repair parts. In our experience it has not developed that a stock of repair parts becomes obsolete. The manufacturer is in a position to govern his product in accordance with his sales and to adapt his improvements to tools already in use.

"I occupied for several years a position with one of the principal railroad systems operating steam and electric equipment, and there I found it more satisfactory to carry a minimum stock for my storehouse and have the manufacturer carry the repairs for our equipment. There was not a single case where the manufacturer did not desire to co-operate. I found it not only to my advantage but also to the advantage of the manufacturer, to anticipate my requirements by sixty and ninety days on wearing parts. This enabled the manufacturer to make prompt shipment and to save the company money by having the order requisitioned and shipment handled in the regular way, coming forward by freight, wherever possible, over our own lines."

JOHN BENHAM RECITES REGISTER COMPANY PRACTICE

"We feel that we are giving our customers very liberal treatment," says John Benham of the International Register Company. "We bought out the New Haven Register Company thirteen years ago and up to within the past two years we have aimed to be in a position to fill with reasonable promptness all orders for repair parts for New Haven

registers. We feel now that we have reached the limit, and while we will fill orders for any parts we have, we do not feel called upon to make up parts that we do not have; and anyway these registers should be about worn out now.

"So far as International registers are concerned we commenced the manufacture of the type R-7 single register in 1901 and the type R-5 standard double register in 1902. There have been slight modifications in these registers so that repair parts for the present type in some instances would not be just right for the older types, especially the double registers. Notwithstanding that, we have aimed to be in position to fill, generally upon receipt of order, any demands upon us for repair parts."

TRACK-DRILL REPAIR PARTS NOT A BURDEN

J. McKinnon, Kalamazoo Railway Supply Company, believes that "the railroads should anticipate their wants to a certain extent and carry in stock some of these parts and not expect the manufacturer to make immediate shipment of the few parts that may be needed. For instance: Take our track drills, of which we have many thousands in service. The parts which are liable to wear out are inexpensive, and it would not be a great burden upon the railroad to carry a reasonable amount of such parts, so that the machines would not be out of commission any longer than is necessary to make replacement of the part in question.

"There was a time when the railroads did carry large stocks of repair parts. In fact, I think they were overburdened in this respect. But with the depression in railroad business orders came for retrenchment. This meant a depletion of their stores and as business at that particular time was rather light, the manufacturers made up greater numbers of these parts than usual for the purpose of keeping their men together; so, when the railroad needed anything in a hurry they were able to get it. Now that business is a little more brisk and the roads are buying more freely, we believe they should replenish their stocks, but not to the extent they did previous to the time when they were ordered by the managements to retrench.

"The same comments apply to our hand, push, velocipede, track-laying, and motor cars. The large systems are buying their spare parts more freely than they did some little time since, and we really do not believe it is the intention of the railroads to be unfair with the manufacturers."

SEND NOTICE WHEN DESIGN IS TO BE CHANGED

Irving T. Hartz, Morden Frog & Crossing Works, holds the view that "a concern should have the dies and patterns ready to fill all orders for repair parts of machines within a reasonable time, and for tools, a stock of repair parts for all standard tools in use.

"When a machine or tool is considered by the manufacturer as getting obsolete, a notice to all who have been purchasers of such machines or tools should be sent, advising them that within six months or one year the dies or patterns for such tools would be destroyed and if they have the machine or tool in use and desire any additional parts, to order at once.

"No railroad can expect a manufacturer to carry the repair parts for a great many makes of machines that can be made by any one manufacturer, ready to supply all users, as some might never be called for. This would mean dead stock. The most that should be asked of the manufacturer is to be prepared to furnish repairs within a reasonable time."

RUBBER-COVERED WIRE BUYING CONDITIONS IMPROVING

Manufacturers and jobbers are making a better profit in rubber-covered wire to-day than ever before. The demand is large and the output is not sufficient. Rubber-covered wire, being a staple, never was very profitable. Until quite recently it was sold on a basis of the best price. Thus a buyer would place an order at to-day's prices, say 21 cents, for four months' delivery. If at the delivery date the prevailing price was 18 cents the buyer expected this price and received it, although the contract was made at 21 cents. If, on the other hand, the price had advanced to 23 cents, the buyer held to the contract price of 21

cents. The buyer therefore was protected against any advance in the market, but he also received the benefit of any decrease in market prices.

Under such a scheme it was nothing more than heads the buyer wins, tails the seller loses. With the margin of profit always small it often reached the vanishing point on a rising market. To-day, however, all of this has been changed. Wire is bought at the delivery market price of copper-wire base. The benefits of a rising market are now going to the seller.

A question arises, however, of just how much of this apparent profit can be counted a real profit. Just so sure as more money is made on a rising market just so sure is less money made on a falling market. If stocks are small and the decline very gradual the drop in profits is very small. If stocks are large and the bottom falls out of the market then instead of a profit a loss is taken. If the market recedes in the same manner and rate it advanced and if stocks were the same in both cases then the increase in profit on the rising market would just offset the decrease in profit on the falling market.

BAY STATE STREET RAILWAY TO REMODEL 200 CARS

The Massachusetts Public Service Commission has authorized the Bay State Street Railway, Boston, Mass., to reconstruct 200 semi-convertible cars, the work to include changing to the pay-as-you-enter type by removing the bulkhead and bulkhead doors; installing the National Pneumatic Company's air operated vestibules and steps, with an electrical device to prevent the starting of the car before the doors are closed, equipping the cars with a buzzer system with push-button on each window post; installing fare boxes, etc. At this writing the selection of part of the equipment has not been made, but work has been under way for some weeks on cars in the shops at the south of Boston. One car has been placed in service within the past four days, and it is hoped to push the remodeling as rapidly as possible during the winter and early spring.

ROLLING STOCK

London & Port Stanley Railway, London, Ont., is reported to be in the market for three trail cars.

North Carolina Public Service Company, Greensboro, N. C., has ordered two city cars from the Southern Car Company, High Point, N. C.

Rutland Railway, Light & Power Company, Rutland, Vt., has ordered through the Wendell & MacDuffie Company Eastern agents for the Russell Car & Snow-Plow Company, one Russell wing elevator snow-plow and flanger.

Citizens Railway, Clarksville, Tenn., noted in the *ELECTRIC RAILWAY JOURNAL* of Sept. 30, 1916, as being in the market for two double-truck closed cars, has ordered this equipment from the Southern Car Company, High Point, N. C.

Connecticut Company, New Haven, Conn., has ordered through the Wendell & MacDuffie Company, Eastern agents for the Russell Car & Snow-Plow Company, one double-truck combination snow-plow and express car and six sets of flangers for double-end ballast cars.

TRADE NOTES

Ohio Brass Company, Mansfield, Ohio, agent for Crouse-Hinds headlights, has received an order for 200 12-in. headlights from the Bay State Street Railway.

Philadelphia Holding Company, Philadelphia, Pa., has received an order from the Fishkill Traction Company, Beacon, N. Y., for four radial trucks.

Southern Pennsylvania Traction Company, Chester, Pa., have recently purchased four Westinghouse 512C motor equipments, four GE CP 27 straight air-brake equipments and four pair of Brill 76E double trucks.

Nelson S. Moore has resigned as assistant general manager of the Electrical Engineers Equipment Company of Chicago to enter the employ of Lewis & Roth Company of Philadelphia as sales engineer.

Drew Electric & Manufacturing Company, Indianapolis, Ind., announces the addition of G. R. Miller to its organization as sales manager. During the past eight years Mr. Miller

has spent most of his time with the Russell M. Seeds Company and with the Schwartz Electric Company of Indianapolis.

E. F. Berger, who has represented the Midvale Steel Company in Chicago territory for a number of years, has been promoted to the position of office manager, and assigned to the Cincinnati office in the Union Trust Building. In addition to his work with the Midvale Steel Company, he will also look after the interests of the Cambria Steel Company and of the Worth Bros. Company.

Holden & White, Chicago, Ill., have been appointed general sales distributors for the Car Lighting Improvement Company of Milwaukee, Wis., manufacturers of the Watson car lighting regulator. This device is designed to give constant illumination of car lights and headlights, irrespective of line-voltage fluctuations. Holden & White have also been appointed general sales distributors for the Anderson Brake Adjuster Company, Omaha, Neb., manufacturers of slack adjusters.

F. B. Gleason, formerly in charge of the Western Electric Company's business in the Far East, with headquarters at Tokio, Japan, has been appointed manager of the southern district of the Western Electric Company, with headquarters at Atlanta, Ga. He will succeed E. J. Wallis, who, on Jan. 1, will take up his new work as manager of the Pacific Coast district, with headquarters at San Francisco, Cal. Mr. Wallis will succeed F. H. Leggett, who returns to the company's executive offices at 195 Broadway, New York City, N. Y.

B. A. Brennan, well known to the engineering and industrial world as contract manager of the Westinghouse Machine Company, and later as sales manager of the power department of the Bethlehem Steel Company, has resigned from the Mercantile Trust Company, St. Louis, Mo., of which he was vice-president, to accept the presidency of the Citizens Company, Inc., Baltimore, Md., to which office he has just been elected. The Citizens Company, Inc., is an investment banking institution, which finances corporations, engages in underwritings and handles complete issues of securities.

Francis A. Vaughn and Hans J. Meyer, of the firm of Vaughn & Meyer, consulting engineers, 1007 Majestic Building, Milwaukee, Wis., have joined in partnership with Chas. L. Pillsbury, of the consulting engineering firm of Chas. L. Pillsbury Company, 805-11 Metropolitan Life Building, Minneapolis, Minn., and 716-20 Capital Bank Building, St. Paul, Minn. Mr. Vaughn and Mr. Meyer will continue to conduct their Milwaukee offices under the firm name of Vaughn & Meyer. The Minneapolis and St. Paul offices will be conducted under the present firm name of Chas. L. Pillsbury Company. The three offices cover a wide range of engineering activities, and the combination of these old and well-known organizations will be able to cover an extensive field.

C. C. Nuckols, who was elected president of the Consolidated Car-Heating Company at the meeting of the directors held in Albany, N. Y., on Nov. 20, 1916, has been connected with the company for the past twelve years. In 1904 he was employed as a salesman in the Chicago office; two years later he was transferred to the New York office as purchasing agent, and in 1908 he was again transferred to the factory at Albany, N. Y., as superintendent and purchasing agent. Since 1912 he has held the position of vice-president and general manager of the company. Mr. Nuckols is thirty-six years old, being born at Versailles, Ky., on Feb. 26, 1880. His education was obtained in the high schools of his native town, at Morgan Park Academy, Morgan Park, Ill., and at the University of Chicago.

Adams-Bagnall Electric Company, Cleveland, Ohio, is now completing an addition to its factory with the installation of a complete vitreous or porcelain enameling plant. The primary object of this addition is to further improve the quality and service of the well-known "Abolite" line of porcelain enameled reflectors for industrial lighting, the porcelain enameled reflectors used in pendent fixtures for street lighting and enclosed arc lamps, as well as some parts used in the manufacture by this company of trans-

formers, electric fans and auto electrical accessory equipment. The steadily increasing demand for these reflectors, as well as faith in the maintenance of this growth, has led the company to make this investment in order to insure increased production facilities and elimination of the extra hauling and handling that is the general practice in the manufacture of enameled steel reflectors. The enameling plant is being equipped for all classes of high-grade vitreous enameling. A battery of four 12-ft. furnaces will be supplemented with complete equipment of mixing vats, smelt furnaces, drying ovens and handling apparatus capable of producing a large output. The plant will be in full operation before Jan. 1, 1917.

ADVERTISING LITERATURE

Ohio Brass Company, Mansfield, Ohio, has sent out an illustrated folder demonstrating how the National railroad trolley guard promotes good will.

Laclede-Christy Clay Products Company, St. Louis, Mo., has distributed an attractive folder telling how the problem of making four boilers equal six was solved. This folder is illustrated and has been carefully prepared.

Templeton-Kenly & Company, Ltd., of Chicago, Ill., manufacturers of Simplex car and track jacks, have issued bulletin No. 216, which is a 34-page booklet, illustrating numerous unusual applications of these jacks.

Vanadium—Alloys Steel Company, Pittsburgh, Pa., is distributing a new pamphlet on "Vasco-Vanadium" steel. It also gives data regarding other alloy steels and their use in tools, gears, springs, etc., together with a complete list of carbon steel extras.

E. C. Atkins & Company, Indianapolis, Ind., have issued an illustrated catalog describing their metal saws. These include circular saws for the different standard machines, flexible-back metal-cutting band saws, "Hoosier" extension hack saws and their new Kwit-Kut power hack saw machine. The last ten pages of this thirty-two-page catalog are devoted to useful information of a miscellaneous nature.

Stone & Webster Engineering Corporation, Boston, Mass., construction engineer, has issued the second edition of its booklet, describing and illustrating industrial plants, office and educational buildings, power stations and warehouses constructed by the company. The work includes a wide variety of construction problems, including those met with on the hydroelectric power stations of the Mississippi River Power Company, the new Massachusetts Institute of Technology, etc.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued leaflet 3865 on its HL unit switch control. The control switch, controller box, control resistors and master controller are illustrated and described. In addition a schematic diagram of the general arrangement of the apparatus and wiring is shown. The company has also issued a very elaborate and profusely illustrated circular No. 1516-A covering electric locomotives for freight haulage. Twenty-two of these Baldwin-Westinghouse electric locomotive installations are illustrated. In addition, particular attention is paid to the description and illustrations of locomotive control, to the centralization of equipment, and to the mechanical parts which make up the electric locomotive.

Van Dorn & Dutton, Cleveland, Ohio, has just issued a valuable 40-page booklet on "Facts About Gears." This digest of specialized gear data contains twenty-one sections, a study of which will enable even the non-technical gear user to figure out complete and accurate specifications for any system of gears. The sections treated are as follows: Different Type of Gears, Facts About Gears, Gearing Terms, How to Order Gears of All Kinds, Spur Gear Specifications, Bevel and Mitre Gear Specifications, Worms and Worm Gears, Sprocket Specifications, Lewis's Rule for Strength of Gear Teeth, Diametral-Pitch Formulae, Diametral-Pitch Table, Circular-Pitch Formulae, Circular-Pitch Table, Decimal Equivalents of 113 Fractional Dimensions of One Inch, Decimal Equivalents of Fractions of Millimeters, Metric Pitch Module, Standard Keyways, Comparative Size of Gear Teeth, Weights of Round Steel, Weights of Metals, Circumferences and Areas of Circles from 1/64 in. to 100 in.