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A Startling Opinion on Public Utility Boards

The air is rife with many ideas about government by commission in general and by State public service boards in particular. We do not believe, however, that many hold the view on commissionership duties which was expressed by Governor Baldwin in his inaugural address to the Legislature of Connecticut. In this document, which was abstracted in the Jan. 14 issue of the *ELECTRIC RAILWAY JOURNAL*, the Governor approves a proposed bill to create a public utilities board but objects to paying each commissioner \$7,500 on the startling ground "that the time of the commissioners would by no means be fully occupied by their official duties and that to some extent each would pursue what had been his former occupation in life. An annual salary of \$5,000 would seem quite sufficient." While we have no quarrel with the Governor as to what is or is not an ample salary for the office in question, we take most decided exception to his attitude which implies that a public service commissioner's duties are not onerous enough to require all of his working time. Political hacks may be the right timber for figurehead commissions. It should be otherwise when a State creates a board with sweeping judicial and executive powers over properties of enormous value. In the latter case it is absolutely essential for the well-being both of the people and the corporations that the commissioners should have talents commensurate with their responsibilities and that they should receive salaries which will enable them to give their whole-hearted attention to the complex problems before them for solution. Their decisions often have a direct effect on the prosperity of the railway companies and of the State and even upon the lives of the people who travel by the railways. Should such labors as these be intrusted to men of mediocre abilities? In short, if a State undertakes at all to regulate closely any of its important industries, its representatives should be as free from material cares and as broad-minded as the judge who sits on a Supreme Court bench. Unlike the proverbial loaf of bread, half a commissioner is worse than none.

Shortening Business Trips by Interurban Patronage

The value of a well-appointed electric interurban railway service is probably better known to traveling men than to almost any other class of transportation patrons. It is difficult to gage the benefit of a fast and frequent trolley service through a district formerly served only by a few daily steam trains on a rigid schedule. Perhaps no other agency has done so much as the electric railway to modernize communities that without superior transportation connections with the larger and distant centers of population would soon "lapse back into aboriginal social haphazardism," to quote the words of an eminent divine. Many of these benefits, such as the opportunities for social intercourse and the advantages to be derived from better schools and other educational facilities, have been

mentioned before. These follow as the means are improved of reaching the city from the country. But the reflex gain to the country resident when the suburban town becomes more accessible to the city resident and to commercial travelers has not been so thoroughly discussed. The influx of the permanent resident from the city, the more frequent receipt of mails and of magazines and the more prompt delivery of the daily papers must keep the old-time country resident more in touch with outside events. Even the fact that the traditional village store is modernized by having added to its stock the latest patterns of salable articles should have a beneficial influence compared with the condition when so much time was lost by traveling men in going from place to place that often only the largest centers were profitably visited.

Standardizing Air Brakes

Up to the present time there has been little necessity or even opportunity for the general interchange and joint operation of interurban railway rolling stock equipment, and for this reason a wide diversity of types of couplers, control apparatus and air brakes is to be found on the cars which are now in service. The standardization committee of the Central Electric Railway Association has been endeavoring for the past two years to determine upon standards for such parts of interurban cars as affect their interchange and joint operation in trains. The committee has already recommended the M. C. B. type of automatic coupler without the complication of a self-centering radial attachment, and at its last meeting held in Indianapolis on Jan. 6 it took up the question of standards for air brakes. In line with its policy of recommending standards consistent so far as possible with those of steam railroads the committee decided to recommend the adoption of automatic air brake equipment conforming to the standards and operating practices of the steam railroad brake equipment. The automatic air brake is a very delicate piece of apparatus and it is difficult to make the various essential parts work properly together unless each detail is proportioned and built especially to operate with all the other details which go to make up a complete car or train equipment. This fact has led to the creation of a practical monopoly in the manufacture of brake apparatus for steam railroads. Obnoxious as a commercial monopoly may be in the abstract, the great progress which has been made in steam railroad air brake equipment has been due largely to the fact that each successive step in advance has been worked out by a single manufacturing company which has devoted millions of dollars to development work and has had at its command from the beginning every opportunity for experimenting and improving its devices. In the electric railway field a number of manufacturers have made and sold air-brake apparatus, but unless care is taken to maintain standard connections it will be impossible satisfactorily to operate together in trains cars equipped with brakes of different makes. The work of the standardization committee of the Central Electric Railway Association has not terminated with the general recommendation of the adoption of automatic air brakes. It will be necessary in the future to go even farther and determine upon certain requirements of operation which will insure that the brakes on any car will operate satisfactorily in conjunction with brakes on any other car. The Master Car Builders' Association adopted standards of this kind some years ago, and the essential parts of the brake equipment for all freight and passenger

cars must conform to these standards. Needless to say, such recommendations should not be made without full consultation with and co-operation from all of the manufacturers who are to-day engaged in making and selling air brakes for electric cars.

ANOTHER DECISION IN FARE COLLECTION

The subject of reasonable regulations in fare payment was discussed editorially in our issue of Sept. 3, 1910, in connection with a recent decision by the New York Supreme Court according to which passengers on pay-as-you-enter cars must deposit their fares in a fare box when requested by the company to do so. The increasing use of prepayment cars renders of special interest all further legal decisions of this character, and one involving some new points was rendered last week by the Supreme Court of Rhode Island. This decision upheld the right of the Rhode Island Company to require a passenger to deposit his fare in the form of a nickel in the Rooke fare registers used on the lines of that company.

The case was that of Joseph Martin vs. the Rhode Island Company. It seems that the plaintiff was ejected twice from the cars of the company. On one occasion he tendered a nickel in payment of his fare, but the conductor refused to accept it and asked him to insert it in the automatic registering device which the conductor held in his hand. This the plaintiff declined to do and his ejection followed. On another occasion he gave the conductor five pennies, which the conductor took and tendered him a nickel, asking him to insert it in the registering device. This the plaintiff again refused to do and was again put off the car. The court considered the subject from two points of view. The first was whether a passenger could be compelled to pay his fare and also insert it in an automatic registering device. The most closely allied cases were several which had been adjudicated in connection with the use of the "coffee pot" fare box in Michigan, but the court also reviewed other regulations, such as that requiring passengers to purchase and deposit tickets in a fare box, as on the elevated and subway lines in New York. The New York case already mentioned was also cited. From these cases the court concluded, and we think properly, that the regulation of the Rhode Island Company was entirely reasonable, even to the extent of declining to allow the passenger to put five pennies in the register. The court held that the advantages to the company of the registering device which it used in simplifying its accounts and in securing accuracy in the collection of its fares should be approved rather than condemned and that they more than counterbalanced any slight degree of annoyance to the passenger incident to the use of the device.

The final legal point involved was whether the company violated the statute of the United States which provides that minor coins of the United States shall be a legal tender, at their nominal value, for any amount not exceeding 25 cents in any one payment. This statute undoubtedly makes the tender of five separate cents legal tender for a debt of 5 cents. On this point also the court upheld the company, because it held that the conductor did not refuse the five separate cents on the ground that their purchasing power was not equivalent to a nickel and not sufficient for the full payment of a fare. On the contrary, the conductor accepted them and tendered a nickel in exchange for them, so that the case became analogous to those

in which the passenger is required to purchase a ticket and deposit it in a box.

The decision as a whole emphasizes the extent to which the courts will allow companies to go in enforcing regulations for their own protection in the mode in which passengers must pay their fares. Statutes which specify the amount of fare to be charged for transportation are simply to protect travelers from demands for excessive amounts of fare and are not intended to interfere with any reasonable rule which a railway company may find necessary to make in regard to time, place and mode of making the payment.

ARBITRATION IN INDUSTRIAL DISPUTES

At the annual meeting of the National Civic Federation, which ended last Saturday, one entire session was given up to the subject of arbitration of labor disputes. The discussion centered principally upon the practical results secured in Canada with the Industrial Disputes Investigation Act and in this country with the Erdman federal act, which provides for the investigation of the causes of labor troubles on interstate railroads in the United States. It was stated that in the three years during which the Canadian law has been in force 82 boards of arbitration had been appointed, that in 76 of these cases the decisions of these boards have been accepted and that the other six ended in strikes which were failures. The law provides simply for an investigation of the causes of the dispute and is compulsory only in cases of mining and public service corporations, but labor difficulties in industrial enterprises are investigated in the same manner, where both parties agree. Acceptance of the findings of the board is not obligatory, but the inauguration of a lock-out or strike during the investigation is punishable by fines of from \$100 to \$1,000 a day for the employer, of from \$10 to \$50 a day for the employee and of from \$50 to \$1,000 a day for any strike organizer or lockout inciter. The board is made up of three persons, one recommended by each of the parties to the dispute and a third recommended by the Deputy Minister of Labor. Originally the act prescribed that 30 days' notice should be given in the case of either employer or employee before any change affecting wages or general conditions of work could go into effect. Later this provision was amended to provide that such changes may not take place until the dispute has been finally dealt with by a board. Under the Erdman investigation act both parties must agree to arbitration, but it was stated that in only one case has mediation been refused where the other side applied for arbitration. This was in the case of the switchmen's strike in the Northwest in 1909, and this strike failed.

At present nearly every State in the Union has boards of arbitration, but the composition of the boards and their powers vary greatly. Their practical utility, moreover, in cases of serious trouble is questionable. Their great weakness is the tendency of boards of this kind to recommend a compromise, independent of the merits of the question under consideration. The reason for this is obvious. The services of the board are not usually requested until matters have reached an acute stage. At that time each side submits its maximum demands. The board can see its way more easily to bring pressure upon the employer than upon the employees to accept its decision, so that its efforts have usually been directed toward determining the extent to which the employees would modify their demands rather than judicially to consider the merits of the case. This fact explains the reluctance of most employers

to submit their cases to arbitration. If the principle of arbitration is to be successful, the method followed must be different from that usually employed.

From the many suggestions, based on the practice of other countries, to reduce strikes in this country we can eliminate at the beginning that of compulsory arbitration, known as the New Zealand system. This is contrary to our idea of individual freedom and, in fact, to that of most other civilized countries, and, according to reports, is not working out satisfactorily in the place of its origin. Unless the workmen of an industry are placed practically under military law, as is now proposed on the railway systems in France, it is difficult to understand how they can be coerced to work, nor has it been found possible even in New Zealand to require employers to continue a business at a loss.

One step toward reform in decisions of boards of arbitration would be to forbid compromise decisions, as is done under the arbitration law of Great Britain. There the arbitrators must decide directly in favor of or against the claim of each side. Such a plan has discouraged the making of excessive demands, because the board must select of the two propositions before it without modification the more reasonable.

The discussion at the meeting of the National Civic Federation, however, also developed the value of an examination of the merits of the questions involved in labor disputes before a strike begins. This is the chief feature and also the chief merit of the Canadian act. During an investigation under this act work must be continued under existing conditions until the board renders its decision. The penalties have already been mentioned. The hearings before the board are open, and the public can learn through the testimony presented at them the merits of the controversy. It is true that some of the labor representatives at the Civic Federation meeting expressed a belief that an enforced delay of a strike during the course of the arbitration proceedings, as required by the Canadian law, was detrimental to labor because it gave the employer long warning of a proposed strike; but the point was made that if there was immediate advantage from a sudden strike the advantage was temporary only. Another suggestion made at the meeting was that all arbitration boards should consist of six members rather than of three, the usual number. Two would represent each side and two be the judges. The theory of this plan is that the two representatives for each side would be more apt to agree to a reasonable proposition than one because each would receive the moral support of the other and there would be fewer charges of weak judgment or of "selling out" with two representatives on each side than with one.

The subject is not an easy one to settle. We believe, however, that there would be far fewer industrial strikes if the public knew the facts in regard to matters in dispute in advance of the beginning of the strike. It is notorious that the public press in cases of this kind does not properly present the case of the employer, especially after a strike has been called and the passions of the employees, and possibly of both sides, are inflamed by open hostilities. Perhaps this attitude of the press is unavoidable and will continue just as long as the proprietors of these papers think that the public is more interested in a distorted story than in the facts. But if all the points at issue were brought out thoroughly and analyzed impartially at a public hearing so that the facts would be a matter of record there could not be the same excuse for public ignorance or bias. Experience has shown that publicity is the strongest weapon for peace.

THE ELECTRICAL EQUIPMENT OF THE DETROIT RIVER TUNNEL—II

The article published in last week's issue of the *ELECTRIC RAILWAY JOURNAL* described the general scope of the Detroit River Tunnel electrification and presented details of the substation, the third-rail construction and the locomotives. This article will conclude the description with data concerning different miscellaneous features.

PUMPING EQUIPMENT

The arrangements provided for keeping the tunnel free from water are of interest. The capacity of the machinery installed for this purpose was based on the heaviest rainfall for 35 years and the addition of an ample margin of safety. Five pumping

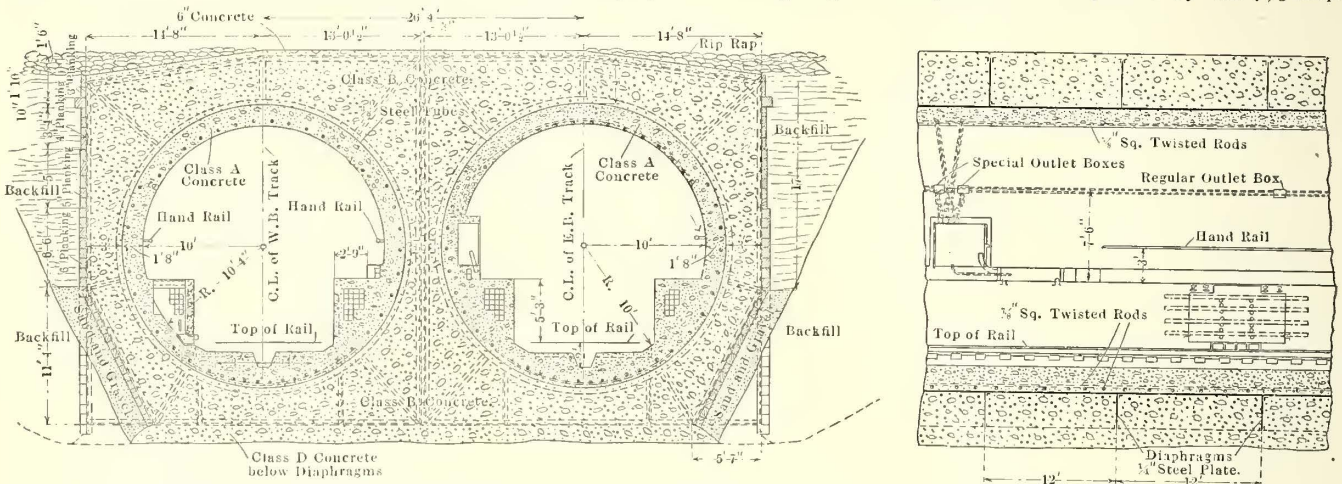


Fig. 1—Detroit Tunnel—Cross-Section of Tunnel and Longitudinal Section of East-Bound Track

stations or sumps have been constructed. One is situated at each portal, there is one at each shaft and the fifth is in the center of the subaqueous section.

The pump motors range from 15 hp to 30 hp in size, and are operated from the substation. An annunciator system, installed for each sump, rings a bell and lights a red pilot lamp in the substation when the water in either sump reaches the high-water setting for the float equipment. The bell alarm is cut

and are provided with aluminum shades so as to reflect the light in the direction of travel and thus avoid glare in the eyes of trainmen.

Transformers are placed in niches at suitable points to both tunnels and the primaries are fed by 440-volt feeders from the substation, while the 104-volt secondary side of the transformers is fed directly to the lamps. There is a lighting cabinet in each transformer niche to control the lighting in its immediate vicinity, and each cabinet controls eight local lighting circuits and in some cases signal track transformers have a primary feed from the lighting cabinets. These transformers are single phase, of 7½-kw capacity, and are connected alternately to the different legs of the three-phase feeders in such a manner as to balance the load.

The lighting of the yards is accomplished by 100 7½-amp-

440-watt, series a.c. arc lamps. Each lamp is supported on a cast-iron pole of neat design. This lighting system is fed from the constant-current transformers already mentioned.

The motor-generator room of the substation is lighted by 21 clusters of tungsten 40-watt lamps. Two of the clusters in the center of the station are fed from the main storage battery for emergency lighting. The other clusters are fed from the substation light and power transformer equipment.

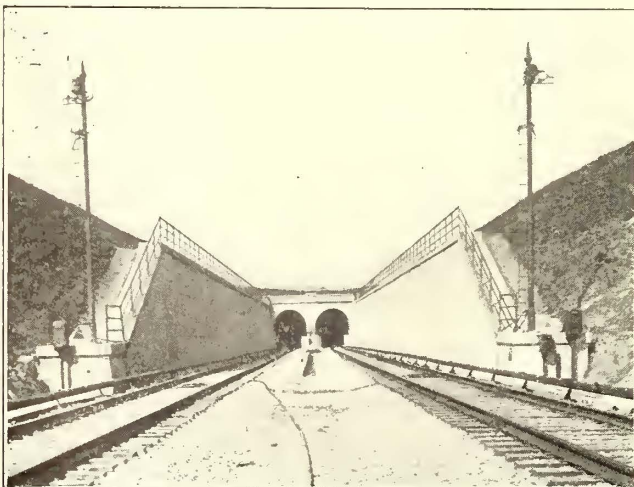


Fig. 2—Detroit Tunnel—Windsor Approach



Fig. 3—Detroit Tunnel—Locomotive at Detroit Approach

off when the operator starts either pump set located in the sump from which the alarm was received, and when the water in the sump is pumped to the low-water level for which the float equipment is set a green pilot lamp is lighted on the sump control panel and the pump is shut down.

LIGHTING SYSTEM

The tunnel is lighted by approximately 860 incandescent lamps, which are spaced 40 ft. apart on both side walls of either tunnel. The lamps have carbon filaments, are of 16 cp each,

TUNNEL DETAILS

In this article it would be interesting to deal at some length with the tunnels themselves, as undoubtedly their construction is one of the most interesting pieces of engineering work accomplished in recent years, but as this part of the subject has already been covered in other articles only a few of the most important facts bearing on the scheme of electrification will be mentioned.

Fig. 1 shows a section through the tunnel and Fig. 5 is the

reproduction of a view in the tunnel showing the third rail.

The subaqueous portion of the tunnels was built up in 11 different sections on land and afterward sunk in position on a concrete bench placed on the bottom of a trench dredge in the river bed. These sections when in place were bolted together, gaskets being used to insure the waterproofing of the joints. With this form of construction it was questionable whether stray current would not lead to electrolysis at these joints. Therefore copper bonds were employed to make the metallic portion of the tunnel a continuous conductor with the Detroit end tied in with the negative return feeders.

The running rails are of special composition; they weigh 100 lb. per yard, and are of the A. S. C. E. standard section. Each joint is bonded with two bonds General Electric, each of 500,000 circ. mil capacity. The drainage scheme of the tunnels calls for a continuous open gutter for the entire length of each tunnel, which made necessary a special form of ties for the track rails. Fig. 5 shows the construction adopted. The ties are embedded in concrete, protruding only about 3 in. above the surface. Dowels were placed in the concrete between each tie to prevent any possibility of slipping, and to make the road-bed a thoroughly homogeneous mass. These ties have a section of 8 in. x 11 in. and are 4 ft. long. They are of Louisiana long-leaf yellow pine. The long ties for supporting the third rail brackets are of the same section and are 6 ft. long. They are spaced with 10-ft. centers. The distance from center line to center line of the tracks in the tunnel is 20 ft. 6 in. on tangent and 26 ft. 4 in. on maximum curves.

Fig. 2 shows the Windsor approach, while Fig. 3 is a view of the Detroit approach. The latter picture was taken with the locomotive in the portal to show the ample clearances provided in the tunnel. It also shows the point where the ordinary yard track construction gives way to the special construction for the tunnel.

Referring back to Fig. 1, the conduits provided in the tunnel for the different electric cables will be noticed. Those on the extreme right are reserved for future power requirements. The telephone, telegraph and signal cables are carried in the large nest of ducts in the base of the dividing wall between the two tunnels, while the cables for tunnel lighting are taken in the three ducts shown under the left bench wall on the right-hand tunnel. The power cables for the operation of the tunnel and Windsor yards are carried in the ducts shown in the

The splicing chambers are spaced approximately 400 ft. apart on straight work and are all properly drained and ventilated. In the tunnel their width and height is necessarily small on account of the limited space, but is sufficient for all the requirements. They are each 8 ft. in length.

The lead-covered cables are supported in the manholes from malleable iron cable racks hung from vertical tee irons secured to the walls of the splicing chambers. These tee irons are



Fig. 5—Detroit Tunnel—Track Construction in the Tunnel

provided with holes for practically their entire length to facilitate the adjustment of the cable supports and for the better accommodation of the cables. In many places double cable supports have been used to reduce the amount of fanning necessary from the cable ducts to the splicing sleeves. Ground connections are provided in the manholes for grounding the lead covers of all cables.

As the substation is located near the Detroit shaft this shaft is employed as the cable run instead of the Detroit portal. There are three vertical wells in this shaft for the exclusive use of the cables, the concrete surfaces of each well consisting of a series of shallow grooves each large enough for a single cable of the largest size; thus there is a barrier on each side of every cable. The weight of the lead cable is taken by wooden clamps held by U-bolts set in the concrete. These are spaced approximately 4 ft. apart.

The total amount of cable installed was 229,000 ft., of which by far the greater portion is multiple conductor. Most of this cable has varnished cambric insulation of a thickness depending upon the voltage of the circuit on which it is used, and a lead covering is used on all cables except the 110-volt lighting cable, which is located in the iron conduit, where there is no possibility of water accumulating.

In the splicing chambers the lead covering is protected by a covering of asbestos felt $\frac{1}{8}$ in. thick, applied with a one-half lap and coated with silicate of soda. This precaution was taken to prevent communication of fire from one cable to another, where,

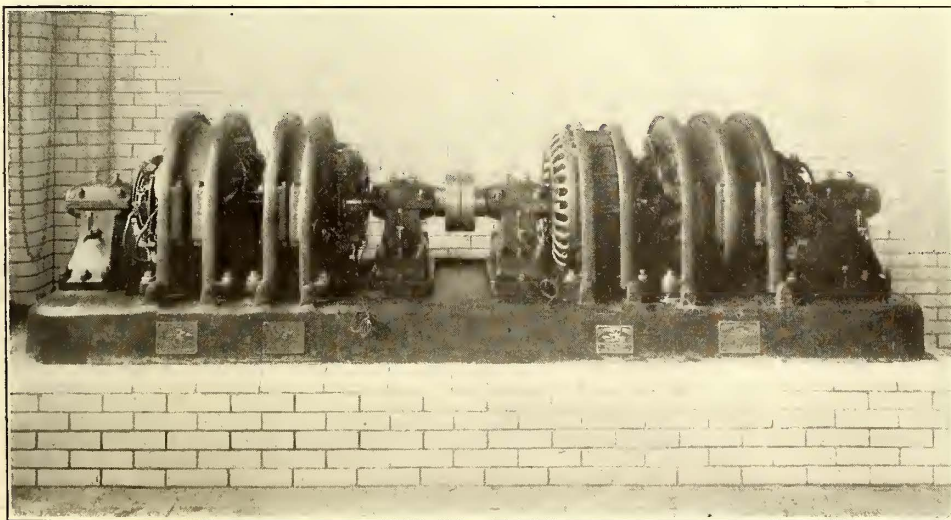


Fig. 4—Detroit Tunnel—Exciter Set for Booster

extreme right of the drawing presented on the preceding page.

To avoid the use of poles throughout the yards all cables are carried in ducts underground. Vitrified clay ducts are employed in the tunnel and throughout the yards, and iron conduits are used for the secondary wiring for the lighting of the tunnel. This lighting conduit is built in the concrete lining of the tunnel and runs directly into the junction boxes holding the incandescent lamps.

on account of the somewhat limited space, it was impossible to separate the cables properly with barriers or split ducts.

REGULATION OF LOAD

The nature of the load and the mode of regulation are such as to warrant a somewhat detailed account.

The energy is purchased on a maximum demand basis, which makes it necessary for economical operation to eliminate as far as possible excessive peaks from the incoming lines. A Gould

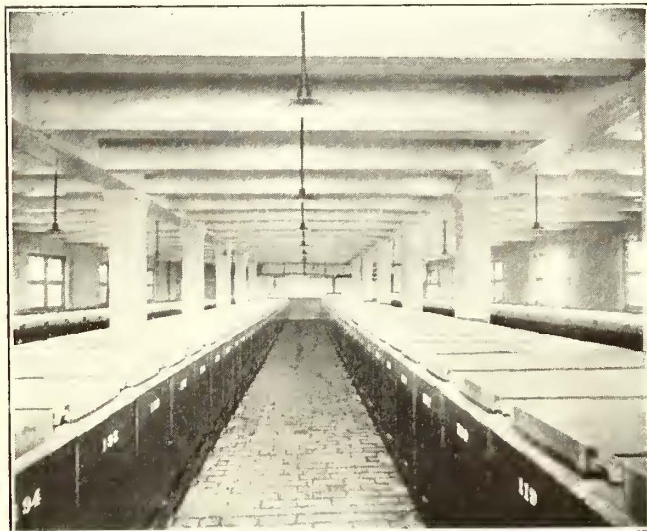


Fig. 6—Detroit Tunnel—Lower Battery Room

storage battery has been installed to take care of the fluctuations of load and the regulation devices are such that the first 800 amp are taken from the motor-generator sets; then the battery takes care of the load from 800 amp up to 8360 amp; that is, the battery takes 7560 amp. Anything above this figure is again taken from the motor generators. The maximum load is 9100 amp. When this load is being carried the motor-generator sets would be delivering 1540 amp (their full-load rating), and the battery would be supplying 7560 amp.

The battery consists of 312 cells, type U-43 plate elements in 59 plate tanks. These plates are 18½ in. square, and each element has a capacity of 630 amp for 8 hours, 1260 amp for 3 hours, 2520 amp for 1 hour, or 5040 amp for 20 minutes, and is capable of withstanding discharges up to 8000 amp capacity.

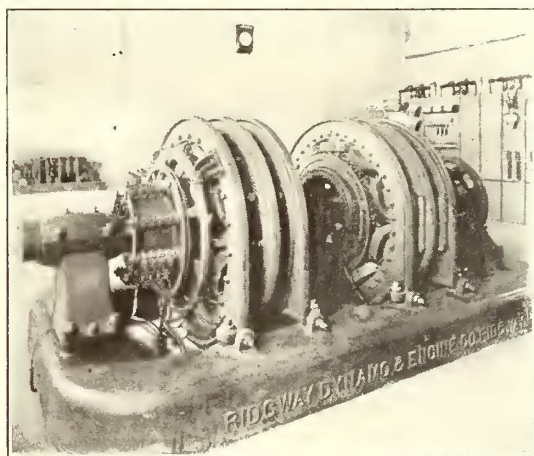


Fig. 7—Detroit Tunnel—Booster Set

When a total of 59 plates is installed in the tanks each element will have a capacity of 870 amp for 8 hours, 1740 amp for 3 hours, 3480 amp for 1 hour, or 6960 amp for 20 minutes, and will be capable of withstanding discharges up to 11,000 amp.

The battery installation is for the purpose of removing the fluctuations from the load and insuring a practically constant input from the Detroit Edison Company. It consists of the battery, a motor-driven booster, an exciter set for the booster

and a small rectifier set for obtaining current for regulating purposes, which varies according to the ampere times the power factor on the incoming supply. One floor of the battery house is shown in Fig. 6, while the exciter set, the motor-driven booster and the small regulating rectifier set are illustrated respectively in Figs. 4, 7 and 8. The load requirements are such that, taken in connection with the relatively low average demand, a practically instantaneous response to load changes must be obtained from the battery and booster, and to accomplish this result a special Gould high-voltage exciter has been provided, which upon the change of load occurring impresses an abnormal voltage on the booster field. This voltage is maintained until the proper current flows through the booster field circuit to cause the booster to respond and so compel the battery to charge or discharge in accordance with the load changes.

To reduce the size of the battery required to accomplish the work and also the size of the booster necessary, it is desirable to have the station voltage changed inversely according to the demand on the station; that is, to have a high station voltage when the load is light and a low station voltage when the load is heavy. It is, however, not desirable that the variations in station voltage should occur at times other than times of maximums and minimums. To accomplish this a load-limit device (see Fig. 10) has been installed, which changes the excitation of the direct-current end of the motor-generator sets either when the booster voltage capacity is reached or when the booster current capacity is reached, but at all other times permits normal excitation of the motor-generator set. This causes the motor-generator set voltage to be increased when the booster voltage reaches the limit in a charge direction or when the booster current reaches the limit in a charge direction, and decreases the voltage of the motor-generator set when either the booster voltage or current capacity in a discharge direction is exceeded.

Inasmuch as the energy is purchased on a kilowatt-hour basis, it is desirable that when the voltage is decreased on the motor-generator sets the current be increased, and to accomplish this a booster load limit device has been installed. This apparatus, in the event of a load carrying beyond the capacity of the battery and booster, automatically shifts the excess load from it to the motor-generator set, thus preventing the opening of the battery circuit breaker and the consequent transference of the total load to the motor-generator set, which would result in the opening of the motor-generator circuit breakers. This load-

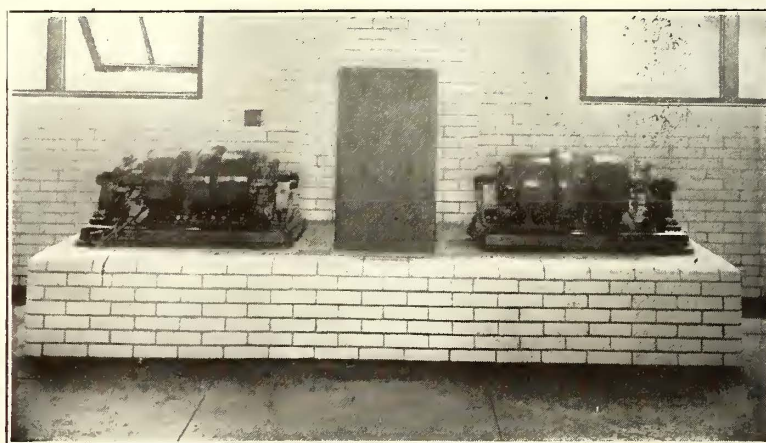


Fig. 8—Detroit Tunnel—Rectifier or Permutator Sets

limit device is actuated by battery discharge current and battery charge current, and by booster voltage in a charge direction and in a discharge direction. When the battery is discharging and this load-limit device is actuated, additional load is thrown on the motor-generator sets, and when the battery is charging and the load-limit device is actuated the load is removed from the motor-generator sets, but this device, like the load-limit control of the motor-generator sets, does not come into opera-

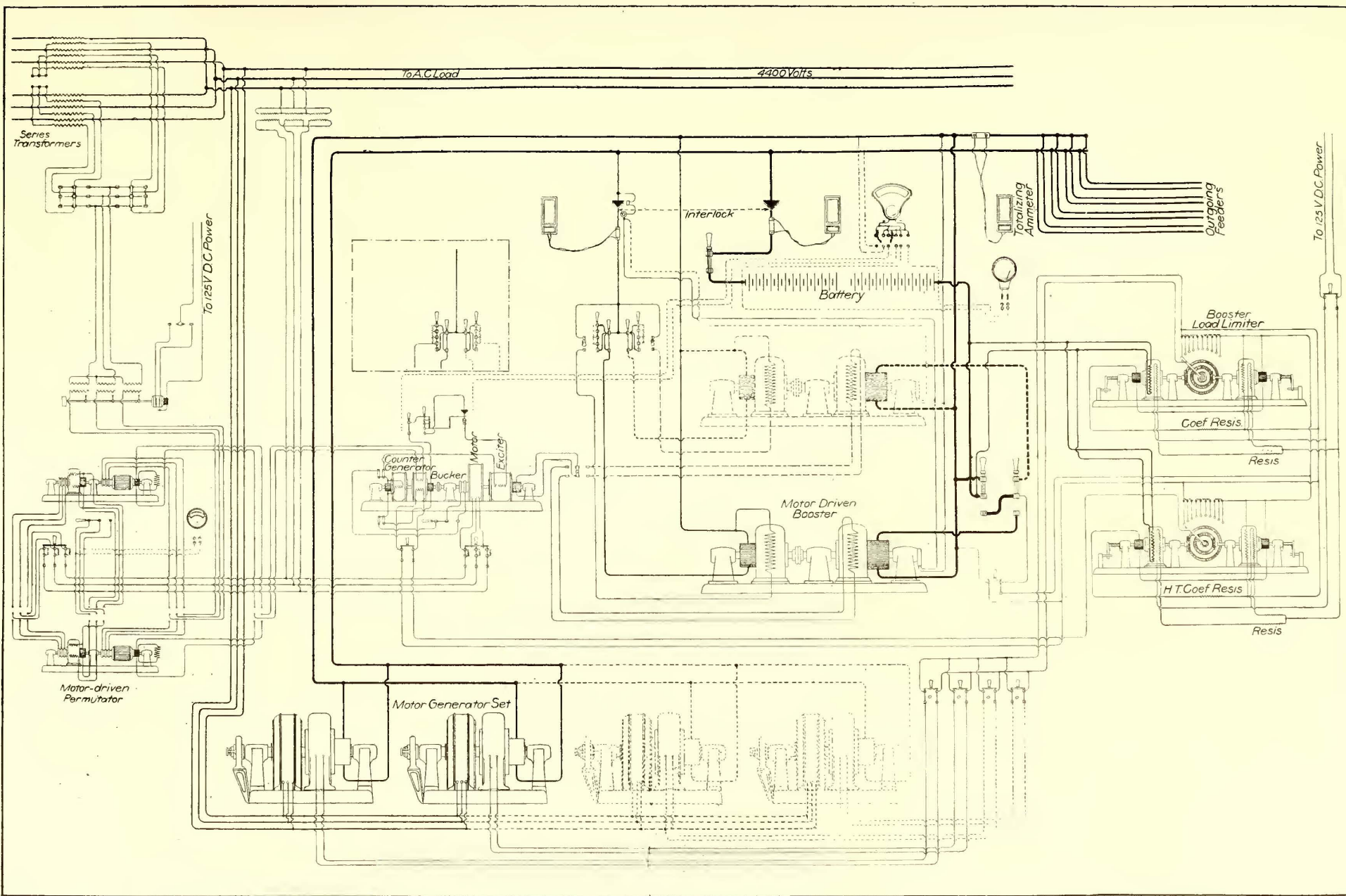


Fig. 9—Detroit Tunnel—Wiring Diagram, Showing the Present and Future Connections of the Apparatus in the Converter Station

tion until certain limits have been reached. At all other times the regulating apparatus and the battery preserve practically constant load on the lines from the Detroit Edison Company.

It is thought that the following details of the apparatus may be of interest: In the incoming lines from the Detroit Edison Company series transformers are inserted and from these series transformers current is led to a small rectifier set which consists of a synchronous motor and a small permutator. The synchronous motor drives the permutator in synchronism with the voltage, but in a reverse direction to the direction of the field set up by the current from the series transformers. This results in a field which is fixed in space so long as the power factor is unchanged. The permutator is provided with two sets of brushes, one practically at 90 electrical degrees to the other, one set being connected to the field of the counter machine and the other set connected to a by-pass circuit. The brushes are so set that with the normal current flowing from one set of brushes through the field of the counter machine no current flows through the by-pass circuit when the power on the incoming lines from the Edison Company is at 100 per cent power factor. When set in this way a change in power factor on the incoming lines without a shift of current will cause the current supply from the permutator to the field of the counter machine

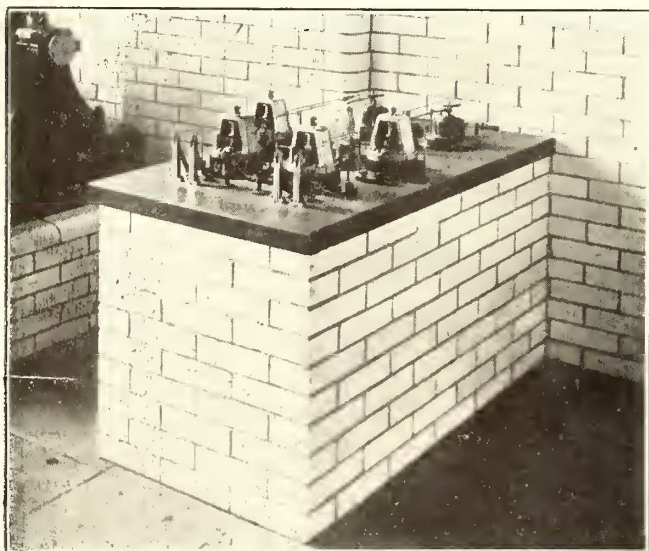


Fig. 10—Detroit Tunnel—Quadruple Load Limit Device

to be reduced and the current to flow in the by-pass circuit, and by proper adjustment of the resistance of the two paths the current flowing through the counter machine field is at all times proportional to the current times the power factor on the incoming lines from the Edison Company.

From the counter machine armature a circuit extends to and includes one field of the exciter and the armature of the buckler, this buckler being a machine designed to generate constant voltage irrespective of the direction and amount of current through its armature and provided to furnish a constant opposing force for the regulation to work against. The voltage of this buckler is equal to the voltage of the counter machine when the normal load is on the incoming lines, and any change in load on the incoming lines will cause current to flow from the counter machine or to the counter machine through the exciter field, depending on whether the load is increased or decreased. From the exciter armature a circuit extends to the booster field and includes a reverse series winding on the exciter. This winding cuts down the exciter voltage when current flows to the booster field, thus permitting an abnormal voltage to be obtained from the exciter and applied to the booster field as long as required, or until current begins to flow through the booster field circuit, when this voltage is cut down in proportion to the current flow to the booster field. The wiring details of this apparatus are shown in Fig. 9.

In this plant the time which is required to reverse the

booster from approximately 80 volts in one direction to approximately 80 volts in the other direction, with normal voltage applied to its terminals, is approximately $4\frac{1}{2}$ seconds. By using the differential exciter voltage as high as 300 volts can be impressed on the booster field, which is wound for approximately 20 volts. The result is that the response of the booster is enormously quickened, and this excess voltage is cut down exactly as desired, so that at no time does an excessive or abnormal current flow through the booster field. Means are provided whereby the average load supplied by the Detroit Edison Company can be changed at will to accommodate this system to different schedule conditions. Means are also provided whereby the regulation can be changed from $7\frac{1}{2}$ per cent to 33.1-3 per cent; that is to say, the incoming power from the Detroit Edison can be kept constant within the limits of plus or minus $7\frac{1}{2}$ per cent, or can be permitted to vary plus or minus 33.1-3 per cent from any desired average.

ELECTRIC CLUB OF CHICAGO

A well-attended meeting of the Electric Club of Chicago was held on Jan. 11 in the Coliseum during the Electrical Show, by the courtesy of Homer E. Niesz, who is general manager of the Electrical Show, as well as vice-president of the club. H. H. Cudmore, president of the Electrical League of Cleveland, was the principal speaker, as the result of an interchange of courtesies between the Cleveland and Chicago clubs, Mr. Vose, the president of the latter organization, having previously addressed the Cleveland League. Mr. Cudmore said that the association in Cleveland is conducted on lines similar to those followed by the Electric Club of Chicago. Meetings are held twice a month, although it is expected that the plan of holding weekly meetings as in Chicago will be adopted at some future time. One feature of the Cleveland meetings is the chorus singing, which has proved an enjoyable diversion. Mr. Cudmore spoke particularly of the plan of co-operative newspaper advertising adopted by the electrical interests of Cleveland and he caused to be distributed sample pages of the newspaper publishing these advertisements. An arrangement was made with the *Cleveland News*, an afternoon paper, by which on every Saturday there is published what is called "the People's Electrical Page." In the center of this page there is a collection of items of electrical information of general interest, and surrounding it are the advertisements of local electrical dealers, contractors and central-station interests. The idea is that the electrical advertising of Cleveland is thus massed in one broadside, as it were, and is, therefore, more effective. The work is in charge of M. E. Turner, of the Cleveland Electric Illuminating Company, who is also an officer of the league. Mr. Cudmore closed with a cordial invitation to the members of the Electric Club of Chicago to visit the Electrical League of Cleveland.

J. S. Badger, general manager and chief engineer of the Brisbane Tramways, of Brisbane, Australia, who has been spending some time in the United States investigating the management of street railways in American cities, was a visitor, and spoke briefly by invitation. He said that all the trunk railroads and many of the street railway and electric light plants in Australia are owned by the government or by municipalities. He believes, however, that the electrical industry does not reach its highest development under government ownership. Public ownership has many good features, but it is undoubtedly true that private enterprise supplies that initiative which makes for the greatest degree of enterprise and development. Mr. Badger spoke of the remarkable progress in street-railway service in Chicago since he visited that city 15 years ago. The street railway systems of Australia are small compared with those of the United States, and the speaker gracefully expressed a sense of obligation in being permitted to study freely many examples of American development.

George H. Porter and Thomas C. Ringgold spoke briefly. The treasurer's statement was submitted, showing that on Jan. 1 the Electric Club of Chicago had \$3,222.35 in its treasury.

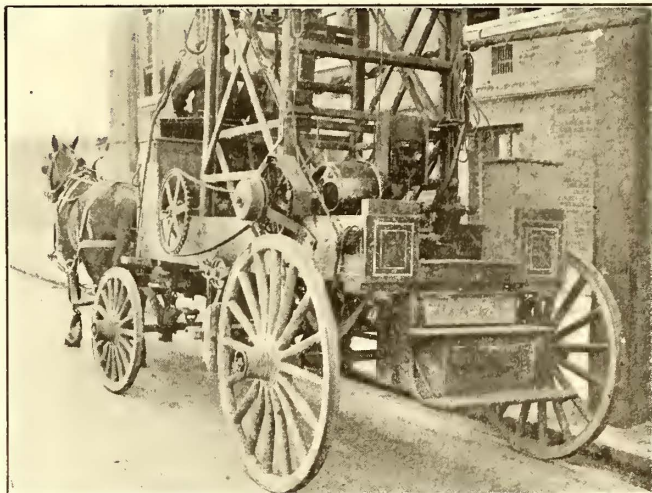
**PORTABLE ERECTOR FOR ORNAMENTING IRON POLES
IN SAN FRANCISCO**

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

In San Francisco the United Railroads is at present engaged in installing about 600 iron poles with ornamental castings of an unusual design on three of the principal streets of the city—Market, Valencia and Sutter. These poles were modeled after the very ornate columns on the Alexandria bridge in

being lowered into place, some device outside of the linemen's usual resourceful list of tools had to be provided. As the erection of 600 sets of these castings was a large piece of work, it justified considerable expense in constructing the apparatus so as to make it as labor-saving as possible and also to insure that this saving should more than repay the cost of building the hoist.

The illustrations tell the story. An ordinary swinging-leaf, telescope tower wagon was equipped with a guyed rigid square 5-in. x 5-in. Oregon pine lower mast and a 3 7/8-in. x 3 7/8-in. pine top mast hinged to the former and tapering to 3 3/8 in.

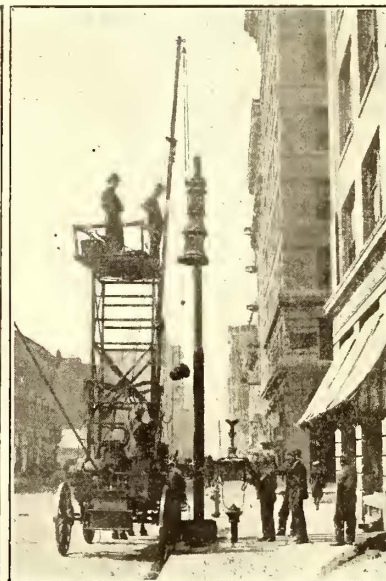
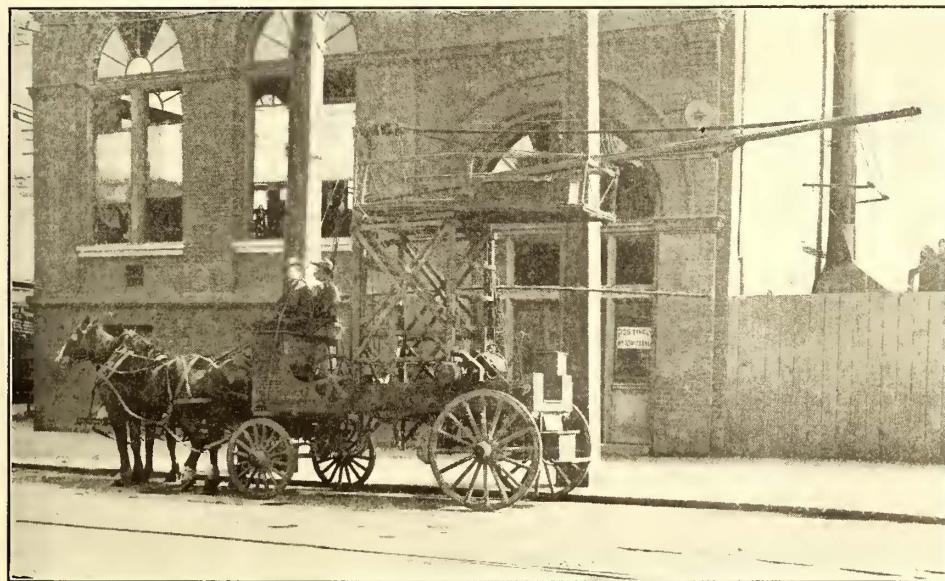


San Francisco Poles—View on Market Street and Rear View of Erector

Paris and carry on the base many figures in bas relief representing typical scenes from early California history. This article does not deal with the artistic design of the pole so much as with the practical task of installing the heavy ornamental iron castings on the already set poles.

The poles are of the usual steel tubular three-part construction—6 in., 7 in. and 8 in. in trade diameter. On Market Street, where there are four trolley wires and the distance

between curbstones is 85 ft., "extra strong" pipe is used, but on the other streets, where there is but 42 ft. or 48 ft. between opposite poles, the "standard" pipe poles are used. To maintain the continuity of the figures and produce the most completely artistic effect each casting was made in one piece and had to be threaded over the pole.



San Francisco Poles—Portable Erector Closed and in Action

As the base was nearly 6 ft. high and weighed 500 lb. and had to be swung in the clear above the 24-ft.-high pole before

the top of the mast. This gin pole is leaned so that the top is perpendicularly above a point enough beyond the side of the wagon to allow the 27-in. diameter sub-base to be hoisted clear of the tower.

For the actual work of hoisting the half-ton of parts per pole expeditiously, a 2 hp, 500-volt shunt motor is used. This motor's pinion runs at 1200 r.p.m. and is geared by a double gear and sprocket chain reduction to a drum to which the rope

from the blocks is attached. On this 6-in. drum the 1-in. rope is wound as it comes off the combination of single block above and single block below.

The connection to the trolley wire is made by a long light "fishpole" and to the "ground" through the iron pole that is being ornamented. The speed of hoisting the heaviest piece, the base, weighing 500 lb., is 45 seconds. The lighter collars are hauled up by hand with a "whip" or single block, while the slings are being rigged on the heavier pieces.

The span and anchor wires have to be cast off and the strains temporarily taken care of from the top of the tower, while the sub-base, base and ornamental rings are being slipped over the pole. Under favorable conditions 25 sets can be put in place in a day with this device. Before the ornamentations are put on the pole it is bored at the base for the arc-light conductors to connect the underground lines with the lamp in the ornamental top. Every fifth pole on one side of the street has also been bored for the accommodation of the feed-in cable for



San Francisco Poles—Ornamental Bases

feeding the trolley wire from the underground feeders and each pole has been equipped with a roomy maple oil-impregnated switchboard for the attachment of switches and cut-outs to be located in the double-doored sub-base.

The iron castings as received from the makers have been painted with one coat of red lead on the outside. The core sand is scraped or blown out by compressed air and the inside given a coat of pole paint by the company before erection. The pole is painted again where it is to be covered by the castings.

After the installation of the ornamentations the pole is pulled or jacked plumb. The sub-base is then leveled up, cemented in and provided with drainage for water of condensation or leakage, the cracks are puttied up over oakum and the whole pole is repainted.

As the operator of the mechanism sits at his work he has the handle of the motor-starting resistance box conveniently before him and a foot lever below him for throwing a dog into the teeth of a gear on the end of the rope drum for emergency use in case both hoisting motor clutch and band brake should fail. A lever is at his right side for controlling a band brake on the drum on which the hoisting rope is wound and a

lever at his left side for throwing into or out of contact an 8-in. diameter cone friction head clutch coupling for use in connecting the motor mechanism to the hoisting rope mechanism. The band brake is used to control the speed of lowering the castings after being threaded over the top of the pole.

To a street railway man visiting San Francisco the fine appearance of these ornamented poles is a striking feature of the rebuilding of the recently burned city.

PATENTS—WHAT THEY ARE, AND HOW TO READ AND UNDERSTAND THEM

BY S. E. DARBY, ATTORNEY-AT-LAW, NEW YORK

Although the government has been granting patents for inventions for more than 100 years, they are, perhaps, the least understood of the various forms of property. In the popular mind they are regarded with more or less mystery and are frequently associated with visions of wealth, or else with vagaries of a diseased mentality. It is true that instances are common where patents for inventions have formed a basis for the accumulation of fortunes of greater or less degree, but the vast majority of patents have brought little or no return to the inventors who have given their time, efforts and patient toil in the creation of new ideas in the advancement of the useful arts.

Perhaps herein lies the other popular fallacy referred to. It is often difficult to understand why any one in a normal state of mind should go on with experiment and development without reaping some benefit or advantage from the efforts, and often the expense, devoted to this work. It would be too much to say that in such cases the reward comes from the knowledge that mankind has benefited by the production of the invention. The making of inventions is not, as a general rule, founded on any such high and disinterested motive. There is always the hope of remuneration of some sort. At the same time the public does benefit, to some degree at least, by each invention made, and we owe our present stage of perfection in every line of industry and in every direction to the steps of advancement brought about by the exercise of the creative faculties which we call invention.

To understand what a patent is we must not lose sight of the underlying basis of its grant. Among the powers conferred on Congress by the Constitution, which forms the basis for all our federal laws, is the power "to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

This is the foundation on which the entire structure of our patent laws is erected. The invention or discovery which promotes the progress of a useful art is to be secured to the inventor for a limited time. It is secured by the grant of a patent. The limited time has been fixed as 17 years. During this period the patent secures to the inventor the exclusive right to the invention. At the expiration of this period it terminates and the invention becomes available to the free use of the public. The term of exclusive right which the grant secures to the inventor is known as the life of the patent. During this term the exclusive right to the invention is a property right. It can be owned, enjoyed, used and transferred like any other property. There is nothing peculiar or difficult in the application of the ordinary rules to the property right secured by a patent.

A patent has sometimes been referred to as a contract between the inventor on the one hand and the government on the other. Being a contract it is based on mutual considerations passing between the contracting parties. The inventor, on his part, having made an invention, agrees that if he be granted the exclusive right to the invention for 17 years the public may have the free use of it thereafter. The government, on its part, agrees that if the inventor has made an invention it will secure to him the exclusive right thereto for 17 years, by

the grant of a patent, provided the public may have the free right to the use of the invention at the expiration of that term. This is the contract. The inducement to the inventor is the knowledge that for 17 years he shall have exclusive right to his invention, that during this time he can do with it as he pleases and that no one else can use or enjoy it without his consent. The inducement to the government is that of promoting the progress of the useful arts and securing to the public at the end of the exclusive period the right to the free use of the patented invention.

Every patent consists of two principal parts: first, the specifications, including drawings, where the nature of the invention is such as to be capable of illustration by drawings, and, second, the claims. Since the invention is the exclusive property of the patentee for 17 years and is to become public property at the expiration of that time, it is necessary that the public may know exactly what the patented invention is. Therefore the specifications must include a written description of the thing patented and in such clear and concise terms as to enable any one skilled in the particular art to which the patented device relates to construct, compound or use the device, by following the written description and the drawings forming part of the patent. The thing patented, the invention, may be a new method of operation, a new machine, a new article of manufacture, a new composition of matter, a new combination of elements, or a new improvement on an old method, machine, manufacture, composition or combination.

To define the exact scope and breadth of the invention, and of the grant which secures it for the limited period to the inventor, the claims of the patent are necessary. It is the claims which particularly point out and make clear the part, improvement or combination which the inventor claims as his invention or discovery. In securing a patent, therefore, the inquiry is: (1) Is the device sought to be secured by the inventor an invention; that is, is it the result of the exercise of the creative faculties? (2) Do the specifications, including the drawings, describe it with such particularity, fulness and clearness as to enable any one skilled in the art to which it relates to make, construct and use it? (3) Do the claims sufficiently define the invention and distinguish what is new from what is old?

Of these inquiries the last is the one which gives rise to the greatest conflict between the examiners in the Patent Office, whose duty it is to pass on the application for the patent, and the applicant for the patent. In this action there must be taken into account everything that has been done before in the particular art to which the invention relates. The examiners, while, of course, not infallible, devote careful, conscientious and trained intelligence to their examination of each application for patent they are required to pass on and allow the patent only after being thoroughly satisfied that the invention is one worthy of being secured exclusively to the inventor and is a promotion of the useful arts. In the large majority of cases the conclusions and findings of the expert Patent Office examiners are sustained when finally tested in the courts.

Many stand in great awe of a patent, and believe that all patents are good. To a certain extent this is as it should be. The grant of a patent carries with it the presumption that it is good. Indeed, so strong is this presumption that it requires proof to defeat it of the same order that, in the criminal law, is required to convict of murder, namely, proof that does not admit of a reasonable doubt. On the other hand, there are many who seem to believe that a patent is not good and is without value until it has been passed on by the courts and held to be good and valid. This view is too frequently held by those who find themselves unlawfully appropriating that which has been exclusively secured by a patent to another. A very small minority bring a really intelligent understanding to bear on the subject when presented to them before venturing to declare a particular patent under consideration to be good or bad.

A patent grant may be revoked and set aside by the courts on proper application based on fraud in connection with its

grant, but this course is very rarely invoked and is still more rarely effective. In the vast majority of cases where patent grants are held invalid, either wholly or in part, it is in suits brought on the patents for their infringement. This situation arises where the owner of the exclusive right secured by a patent grant finds that the exclusive right is being appropriated by another without his consent. To enforce his right to exclude others from the use of the patented invention the owner of the patent sues the unauthorized user for remuneration and damages for the unauthorized use and for an injunction against the continued use of the patent grant. The usual defense to such a suit is that the patent is invalid and void because it does not cover a patentable invention, having been anticipated by something which existed in the art prior to the date of the inventive act creating the patented invention. It then becomes the duty of the court to consider and pass on the questions whether the patent is valid and whether the one charged with its infringement really does appropriate and use the patented invention, giving, as a general rule, the patentee the benefit of any doubts that may exist. Unfortunately patent infringement litigation is expensive to the parties engaged in it. To this may be due, in large part, the terror and awe in which patent rights are held by a large part of the public. But this is a fault of the practice that has grown up in connection with patent litigation, rather than of the patent system itself.

It is usually difficult for the public at large to comprehend the difference between an invention and the machine, article, combination or thing into which the invention is incorporated. We very frequently hear one charged with infringement of a patent say: "I am not infringing because I have a patent myself for the machine or article I am using. The Patent Office would not grant me a patent for something which infringes a patent previously granted to someone else." On its face this reasoning appears plausible, and to understand its fallacy it is necessary to go back to first principles. The invention which a patent grant secures exclusively to the inventor must be defined and particularly pointed out in the claims, which thus become the measure by which the scope of the exclusive right is gaged. Therefore, in granting a patent the Patent Office considers in this connection only the question of whether the claims properly distinguish the new idea from what was old. It has no right or power to consider whether or not the machine, article or combination shown and described in the drawings and specifications contains the invention or inventive idea of some prior patent. That question is solely for the courts to consider. The duty of the Patent Office is to see whether or not the claims of the application for the patent can be allowed over what is shown or described in prior patents. It does not consider what is claimed in the prior patents. If what an applicant for a patent defines in his claims to be his invention is found to be old in a prior patent the applicant's claims are refused. If what is defined in the claims of the application is found to be new the claims are allowed, but their allowance and the issuance of the patent grant thereon do not give the patentee any right to use what has been exclusively secured in the claims of a prior patent. This can possibly be made clearer by illustrations.

Let us suppose ourselves back at the dawn of civilization and that our present patent laws were then in force. Now suppose "A" to be the first to invent and build a house—a log cabin, as distinguished from a tent or a cave—and that he provided the house with a doorway through one of its walls, and a door for the doorway, the door being suspended by leather thongs from a horizontal pole arranged above the doorway so that the door could be shifted along the pole into open or closed position. "A" becomes so impressed with the value of being able to employ a door which is movable into open position to let the light of the sun shine into his habitation, or into closed position to shut out the cold winds and the rains, that he decides to secure the exclusive right to the invention he has made in the promotion of the useful arts. He thereupon makes application for a patent and makes the door the important feature of the invention, which he defines in a claim as follows:

The combination with a house having walls, one of the walls having an opening therethrough to form a doorway, a door for the opening, and means for supporting the door for movement into and out of position to close the opening.

The examiner of the Patent Office, finding this invention to be new, allows the claim and the patent grant issues securing to "A" for 17 years the exclusive right to the invention defined in the claim. Subsequently "B," whether he has knowledge of "A's" invention or not, conceives the idea of supporting the door at its vertical edge upon hinges so that the door may rock or swing on its hinges into and out of position to close the doorway. This invention makes the use of the horizontal pole of "A's" device unnecessary. "B" then applies for a patent and defines his invention in a claim identical with that previously granted to "A." This claim, it will be seen, applies as readily to the one structure as to the other. The Patent Office examiner, in making his examination of "B's" application, finds "A's" patent, and seeing that "B's" claim is satisfied by "A's" structure, refuses "B's" claim as being anticipated by "A's" prior patent. Thereupon "B," being satisfied that his construction possesses merit and advantage over "A's" arrangement, modifies his claim defining his invention, and asks that a patent be granted to him upon the modified claim as follows:

The combination with a house having walls, one of the walls having an opening therethrough to form a doorway, a door for the opening, and hinges for supporting the door along one of its vertical edges whereby the door may be rocked or swung upon its hinges into and out of position to close the opening.

The examiner finds that this claim points out a structure which "A's" patent does not disclose, and allows this claim, and a patent grant issues to "B" securing to him the exclusive right to the invention he has made. Therefore, "A," although having obtained a patent, is excluded from the use of "B's" invention. At the same time "B" is excluded from using "A's" invention. In granting "B's" patent the examiner did not take into account the scope of "A's" invention as defined in his claim, but considered only the question presented to him by "B's" application, namely, whether "B's" claim defined a new structure and arrangement. Finding this question in "B's" favor, the patent issued to "B" as a promotion of the useful arts. While "B" secured the exclusive right to his own invention, still this grant did not give him the right to use that which had been previously secured exclusively to "A," and since "A's" patent defined and pointed out in its claim a construction which included "B's" invention, that is, since "A" secured the exclusive right to employ a door for the doorway opening in the wall of the house, which door was defined as being "supported for movement" into and out of position to close the doorway opening, "B" is excluded from using his arrangement wherein the door is supported on its vertical edge on hinges so as to rock or swing into and out of position to close the door opening because in doing so he would be using a "door supported for movement" into and out of position to close the doorway opening. That was just what "A" had secured exclusively in his patent. This exclusion of "B" from using what he had invented must continue till the period of "A's" exclusive right terminates. During this period "A" is not at liberty to use a door supported at its vertical edge by hinges because that is what has been exclusively secured to "B."

Suppose, however, that when "A" had originally applied for his patent he had failed to realize the value, importance and possibilities of different door movements, and had defined his invention in his claim as follows:

The combination with a house having walls, one of the walls having an opening therethrough to form a doorway, a horizontal pole supported above the doorway opening and a door suspended from the pole to be shifted therealong into and out of position to close the doorway opening.

A patent would have issued to him for the invention so defined. Now, if subsequently "B" made application for patent for his improvement of a hinged door and defined his invention in the terms of the claim specifying merely "means for supporting the door for movement into and out of position to close the doorway opening," the examiner would have refused allowance of this claim, as before, because in "A's" patent the door is

shown and described as being so supported. If, then, "B" restricts his claim the same as before to a door supported at one vertical edge thereof on hinges to rock or swing into position to close the door opening, his claim would be allowed, because "A's" patent would not show or describe any such structure. Moreover, the grant of "A's" patent for the invention defined in his claim for the horizontal pole and the sliding door suspended from it would not prevent "B" from using his invention of the hinged door, because "A's" claim does not in this case apply to "B's" structure, and the use of "B's" structure would not involve appropriation of that which had been exclusively secured to "A."

Suppose, again, that in the first instance "A" had defined as his invention in his claim merely the structure of the house itself, though showing and describing but not claiming the door. Now, when "B" applies for his patent, claiming the door broadly, as before, his claim would be refused because the broad idea is shown and described in the earlier patent to "A," although not claimed therein. When "B" limits his claim to the hinged door structure his claim is allowed. In this case he is still excluded from using his door construction in connection with the house, because the house has been exclusively secured to "A," although he is at liberty to sell his door to one who buys the right from "A" to use the house, but "A" cannot use the hinged door construction without the consent of "B," because that is the invention which has been secured exclusively to "B."

In this last case, where "A" defines his invention as the house structure, and "B" defines his invention as a hinged door structure for the house, it might happen that "A's" application for patent might be assigned to one examiner or to one class of inventions in the Patent Office, and "B's" application for patent for his hinged door structure might be assigned to another examiner or class for examination. Therefore, when "B's" application is first filed with the broad claim for the door however supported, the examiner might not think of examining the class of house structure patents and so might overlook the previously granted patent to "A." In this case "B" would get his patent with the broad door claim, but the patent would be invalid because the claim granted in "B's" patent would apply to what had been previously shown and described in "A's" patent. Consequently, if "B" should sue "A," or any one else, for infringement of his broad door claim it would be a good defense to the suit to bring forth to the court the earlier patent to "A." But suppose "B" had defined his door invention in two claims, one for the broad door structure and another for the hinged door structure, his patent would have been good and valid as to the hinged structure, though void and invalid as to the broad door structure.

Coming down to modern times, we find life more complex, and we encounter greater refinements and advances in all directions. So, too, we find our patents and the inventions they define in their claims more complicated and refined. We find that they mark narrower steps of advancement and hence include a greater number of elements. We also find a wider and ever increasing range of prior art to be considered in reading and ascertaining the true scope and breadth of our patents. The process remains just as simple and easily understood as originally, but greater care and discrimination are required. The great considerations in any case remain just the same, and these are: (1) What is defined and particularly pointed out in the claims as the invention which is exclusively secured to the inventor by his patent? and (2) Is that invention, so defined and pointed out, new and useful and a promotion of the useful arts? In the solution of these questions many rules have been developed of more or less technical character, and these rules constitute the test by which each case is measured.

Perhaps the most fruitful source of trouble in the application of the technical rules to ascertain the breadth, scope and strength of a patent is the question of proper combination of the elements which enter into the invention and are defined in the claims as the invention which is secured exclusively to the patentee. For a claim to be valid it must be for a true combi-

nation and not for an aggregation of the recited elements. The distinction between these is one that is frequently misunderstood and misapplied, although the principles involved are comparatively simple. It is not necessary that all the elements which enter into an invention shall be new. Indeed, it is not even necessary that any of them shall be new, since invention may reside as well in a new combination of old elements as in a combination of new elements. In fact, most of the inventions of modern times, particularly those relating to mechanical structures, are made up of elements which are themselves individually old. An inventor of to-day is entitled to call to his aid all the knowledge and information which the prior art can afford him, and if from this knowledge and information he can evolve a new combination which promotes the progress of the art in which he is working, and which attains advantages and utility not before realized, he has complied with the requirements and is entitled to be secured in the exclusive right to the invention he has made, always provided that he has made a true combination and has not merely aggregated the various elements he has called to his aid.

REPORT OF THE CHAIRMAN OF THE CENTRAL ELECTRIC TRAFFIC ASSOCIATION*

BY A. L. NEEREAMER, CHAIRMAN

Congratulations are due you for the expeditious manner in which business has been transacted at the meetings and by the committees during the past year and for the peace and harmony which have existed.

The Central Electric Railway Association has a membership of 46 interurban lines and one city line representing 3480 miles. Out of this, 36 interurban lines, representing 2962 miles, are active members of this association and participate in various publications. Thirty-three lines, representing 2840 miles, will be represented in Joint Passenger Tariff No. 3 when revised. Twenty-eight lines, representing 2354 miles, are now party to the interchangeable 1000-mile ticket. Twenty-six lines, representing 2169 miles, are party to the Official Classification, as filed by the chairman.

During the latter part of the year 1910 the time of the association has been occupied in revising Joint Passenger Tariff No. 3. Part of this work is brought about by slight revisions of the various local passenger tariffs, the correction of errors made in the original publication and the insertion of new routes and rules for the accommodation of the traveling public as a result of the experience derived during the past year from its use. A considerable amount of the work of the revision is caused by the addition of four new lines which are to become party to the new tariff. The inclusion of their stations and the opening up of their new routes tend to increase the value of the publication. An extension built by one line has opened another gateway for the routing of passengers, while extensions built by other lines have increased the territory and list of stations covered. The work of the revision is not yet completed, but at the rate it is progressing it will be but a short time until the revised tariff can be placed in the hands of the various companies for distribution. Following as a natural result of this, the tariffs covering the interchangeable 1000-mile ticket and joint and local baggage should be revised to incorporate the additional lines that are participating in the other tariffs. At this point it may be well to call attention to the increased demand for the interchangeable 1000-mile ticket. During the first two years 7000 of these tickets were ordered by the various companies party thereto and placed in the hands of their agents. During the past year nearly 5000 additional tickets have been disposed of. This is a ratio of over two to each mile represented by the lines shown on the cover.

The first step in the association toward uniformity in freight traffic was accomplished this year by the adoption of

Freight Circular No. 1, covering a table of estimated weights of standard commodities, and the filing of the Official Classification. While but 26 lines are party to the Official Classification, as filed by the chairman, there are quite a number that are purchasing the classification through this office in order to use a publication that has the association cover.

At the present time we have in the hands of the various committees a number of important subjects which will be decided within a very short time. These subjects cover an official interurban map, an official interurban guide, a standard scale for the transportation of milk and cream and a uniform exception sheet. The committees in charge of the above propositions have been working faithfully, and the results of their investigations will be of great benefit to the association.

During the past year your chairman has had considerable correspondence with various lines outside of the territory regarding information on various traffic propositions which have been worked out in our meetings. He has been able to answer these communications and give the valuable information requested. During the same period correspondence was carried on with various steam lines and associations regarding the exchange of information and recommendations in joint territory, and this correspondence has resulted in considerable benefit to our members.

In conclusion, the chairman desires to express his sincere thanks and hearty appreciation to each and every member for the earnest support and co-operation given him during the past year in his endeavors to work out the desires and orders of this body. Without this support very little would have been accomplished and our time would have been spent in vain. While the chairman is nominally the executive officer of your association, he is in reality nothing but an employee whose duty it is to carry out the instructions and orders which you give him. Therefore, without the support you have rendered the success which has been achieved during the past year might have been "weighed in the balance and found wanting."

You still hold the record of being the only traffic association existing among interurban lines, as the associations organized in other territories are still in their infancy and have not energetically or systematically taken up this important branch of interurban operation.

EXTENSION OF ENGINEERING FORCE OF MCKINLEY PROPERTIES

H. E. Chubbuck, vice-president executive of the McKinley properties, has just inaugurated a new operating engineering department with a staff which will serve to keep his office in touch with the local properties operated in the States of Illinois, Iowa and Kansas. The new engineering department will have headquarters in the Peoria offices. At the head of the department is W. H. Thompson, Jr., chief operating engineer, and associated with him are F. W. Bedard and R. F. Carley, operating engineers. W. J. Achelpohl, auditor of the Western Railways & Light Company, will look after the accounting of the statistical part of the work of the operating engineers. The new operating engineering department will endeavor to keep in close touch with the conditions on each of the local properties of the Illinois Traction System and the Western Railways & Light Company and serve to bring about a uniformity of operating methods on all properties which have similar operating conditions.

The operating engineers just appointed will visit each of the railway, lighting, gas and heating properties in Illinois at least once every two weeks. The properties in Iowa and Kansas will be visited at least once a month. The engineers will pay particular attention to the operating conditions at each plant and will submit reports of observations to Mr. Chubbuck, calling special attention to any unusual conditions. The operating engineering department will issue no instructions to the various superintendents in charge of the local properties but will submit their recommendations to the vice-president of the

*Report submitted at the annual meeting of the Central Electric Traffic Association at Indianapolis, Jan. 18, 1911.

company at Peoria; then, if any changes in methods are found desirable, instructions to the superintendents of the local properties will be issued from Mr. Chubbuck's office. This new department and staff also will be available for making special reports on power contracts and for similar promotion work.

TRAIN DISPATCHING ON INTERURBAN ROADS*

RY C. E. LEWIS, CHIEF TRAIN DISPATCHER NEW YORK STATE RAILWAYS, ROCHESTER, N. Y.

The safety of passengers and trains is of the first importance in railroad operation. To accomplish this on single-track, interurban railroads where first-class trains are operated at high speed on frequent schedules it becomes necessary to have a first-class dispatching system and a book of rules which are plain, brief and cover all points of train movement in such form as to eliminate all chance of doubt as to their interpretation.

Train dispatching covers a wide difference of opinion, and as the American Railway Standard Code is the result of many years of study of experienced and efficient railroad men, it seems to me to be the only one to follow.

Two forms of orders are used on the Rochester interurban lines of the New York State Railways: the train clearance order and the "31" telephone order. Order offices are situated along these lines about 10 miles apart and are positive block stations. Trains cannot pass or leave these stations without obtaining one of these forms of orders. In the absence of other order the train clearance order is used to allow a train to pass a positive block station. It is issued by the dispatcher under a distinct order number and is recorded in the dispatcher's order book with the train number, motor number, time O. K.'d, station receiving and operator's name. The operator, after repeating this order to the dispatcher and receiving the O. K., will hand it to the conductor, who will repeat it to the operator, the operator giving the "complete." Copies are supplied for both conductor and motorman and one is retained by the operator for his record.

When it becomes necessary to make train movements not provided for by the timetable the "31" telephone train order is used and is issued in the following manner:

The operator at the station where the order is to be placed for the superior train is called and is instructed to copy three or as many as are required. Then the operator at the station where the order is to be placed for the inferior train is called and is given the same instructions. The dispatcher then gives the order number and the addresses of the trains in the order of their superiority. The order is then transmitted and is written in full without abbreviation by the operator. After the dispatcher has transmitted the order and the superintendent's initials, the operator will read it back to the dispatcher without abbreviation. The dispatcher will then O. K. the order if correct and the operator will give his name and order number.

The operator will hand the order to the conductor of the train addressed. The conductor will then repeat the order to the dispatcher without abbreviation and when he has finished he will give his name and train number. The dispatcher will complete the order if correct, giving the time and his initials. The order is then in full force and effect and a copy is given to the motorman by the conductor. The motorman must read his order aloud and without abbreviation to the conductor, the conductor watching closely to see that the motorman repeats it correctly. After the order is fully understood by the conductor and motorman they may proceed.

The requirements where orders are delivered at sidings are the same as the foregoing except that the motorman becomes the operator and receives the order and O. K. from the dispatcher, the conductor getting the "complete" in the usual manner. If, for any reason, the conductor or the motorman does

not understand the order, the dispatcher will be notified at once. The responsibility for its correct interpretation must not be assumed and the decision of one must not influence the other.

Twelve different forms with numerous examples and explanations are given for the transmission of the "31" telephone train order, and these forms must be followed if possible. When a train crew is in doubt as to the correct method of handling an order or wishes to refer to the rules that apply in a particular case, the information is easily found by referring to the forms in the book of rules.

Train dispatching on our lines is a very simple matter when all trains are running on schedule time because our rules prescribe that trains in either direction have no superior rights over trains of the same class in the opposite direction, but that they must meet as per timetable unless other orders are issued by the dispatcher.

The numerous causes of delay, such as motor failure, wire down, heavy traffic, etc., require quick, decisive and accurate action on the part of the train dispatcher so as to prevent all of his trains becoming as late as the one which is in trouble. To accomplish this successfully, I believe that a dispatcher's office should be roomy, pleasant and well ventilated and that the furniture should consist of a switchboard, dispatcher's desk, cupboard for stationery, coathook and one chair.

REPORT OF THE SECRETARY AND TREASURER OF THE CENTRAL ELECTRIC RAILWAY ASSOCIATION

BY A. L. NEEREAMER, SECRETARY AND TREASURER

Your secretary and treasurer has the honor to submit herewith his annual report for the year ended Dec. 31, 1910.

Our railroad membership now consists of 46 interurban lines, representing 3480 miles, and one city line, making a total of 47 lines, a net loss of one interurban line and 51 miles. During the past year two lines have withdrawn, causing us a loss of 189 miles. One new line, covering 44 miles, became a member, and a gain of 98 miles was made by the extensions built by a number of the member-lines. During the past year we had 128 supply members, as compared with 121 supply members and two associate members in the preceding year, a gain of seven supply and the loss of two associate members.

The receipts and disbursements for the year just past are as follows:

RECEIPTS AND DISBURSEMENTS, JAN. 1 TO DEC. 31, 1910.	
Cash on hand.....	\$427.30
Received from railroads.....	3,553.15
Received from city lines.....	37.50
Received from supply men.....	1,024.00
Received from stationery and printing.....	587.60
Received from miscellaneous.....	9.35
Total	\$5,638.90
Payroll	\$2,825.66
Traveling expenses.....	123.85
Stationery and printing.....	877.89
Postage	230.60
Telephone and telegraph.....	83.44
Office incidentals.....	32.12
Taxes and insurance.....	8.81
Express	45.20
Office fixtures.....	63.75
Office rent.....	546.00
Cash on hand.....	801.28
Total	\$5,638.90

It will be observed from the above statements that the gross receipts and expenditures are less than the same items for the preceding year. This is due to the fact that during 1909 "Joint Passenger Tariff No. 3," which was a very large publication, was issued and no reissue of the tariff has been made since. While the gross revenue has decreased the fact still remains that we are still just as prosperous as we were during the past year. This is borne out by the fact that we now have on deposit in bank \$801.28, as compared with \$427.30 for the year preceding. Your attention is also called to the following statement:

*Paper presented at a meeting called by Public Service Commission, Second District, New York, Syracuse, N. Y., Jan. 19.

*Report presented at the annual meeting of the Central Electric Railway Association, Indianapolis, Jan. 19, 1911.

ASSETS AND LIABILITIES, DEC. 31, 1910.	
Cash on deposit.....	\$801.28
Due from railroad members.....	44.04
	\$845.32
Liabilities	\$900.00
Balance	845.32
Total assets.....	\$845.32

It is with pleasure that I refer to the above statement and call special attention to the fact that our bills are all paid and our assets are nearly 100 per cent more than in the preceding year. Your association is now practically upon a sound financial basis with an established standing and can be operated, if economy is practised, successfully.

There is still an opportunity to increase the membership and the revenue of the association by active work among the member lines in endeavoring to bring into the fold the rest of the lines in the territory covered by this association. The territory covered by this association embraces in round numbers some 10,000 miles of interurban lines, of which 3480 miles are members of this association.

Since the last annual meeting the various reports by the standardization committee which have been adopted have been compiled, published and placed in the hands of our members. Special publications have been purchased for use by that committee and are now in the secretary's office.

Your secretary cannot help but to call your attention to the claim index bureau. This bureau has been in existence for about three years and has now arrived at the point where the records are valuable. The support given this bureau has not been what it should be, as a number of member lines have been negligent in the matter of reporting. There is no expense attached to this branch of the association other than the postage necessary to send in the reports. The information which can be furnished from this office is invaluable. It is to be very much desired that this branch of the association will be given more attention in the future and that every effort will be made to make it one of the leading features. The success during the past year is due to the support and co-operation given the officers by the various members and committees.

In conclusion I desire to express to the members and officers my heartfelt thanks for their assistance during the past year and to call their attention to the fact that such support and assistance given to the officers mean the establishing of the greatest association of this kind in the United States.

HEARING ON ATTLEBORO FARES

The Massachusetts Railroad Commission on Jan. 12, 1911, heard the petition of the Selectmen of Attleboro for a reduction in fare and additional service on the Interstate Consolidated Street Railway. The case of the petitioners was conducted by Frank I. Babcock. The company was represented by F. H. Dewey, president, and Henry C. Page, general manager.

The company showed that while the seating capacity was frequently exceeded extra cars were run to handle heavy travel and that in general the company endeavored so far as possible to forestall demands upon its service. The petitioners requested the establishment of workingmen's tickets at the rate of about 35 for \$1 good between 5 a. m. and 7 a. m. and 5 p. m. and 7 p. m. Mr. Dewey said that this would reduce the average fare between these hours to about 3.5 cents. The effect would be serious on all the lines of the company, since it would not be feasible to discriminate in favor of Attleboro. Counts of traffic showed that 15,600 persons used the company's service between 5 a. m. and 7 a. m. and 5 p. m. and 7 p. m., which would mean a direct loss of \$43 per day, or \$12,000 per year, if the workingmen's tickets were put in force. The company paid only 4 per cent dividends and there was little money for a surplus to meet contingencies. The company was liberal in the extent of its service, since one could ride from 6 miles to 12 miles for a 5-cent fare, with a transfer. The board took the case under advisement.

LOGICAL BASIS FOR VALUATIONS OF INTERURBAN STREET RAILWAYS*

BY C. G. YOUNG, CONSULTING ENGINEER, NEW YORK, N. Y.

Much of importance has been said of a more or less contradictory nature on the subject of valuations of various classes of public utility properties, so that an analysis as affecting the investor, the public, the corporation and the government in respect to interurban street railways should be of interest to everyone seeking a fair and reasonable solution of the present perplexing problems involved.

The writer proposes to assume and maintain an independent attitude in dealing with the questions, believing that there is something to be said on both sides, and hoping thereby that a full discussion may be brought out and definite conclusions reached on a basis that will eliminate many of the existing contentions between the public utility corporations and the public; therefore, the writer would prefer to regard the government authorities as occupying the neutral, unbiased position.

To-day there are operating in the United States approximately 12,000 miles of interurban electric railways, representing an investment of probably \$400,000,000. The net earnings are possibly \$24,000,000, or 6 per cent on the investment, but not over 70 per cent of net earnings can be paid out in dividends.

There is in contemplated construction approximately 2500 miles of additional interurban railways, every mile of which is desired by the public, and which it is conceded would add enormous definite financial values in the sections to be served.

To secure the building of any of these lines requires capital, which, for perfectly evident reasons, does not now seem to be forthcoming. It, therefore, behooves both the general public and the corporations to consider carefully fundamental conditions. To secure capital for the construction of an interurban electric railway it is usually necessary to show, by carefully considered examination by competent and experienced engineers in whom the investor has faith, that the road will probably earn double its fixed charges. The investor requires bonds for his investment, and if they be 5 per cent gold bonds they must be issued to him at a considerable discount in order to give him a minimum return of perhaps 6 per cent from the bonds, and, as this return is not guaranteed, he will require in addition a considerable portion of the common stock to justify the risk he takes by investing in a new property and before the actual earnings are demonstrated. In other words, the investor requires and is entitled to receive, if earned, a return in excess of 6 per cent to offset his risks of the actual earnings bringing him much less than 6 per cent.

The differing reasons for the valuation of a public utility property have brought about many divergent views held by different commissions as to the correct and basic method for making valuations. The following are some of the principal purposes that have been advanced for desiring a valuation of a property:

1. To limit the bond issue to the physical appraisal.
2. To determine a basis for taxation.
3. To control the issue of stocks and bonds.
4. To determine the basis of valuation for rate making.
5. To determine a basis for the sale and purchase of property, or for future government ownership.
6. To ascertain a basis for rentals on joint operation.

The purpose of the valuation has a direct bearing on the method to be used in the eyes of the commissions and of the corporations, as may be noted by their usually diametrically opposite views. It is, therefore, advisable to consider carefully what bearing the method of valuation has upon the purpose to be accomplished, not to warp one's ideas in considering the matter, but to determine definitely just what factors in valuation should rule. The method of valuation will have a larger influence and cause a greater variation in the results than a mere guess at the physical appraisal, hence it is of importance

*Abstract of paper presented at the annual meeting of the Central Electric Railway Association, Indianapolis, Ind., Jan. 19, 1911.

to consider the purpose of the valuation, the method to be employed, and the logical and correct plan to be pursued.

The courts have held that the public service corporations are entitled to earn:

- A. Operating expenses.
- B. Expenses of repairs and maintenance.
- C. Taxes.
- D. Sinking fund to cover obsolescence and depreciation.
- E. A reasonable profit on the fair value of the property.

From this it will be seen that the whole question rests on:

1. What is a fair rate of return on the investment?
2. What is a fair value of the property?

After the above are determined and an analysis made of the service necessary and operating details, maintenance of the property, taxes and sinking fund, it can be determined what the proper tariffs should be to insure a reasonable rate of return on a fair value of the property.

A practical method of determining what is a fair rate of return on the investment may be had by considering on what basis and on what terms funds can be obtained for the construction and equipment of a new property.

The investor in a new property always considers it somewhat of a risk even though he has faith in the final result, but his experience in the past has shown him that he would not be warranted in making an investment unless the examination and report, prepared by competent authorities, indicated that the probable net earnings above operating expenses, maintenance and taxes are approximately equal to perhaps twice the total fixed charges, i.e., interest on the bonds issued to produce the property. The investor would not be satisfied to go into a new property if the return on his investment was to be limited to 6 per cent unless that amount were guaranteed, for experience shows that he takes a decided risk and may not receive even the rate obtainable by investment in "seasoned" or proved securities; therefore, he feels justly entitled to participate in any expected surplus earnings made above the fixed charges. This has usually been accomplished by issuing common shares as a bonus. The promoter, who has generally spent much time—perhaps years—as well as money to bring about the establishment of the enterprise, also feels that he is justly entitled to share in any possible surplus through ownership of a portion of the common shares. Now, if the public is fully informed that the common shares do not represent cash investment, or only partially so, no harm or wrong can accrue.

Should the property not earn its fixed charges, as too frequently has been the case, the investor would sustain a large loss. The property, however, must continue to operate and serve the public, and at the expense of the original investor. This requirement and obligation of the original investor is generally disregarded by the public, but it is an important factor and consideration by which, due to there being no minimum guarantee of return on the investment, he is reasonably entitled to a return up to the estimated rate on the faith of which he undertook the investment.

A FAIR RATE OF RETURN

Unquestionably a fair rate of return, or a reasonable profit, that can be expected on an investment in any public utility property depends principally on the risk involved in the investment.

Where the risk is low, or nil, the rate of return demanded will be a minimum.

Where the risk is high, the rate of return required will be a maximum.

Between these limits it is possible to classify all public utility properties.

It is not necessary to specify what particular element is the greatest factor toward increasing the risk, but anything that intimidates capital from investment in public utility properties is necessarily a destructive and wasteful condition or policy, and it should be the united desire and effort of the general public, as well as the management of such corporations, to do whatever is needful to re-establish permanently the confidence of the investors. Otherwise everyone will have to contribute

in one way or another to pay for the higher rate of return justly demanded by capital supplied under unfavorable conditions.

Merely as suggestions and without attempting to say that they should be adopted, the writer gives the following tentative percentages as a fair rate of return on invested capital that would not seem unreasonable under the conditions named:

(1) 5 per cent where the interest and principal are guaranteed by the government.

(2) 6 per cent on extensions of large properties showing substantial surplus earnings.

(3) 7 per cent on extensions of large properties showing small surplus earnings.

(4) 8 per cent on extensions of small properties showing substantial surplus earnings.

(5) 9 per cent on extensions of small properties showing small surplus earnings.

(6) 10 per cent on new properties where the estimated net earnings for the first year of operation under certain accepted methods are from 8 per cent to 10 per cent on the total cost of organization, construction and development.

(7) 12 per cent on new properties where the estimated net earnings under accepted methods would not pay 5 per cent on the cost of organization, construction and development during the first three years, but where ultimately it is estimated that the property would earn good dividends.

(8) A variable percentage on existing properties.

Taking the case of a proposed new interurban electric railway or any other proposed new public service utility, it may be reasonably certain that investors cannot be found for any new public service property unless the estimated expected net earnings are likely to show from 7½ per cent to 10 per cent on the total cost of the organization, construction and development, therefore, if by government action the rate of return is likely to be unduly limited to less than what can be obtained in other investments there will be no investment capital available for public utility properties.

The construction of an interurban railway certainly adds greatly to the convenience of the public and greatly enhances the value of the land throughout the territory served. In fact, the actual enhancement in value of the tributary land might aggregate more than the total cost of the railroad and the investor would frequently make more profit by buying up land along the projected railroad than he could possibly make by investment in the securities of said railway even though his return was not limited to even less than 15 per cent.

A prominent builder of steam railways has very pertinently said that in the case of a new steam railroad built through new territory, causing the land to increase in value 1000 per cent or more, as is usually the case, no objection is made by the public, the purchasers of the land or the government, and no attempt is made to hold the value of the land down to its original total cost value; yet the steam railroad that has created these enormous values in land and added great and needed facilities for the people is told that it cannot be permitted to maintain tariff rates which would enable it to receive a return of 10 per cent to 15 per cent on its total cost, nor to permit its total valuation to increase by reason thereof in proportion to the risk taken by the investor, and certainly it would not be permitted to increase its capitalization in proportion to the increase in the value of the lands brought about by the funds invested in the railroad.

In addition the public utility property must continue its operations and serve the public even though its expected earnings are not realized, and if it cannot pay its fixed charges the court intervenes, assumes charge and continues to operate the property for the benefit and service of the public, and this is necessarily so and right, and no corporation can dispute it, but the fact remains that in such cases the original investor is generally a heavy loser and the property is rebuilt, if necessary, out of funds obtained by the receiver, by giving the new funds preference in the distribution of the earnings, and the property continues to operate to serve the public.

The question of physical appraisal has been rather fully covered during the last few years, and the writer finds no great difficulty, by eliminating the theoretical ideas, in harmonizing the various practical methods used or suggested in arriving at the present physical value of any property. However, very grave questions arise in the use of any basis of physical valuation to prove the real worth or value of a property. In other words, physical valuation of a property does not establish its worth or value. This holds true whether it be a new interurban electric railway which does not earn more than operating expenses, nothing toward interest, or a railway operated and maintained in first-class physical condition and earning a substantial surplus above fixed charges.

In the case of a property originally non-productive during several years of the development period and perhaps requiring to be reconstructed by investment of new capital, thus duplicating the original investment before it reaches the time when it can earn interest charges, it has been suggested and approved by at least one of the State public service commissions that a proper valuation would include its duplicate investment or cost of development and also the accumulated deficit capitalized, due allowances being made for charges against interest, depreciation, etc. In other words, it was assumed and granted that since the property was first constructed it was entitled to credit in a valuation to a fair rate of return on the investment from the beginning, in addition to a proper amount for depreciation, and, therefore, if not earned and paid out the company would be entitled to calculate the accumulated deficit and add the capitalized amount to the valuation.

All public utility properties, like private industrials, are entitled to the benefits of good creative judgment, good engineering and all the advantages accruing to the utilization of talent in their investment. If this is not conceded, then the government must step in and guarantee a certain and definite return for all investments alike, whether made with good judgment or otherwise, and manifestly this cannot be accepted nor would it be prudent or advisable.

The principal methods used in valuations of properties are:

1. Valuation based on the earning power. This basis is generally used in the purchase and sale of properties between private interests.

2. Valuation based on market value of securities. This method will appeal practically to business men as indicating a commercial going value, but it should be noted that the market value of securities depends largely upon the earnings, and the earnings depend very largely upon the tariff rates in vogue, so that such a valuation may be directly affected by either a proposed or an actual change in tariff rates and is also subject to speculative movements.

3. Valuation based on original cash cost of organization, construction and development, less depreciation and plus appreciation. This method has great merit in arriving at a fair valuation of the property on which to calculate a reasonable rate of return commensurate with the original and subsequent risks.

4. Valuation based on the cost of reproducing the property new to-day. This basis of valuation has certain merit, but is considered not so equitable as No. 3.

5. Valuation based on an inventory of the physical property at estimated cost of production less depreciation and plus appreciation. This method is that usually employed by appraisers and its results depend very largely upon the personal equation of the men directing the appraisal and the previous experience of the staff employed. Its errors are principally of omission. All things considered, it is not so reasonable, reliable or fair a basis except for limiting a bond issue as outlined in method No. 3.

PHYSICAL PROPERTY VALUATION

It is advisable to consider what should be included in the appraisal of physical property.

1. Legal expenses, including that for right-of-way, franchises, permits, organization, construction, etc.

2. Cost of promotion, covering expenses of preliminary in-

vestigations and reports, preliminary surveys, expenses of conducting a large number of possible investors, local authorities and others over the line, in addition to the legal expenses.

3. Brokerage expenses for securing the necessary funds during the construction period.

4. Interest on carrying charges, on all money expended up to the time the property goes into complete operation.

5. Engineering and supervision.

6. Total cost of construction, including contractors' profits on material and labor.

7. Total costs of right-of-way.

8. Accidents and damages, including all insurance premiums, fidelity, casualty, fire, boiler or other insurance and allowances for contributions to charitable and hospital funds.

9. Cost of complying with conditions of franchises, etc.

10. Overhead charges, including management, office rents and supplies.

11. Working capital.

12. Costs of organizing the business, securing customers, testing-out entire plant and drilling new men for operating.

13. Cost of marketing and discounts on the bonds (considering it as part of the price or cost at which money can be secured from the sale of the bonds).

14. Contingencies to cover incomplete inventories, unforeseen difficulties of construction and other items of expense which cannot be foreseen.

15. Obsolescence.

16. Replacements and betterments—made out of new capital investment.

17. Loss in the early operation during the period of development.

The items outside the actual physical construction constitute a very large part of the total cost of organization, construction and development.

FRANCHISE VALUATION

The question as to whether or not the franchise should be appraised and included in the valuation of a property has been the subject of considerable discussion and argument. Personally the writer feels that if any equitable plan of valuation can be made acceptable to all concerned without including a value for the franchise it would be desirable, for it would immediately eliminate strong public opinion, which undoubtedly stands against crediting public service corporations with a considerable value obtained by grants from the public, and, therefore, it is highly desirable that we should make an analytical study of the conditions in order to suggest a plan, if possible, that would eliminate the value of the franchise from necessary consideration.

In the case of an interurban electric railway the value of its franchise might be considered on its economic basis compared with the line if built on a private right-of-way. The original comparative investment can be readily computed, and against the increased cost in private right-of-way would be the saving in operating expenses, and particularly the costs of maintaining tracks in city streets, pavements and the expense of complying with other stipulations of the franchise, together with the additional expenses of accidents and damages on streets, all of which when capitalized will often more than offset the increased cost of entrance over private right-of-way. In addition there are items which should be credited, such as increase of traffic due to increased speed and right to charge a reasonable fare of, say, 2 cents or 3 cents per mile instead of being limited to a 5-cent fare for any distance with or without transfer. In such cases it is quite possible that the franchise value to operate on city streets may be nil or even negative.

The value of the franchise is generally offset at the time it is granted by the stipulations and conditions imposed. Of course, after a term of years its value may be greatly enhanced, and therefore it is reasonable that the term of expiration be limited, with possibly a renewal stipulation on a new basis of compensation to the city.

In certain cases where the municipality may desire to take over an operating company and where the method of apprais-

ing the property is not stipulated in the franchise, it is generally acknowledged proper to estimate a value for the unexpired term of the franchise. This was worked out in a systematic way in the Chicago appraisal, where several franchises expiring at different dates were involved.

The capitalization of a property should not be limited to the actual investment in the physical property or by the net earnings capitalized on a 5 per cent or 6 per cent basis. The only equitable basis is first to consider and determine the estimated rate of return that the original investor expected and that new capital would require. It is manifestly unfair to hold the total capitalization to the appraised physical value on existing property, as new capital cannot be secured on that basis nor did the original investors undertake the business with that understanding.

Also it is unreasonable to limit the capitalization to the net earnings capitalized, for it would be a hardship on properties earning but a small margin above operating expenses, although they may be serving the public well and in a growing territory that will produce large net earnings in succeeding years; therefore, such a method of controlling capitalization would be very objectionable—going up and down as earnings increased or decreased. It would also mean higher capitalization if tariff rates are increased and vice versa, giving too great a latitude to public utility properties.

Although shares or stock may carry its par, or dollar mark, for perhaps years, it is nevertheless helpful in analyzing the situation to regard shares merely as a division of surplus earnings into shares or parts.

Proper supervision and regulation of the issuance of securities in any public service property, or by any incorporated company for that matter, is advisable. Probably the best regulation that could be effected would be adequate and intelligent publicity and limiting or controlling the issues as follows:

Bonds against the cost of organization, construction and development at the price sold, allowing for the usual discount and commissions, but limited to the estimated net earnings until earnings increase sufficiently to carry the entire authorized bond issue.

Stock.—(a) As preferred shares representing that portion of the cost of organization, construction and equipment which is not covered by the bond issue. (b) As common shares without carrying any stated par value, representing the basis of subdivision for the distribution of estimated expected profits.

OPERATING EXPENDITURES

The writer believes it would pay many of the corporations to go very carefully into the methods and costs of operation by the employment of experts with experience not only in railroading, but also those familiar with outside systematic management and development of industrial methods from a worldwide study of conditions, and then adopt the practical methods which it could be shown would reduce operating costs.

If the purpose of desiring to determine a value for the franchise is to establish a basis for taxation, it would seem reasonable that a tax based on a certain percentage of the gross or net earnings would be more equitable.

Corporations and investors would not so generally object to paying taxes if a method was adopted that would be uniform and definite. What capital fears most in the matter of taxation is the uncertainty of how a corporation will be treated by the tax assessor and the various taxing authorities.

If the value of a railroad for purposes of taxation should be determined by its earning power, which seems reasonable, why go to the trouble of endeavoring to ascertain a valuation by introducing the variable factor of the rate of capitalizing the net earnings? It would be better and more simple to tax the earning power direct by levying a definite percentage of the earnings. This plan would obviate the present difficulties and discussions regarding valuation for taxation.

TARIFF RATES

Rates basically considered should be made upon the value of the services rendered.

The practice of permitting higher rates to be charged for superior service in the same locality is applicable to every mercantile and industrial business and is equally applicable to all public service properties.

The best regulation would be to require:

1. Adequate service for the conditions and the locality having regard to the cost of rendering additional and improved service.
2. Publicity regarding the stock and bond issues.
3. Publicity as to earnings, expenses, taxes, depreciation and sinking fund segregated as to divisions between main line, branches and the underlying properties.
4. Regulation as to unfair or unequal competition and of minimum rates or rebates.
5. Regulation of uneconomical differential rates resulting from competition between cities, shippers, jobbers and wholesalers, which differentials are now equivalent to rebates.
6. Limitation of bond issues to a fair cost of the organization, construction and development. Authorizing the issue of common shares to an appropriate amount, but without any indication of par value attached.
7. Regulation of the granting of charters and articles of incorporation, particularly on the question of authorizing competing unnecessary properties.
8. Directors to give more time and attention to management, holding them responsible, and compensating them better by participation in the net earnings.

COMMITTEES OF THE AMERICAN ELECTRIC RAILWAY ENGINEERING ASSOCIATION

Following is a list of complete committees appointed by W. J. Harvic, president of the American Electric Railway Engineering Association, with the number of years each committee member is to serve. The committee on standards is made up of the chairmen of the other committees.

COMMITTEE ON STANDARDS

Paul Winsor, chief engineer motive power (chairman), Boston Elevated Railway, Boston, Mass.

M. V. Ayers, electrical engineer, Boston & Worcester Street Railway, Boston, Mass.

A. F. Hovey, cable engineer, Interborough Rapid Transit Company, New York City.

J. M. Larned, engineer of way, Pittsburgh Railways Company, Pittsburgh, Pa.

L. P. Crecelius, superintendent of power, Cleveland Railway, Cleveland, Ohio.

Martin Schreiber, engineer maintenance of way, Public Service Railway, Newark, N. J.

E. R. Hill, assistant to chief engineer, Pennsylvania Tunnel & Terminal Company, New York City.

F. G. Simmons, superintendent of way, Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

Charles Hewitt, superintendent of motive power, Philadelphia Rapid Transit Company, Philadelphia, Pa.

M. H. Bronsdon, electrical and chief engineer, The Rhode Island Company, Providence, R. I.

Edwin B. Katte, chief engineer electric division, New York Central Railroad, New York City.

J. H. Hanna, chief engineer, Capitol Traction Company, Washington, D. C.

H. H. Adams, superintendent roads, stations and structures, Metropolitan Street Railway, New York City.

COMMITTEE ON WAY MATTERS

J. M. Larned, engineer of way (chairman), Pittsburgh Railways Company, Pittsburgh, Pa., one year.

M. J. French, engineer maintenance of way, Utica & Mohawk Valley Railway, Utica, N. Y., one year.

C. L. Crabbs, engineer of way and structures, Brooklyn Rapid Transit Company, Brooklyn, N. Y., two years.

Rudolph F. Kelker, division engineer of track and roadway, Board of Supervising Engineers, Chicago, Ill., two years.

C. B. Voynow, assistant engineer of way, Philadelphia Rapid Transit Company, Philadelphia, Pa.

R. C. Cram, assistant engineer, The Connecticut Company, New Haven, Conn., one year.

C. S. Kimball, engineer maintenance of way, Washington Railway & Electric Company, Washington, D. C., three years.

H. F. Merker, engineer maintenance of way, East St. Louis & Suburban Railway, East St. Louis, Ill., three years.

B. E. Tilton, engineer maintenance of way, New York State Railways, Rochester, N. Y., two years.

JOINT COMMITTEE ON ACCOUNTING

A. D. McWhorter, master mechanic (co-chairman), Memphis Street Railway, Memphis, Tenn.

Charles Hewitt, superintendent of motive power, Philadelphia Rapid Transit Company, Philadelphia, Pa.

H. H. Adams, superintendent of road, stations and structures, Metropolitan Street Railway, New York City.

E. O. Ackerman, engineer maintenance of way, Columbus Railway & Light Company, Columbus, Ohio.

John W. Corning, electrical engineer, Boston Elevated Railway, Boston, Mass.

COMMITTEE ON POWER GENERATION

L. F. Creclius, superintendent of power (chairman for one year), Cleveland Railway, Cleveland, Ohio, three years.

H. G. Stott, superintendent of motive power, Interborough Rapid Transit Company, New York City, one year.

B. F. Wood, assistant engineer, motive power department, Pennsylvania Railroad, Altoona, Pa., three years.

W. E. Ralston, superintendent of power and shops, The Cleveland, Southwestern & Columbus Railway, Elyria, Ohio, one year.

William von Phul, engineer Southern properties, Ford, Bacon & Davis, New Orleans, La., three years.

R. A. Dyer, assistant general manager and electrical engineer, Rochester, Syracuse & Eastern Railroad Company, Syracuse, N. Y., two years.

C. L. Gates, chief engineer of power stations, Fonda, Johnstown & Gloversville Railroad, Tribes Hill, N. Y., two years.

A. R. Myers, electrical engineer, Buffalo & Lake Erie Traction Company, Buffalo, N. Y., two years.

A. Wolff, superintendent of power, United Railways & Electric Company, Baltimore, Md., one year.

COMMITTEE ON EQUIPMENT

M. V. Ayers, electrical engineer (chairman), Boston & Worcester Street Railway, Boston, Mass., one year.

H. A. Benedict, mechanical engineer, Public Service Railway, Newark, N. J., one year.

A. T. Clark, superintendent of road, stations and structures, The United Railways & Electric Company, Baltimore, Md., two years.

F. R. Phillips, superintendent of equipment, Pittsburgh Railways, Pittsburgh, Pa., three years.

F. G. Grimshaw, master mechanic, Pennsylvania Railroad, Camden, N. J., three years.

W. Thorn, division engineer, cars, Board of Supervising Engineers, Chicago, Ill., two years.

J. M. Bosenbury, superintendent of motive power, Illinois Traction System, Champaign, Ill., three years.

Homer MacNutt, master mechanic, San Diego Electric Railway, San Diego, Cal., one year.

H. L. Patterson, chief engineer, Mahoning & Shenango Railway & Light Company, Youngstown, Ohio., two years.

COMMITTEE ON POWER DISTRIBUTION

A. F. Hovey, cable engineer (chairman), Interborough Rapid Transit Company, New York City, one year.

S. L. Foster, chief electrician, United Railways of San Francisco, San Francisco, Cal., one year.

E. J. Dunne, superintendent district, Public Service Railway, Newark, N. J., one year.

William Roberts, superintendent of motive power, Northern Ohio Traction & Light, Akron, Ohio, two years.

J. J. Brennan, superintendent of roadway and overhead, Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind., three years.

*Prof. A. S. Richey, professor electric railway engineering, Worcester Polytechnic Institute, Worcester, Mass., three years.

G. W. Palmer, electrical engineer, Boston & Northern Street Railway, Boston, Mass., two years.

S. D. Sprong, electrical engineer, The J. G. White Company, New York City, two years.

Charles Rufus Harte, The Connecticut Company, New Haven, Conn., three years.

*Professor Richey is appointed special representative of the committee on power distribution to confer with overhead line construction committee of the National Electric Light Association.

COMMITTEE ON BUILDINGS AND STRUCTURES

Martin Schreiber, engineer maintenance of way (chairman), Public Service Railway, Newark, N. J., one year.

George M. Pegram, chief engineer, Interborough Rapid Transit Company, New York City, two years.

F. F. Low, architect, Boston Elevated Railway, Boston, Mass., two years.

C. H. Clark, engineer maintenance of way, Cleveland Railway, Cleveland, Ohio, one year.

M. H. Bronsdon, chief engineer, The Rhode Island Company, Providence, R. I., two years.

F. G. Simmons, superintendent of way, Milwaukee Electric Railway & Light Company, Milwaukee, Wis., one year.

J. H. Frank, architect, Philadelphia Rapid Transit Company, Philadelphia, Pa., three years.

C. G. Young, construction engineer, 60 Wall Street, New York City, three years.

George Weston, Board of Supervising Engineers, Chicago, Ill., three years.

COMMITTEE ON HEAVY ELECTRIC TRACTION

E. R. Hill, assistant to chief engineer (chairman for one year), Pennsylvania Tunnel & Terminal Company, New York City, two years.

Edwin B. Katte, chief engineer of electric traction, New York Central Railroad, New York City, one year.

W. S. Murray, electrical engineer, New York, New Haven & Hartford Railroad, New Haven, Conn., three years.

J. H. Davis, electrical engineer, Baltimore & Ohio Railroad, Baltimore, Md., three years.

Hugh Hazelton, electrical engineer, Hudson & Manhattan Railroad, New York City, one year.

E. F. Gould, electric and mechanical engineer, Aurora, Elgin & Chicago Railroad, Wheaton, Ill., two years.

COMMITTEE FOR CONFERENCE WITH THE AMERICAN SOCIETY FOR TESTING MATERIALS

Martin Schreiber, engineer maintenance of way, Public Service Railway, Newark, N. J.

John Lindall, superintendent of road, stations and structures, Boston Elevated Railway, Boston, Mass.

E. O. Ackerman, engineer maintenance of way, Columbus Railway & Light Company, Columbus, Ohio.

W. J. Harvie, president of the Engineering Association.

Norman Litchfield, secretary-treasurer of Engineering Association.

COMMITTEE ON BLOCK SIGNALING FOR ELECTRIC RAILWAYS

(Jointly with committee of three from Transportation & Traffic Association)

J. M. Waldron, signal engineer (chairman), Interborough Rapid Transit Company, New York City.

John Ross, assistant superintendent of tracks, Detroit United Railways, Detroit, Mich.

G. H. Kelsay, superintendent of power, Indiana Union Traction Company, Anderson, Ind.

COMMITTEE ON EDUCATION OF ENGINEERING APPRENTICES

W. H. Evans (chairman), Indiana Union Traction Company, Anderson, Ind.

W. G. Gove, superintendent of equipment, Brooklyn Rapid Transit Company, Brooklyn, N. Y.

H. A. Benedict, mechanical engineer, Public Service Railway, Newark, N. J.

COMMITTEE OF THREE TO DRAFT RULES FOR THE COMMITTEE ON
METHOD OF ADOPTING STANDARDS

Paul Winsor (chairman), Boston Elevated Railway, Boston, Mass.

Rodney Hitt, associate editor, ELECTRIC RAILWAY JOURNAL, New York City.

C. B. Voynow, assistant engineer of way, Philadelphia Rapid Transit Company, Philadelphia, Pa.

METHODS OF EMPLOYMENT, INSTRUCTION AND DISCIPLINE OF MOTORMEN AND CONDUCTORS ON INTERURBAN LINES *

BY JOSEPH K. CHOATE, GENERAL MANAGER OTSEGO & HERKIMER RAILROAD

The preamble and resolution of the Public Service Commission calling this meeting again bring us face to face with a subject not only of the greatest importance, but one that has been ever present in the mind of the official responsible for the comfort, convenience and safety of life and property on the interurban roads.

Not only is it the horror of accident that has caused him to stop and think, but it has been the thought of absolute financial disaster to the corporation he represents. There are not many railroads in this State that could avoid bankruptcy were they to suffer such misfortunes as have come to some of our Western roads.

I can assure the Public Service Commission that all officials of the interurban roads of the State of New York appreciate the commission's desire in calling this meeting, and I can further assure it that it will have the hearty and earnest co-operation of each and every one in bringing about such methods as shall add to the safety of our operations.

There is no more important part of our operation than the employment, instruction and discipline of motormen and conductors, and it is the most vexatious question we have to contend with.

When travel is light we have all of our oldest and most competent men in charge, and when our travel is the heaviest we have in addition to these old and tried men all of the men youngest in the service and experience.

Every manager and superintendent is always looking forward to the big day on his line, but I can say to you that there is no one so glad as these same officers when they know at night that the last car has been returned to the barn and the day has passed without accident or interruption.

This is a condition that cannot be changed, and our efforts must be devoted to meeting the situation as it is and safeguarding our operations in every way that past experience and science can suggest.

In the employment of men there are more difficulties in the selection of motormen than in the selection of conductors for the reason that, while both the motorman and conductor must fully understand and appreciate the rules and while both are held jointly responsible for the operation of cars, the education of the motorman is not complete until he understands the machinery and apparatus that are placed in his charge, not only that he may get the best service from the machinery, but that he may know what to do in case of accident, delay or emergency.

It is the general custom on all interurban lines when employing motormen and conductors for the superintendent, first of all, to pass judgment on the applicant from his personal appearance and general bearing. If the superintendent is favorably impressed he then requires of the applicant that he submit references as to his character and a statement regarding his previous employment. These references and statements should be carefully and thoroughly investigated and verified.

Next, the applicant should be sent to a competent physician for a physical examination. This examination should be most thorough, not only of his hearing and sight, but should include a most careful examination to determine, as far as possible, the reliability that might be expected of the candidate in cases of emergency; for an excitable or erratic man would be dangerous to trust in charge of the operation of an interurban car. I believe this physical examination of the greatest importance and one too often overlooked.

I would then strongly recommend the procedure recommended by the committee on training of transportation employees as approved by the American Electric Railway Association at the October convention at Atlantic City. [The portion of the report of this committee which Mr. Choate then quoted was published in the ELECTRIC RAILWAY JOURNAL for Oct. 15, 1910, page 846.—Eds.]

In connection with this procedure too much stress cannot be laid upon the rules for interurban service being standard and alike on all lines. This, I think, is now conceded by all operating officials, and an earnest effort has been made in the past two years to standardize and perfect rules so that the operation of all interurban lines shall be alike, excepting as to local conditions.

The procedure recommended by the American Association is in a general way that adopted by all of the interurban roads, and is as good a system as can be devised, but the great value of this system lies wholly in the instructions and the care and thoroughness with which the examinations are carried out.

The superintendent, from his experience, is usually a good judge of men, but is often imposed upon unless he is very careful and thorough in looking up the references that are first given to him, for there are many tramp applicants for these positions who go from place to place who know in advance what the superintendent is likely to ask them and have fortified themselves with recommendations that may deceive him. With honest applicants this is not to be feared, and usually the deceitful man is soon found out.

The examinations, both oral and written, should be conducted in the most thorough manner and should be so changed, from time to time, that the applicant cannot be simply coached to the extent of ability to pass them; and he should be re-examined from time to time that the superintendent may know positively that his motormen and conductors have a clear and full understanding of all the rules and regulations under which they are employed and are alive to their importance. The written examination should be carefully filed for future references.

The work in the shops of the applicant motorman should be under a man who thoroughly appreciates what is expected of him in teaching. This assignment should never be carelessly made, and the possibility of students being treated as a nuisance and given simply roustabout work to do should be guarded against by the most careful selection of the man to whom this student is to be intrusted.

A recent reference to the harm that can be done in this direction will be remembered by most of the railroad men here in the paper read at the last quarterly meeting from the pen of the general manager of the Fonda, Johnstown & Gloversville Railroad Company.

The whole secret in the employment of motormen and conductors is in the thoroughness of the original examination and in the careful watching of the employee.

While the corporation that I represent has no school or skeleton car I strongly recommend that every railroad should have an equipment of this kind in which men can be carefully and thoroughly schooled for the service they are to perform, and I further believe that a railroad should, above all, have a paid instructor, or, if a small road, some one of its men assigned to such duties, who could, from time to time, call in, examine and post the men in this direction.

At a recent hearing on interurban operating methods before the Illinois commission a suggestion was made that the roads adopt a uniform application blank, and the commission was

*Abstract of paper read at conference of interurban officials with New York Public Service Commission, Second District, Syracuse, N. Y., on Jan. 19, 1911.

asked if it would take special action on this subject and would require the applicant to swear to the correctness of his blanks and to file a copy at the State House; and that a similar procedure might be adopted upon examination of the applicant by physicians. The Illinois commission indicated its approval of this plan.

I am inclined to agree with this suggestion, as it is the desire of all railroads to secure the best men they possibly can, and some such State provision as this would make our men feel the importance of the service.

After using all the care possible in selecting men and instructing them in their duties the next important step is knowing that the men do their duty and live up to their rules. The secret of this is the constant vigilance of the officer in direct charge of the men.

He should be a disciplinarian and should brook no violations or variations from the rules and regulations, but to be a good disciplinarian he must be absolutely fair and just. The best disciplinarian is the one who, while strict to the letter, is known for his justice and is respected by all his men.

There are men who are very strict disciplinarians and rule with a rod of iron who have been successful, but they are not the men who get in return all that is best out of the men or best for the interests of the company they represent.

In this connection I am very doubtful if railroad officials have always gone as far as they should in the punishment of men responsible for gross and criminal negligence. The simple discharge of such a man is of little consequence or little punishment; he simply disappears and goes where he is not known.

I do not know of a railroad manager in this State who does not believe in publicity and does not welcome honest and fair criticism. But if there is one thing he dreads more than another it is the notoriety given by a reporter of a newspaper who is hungry for news, who likes big headlines and is willing to print the first cause suggested to him of how the accident occurred, before there has been time for anyone to make an investigation and fix the responsibility.

For such reasons we are prone to allow gross and criminal negligence to pass simply with discharge in the hope that the accident will soon be forgotten. I am doubtful if this is as it should be.

Men guilty of gross and criminal negligence should understand that their punishment will be of such severity as to be a warning to others. I am not prepared to say just how this should be brought about, but it is a matter of sufficient importance to receive the serious thought of the railroad managers themselves, if not of the commission.

There are numerous violations by motormen and conductors the cause of which it is a very difficult matter to determine. Violations that can be traced to bad habits, such as drinking, late hours and bad company, can be checked, but why violations occur with men whose characters are good, who have been faithful and long in the service, is hard to explain.

During the past year we had the misfortune to have a head-on collision on the Otsego & Herkimer Railroad caused by a crew passing a time-card meeting point, where the car had to come to a full stop at a steam railroad crossing, and the conductor was obliged to walk across the crossing and throw a derailing switch which was within 30 ft. of the switch he was to take to clear the opposing train.

This motorman and conductor had been in the service of the company for three years and had been making this same meeting point for 30 days previous to the day of the collision. On this occasion the conductor, after having thrown his derailing switch and after his car had crossed the steam railroad, boarded his car, gave his motorman the forward bell, and they deliberately proceeded in the face of the opposing train, passing their time-card meeting point, with the result of a serious collision.

A most thorough investigation of this accident was made immediately. Both the motorman and conductor admitted their responsibility and failure, but could give no explanation of how or why they had forgotten their meeting point. Both men

were absolutely truthful and straightforward, and keenly felt their error. Accidents of this kind do occur, and will occur as long as railroads are operated.

Our greatest safeguard against the violation of rules and regulations, other than those that can be easily and readily traced, is in the character of the officers in control and in the character of the men themselves. For high character is the greatest safeguard against the violation or negligence of all the rules that govern our daily lives.

After covering in a general way the employment, instruction and discipline of motormen and conductors we are again, as expressed in the beginning of this paper, up against the proposition that during the season of the year when our service is the lightest and most easily handled we have our best men in the service, and then when our service is the heaviest and most complex we have not only our best men, but all of our men least experienced and shortest in the service.

I know of no way to overcome this situation. Our oldest and best men are proud of their service and their uniform, are happy in their work and stay with us year after year.

In the early summer season we take on new men. We use every care in selecting and training them, and are obliged to put them on our cars when the service is the most exacting. It is true that these men are divided as far as possible, so that a green motorman is with a long experienced conductor or a green conductor is on with a long experienced motorman. We watch these men with the greatest care, devoting more time to them than to our older men, and safeguard, as far as possible, their work.

The large percentage of new men that make good and efficient motormen and conductors is simply astonishing, but the hardship comes in the fall when the heavy business is over and these men are either dismissed or put on the extra list. It is at this period of the year that the greatest number of men leave the service.

On the Otsego & Herkimer Railroad we try to overcome this as far as possible by dividing up the time of the men kept upon the extra list so that each shall earn a wage that will be sufficient inducement for them to stay through the winter months, with the hope of earning a permanent run when the first vacancy shall occur.

In conclusion I wish to say that I regret that I have not had more time that I could devote to this important subject of the employment, instruction and discipline of motormen and conductors.

I fully appreciate its importance and recognize that I have presented in this paper little that is new; but I hope sufficient will be found in it to bring out a discussion between the railroad men here present and the commission that may lead to a better understanding and to improved methods in the operation of the interurban lines of the State of New York.

STUDY OF STATION CONGESTION IN PHILADELPHIA

At the suggestion of the directors of the Pennsylvania Railroad President James McCrea has appointed two committees to study the subject of the existing congestion of the train service in the Broad Street station in Philadelphia and suggest means for relieving it.

The first committee consists of W. W. Atterbury, fifth vice-president; W. H. Myers, general manager; A. C. Shand, chief engineer, and George Gibbs, chief engineer of electric traction. The second committee consists of E. R. Hill, assistant chief electrical engineer of the New York terminal; E. B. Temple, assistant chief engineer of the Pennsylvania system; A. M. Parker, superintendent of the Hudson division, and E. V. Somerville, assistant engineer of the lines West. It is understood that the latter committee will report to the first committee and that this committee will then make its suggestions and that the use of electrically operated trains will be considered among other means for increasing the capacity of the station.

ELECTRIC RAILWAY REPAIR SHOP PRACTICE*

BY W. J. KELSH, MASTER MECHANIC WISCONSIN ELECTRIC RAILWAY COMPANY AND EASTERN WISCONSIN RAILWAY & LIGHT COMPANY

The Eastern Wisconsin system, composed of the Eastern Wisconsin Railway & Light Company, of Fond du Lac, and the Wisconsin Electric Railway Company, of Oshkosh, operates 67 miles of electric railway along the east shore of Lake Winnebago, including city lines in Neenah, Fond du Lac and Oshkosh and interurban lines from Fond du Lac to Oshkosh, Oshkosh to Neenah and Oshkosh to Omro. Our equipment consists of 10 double-truck interurban cars, 5 double-truck city cars, 23 single-truck closed city cars, 2 sweepers, 1 snow plow, 1 work car, 1 double-truck, 15-bench Narragansetts, 6 single-truck 10-bench open cars and 17 open trailers.

Six cars are required in our daily interurban service, three double-truck cars in our daily Fond du Lac service and from three to five additional cars in the morning and evening to handle our shop traffic between Fond du Lac and North Fond du Lac. Eleven single-truck cars are in daily operation in our Oshkosh city service and from three to five additional cars are required to handle our shop service morning and evening. In Neenah one single-truck car is required. Our summer traffic requires much additional equipment, the amount depending upon the weather and attractions.

At Fond du Lac, our southern terminus, we have a large inspection barn and shop for light repairs. At Oshkosh, about the center of our system, our main shop is located. An inspection barn is maintained at our substation 10 miles north of Oshkosh, where the Neenah city car is taken care of. At Fond du Lac we keep an extra interurban car, allowing us to change every round trip or every 67 miles. As soon as a car is over the pit two inspectors go over every part of the car, making such repairs as are necessary or as can be made in one hour. If anything is discovered which cannot be taken care of in this barn the shop at Oshkosh is notified by telephone and the car is taken off the road when it reaches there on its outward trip. This car, while being inspected, is also being cleaned and fumigated. This gives us a clean and fresh car every round trip. The Fond du Lac city cars are taken care of at this barn.

All city cars, both at Fond du Lac and at Oshkosh, are inspected by night men as to armature clearance, loose bolts, carbon brushes, brakes and lubrication, and are also swept and dusted. All cars are left in the car barn or shop one day each week for a general inspection and a thorough cleaning. We believe that thorough inspection will prevent failures on the road and also is much cheaper from a maintenance standpoint.

Our shop is equipped with a 200-ton Niles wheel press, a 38-in. Niles wheel-boring mill, and a 48-in. Niles wheel lathe, all operated by individual motors geared to the machines. In addition to the foregoing a 24-in. engine lathe, a planer, drill press and other minor machinery are operated by a line-shaft belt connected to a single motor. We also have two 10-ton chain blocks suspended from an overhead truss, enabling us to raise one end of a car at a time. With this shop equipment we are able to do all of our own work, both in equipment and power-plant maintenance.

For our fenders we use 3/4-in. pipe for the frame and strips of 1/8-in. x 1-in. iron, fitted and riveted around pipe, for a filler. These fenders are designed to be tripped by the motorman and cost us \$8.06 per pair installed. We make our armature shafts out of broken car axles for one-half the price we would have to pay for new ones.

Our railway storeroom is at Oshkosh, from where supplies are distributed to the different car barns and other departments. We keep an individual mileage record of all cars, also a card system on all wearing parts, showing actual mileage obtained on car wheels, brake shoes, trolley wheels, carbon brushes, bearing metals and oil. This enables us to judge what material is best adapted to our conditions.

We have adopted as standard on our interurban cars a 34-in. steel wheel with 3-in. tread and 7/8-in. flange, after trying cast-iron and steel-tired wheels. While the steel-tired wheels compared well with the steel wheel in mileage we found a difference in cost.

Our present steel wheels have given us 80,000 miles before the first turning and 60,000 miles since turning. The softest part of steel wheels, it is claimed, is after the first turning, that being the part farthest from the rolls when the wheel is being made. I have reason to believe from the present condition of these wheels that with another turning we shall get 60,000 miles more before scrapping them.

We use 425-lb. cast-iron wheels on all city cars, and get about 50,000 car miles from them. I believe that all double-truck cars equipped with air brakes and weighing 20 tons or over should be fitted with steel wheels from the standpoint of economy. We use a soft-composition-filled brake shoe on all cars, costing us \$0.3392 per 1000 car miles.

We are using a 6-in. trolley wheel without a bushing on our interurban cars. It has a 3/4-in. axle and is lubricated by a special graphite grease which is forced through a 5/16-in. hole in the end of the axle. This hole extends through the center of the axle to a deep groove in the middle of the axle and the grease flows through this groove into the oil cellar of the wheel. We rarely have to change a wheel because it is worn in its bearing. This shows that we are getting good contact as well as good lubrication. We get an average of 5000 car miles from this type of trolley wheel. On our city cars we are using a 5-in. trolley wheel with oil-lubricated graphite bushing and get 10,000 car miles from it. Part of the motors on our cars are oil-lubricated and the rest are lubricated with cup grease. In 1909 the oil and grease used on all cars cost us \$0.2015 per 1000 car miles, and I am satisfied that in 1910 we have done as well, if not better, but the figures have not yet been compiled.

During the past two years we have painted nine interurban and 14 city cars from the bare wood at an average cost of \$137.38 for interurban cars and \$83.55 for city cars. This cost includes burning off old paint, three coats of primer, two coats of color, lettering, striping, two coats of outside varnish and one coat of inside varnish. The floors and roof are painted with lead and the rattan seats are enameled.

All cars go through the paint shop at least once a year for varnish and at this time, if the color is marred so much as to require any spotting out, we cut in between stripes and letters with the original shade of color, and with two coats of varnish outside, one coat of varnish inside, roof and floors painted with lead and rattan seats enameled. For a 38-ft. interurban car this work costs us \$81.57 and for an 18-ft. city car the cost is \$43.47. We do not attempt to spot out defects in paint after the car has been in service, as the color is more or less faded. While we might be able to match faded color at the time it would not stay matched long and would soon show a difference in color, but when the entire panel is cut in between stripes and letters we have no trouble in keeping our cars looking fairly well. We believe we shall not have to paint cars throughout oftener than once in six or seven years.

During the past two years we have rebuilt vestibules on 12 single-truck closed cars. These cars originally did not have vestibules, but later the platforms were inclosed with temporary frames which had glass fronts extended over the dash to allow room for the brake handle and were fastened to hood at top. The left side of the platform was also closed. From this style we changed to a permanent solid vestibule, like those on modern cars. They cost \$116 per car.

Our shop organization is such that we can take care of the general repairs of our Fond du Lac electric light and gas departments. We maintain a testing department with our light department, which also can take care of light repairs required by customers from time to time.

Twenty-five salesmen of N. W. Halsey & Company, New York, N. Y., financiers, inspected the Illinois Traction System recently to gain information on interurban railroading.

*Abstract of paper presented at meeting of Wisconsin Electrical Association, Milwaukee, Jan. 19, 1911.

HEARING ON PLAN FOR REORGANIZATION OF METROPOLITAN STREET RAILWAY

The first hearing on the plan for reorganization of the Metropolitan Street Railway of New York was held before the Public Service Commission, First District, on Jan. 11. Commissioner Maltbie presided.

Charles F. Mathewson, counsel for the joint committee of bondholders, said that as no judicial interpretation of the effect of Sections 9 and 10 of the stock corporation law in connection with the reorganization of corporations had been had the petitioners reserved rights and objections, constitutional or otherwise, to the powers of the commission as to fixing capitalization below that legally outstanding of the company undergoing reorganization and as to the constitutionality of any action which would reduce the value of outstanding stocks and bonds.

The preparation of the plan was a vast work. Every effort had been made to prevent what the commission would concede to be a great calamity, the entire disintegration of the system. The amount of securities outstanding upon the Metropolitan system at the time of the receivership exceeded \$158,500,000, including the Metropolitan Securities Company stock paid up to the amount of \$22,500,000. The capitalization under the present plan was \$96,305,500, or a reduction of nearly 40 per cent.

In a considerable experience in such matters Mr. Mathewson had never known a reorganization so drastic, either in the absolute reduction in the amount of capital obligation or in the percentage of reductions from the previous existing securities. He presented the accompanying statement in relation to the reorganization:

STATEMENT REGARDING METROPOLITAN STREET RAILWAY REORGANIZATION. PRESENTED BY CHARLES F. MATHEWSON.

Metropolitan Street Railway securities, including Metropolitan Securities Company paid-up stock, about.....	\$158,500,000
Capitalization under plan.....	96,305,500
Reduction, nearly 40 per cent.	
Outstanding securities and obligations of Metropolitan system only, about.....	\$136,000,000
Capitalization under plan.....	96,305,500
Reduction, about 30 per cent.	
Securities to be readjusted, about.....	\$104,500,000
New securities in lieu thereof.....	64,850,000
Reduction, nearly 40 per cent.	
Stock of Metropolitan company.....	\$52,600,000
Stock of new company.....	14,150,000
Metropolitan company:	
Fixed charge 4 per cent and 5 per cent bonds superseded....	29,104,000
New company:	
Fixed charge bonds.....	11,768,000
Reduction 60 per cent.	
Annual fixed charges on superseded securities, at present amount (including only Metropolitan 4s, 5s and the Metropolitan Crosstown 5s and Central Crosstown 5s) to.....	\$1,415,910
Fixed charges of the new company will amount to only.....	\$470,724
Reduction, 66 per cent.	
Including also the Metropolitan notes (\$8,000,000) and the Metropolitan stock (\$52,000,000), the guaranteed annual charges upon the superseded securities amounted to over \$3,455,000, from which sum the new fixed charge of \$470,000 will represent a decrease of no less than.....	\$4,850,000
Two and one-half per cent on the income bonds to be issued under the present plan would require only \$1,000,000, and the entire 5 per cent thereon only \$2,000,000 additional, per annum, and if 5 per cent were additionally paid on the stock to be issued under the plan, the total annual requirement for fixed charges, income bonds and stock combined (outside of "undisturbed securities") would be but little more than.....	\$3,000,000
Gross earnings were about \$13,000,000 for the last available year.	

Referring to the valuation Mr. Mathewson stated that by appraisal of real estate and by an engineering inventory and estimate, with none of which he believed the commission and its engineers would differ seriously, there was computed what was called construction cost pure, which was found to amount, including a little more than \$1,000,000 of working capital, to \$83,701,000. In addition to this cost, as was recognized by the commission in repeated decisions and by the courts, there was a development period, a development cost in the production of a system of this character. The best method of determining development costs in the light of experience was to compute

the amount of development charges in percentage of the cost of construction. Evidence would be produced that these amounted in a system of this character to 20 per cent to 25 per cent at a minimum on the cost of construction. That would indicate a development cost of about \$20,000,000. By way of illustration Frank R. Ford had worked out in some detail the items which would be included in development cost according to that method and they amounted to a little over \$18,000,000 or, including one or two items of construction which were related thereto, to a little less than \$20,000,000. The total, including construction and development, was \$101,798,000. That did not include the amount of the capitalizable assets.

The reorganization assets coming to the new company in cash and in the value of bonds and stock of the Central Park, North & East River Railroad were estimated at \$5,000,000 at least, which would make a total of nearly \$107,000,000. If there were to be added to this figure the net investment in superseded property, that is to say, the transfer from horse to cable and from cable to electricity, which was a proper investment in its time and which there had not been time or opportunity to sink, there would be added the further item of \$13,355,000, making a total of \$120,154,000.

There were several other assets which had not been taken into consideration, Mr. Mathewson said. The largest, and one of extreme importance, was what was known as the going concern value of the property. That value had been referred to by one or the other of the commissioners in various decisions, as he read them, and it had been accepted as a capitalizable asset of great value by the highest judicial authorities in this country. He thought it was fair to say that the going concern value in a well-kept up corporation was invariably more than the ordinary physical depreciation which existed where the property had been maintained, as property should be, by ordinary repairs and renewals.

Even this going concern value still left unaccounted for in the total of assets the value of claims against various street railway companies which were described in lot 13 of the supplemental decree of foreclosure under the 4 per cent mortgage and the special value of the bonds of the company for street railway purposes as distinguished from ordinary purposes, and it included no profits of promotion and no discounts on securities, or any special value of franchises which were perpetual.

Guy E. Tripp, vice-president of the Stone & Webster Management Association and chairman of the joint reorganization committee, identified various documents. Oliver C. Semple, assistant counsel for the commission, asked a question regarding the Central Park, North & East River Railroad, to which Mr. Tripp replied that the method of disposal of the ownership in that property had not yet been finally determined.

Mr. Mathewson said that the ownership of the \$1,200,000 Central Park, North & East River Railroad bonds had been in litigation. The right to retain them had been approved by the United States Circuit Court, and if the decision was sustained on appeal these bonds would pass to the reorganization committee.

William H. Wheelock, of the Douglas Robinson, Charles S. Brown Company, testified regarding values of real estate.

Mr. Semple thought that the property which belonged to the Metropolitan company or was directly subject to the mortgage and was directed to pass to the new company should be separated from the property held by leased lines.

Mr. Mathewson said that the course of the case would be facilitated if the proof was offered in the order planned. If it was considered pertinent, he would point out hereafter the portions of the real estate which were held in fee by the Metropolitan and the subsidiary companies respectively. Some of the real estate belonged to a company on whose property the Metropolitan had a lease of 1000 years, which was practically equivalent to the fee.

Mr. Semple said the point might as well be drawn directly, because he would stand for it as far as it was allowed to him to do so, that the only thing that could be turned into

capital was what belonged to the Metropolitan or what would belong to the new company. Leases that were thought unprofitable had been abandoned on three months' notice under authority of the court decree.

Commissioner Maltbie decided that, as a matter of convenience to the applicants, he would allow them to proceed to offer the estimates of the value of the property, without prejudice, however, to the rejection of the testimony later.

Mr. Wheelock then stated that he determined the cost of acquisition of the plots by taking first what he believed to be the market value of the various plots, plus an allowance per lot for such improvements as existed in the immediate neighborhood of the property, or, in other words, the typical improvements of the property, and in addition the cost of securing a policy of insurance and survey and of recording the various papers connected with the purchase of each parcel.

Charles F. Uebelacker, chief engineer of Ford, Bacon & Davis, said that, acting for that firm, he was acting chief engineer for approximately two years for the receivers of the Metropolitan Street Railway. He had made a study of the property in order to determine the cost of reproduction aside from land.

Commissioner Maltbie asked if the practice had been followed of considering the property of the Metropolitan and the leased and controlled companies in one schedule.

Mr. Mathewson said it had, and that it was absolutely impossible to disconnect the two for any purposes of operation. If the company could not be reorganized in such a manner that it might be capitalized as a single system, taking the value of the property as it existed and not valuing a lease as such, it simply meant the disintegration of the property into its elements. It was impossible to make any segregation which would not leave the system disintegrated. Of course the committee would be able to show a substantial title in all the properties, either by lease or otherwise.

Mr. Semple said it ought not to be impracticable to show what was the direct property of the Metropolitan and what was subject to this mortgage, and what was to be acquired by the committee and what was to be conveyed to the new company. The commission had to know that the property which the securities were to represent was to be the property of the new company, and was not to be leased property which the new company would have under a tenancy, perhaps for a long time, but subject to be cut off by contingencies that could not be anticipated and that would not furnish a basis for capitalization under the statute. He objected to testimony of the estimate of the cost of reproduction new of property of the system, considered as one corporation. The property described in the plan of reorganization included property owned directly and also leased lines. The witness was asked to testify regarding an estimate of the value of property which was not to be acquired by the company or the committee and could not therefore be property acquired against which stock or bonds might be issued under the statute.

Mr. Mathewson said that the property which the witness was asked to value was property to which the Metropolitan Street Railway Company had the title, and which it was using daily, subject to an annual charge. All the property was held by direct ownership of the Metropolitan company, by direct ownership of a lessor company or by companies controlled by stock ownership. The estimate of value applied only to the roads still operated by the receivers. The commissioner would see that the length of ownership in all these properties was so long that the difference between an ownership in fee and the use under the lease was negligible. No presumption could be entertained for the purpose of defeating their ownership and rights that the lease would be broken or abandoned. He thought that the statute to which the counsel for the commission had referred did not prevent the commission from capitalizing the actual value of property which existed and for which a capitalization was proper to some party.

The hearing was adjourned to Jan 17, and was then postponed to Jan. 20.

MR. TRIPP'S STATEMENT REGARDING LEASED LINES

Guy E. Tripp, chairman of the joint committee, has issued the following statement in reference to the discussion regarding the position of leased lines:

"The effort of the bondholders' committee for the last three years has been to devise a plan that would leave a unitary or complete system. It should be borne in mind that practically all the leases were made for 1000 years, and provide that the Metropolitan company shall make all additions and improvements on its own credit on the theory that it has the use of these improvements for 1000 years.

"It has procured funds and issued its securities for them and expended the money under the terms of these leases. In addition the receivers, acting under the authority of the United States circuit court, have issued receivers' certificates which are chargeable against the Metropolitan Street Railway Company (and not the leased lines) and have expended a large portion of the proceeds for additions and improvements of leased lines. Therefore it is plain that unless the reorganized company be permitted in effect to retain the capital already issued for these improvements, among which is the electrification of all these lines, and in addition be permitted to issue additional capital when required for future additions and improvements, there is no alternative but complete disintegration.

"There are very few steam railroad systems that do not include in their organization similar leased lines, which are financed by the parent company. The sweeping reduction in capital obligations under the plan transfers the burden of any high lease rentals from the public to the Metropolitan security holders."

INCREASED PAY FOR INDIVIDUAL EMPLOYEES ADOPTED BY BRADFORD (ENG.) CORPORATION TRAMWAYS

In accordance with the recommendation of C. J. Spencer, manager of the Bradford (England) Corporation Tramways, the Bradford City Council has approved certain increases in pay of different classes of employees, provided that the men show marked efficiency as individuals. Mr. Spencer's report included the following comments:

"On the general question of advances of wages to certain employees I desire to say that many of our employees could make themselves worth considerably more pay by better attention to work and by exercising a little more intelligence in the execution of their duties. Many men do their duty in a conscientious and efficient manner, and such men, in my opinion, are worthy of recognition, as compared with the man who, while managing just to keep his job, does his work more or less indifferently.

"The current consumption figures show that certain men, due to the manner in which they drive their cars, are costing from 1d. to 2d. per hour more in consumption of current than others.

"Some conductors, by close attention to duty, courtesy, civility and carefulness, succeed in avoiding accidents to passengers and, by encouraging passengers to travel on the cars, are certainly worth more than others who may have been in the service quite the same length of time.

"The same remarks are true even in a stronger sense in the case of inspectors and other administrative officers, who, by their strict attention to duty, make themselves very valuable servants of the corporation.

"I therefore ask the committee, when considering any proposals for advances, to recognize that all men in the service are not of equal value, and that while a man may have succeeded in keeping his job for a number of years, that may mean that he has only been able to observe the minimum requirements of efficiency. The object of increased pay and other inducements for betterment should be educative. If increased pay could only be got by effort toward higher efficiency, then it seems to me that both employer and employee would ultimately benefit."

MESSAGES OF THE GOVERNORS

The following abstracts from the messages of the Governors to the State Legislatures supplement those published in the *ELECTRIC RAILWAY JOURNAL* of Jan. 14, 1911, page 75:

GOVERNOR WOODROW WILSON OF NEW JERSEY

We have a Public Utilities Commission in New Jersey, but it has hardly more than powers of inquiry and advice. It could even as it stands be made a powerful instrument of publicity and of opinion, but it may also modestly wait until it is asked before expressing a judgment, and in any case it will have the uncomfortable consciousness that its opinion is gratuitous and carries no weight of effective authority. This will not do. It is understood by everybody who knows anything of the common interest that it must have complete regulative powers: the power to regulate rates, the power to learn and make public everything that should furnish a basis for the public judgment with regard to the soundness, the efficiency, the economy of the business—the power, in brief, to adjust such service at every point and in every respect, whether of equipment or charges or methods of financing or means of service, to the general interest of the communities affected. This can be done, as experience elsewhere has demonstrated, not only without destroying the profits of such business, but also with the effect of putting it upon a more satisfactory footing for those who conduct it no less than for those who make use of it day by day.

Such regulation, based on thorough and authoritative inquiry, will go far toward disclosing and establishing those debatable values upon which so many questions of taxation turn. It would seem that in every locality there is some local variety of practice, in the rate, the ratio of assessment value to market value, and that every assessor is a law unto himself. Our whole system of taxation, which is no system at all, needs overhauling from top to bottom. There can be no system, no safety, no regulation in a multitude of boards. An efficient Public Utilities Commission will be a beginning toward a system of taxation as well as toward a system of corporate control. We cannot fairly tax values until we have ascertained and established them.

GOVERNOR HERBERT S. HADLEY OF MISSOURI

We need more railroads to assist in the development of the undeveloped sections of the State, as we need more capital to aid us in the development of our undeveloped resources. In order to secure this result such interests must be assured of fair and conservative treatment by the State. I believe that this assurance can be best given and a satisfactory result secured if the Legislature would create an appointive public service commission, with such provisions as to its personnel and powers as would insure a careful, scientific and conservative investigation of every situation before an order was made in reference thereto. It is my judgment that a State public service commission can more effectively and satisfactorily regulate all public service corporations doing business in the State than can such commissions created by the Councils of the different municipalities, or can the Councils themselves. However, if it was deemed advisable to except those municipalities in which public service commissions exist, or may exist by law, such an exception could be easily made. The experience, however, of the various municipalities in regulating public service corporations doing business therein has not, in my opinion, been sufficiently gratifying to justify or necessitate such an exception. The establishment of a State public service commission would, I am satisfied, give to capital invested and seeking investment that assurance which it seeks and requires that investigation would precede regulation; that no radical, extreme or retaliatory orders would be adopted or enforced, and, on the other hand, it would give the people assurance that their rights would be safeguarded and their interests protected.

In order that Missouri may not lag behind other States in the consideration of employers' liability and workmen's compensation laws, I have asked a number of those interested in this question to investigate the subject and report their recommendations to this General Assembly. There is some question as to how far we can go under our constitutional limitations in

the enactment of a law providing for compulsory compensation for workmen injured in industrial pursuits. If it is the opinion of the members of this General Assembly that there is not sufficient time to give to the different phases of this subject the consideration and investigation necessary for such an important change in our system of litigation and in the conduct of our industrial and commercial occupations, I earnestly recommend that you provide for a commission which shall further investigate this subject and make its report to the next General Assembly.

GOVERNOR BERYL F. CARROLL OF IOWA

I do not understand that compliance with the finding of a board of arbitration with reference to disputes between employees and employers could be enforced, but the public is entitled to know the facts relating to matters of controversy which usually involve the public welfare, and it is hardly likely that either party to a dispute could long maintain itself against the finding of a competent and unbiased tribunal. I therefore recommend that you give careful consideration to the question of establishing such a body in this State.

In this connection I desire to call attention to the fact that efforts will be made at this session of your body to have enacted a law with reference to compensation of workmen injured in hazardous occupations. While not fully advised with reference thereto, it is my understanding that such a law is desired, both by the employer and the employed, so that the conditions under which and the amount of damages that may be recovered in so far as is possible, may be determined in advance. It is desired also in order that expensive litigation and excessive costs of insurance may be avoided as well as for various other reasons. This is an important subject to the industrial interests of the State and it merits careful consideration.

Two years ago I recommended to the General Assembly the creation of a public utilities commission or the enlargement of the powers of the Board of Railroad Commissioners of Iowa. I then suggested that the membership of the railway commission, if clothed with the powers referred to, be increased to five and that the added members be appointed by the Governor, and as the terms of the present members expire their successors shall be appointed. I desire now to renew that recommendation and to say that, in my opinion, a commission clothed with such power and authority as is given by the laws of New York or Wisconsin would prove of great benefit to the State. Then too the question of the regulation and control of the water-power of the State should be lodged with the proposed commission. This is an important matter and one which has been very much neglected.

The thirty-second session of the General Assembly enacted a law to prevent the issuing of watered stock. It provides that no stock shall be issued by any corporation except for cash, unless the consent of the Executive Council is first obtained, and that no stock shall be issued unless the par value is paid in cash or its equivalent. As to incorporating an ordinary going business the law does not seem to have worked any particular hardship, but as to promoting new corporations, and especially electric railways, it evidently has proved a hindrance. The particular cause of the trouble seems to be that the law does not take into account the expense incurred before arriving at the time to issue stock, nor does it take into consideration any depreciation in the sale of bonds. It is the claim of those interested in railway building that they cannot meet the requirements of the statute, and consequently railway construction in this State is practically at a standstill. It is possible that if other States and the federal government were to enact laws similar to our own it might to some extent relieve the situation, or at least Iowa would be placed upon an equality with other States. But until such laws are passed we seem destined to suffer a decided disadvantage. I have called your attention to this matter in order that it may be determined whether any relief can be had without defeating the real purpose of the law and, if none can be had, so that you may decide whether the law shall continue unchanged to await the hope of action by other States and by Congress.

ELECTRIC RAILWAY TRANSPORTATION

The issue of the "Annals of the American Academy of Political and Social Science" for January, 1911, is devoted to the subject of "Electric Railway Transportation." The contents are divided into discussions on two general aspects of this subject. Part 1 is devoted to "Traffic and Financial Problems" and Part 2 relates to "Public Regulation of Electric Railways."

Bion J. Arnold, chairman of the board of supervising engineers, Chicago Traction, contributes a paper on "The Urban Transportation Problem—a General Discussion." An abstract of this, which is a report on the Pittsburgh traffic situation, was published in the *ELECTRIC RAILWAY JOURNAL* for July 30, 1910, page 179.

Thomas Conway, Jr., Wharton School of Finance & Commerce, University of Pennsylvania, discusses the decreasing financial returns of urban street railway properties. He declares that there is no matter in which it is more important that the public receive the fullest, frankest and most complete information than that concerning the earnings and financial problems of electric railway properties. Professor Conway says that the urban street railway industry at the present time is facing a financial crisis, due to the decrease in the average earnings per rider and to the widespread increase in the cost of maintenance and operation. The writer says that the most important factor in decreasing the earnings of urban systems has been the alarming decline in the average fare, due to the rapid growth in transfer traffic. Professor Conway concludes that the solution of the problem must be found in the readjustment of the average fare per passenger carried on a basis which will remove the danger and accord satisfactory financial conditions.

William B. Jackson, of D. C. & William B. Jackson, consulting engineers, Chicago and Boston, discusses "The Depreciation Problem." Mr. Jackson concludes that it seems unavoidable that rates will be periodically revised in the future and that it therefore appears manifest that a full understanding of all the elements which make up the cost of railroad service is necessary. An important one of these elements and one which has heretofore failed of adequate attention is that of depreciation renewals. The renewal expenses required by depreciation should be squarely faced and not passed on in multiplied ratio to future generations.

"Methods of Increasing the Efficiency of Surface Lines in Large Cities" is the title of an article by Williston Fish, assistant to the president, Chicago Railways Company. Mr. Fish says that the whole question of clear roadway and of stops is one of arithmetic and evolution. He concludes: "If the people in New York, Chicago and other large cities can give themselves a street car service one-half more rapid and much more regular than they now enjoy, at no more expense than the discipline of their team traffic and an extra walk averaging about 150 ft., I think they will demand the better service."

William S. Twining, of Ford, Bacon & Davis, consulting engineers, New York, N. Y., contributes an article on "The Investigation of Traffic Possibilities of Proposed Subway Lines." The writer believes that "inasmuch as the growth of large cities demands the supply of some quicker form of transportation than is afforded by street cars, the city itself should construct the tunnels or elevated structures which represent a large part of the investment, leaving the same to be operated by a transportation company." He urges the transportation committees in large cities to have a complete urban engineering study made of local needs and conditions before deciding to recommend franchises for any particular rapid transit route, whether subway or elevated, as the transportation of cities should be developed as a whole and along a definite and determined plan.

Frank S. Cummins, traffic manager of the Inter-Urban Railway, Des Moines, Ia., in an article on the "Possibilities of Freight Traffic on Interurban Lines" says that the possibilities of freight traffic on any interurban property are great and the earnings most gratifying.

"Express Business on Interurban Lines" is the subject of a contribution by A. Eastman, general manager Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont. Mr. Eastman discusses the various classes of methods followed in conducting an electric railway express business and says that it nearly always can be made remunerative.

Samuel M. Curwen, vice-president and general manager of The J. G. Brill Company, Philadelphia, Pa., contributes an article on the subject "Economic Factors in the Selection of Cars for Urban Service." He says that great economies in operation can be gained by proper construction standards, enabling the car builder to build the very lightest car to meet satisfactorily the requirements of the service. Standardization will reduce the cost of production to the manufacturers by the elimination of much of the special designing, special patterns, castings, etc. This will benefit the railway company, for besides reducing the initial cost of equipment and the cost of replacement it will be productive of economy in the maintenance and engineering departments and will furnish a lighter and better design of car in most cases.

C. D. Emmons, general manager Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind., in an article on "The Relations of the Electric Railway Company with Its Employees" concludes that the keystone of the policy of most electric railways at the present time is the necessity for fair, impartial and humane treatment of their employees, care for their physical comforts and such treatment that a spirit of courtesy to the public and loyalty to the companies may be fostered.

Daniel T. Pierce, formerly executive assistant of the Philadelphia Rapid Transit Company, in discussing "The Strike Problem Upon Electric Railways" says that no street railway company can win, in any proper sense of the word, a strike of its motormen and conductors, and for this reason if for no other such strikes should never occur. The remedy will be found in the improvement and readjustment of working conditions on street railways.

A. W. Warnock, general passenger agent Twin City Rapid Transit Company, contributes an article on "Educating the Public to a Proper Appreciation of Urban Street Railway Problems." Mr. Warnock believes that the daily and weekly newspapers, the display cards in the company's own cars and the company's folders and publications offer the most effective mediums for conducting a campaign of education.

A. D. B. Van Zandt, publicity agent Detroit United Railway, in an article on "The Presentation of Interurban Problems to the Public" says that the interurban line is not a deterrent but an aid to the small towns. While the course of trade was from the village to the city before the advent of the interurban roads, to-day it runs equally from the city to the village and from the village to the city.

Frank R. Ford, of Ford, Bacon & Davis, consulting engineers, New York, N. Y., discusses the "Valuation of Intangible Street Railway Property." Mr. Ford's exhaustive article on this subject includes the testimony presented before the New York Public Service Commission, First District, in the case affecting the Coney Island & Brooklyn Railroad. The testimony in this case was reviewed in the issues of the *ELECTRIC RAILWAY JOURNAL* for Dec. 25, 1909, and Jan. 15, 1910.

William Osgood Morgan, vice-president and counsel Sheboygan (Wis.) Railway & Electric Company, contributes an article on "The Indeterminate Permit as a Satisfactory Franchise." He discusses the Wisconsin law relating to the indeterminate permit.

B. H. Meyer, member of the Interstate Commerce Commission and formerly chairman of the Railroad Commission of Wisconsin, in an article discussing the "State Supervision of Electric Railways in Wisconsin" describes the study of the service situation in Milwaukee, an account of which was published in the *ELECTRIC RAILWAY JOURNAL* for April 9, 1910. He also refers to other cases which have been before the Wisconsin commission.

Milo R. Maltbie, member of the New York Public Service

Commission, First District, in an article on the subject "The Fruits of Public Regulation in New York" describes the powers and activities of that commission.

George Weston, assistant chief engineer of the board of supervising engineers, Chicago Traction, contributes an article on "Supervising Engineers and Street Railway Service—the Value of a Board of Supervising Engineers in Securing Efficient Street Railway Service." Mr. Weston says that the influence of such a board is toward good service, the best that can be afforded for the rate of fare paid. He adds that the street railway business, like any other business, must be a commercial success in order that it may live and give efficient service.

HEARING ON SERVICE IN TRENTON

Hearings were held in Trenton, N. J., on Dec. 6, 1910, Dec. 13, 1910, and Dec. 22, 1910, on the complaint of the City of Trenton to the Board of Public Utility Commissioners of New Jersey regarding the service furnished in Trenton by the Trenton Street Railway in which it was asked that the board should withhold its sanction of the terms of the lease of the Trenton Street Railway to the Trenton & Mercer County Traction Company. The commission was represented at the first hearing by Frank A. Sommers, chairman, Robert Williams and Thomas A. Hillery; at the second hearing by Mr. Sommers and Mr. Hillery, and at the third meeting by Mr. Hillery and Mr. Williams. The petitioners were represented at all the hearings by John H. Beckes and the company by George W. MacPherson, of counsel. The testimony presented in behalf of the city on the first hearing was confined principally to complaints of the alleged bad condition of the track and pavement in certain streets. Mr. Hurley, formerly general manager of the company, testified on the other hand that the entire system had been rebuilt during the past eight years.

The application of the Trenton & Mercer County Traction Company for permission to lease the Trenton Street Railway, the Trenton, Hamilton & Ewing Traction Company, the Mercer County Traction Company and the Trenton, Pennington & Hopewell Street Railway is now before the board. Each of these leases calls for the payment by the lessor to the lessee of a certain stipulated sum of money, increasing in amount through a period of 15 years, in addition to the payment by the lessor of interest on all bonds outstanding, all taxes, etc., and the proper up-keep. The lease of the Trenton Street Railway also provides that upon request the Trenton Street Railway will further mortgage its property for \$500,000, the proceeds of the mortgage to be used for rehabilitation and improvements.

On Dec. 17, 1910, the members of the board traveled over the principal lines of the company in a special car to study the physical conditions of the property and inspect the track in places about which complaint had been made.

BANQUET ANNOUNCEMENT

The second annual banquet which the American Electric Railway Manufacturers' Association will tender to the officials of electric railway companies attending the mid-year meeting of the American Electric Railway Association will be held in the grand ballroom of the Hotel Astor, New York City, on Jan. 27, 1911. Covers will be laid for approximately 600 guests, and will be so arranged as to accommodate eight or ten persons at each table. The price of the dinner to representatives of the Manufacturers' Association who wish to attend will be \$10 a plate.

Charles C. Castle, president of the Manufacturers' Association, will be toastmaster of the evening. The speakers will include: Governor Dix of New York; President Arthur W. Brady; of the American Association; Hon. W. B. McKinley and Col. H. G. Prout, vice-president and general manager of the Union Switch & Signal Company.

MEETING OF THE CIVIC FEDERATION

At the annual meeting of the National Civic Federation held in New York on Jan. 12, 13 and 14 a number of subjects of public interest were discussed. These included workmen's compensation, arbitration, industrial efficiency, uniform State laws and the regulation of trusts.

Harrington Emerson read a paper whose subject he gave as "Justice, Common Sense and the Pay Roll." He said that it was impossible to gain a greater degree of efficiency without giving a larger proportion to workingmen. He considered the principle of piecework bad, but declared that if men wanted to work hard and earn more they should be encouraged. The reward of efficiency was the best form of promotion.

H. L. Gantt, in discussing "Industrial Efficiency," said that the financiers representing the steam railroads had admitted that rising costs compelled them to ask the public to meet the burden through advances in freight rates. If it was a fact that every possible economy had been effected there was a serious condition to confront. The engineer and his able assistant, the skilled mechanic, asked the financiers to wait before reaching the conclusion that this situation existed. It was the duty of every employer to see that workingmen were rewarded and not penalized for efficiency.

Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers, said that every labor organization had contended with "efficiency methods" in some form or other. The engineers wanted the very best work done and not a bonus system which would enable men to slight their work. It was the same old question of pacemaking. American railroads were managed better than any others in the world. The individual shippers who were now complaining were the very men who reaped the benefits of rebates and brought about the regulation of railroads. There was never a time when so much was demanded of the railroads in speed, roadbed and equipment as now, and the whole country wanted the Interstate Commerce Commission to approve increases in freight rates.

John Mitchell said that the efficiency system should be presented undisguised. It meant the piecework system introduced in a new way.

Andrew Carnegie and Colonel Theodore Roosevelt discussed the advantages of a workmen's compensation law. P. Tecumseh Sherman presented the draft of a proposed bill for uniform State legislation on this subject.

A letter on the need for greater uniformity in railway regulation, written by Martin S. Decker, member of the New York Public Service Commission, was read. Mr. Decker referred to the activities of the National Association of Railway Commissioners in various directions, adding:

"These movements, and others in contemplation, show real progress toward uniformity in regulation and indicate a common purpose on the part of the federal and State commissions to work along harmonious lines. The federal commission could not of itself take up the work of these committees and carry it to a successful conclusion, nor could the State commissions do so acting without the federal commission.

"In my address as president of the National Association of Railway Commissioners at its last meeting I recommended strongly the policy of conference between the federal and State commissions in regard to matters having common interest, and there is good reason to believe that these conferences will become frequent in future.

"I call attention to the matters above indicated as showing practical results and real progress and venture to predict that with persistence along these lines embarrassments resulting from the conflict of federal and State authority in the regulation of railways will eventually become few and unimportant.

"I also venture to point out here how much this course is to be preferred to one involving departure from the scheme of separate State and federal jurisdictions which has always been an essential part of our government."

PROPOSED DUPLEX TRANSFER TICKET

The American Bank Note Company, New York, has brought out a duplex transfer of the type shown in the accompanying illustrations. It consists of a central portion with stubs at the left and right. The front of the transfer is used for a. m. hours and the back for p. m. hours. The central portion of the front contains the usual transfer data, such as the name of the line, the serial number of the transfer, the lines to which direct transfers can be made, the date of issue, the hour time limits and two frac-

In printing this transfer it is important that the points of the compass be printed in colors to avoid mistakes either in punching the tickets or in detaching coupons.

A conductor cannot turn in as three fares a complete transfer from those passengers who do not wish to retransfer. On finishing each trip, he must place all received transfers in a sealed envelope with the time marked thereon. The auditor who looks over the time marked on each envelope and the number of trips can determine from the common serial and conductor's numbers as well as by the time limit and direction marks whether the conductor has made an incorrect report. A conductor whose number does not correspond to the transfer serial numbers cannot issue tickets belonging to another conductor, because such action on his part would be readily discovered. The ticket shown contains the names of various streets in New York, but is not used in that city.

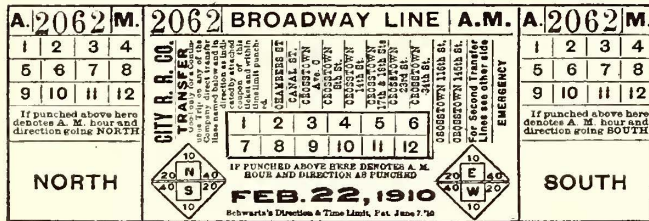


Fig. 1.—Duplex Transfer—A. M. Side

tional time limits, one of which is for north or south and the other for east or west. The front of the left-hand coupon in Fig. 1 has the identifying serial number, the hourly time limit, and is marked "North" to indicate the riding direction. The right-hand coupon is like the other, but is marked "South." The back of the transfer, which is for p. m. use, carries the conductor's number for identification and shows a list of second transfer lines.

The hour limits on both sides of this transfer are so arranged that when a p. m. hour is punched it will not mutilate the a. m. hours and vice versa. However, the fractional time limits are printed exactly back to back. The transfer can be made with any desirable number of coupons, but it will be assumed in the following description of its use that it is provided with two stubs only.

Suppose that a passenger traveling north at 9:40 a. m. asks for a transfer. The conductor will punch "10" on the "North" stub, the cardinal point "N," the hour "10" on the central portion, and the serial number on the "South" coupon to indicate to the auditor that the latter coupon does not represent a cash fare. On reaching the transfer point the passenger boards another car. The conductor who takes his ticket will see that the "South" coupon is not mutilated in the time limit and that the rest of the transfer is properly punched. He then detaches the "South" coupon for registration. It is assumed that if the car is traveling east, the conductor punches the fractional time limit "10" above the cardinal point "E." He then returns to the passenger the ticket, which now consists of the central por-

The A. D. Joslin Manufacturing Company, Chicago, Ill., is making for railway use the "Cosmo" No. 2 date stamp machine shown in the accompanying illustration. This is a five-wheel perpetual dater built with accurately adjusted working parts and an entirely inclosed ribbon feed mechanism with 6 yards of ribbon. The engraved date wheels are of brass, mounted with solid bearings on a revolvable steel shaft to eliminate lost motion and thus prevent illegible impressions. The date wheels are positively locked by individual lever keys. They are released for change of date by the same means, this being accomplished by a short turn of the shaft to carry the released wheel to the required position. The top part of the stamp swings upward on a hinge as illustrated and remains in that position while the dating is being changed. After this it swings back in place and is securely held down by the locking device. The die plate is made of a special bronze reinforced by two braces resting on brass shafts between the date wheels, which construction prevents the die plate from sagging in the center. If desired, the stamp is supplied with a pointer and dial to show the extent to which the ribbon has been used. The dates

RAILROAD DATE STAMP

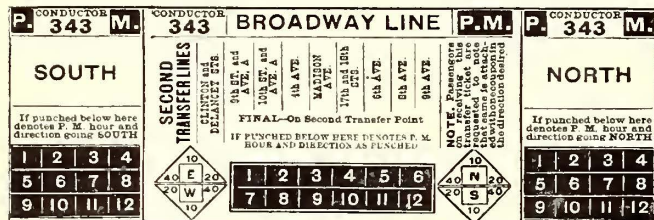


Fig. 2.—Duplex Transfer—P. M. Side

tion and the "North" coupon. The transfer has now been marked "North" and "East" with time limits so that the passenger cannot use it to go toward his starting point via his original line. On arriving at the second transfer point the passenger may again transfer if he does so to a car going north. The conductor on the latter car then detaches the "North" stub and registers it as a fare, but before returning the central portion, he punches a fractional time limit and also punches it at the side of the cardinal point "N." At the third transfer point the passenger may transfer westerly or in any other direction permitted by the rules of the railway. The body portion of the ticket is taken up for passage from the third transfer point.



Railroad Date Stamp

printed run lengthwise of the railroad ticket so that the full date, namely, the month, day and year, is always impressed. The stamp was invented by the late A. D. Joslin, who was for many years auditor of passenger receipts of the Illinois Central Railroad.

The monthly record of passenger train performances on the steam railroads of the State, just issued by the Public Service Commission, Second District, for the month of November, 1910, shows that 61,863 trains were run, of which 82 per cent were on time at the division terminal. The average delay for each train late was 22.8 min.

COASTING CLOCKS FOR THE THIRD AVENUE RAILROAD, NEW YORK

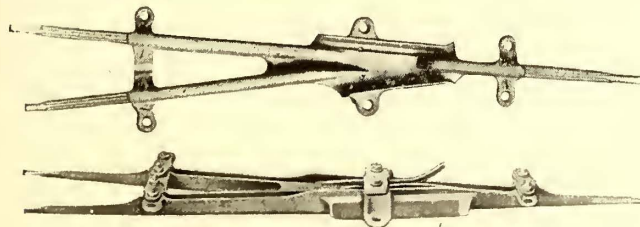
After several months' tests with a sample coasting register, the Third Avenue Railroad, New York, has ordered from the Railway Equipment Company of that city 100 registers. These devices will be installed on all the cars of the Broadway-Forty-second Street line. It is expected that the clocks will be delivered within the next two or three weeks. The company is planning to give awards monthly to a certain number of motormen who have the best records, but the details of the award system and the methods of keeping the records have not yet been finally decided. Judging from the tests made with the sample register, the company believes that it will be possible to effect a saving in energy of 10 to 15 per cent.

This installation will be watched with considerable interest because it is the first one of importance for street railway service in thoroughfares with considerable trucking. The Broadway-Forty-second Street line is one of the most favorably situated, however, as the greater portion of the route is through wide avenues on the West Side of Manhattan Borough. The company realizes the difficulties of making comparisons under city conditions and it will therefore give this matter the closest attention so that proper exceptions may be made for traffic peculiarities.

TROLLEY FROG

E. J. Dunne, superintendent of distribution, Public Service Railway of New Jersey, has designed a trolley frog which is suitable for turnouts on all kinds of special work and which will permit operation at regular running speeds. This design, termed the "Detroit" trolley frog, with a number of minor improvements, is now manufactured by the Westinghouse Electric & Manufacturing Company. The essential features are a long tongue on the turn-out to engage the wheel when taking the curve, a groove in the pan of the frog to steady the wheel when traveling on the tangent line and a very short distance for the wheel to travel on its flanges. The short flange travel reduces arcing and greatly increases the life of the frog and wheel. The mechanical features mentioned allow the frog to be placed 4 ft. further back from the track frog and permit centering the frog with the track, thus avoiding kinks in the tangent wire and avoiding dragging the wheel at an angle to the line when the car is taking the curve. Another feature of the trolley frog is the long, flexible approach. This approach prevents the wheel from striking a blow and thus avoids crystallization of the wire. A large space and a "preventer" between the two approaches prevent a wild wheel from jamming and make it unnecessary to construct additional "preventers."

Differing from frogs of earlier design this frog allows the curve wire to be run through and dead-ended in a strain guy with obvious advantages. The main line is relieved of undue stresses and the trolley wire need not be cut when it becomes



Two Views of Trolley Frog

necessary to replace a frog, nor is any block and tackle necessary in such cases.

The mechanical construction of the frog is such that it cannot buckle, but remains always level and smooth under running. The frog is installed over a point 18 ft. from the track frog for standard 18-ft. to 20-ft. trolley for all curves up to

80 ft. radius. For longer curves this distance is increased accordingly. When properly placed the turn-out points directly to the first curve pull-off, thus avoiding a bend at the frog.

A NEW SLEET CUTTER

The Bonney-Vehslage Tool Company, New York, has recently placed upon the market the "B-V" sleet cutter, which is of the simple type shown in the three accompanying illustrations.

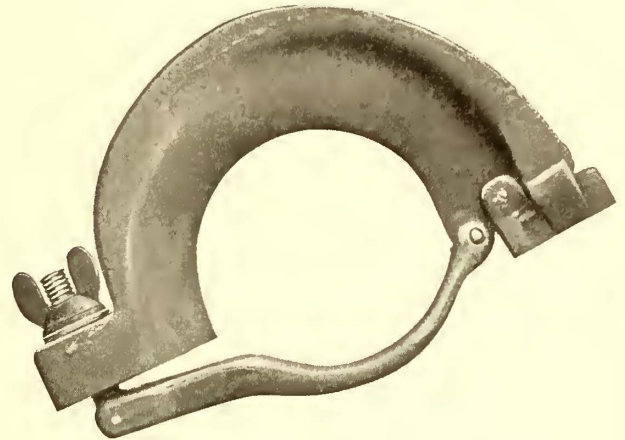


Fig. 1—Cutter Detached from Trolley Wheel

This device is composed principally of an iron yoke and a bronze holder. The yoke has a detachable bronze cutting piece, which is held in place by a pin at one end. The bronze holder

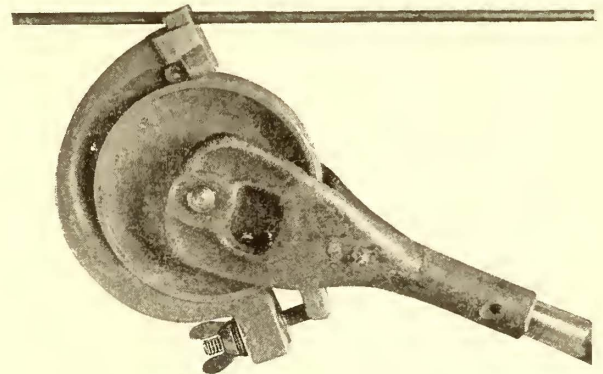


Fig. 2—Sleet Cutter in Position with Forward Running

is hinged to the yoke at the cutter end and locked about the wheel at the other end by means of a thumbscrew. The entire cutter can be removed in a few seconds merely by loosening

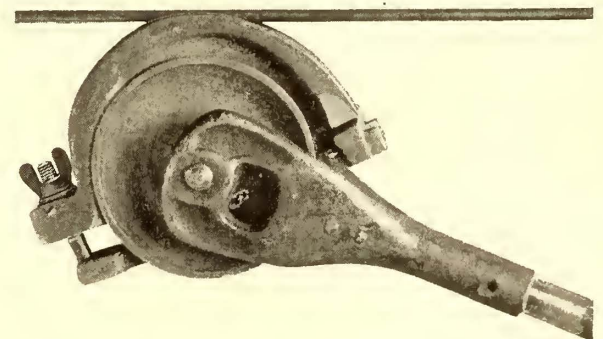


Fig. 3—Position of Sleet Cutter with Car Backing

the thumbscrew. Fig. 1 shows the sleet cutter when removed from the trolley wheel; Fig. 2, when applied to a forward running car; while Fig. 3 shows how the cutting piece remains out of the way when the car is moving backward. In this position the wheel simply slides along underneath the lower part of the wire.

News of Electric Railways

Railway Affairs in Detroit

William B. Thompson was inaugurated as Mayor of Detroit, Mich., on the evening of Jan. 10, 1911, to succeed Philip Breitmeyer, who held the office two years. In his closing address Mayor Breitmeyer defended the position he at first assumed on the street railway situation and the policies which had been followed through his administration.

Mayor Thompson devoted a large portion of his inaugural address to the street railway situation. He said, in part:

"For 20 years the city and the Detroit United Railway, or its predecessors, have been engaged in a bitter controversy over the terms of existing franchises and of franchises sought for by the several traction companies. An adjustment with the company as presently controlled seems very unlikely; in my judgment, the majority of our people have come to the conclusion that the only satisfactory and lasting settlement is to be found in municipal ownership of the street railway system.

"There is now pending before the Supreme Court of Michigan a suit which involves the right of this city to submit to the electors a proposal to engage in municipal ownership and operation of the street railway lines. We cannot anticipate what may be the termination of the suit. If the city is successful the earliest possible date should be selected for the submission of this proposal. On the other hand, if the city should fail in this litigation, the Council should lose no time in taking every step within its power to adjust itself to the new situation, so as to submit this question promptly to the public. The revised constitution gives this power.

"In this same connection I urge that you recommend to the Legislature, and particularly to the delegation representing this municipality in that body, the passage of a comprehensive condemnation act which will completely empower Detroit to condemn the private property of public utility companies, so that if the city embarks upon any municipal enterprises it may carry along the enterprise under the same advantageous conditions now enjoyed by private operators.

"I recommend that you disregard the pending lawsuit in the Circuit Court of the United States which was brought during my previous administration to test the validity of an order to compel a sufficiency of cars so that each car would not be expected to carry in excess of its seating capacity and one-half as many more; and that you take action looking to immediate relief. When a city, upon an important proposition of this kind, waits beyond a period of two years for a decision from a court, no one should be heard to complain if its patience is exhausted.

"As to the litigation pending between the city and the company: While this company continues to maintain its hostile attitude toward the city, no suggestion should be entertained to discontinue the city's struggle for a judicial declaration of our right to control our own property. The suit instituted by the company through its bondholders in the federal court to prevent the enforcement of the Hally ordinance has involved in its principle that Detroit cannot make a public offer for the future use of its streets, and that a term franchise is unending in point of time. The suit started by the city in the Wayne Circuit Court to collect revenue for the use of the unfranchised Fort Wayne system will determine whether the city or one of its favored grantees can continue on its own terms and in defiance to constituted authority to use the streets which Michigan has placed under the control of the people of this city."

Alderman John C. Garvey has introduced a resolution in the Council calling upon Corporation Counsel Hally for an opinion on 10 important questions which virtually cover the street railway situation. The questions follow:

"1. What is the city's title to any physical property on public streets or highways now used for street railway purposes upon which the franchises have expired?

"2. Do non-physical items cease to exist conterminously with franchises that have expired?

"3. Can the city legally guarantee the present or any other company a fixed compensation or return upon any physical property on public streets or highways where the franchises have not expired?

"4. Can the city legally guarantee the present or any other company a fixed compensation or return upon any physical property on public streets or highways where the franchises have expired?

"5. Has the city the right to demand an accounting on lines upon which franchises have expired and to collect the profits thereon from date of expiration?

"6. Under what condition has the city the right to demand an accounting on lines upon which the franchises have not expired?

"7. In case of guarantee or purchase, would the city have to assume or buy all of the physical property, or only such part of it as the city may deem necessary?

"8. In case of guarantee or purchase of physical property, what method of valuation should be used?

"9. Has the city the right to take possession of the company's property upon which franchises have not expired, paying it a daily rental until the franchises do expire, since the company is now paying the city daily rental on all lines upon which franchises have expired?

"10. Has the city the legal right (a) to demand the application of profits to supply adequate service before the company can devote such profits to the payment of a dividend on stock; (b) to demand the application of profits to supply adequate service before the company can devote such profits to retire bonds which have been issued against this property?"

On Jan. 12, 1911, Judge Phelan decided that the company must accept workmen's tickets in the regular hours on the Grand River Avenue line, between the city limits on Grand River and on Jefferson Avenue; in other words, the company must carry passengers within the city limits at one fare on this line. The company held that it was not bound to carry passengers to the new city limits at the same rate of fare that prevailed previously.

The Detroit United Railway has purchased 20 acres of land adjoining the 33 now used for its car houses and terminals, at Highland Park.

Tentative Franchise Prepared by City Solicitor Schreiber of Toledo

City Solicitor Cornell Schreiber, of Toledo, Ohio, has completed his draft of a tentative ordinance as a basis for negotiations between the city and the Toledo Railways & Light Company for an extension of the franchise of the company. The proposed life of the grant is 12 years. The ordinance provides for a straight 3-cent fare, with universal transfers, and no reference is made to a sliding scale to enable the company to increase the fare if it should be found that it is operating at a loss. Children between 8 and 12 years of age shall be carried for 2 cents and those under 8 may ride free. In case the Council found it necessary, a transfer on a transfer would have to be given without extra charge.

Four-minute service between 5 and 8 o'clock morning and evening is required, with a 6-minute service at all other hours of the day, except between 12:30 a. m. and 5 a. m., when hourly service will be required. The Council reserves control of the service, schedules, extensions, double tracking, types of cars to be used, interurban cars and equipment in general, and also reserves the right to examine the books of the company whenever it deems it advisable to conduct such an examination.

Provision is made for an 8-hour workday for all employees, or 56 hours per week. In case of dispute between the company and its employees settlement by a board of arbitration of three members is required, the company to choose one member, the City Council one and the employees the third. The decisions of this board shall be binding on the company if the employees accept the findings.

The city reserves the right to grant the use of the company's tracks to other companies, and it is made compulsory for the Toledo Railways & Light Company to allow any interurban road with 10 miles of track in operation outside of the city to reach terminals within the city over its tracks. Transfers shall be exchanged with the interurban companies. The terms and payments for the use of tracks by the interurban railways are to be decided by the City Council.

The tracks are to belong to the city at the expiration of the franchise or in case of forfeiture, unless the company pays cash for putting the streets in good condition. In case of separation of grades the company will be compelled to pay half the cost. The company will be required to pay \$25 per year for each linear foot of track which it has on the city bridges. As maintained at present the cost to the company would be \$110,000 per year, but the city must keep up the bridges and pay for repairs. Paving assessments are to be paid for in cash when the work is completed and the company will be required to pave the streets 18 in. on the outside of the outer rails instead of between the outside rails as at present.

Before a new grant shall become operative the company must pay all debts due the city, including the amount claimed by the city under the so-called Robison 1 per cent agreement. It is stipulated that the city shall have the protection of all existing laws, including the Schmidt referendum law, even if, in the future, these are amended or repealed, and the right is reserved to purchase the lines at an appraised value and operate them whenever the laws of the State will permit. The company must pay the city \$10,000 to cover the expense of auditing the books and must furnish a surety bond of \$500,000 to guarantee the performance of its part of the contract. Violation of any feature of the ordinance is held to constitute a cause for the forfeiture of the ordinance.

Mayor Brand Whitlock underwent an operation for relief from appendicitis on the evening of Jan. 16, 1911, and may be unable to take part in negotiations for some time.

Transit Affairs in New York

In the *ELECTRIC RAILWAY JOURNAL* of Jan. 14, 1911, page 89, mention was made of the majority report by Comptroller Prendergast and President Mitchel of the transit committee of the Board of Estimate and Apportionment of New York in which they declared in favor of an independent subway as the only solution of the city's transit problem. Mayor Gaynor, the other member of the transit committee, presented a minority report on Jan. 11, 1911, in which he said:

"The false notion, long abroad and industriously disseminated, that private capital built the present subway has not yet been wholly driven from men's minds.

"The report of my associates substantially admits that if what is called the triborough route should be built by the city the Interborough Rapid Transit Company would probably be the successful bidder to operate it, when bids for operation should be advertised for, as required by the statute, after construction is completed; if, indeed, any bidder for operation at all could be found. But they say 'it is not of first importance that the operation of those systems should be in different hands, if only there be two distinct, separate and self-sufficient systems.' But, pray, if both systems are operated by the same company, or by allied or subsidiary companies, how are they 'distinct' and 'separate'? These words and the phrase 'independent system' may be very attractive, but I hope they will delude nobody.

"I have expressed a doubt whether any bid to operate the triborough would be forthcoming. The cost of constructing and equipping that system is put at \$250,000,000. I believe no competent person has claimed that it would be less than \$225,000,000. But if we say \$200,000,000 the case is still hopeless. Five and one-half per cent of that sum for annual interest and sinking fund is \$10,500,000. The highest estimate of gross receipts from operation of the system that any one has made is \$16,000,000. Forty per cent of that for maintenance and operation would be \$6,400,000. This added to the interest and sinking fund amount of \$10,500,000 already shows a deficit without going into other items. But the case is worse, for the gross receipts would probably

not reach \$16,000,000. As is well known, that system was recently put up for bids for operation in advance of construction, but no bid was forthcoming. No one with private capital for investment could see anything but a deficit ahead.

"The Interborough Company offered one year ago to furnish all the funds needed for the city to build the extensions to the present subway, according to my associates, who ask what has caused that company to change its mind in that respect. The Interborough Rapid Transit Company never made such an offer. It did offer to furnish the money to the city to build the extensions from Forty-second Street down Seventh Avenue and to the Battery, and the extension up Lexington Avenue to the Bronx. The extensions which it now proposes that the city should build, and to which it offers to contribute, are in mileage four times the length of the fragments embraced in the said offer by it a year or more ago.

"Permit me to say that the majority of the intelligent people of New York desire that this board now go forward in this matter. An end should come to this perpetual talking and arriving at no result. The Public Service Commission is now ready to proceed to formulate constructive and operative contracts and if there be any delay the cause is here in this board."

William G. McAdoo, president of the Hudson & Manhattan Railroad, has applied to the Public Service Commission for an extension of time in which to build the company's branch line from Sixth Avenue under Ninth Street to Fourth Avenue. The franchise stipulated that the branch should be completed by June 15, 1911, but Mr. McAdoo wants until June, 1913.

Plans for the main section of the new Grand Central Station, which it is estimated will cost \$4,000,000, have been filed by the architects of the New York Central Railroad. The new station will occupy the plot facing Forty-second Street on which the old station stood. The old building is now about demolished. The station will cover the entire block front on the north side of Forty-second Street between Depew Place and Vanderbilt Avenue, and will occupy 245.6 ft. on each of these thoroughfares. Architecturally as well as in size the building will be one of the most imposing in New York. It will be from one to eight stories high. The façade will be of brick, granite and limestone, with massive Corinthian columns and large allegorical figures carved in stone above the bays on the Forty-second Street side. The station will be set back several feet from the Forty-second Street building line, giving room for a plaza approach. A distinctive feature will be the continuation of Park Avenue over Forty-second Street at this point by means of a viaduct. The roadway will be about 20 ft. above the level of Forty-second Street. The main entrances to the station will be on the Forty-second Street side beneath the raised roadway. There will be cab and carriage entrances on the Vanderbilt Avenue side.

Cleveland Traction Situation

J. J. Stanley, president of the Cleveland Railway, sent another letter to Mayor Baehr and the City Council on Jan. 14, 1911, to show his earnestness and sincerity in the endeavor to finance the needs of the system, preserve the value of the property and furnish the people with the kind of service they demand. The letter contains a repetition of the request that the administration confer with the company regarding suggested changes in the Tayler grant that will permit the company to sell its bonds and stock in amounts that will secure the necessary funds for the purchase of cars, the construction of five extensions, the additions to the power equipment that will be required for the increased load and the refunding of the mortgage indebtedness within the next two years.

The letter of the company says that last year the company gave 1000 car miles of service for every 8848 passengers carried, as compared with 8150 in 1909, 7878 in 1908, 7474 in 1907, and 7321 in 1906. The passengers carried were 27,000,000 more in 1910 than in 1909, a gain of 18½ per cent. Two hundred new cars, each with four motors, costing \$6,000 each, are needed. Additions to the power house will cost \$1,250,000. Car houses and shops will cost \$100,000. Demands are made on the company for five extensions, including lines on West Madison to Rocky River.

Superior to Euclid, an extension of the Wade Park line from East Fortieth at Perkins, directly through to East Ninth, and another south from the business section through the flats. These will cost \$950,000. The letter says in part:

"We have tried repeatedly and persistently to sell stock. We have succeeded to the extent of less than \$400,000. People whom we ask to invest in the stock say to us that, while the payment of the 6 per cent interest permitted by the franchise seems to be very well assured, the principal is not so certainly and definitely protected, although the ordinance in several places refers to the security of the capital value and although it was clearly the intent and purpose of Judge Tayler, and the representatives of the city and the company who worked with him in drafting the ordinance, that it should amply protect the entire investment in the securities of the company—stock as well as bonds and notes.

"It was the intention of those who framed the ordinance that every investor in the securities of the company should have his investment secured by property worth, at all times, the amount of the investment in it. Suppose we should sell additional property; it was not intended that the investors should lose 30 per cent of this amount, or nearly \$2,000,000 of their investment.

"It was decided that the maintenance fund should be large enough not only to provide for keeping the 1908 property up to its appraised value, but for taking care of this 30 per cent depreciation, as well as for maintaining the new property in a 70 per cent condition. No injury can be done the city by stating that intention in such language that prospective investors can have no doubt about it.

"If the city should elect to exercise its option to buy the property within the lifetime of the grant it would have to pay to the company, if N. W. Harris & Company's experts are right in their understanding of the ordinance, from 10 per cent to 11 per cent of the cost of the property that might then have depreciated to 70 per cent, no provision having been made for the lost 30 per cent. How, then, can it injure the city or the car riders in any way to amend the ordinance so as to provide that property hereafter acquired shall be maintained by means of a maintenance reserve at its cost?

"Without claiming or pretending to be sponsors for the city, but realizing our own duty to Cleveland and its citizens, we may say that it seems to us decidedly to the advantage of the city that our property be kept in such a good state of preservation, all depreciation being provided for by an ample maintenance fund, as to make it worth the price that the city will have to pay for it, if it elects at any time to buy it.

"In order to obtain money for these purposes we must be able to tell investors that they may rely upon receiving not only interest upon their money, but its full return at the end of the franchise.

"We shall be glad to join with you or your representatives in any method that may be found feasible to bring about the result we assume we both desire, without modifying the spirit of the Tayler ordinance, or making any more changes in its phraseology than are necessary to express and make effective its meaning and purpose."

Mayor Baehr and Street Railway Commissioner Dahl stated that they considered the letter on Jan. 16, 1911, and will frame a reply to be submitted to Council for approval.

Director of Public Service Lea has instructed Superintendent of Streets Kenehan to collect more than \$21,000 from the Cleveland Railway, which is claimed to be due from rentals at 6 per cent on tracks which the city built at a cost of \$137,000. These are the loops in the Public Square which were built under the Johnson administration.

The City Council of Cleveland adopted a resolution on the evening of Jan. 16, 1911, approving a letter prepared by Mayor Baehr, Street Railway Commissioner Dahl and the street railway committee of the Council in which the city again refuses to negotiate with the Cleveland Railway on the changes proposed in the Tayler grant. The city takes the position that the company has admitted that it can sell bonds to the amount of \$6,000,000 for its present needs and that it should not ask the city to enable it to finance by the sale of stock until its inability to secure funds by a bond issue is demonstrated. The letter was sent to Mr. Stanley on Jan. 17, 1911.

Arthur W. Brady on Electric Railways in Indiana

Arthur W. Brady, president of the Indiana Union Traction Company, Indianapolis, Ind., and president of the American Electric Railway Association, contributed an article on the electric railways in Indiana to the *Indianapolis Star* recently, in which he said:

"The most noteworthy changes in the interurban situation in Indiana in 1910 were the completion of the Indianapolis-Newcastle line and the Warsaw-Peru line. The completion of the Indianapolis-Newcastle line added an eleventh to the series of interurban railways radiating from Indianapolis, a development unexampled elsewhere in the world. The completion of the Warsaw-Peru line filled a gap that separated northern Indiana from central Indiana. The first direct railroad communication between Indianapolis and South Bend has thus been due to the interurban railway. Not only is this true, but now it is possible for one to travel by interurban railway from one end of the State to the other, starting at New Albany or Louisville on the south, and ending at South Bend, or even Chicago, on the north.

"The link of interurban railway between Warsaw and Peru, which was completed in 1910, is only about 70 miles long, but it presents a fair example of the interurban situation generally throughout the middle West. The construction of a few links, each of no great mileage, would immensely enlarge the territory reached and benefited by the existing interurban railroads, from which they in turn would profit. For example, only a few additional miles are needed—none in Indiana—to make an all-interurban route between New York and St. Louis. The same is true of interurban routes between Chicago and New York and between Indianapolis and Cleveland, although in the last case there now exists a possible electric route between the two points. There are a number of other similar examples.

"The interurban development in Indiana has been phenomenal, both in quantity and quality. The policy of the State has wisely been to foster the growth of these railways, and the practical results of that policy are seen in the development of to-day. It is reasonable to look for a continuance of that policy, and with it for an improved financial outlook and important further developments.

"Many lines have been projected in the State, some of which are impracticable, but others would undoubtedly bring a fair return to the builders. As the present interurban companies gain in stability and strength, and as investors gain additional confidence in the safety of their investments in this class of property, it is only reasonable to believe that some at least of these projected and needed lines will be constructed. The interurban business for the last year was on the whole satisfactory, and the prospects for a good business during the coming year are excellent.

"No large developments may be looked for in Indiana during the present year. At the same time, the steady improvement of the present interurban lines may be expected. The aim of all of the companies in the State is so to build up their properties that each year may see them better and safer and capable of greater service to the public, for the managers of these properties realized that the financial returns of a company are proportioned on the service which it is capable of giving to its patrons."

Reply by Mayor to Proposal for Subway in Newark

Mayor Haussling of Newark, N. J., on Jan. 12, 1911, sent to Thomas N. McCarter, president of the Public Service Railway, a letter replying to the letter of Mr. McCarter to the Mayor, an abstract of which was published in the *ELECTRIC RAILWAY JOURNAL* of Dec. 31, 1910, page 1288, in which Mr. McCarter urged action by the city on subways.

The Mayor at the same time wrote to the Board of Works informing it of the attitude he has assumed on the subject, inclosing his letter to Mr. McCarter, and suggested that the board invite the Common Council or its committee on finance, the State Public Utilities Commission, representatives of the Public Service Railway and of the Board of Trade to confer in regard to the matter.

The Mayor, in his letter to Mr. McCarter, takes up the subject of the need of subways to relieve traffic congestion in Broad Street and Market Street, and refers again to his repeated recommendations in his annual messages for ac-

tion on that line. He also discusses broadly the manner and method of financing and constructing the projected subways.

The Mayor also stands for public ownership by the respective municipalities of the bed of the Morris Canal when abandoned, with due provision to enable them to acquire reversionary rights. He also returns to the plan, defeated last year in the Legislature, to bring the terminal of the high speed line of the Hudson & Manhattan Railroad to the southern head of Military Park. He favors this plan, regardless of whether the canal should be abandoned and a subway built in Broad Street. He also takes the view that the abandonment or removal of the Centre Market, with the idea of developing the streets in the locality to improve vehicular conditions, is not necessarily involved in the general proposition of transportation facilities.

City ownership of the proposed subway; a rental varying with the terms of the bonds; their construction whether or not the abandonment of the canal is secured, and the right of the city to extend the subways when the growth of traffic requirements demands are other features taken up by the Mayor.

Meeting of Missouri Electric, Gas, Street Railway & Waterworks Association.—The executive committee of the Missouri Electric, Gas, Street Railway & Waterworks Association has arranged to hold the annual convention of the association in St. Louis on April 13, 14 and 15, 1911. R. J. Irvine, Marshall, Mo., is president of the association.

Meeting of New England Street Railway Club.—The regular monthly meeting of the New England Street Railway Club was arranged to be held at the American House, Boston, Mass., on the evening of Jan. 19, 1911. After the regular business meeting Lee H. Parker, railway engineer Stone & Webster Engineering Corporation, Boston, Mass., was to address the club on "The Electrification of Railroad Terminals."

Warren & Jamestown Street Railway to Substitute Direct Current for Alternating Current.—The Warren & Jamestown Street Railway, Warren, Pa., which operates between Warren and Jamestown, N. Y., has decided to replace its present alternating-current single-phase system with direct current, so far as car operation is concerned. The alternating-current service proved undesirable, it is said, because the company was obliged to install transformers so that 550-volt current might be used in Warren and Jamestown. The line is 22 miles long and alternating current will be retained for transmission. The power house is at Stoneham, Pa., and new substations will probably be erected at Frewsburg and North Warren.

San Francisco's Municipal Railroad.—Specifications for general supplies and materials for the municipal railroad which is to be built by the city on Geary Street, San Francisco, Cal., have been received from the city engineer and approved by the Board of Works. The board will ask the supervisors to set aside the following sums, and bids thereon will be called for: 30,000 redwood ties, \$17,000; 530 tubular steel trolley poles, \$17,000; 48,500 pounds of copper wire, \$8,000; rail bonds, \$5,000; rail fasteners, \$18,000; steel tie nuts and rods, \$3,000; total, \$68,000. The president of the Board of Public Works said recently: "Everything is in readiness to begin work on the Geary Street road. The rails will be delivered within 75 days. At the same time, all poles, wires and overhead equipment will be delivered. It is proposed to provide immediately 20 steel cars of the pay-as-you-enter type and the most modern design. The line will be put in shape for immediate operation from Geary and Market Streets to the beach, with a line to the park in Tenth Avenue."

Strike in Everett.—On the afternoon of Dec. 31, 1910, the Everett Railway, Light & Water Company, Everett, Wash., refused the request of a delegation of the motormen and conductors of the company which requested an increase of the minimum wages of these men from 18 cents an hour to go into effect at once, and at 6 p. m. that day a strike was declared, which continued until Jan. 7, 1911, when a compromise was effected, by which the men are to be given a small increase in pay. The company maintained a partial service during the day time with the men who remained loyal to it, but there was considerable disorder. In commenting on the

strike the Everett *Herald*, in an editorial, said: "If the statement of the management of the company is correct that the street car men who went on strike did so without giving the least warning to the company or to the public, the men certainly acted too hastily. The earnings of the company cannot be commensurate with profits of companies in larger cities, but if it is necessary to run fewer cars in order to pay better wages to the men, the *Herald* believes that the company should do so."

Mason Laboratory of Mechanical Engineering at Yale.—Work on the new Mason Laboratory of Mechanical Engineering, which is now being built for the Sheffield Scientific School, Yale University, New Haven, Conn., is now in progress, and the contract calls for its completion in the early summer of 1911. The frontage on Hillhouse Avenue is about 85 ft., and the building extends through to Temple Street, a length of about 200 ft. It will have three stories above the basement. A traveling electric crane with a span of about 40 ft. will extend the entire length of the building on the main floor. This floor will contain the larger part of the equipment, especially the heavier pieces of machinery, and will be surrounded by a gallery on the second floor with space for lighter machinery. The second floor will also contain several offices and a general lecture room, with a seating capacity for 150. The third floor will be used principally for research work and as an exhibit laboratory for instruction in machine design, machine construction and mechanism. The gift for this laboratory included \$200,000 for the building and its equipment and \$50,000 for its endowment.

Public Service Commission Proposed in California.—At a meeting called by Meyer Lissner, chairman of the Republican State Central Committee of California, to listen to reports of legislation proposed for the next session of the California Legislature, Percy V. Long read a report from the committee that had been appointed to prepare a plan for a State public service commission, saying that the measure which it would submit would provide for a commission with the following powers: To issue permits to persons and corporations to engage in public service business; to compel complete publicity in the affairs of corporations and individuals engaged in public service; to control stock and bond issues of public service corporations; to authorize and require capital expenditures; to regulate and prescribe the terms on which franchises may be acquired; to control sales and leases of the property of public service corporations; to compel adequate service and the use of safety devices and to control construction in public service work; to determine the value of property devoted to public service; to assist municipalities in acquiring the property of public service corporations by acting as arbitrator or appraiser when requested so to do; to advise municipalities as to the reasonableness of rates to be fixed for public service.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

Indiana.—More than 100 bills were introduced up to Jan. 14, 1911. The Indiana Railroad Commission has prepared three bills for introduction. One provides for the installation of block signals on steam railroads and inter-urban railways; the other bills relate to grade crossings, trespassing, etc. Senator Proctor has introduced a bill which provides that no stock shall be issued by any corporation unless it is paid for dollar for dollar. No increase in the stock or bonds of public service corporations nor the consolidation of such companies within the State shall be permitted without the permission of the Railroad Commission. Three workmen's compensation bills have been introduced in the Senate. Senate Bill No. 65 provides that only experienced conductors, engineers and motormen shall be employed by railroad companies. House Bill No. 127 prescribes the kind of highway crossings to be put in by railroads and their maintenance.

Massachusetts.—A bill has been filed in the House which provides that a day's work for all conductors, guards, drivers and motormen who are employed by street or elevated railways shall not exceed nine hours, arranged so that the service may be performed within 11 consecutive hours. By the terms of the bill no officer or agent of such a company is permitted to require from such employees more than nine

hours' work for a day's labor; but on legal holidays, Sundays, and in case of accident or unavoidable delay, extra labor may be performed for extra compensation. A maximum penalty of \$500 is fixed for each offence. Another similar measure provides for a reduction of about one hour per day on the present schedule of street railway platform service. A bill has been introduced to abolish the Railroad Commission and establish a railroad court of three justices, to be appointed by the Governor, with the advice and consent of the Council. Three expert assistants, preferably graduates of some school of mechanical or civil engineering, are provided for in the bill. In general the powers of the court are named along the lines now included in the jurisdiction of the commission, except that the orders of the court would have the force of legal decrees. A bill has been introduced which provides that the Railroad Commissioners shall hereafter be elected by the people. A bill has been introduced to provide for a loop subway under the West End from Park to Cambridge Street. A similar bill presented a year ago was referred to the Railroad and Boston Transit Commissions for recess consideration, and has been reported on adversely by these boards on the ground that the line would be unduly expensive. A bill has been introduced which provides for the removal of the present exterior stations of the Tremont Street subway in Scollay Square and Court Street, Boston, with the right granted the Boston Transit Commission to take private property for new and so-called more suitable entrances and exits. The Boston & Eastern Electric Railroad has filed a petition for the passage of a law to require the Massachusetts Railroad Commission to issue to it a certificate of exigency to build a high-speed interurban railway between Boston, Salem and Lynn. Speaker Walker has appointed a special committee to consider the recommendations of Governor Foss to abolish existing public utility commissions and form a single public service board. House Chairman Grafton D. Cushing, of Boston, will preside over the sessions of the committee.

New Jersey.—The Legislature reconvened on Jan. 16. The committee appointed by Governor Fort, who retired from office that day, to investigate the question of employers' liability filed its report with him. This committee has drafted a bill for presentation to the Legislature which embodies its views on the subject of employers' liability. The commission unanimously believes that the compensation to injured workmen is a legitimate charge against the cost of manufacture and that the victim of an accident or his dependents should receive compensation as a matter of justice. Senator Lodge, of Atlantic, has introduced an employers' liability bill which provides among other things that the right to compensate injured employees shall not be defeated on the ground of the negligence of an employee or because of the employee assuming the risk.

Ohio.—Judge Cyrus B. Winters, member of the Legislature from Erie County, is preparing a public utilities bill for introduction. The Ohio liability commission will complete its report soon and a workmen's compensation bill will be formulated and presented to the Legislature. Representative Meyer Geeleerd, of Lucas County, is preparing a bill that will enable cities to own and operate street railways.

Pennsylvania.—The General Assembly reconvened on Jan. 16, 1911, after the usual recess following the opening session. The Law Committee of the League of Third Class Cities has approved several new laws and amendments to the 1889 act to conform with the 1908 constitutional provisions regarding the tenure of office for municipal offices, etc. Among the third class city bills to be presented to the Legislature are: A tax on real estate of all public service corporations, including electric railways; quo warranto proceedings whereby cities may deprive public service corporations of their franchises where violations have occurred; placing all telephone and telegraph wires in conduits, the cities to be empowered to construct their own conduits and compel the companies to install their wires in them or to compel the companies to construct their own conduits; notification of municipalities within 30 days after an accident on a public highway of the intention of the plaintiff to bring suit against the city for damages. At the present time such a suit may be filed two years after the accident.

Financial and Corporate

New York Stock and Money Market

Jan. 17, 1911.

During the past week the Wall Street market has shown quite a satisfactory improvement in prices and some increase in activity. Although the volume of daily sales has almost doubled recently, there is no evidence that outsiders are taking part in the trading. During the week Interborough-Metropolitan issues have been a trifle less active than formerly, owing to uncertainty as to the reorganization plans.

The bond market continues to be fairly good, with the volume of sales increasing. Accumulations of cash are large and rates are easy. To-day's quotations were: Call, 2½@3 per cent; 90 days, 3¼ per cent.

Other Markets

In the Philadelphia market a persistent disposition to accumulate traction stocks has created a firm and steady market for all offerings. The volume of transactions has been fairly large and prices are fractionally higher. Rapid Transit and Union Traction are the leading issues.

In the Chicago market there has been little activity in tractions during the week. Sales have been mostly small lots and prices have been unchanged.

Tractions cut but little figure in the Boston market last week. Moderate sales of Massachusetts Electric issues and Boston Elevated have been made at former prices.

Except for the usual dealing in the bonds of the United Railways there has been little doing in tractions in the Baltimore market. A few shares of the stock of the same company have been sold at about 17.

Quotations of traction and manufacturing securities as compared with last week follow:

	Jan. 10.	Jan. 17.
American Railways Company.....	a42	a44½
Aurora, Elgin & Chicago Railroad (common).....	a40¾	a40
Aurora, Elgin & Chicago Railroad (preferred).....	a8½	8½½
Boston Elevated Railway.....	129½	129½
Boston Suburban Electric Companies (common).....	a15½	a15½
Boston Suburban Electric Companies (preferred).....	a71	71
Boston & Worcester Electric Companies (common).....	a10½	a10
Boston & Worcester Electric Companies (preferred).....	a40	a39½
Brooklyn Rapid Transit.....	75½	77½
Brooklyn Rapid Transit Company, 1st ref. conv. 4s.	83	83½
Capital Traction Company, Washington.....	*129	a120
Chicago City Railway.....	a200	a200
Chicago & Oak Park Elevated Railroad (common).....	*3¼	*3¼
Chicago & Oak Park Elevated Railroad (preferred).....	*7¼	*7¼
Chicago Railways, ptcptg., ctfs. 1.....	a100	a96
Chicago Railways, ptcptg., ctfs. 2.....	a25	a25
Chicago Railways, ptcptg., ctfs. 3.....	a11	a9½
Chicago Railways, ptcptg., ctfs. 4.....	a6½	a6
Cleveland Railway.....	*91½	*91½
Consolidated Traction of New Jersey.....	a72½	a73
Consolidated Traction of N. J., 5 per cent bonds.....	a104½	a104
Detroit United Railway.....	a67½	a67¾
General Electric Company.....	a152	a152
Georgia Railway & Electric Company (common).....	a118	a118
Georgia Railway & Electric Company (preferred).....	88¾	87½
Interborough-Metropolitan Company (common).....	19¼	19¾
Interborough-Metropolitan Company (preferred).....	53¾	54¾
Interborough-Metropolitan Company (4½s).....	79¾	79¾
Kansas City Railway & Light Company (common).....	a22	a20½
Kansas City Railway & Light Company (preferred).....	a71	a71
Manhattan Railway.....	a140	a140
Massachusetts Electric Company (common).....	a19	a18
Massachusetts Electric Companies (preferred).....	a85	a84½
Metropolitan West Side, Chicago (common).....	a22½	a22½
Metropolitan West Side, Chicago (preferred).....	a69½	a69½
Metropolitan Street Railway, New York.....	*19½	*19½
Milwaukee Electric Railway & Light (preferred).....	*110	*110
North American Company.....	64	66
Northwestern Elevated Railroad (common).....	a22	a22½
Northwestern Elevated Railroad (preferred).....	a62	a65
Philadelphia Company, Pittsburgh (common).....	a52	51¾
Philadelphia Company, Pittsburgh (preferred).....	a44½	44½
Philadelphia Rapid Transit Company.....	a19½	20¾
Philadelphia Traction Company.....	a84½	85
Public Service Corporation, 5 per cent col. notes.....	a96	a96
Public Service Corporation, ctfs.....	a100½	a110½
Seattle Electric Company (common).....	a106½	a110
Seattle Electric Company (preferred).....	a103	a103
South Side Elevated Railroad (Chicago).....	a68	a72
Third Avenue Railroad, New York.....	a11½	a11
Toledo Railways & Light Company.....	a8	a8
Twin City Rapid Transit, Minneapolis (common).....	a109	a110½
Union Traction Company, Philadelphia.....	a45¾	a46¾
United Rys. & Electric Company, Baltimore.....	a17	*17
United Rys. Inv. Co. (common).....	a1¾	a2¾
United Rys. Inv. Co. (preferred).....	65	66½
Washington Ry. & Electric Company (common).....	*33¾	34
Washington Ry. & Electric Company (preferred).....	*86½	a90
West End Street Railway, Boston (common).....	a92¾	92¾
West End Street Railway, Boston (preferred).....	a104¾	104¾
Westinghouse Elec. & Mfg. Co.....	66½	67
Westinghouse Elec. & Mfg. Company (1st pref.).....	*124	*124

a Asked. *Last sale.

Chicago Railways

On Jan. 7, 1911, Judge Grosscup, of the United States Circuit Court at Chicago, incorporated the following terms in the order entered by him confirming the sale of the property of the Chicago Consolidated Traction Company to the Chicago Railways:

"Any one of the suburbs served by the old Consolidated lines which can prove that a 5-cent fare to the loop would be compensatory to the street car companies can have such a fare.

"Not only this, but if through routes are desired and can be shown to be profitable they, too, can be demanded by the suburbs without any possibility of objection by either the Chicago Railways or the County Traction Company.

"Whether the terms to be offered by the suburbs are compensatory or not is to be determined not by the companies but by two experts, one appointed by the village interested and the other by Judge Grosscup.

"The present truce offer of the Chicago Railways may be extended from Feb. 12, 1911, to March 28, 1911, if accepted by any of the suburbs before the former date. The truce agreement and the contract for the arbitration of rates are both to expire finally on March 28."

The transfer of the property of the Chicago Consolidated Traction Company within the city limits of Chicago to the Chicago Railways and the property outside of the city to the County Traction Company and the dispute which followed over the extra fares which were exacted were referred to in the *ELECTRIC RAILWAY JOURNAL* of Jan. 7, 1911, page 49.

The County Traction Company has increased its capital stock from \$1,000 to \$300,000. The following statement has been made by President Blanchard, of the company:

"The underlying bonds of the Consolidated Traction Company were trusted with the various committees formed from time to time and the properties were bid in by Andrew Cooke as trustee for the bondholders' committees. That portion of the lines inside the city limits was bought by the Chicago Railways, in accord with the plan of reorganization last promulgated. The lines outside of the City of Chicago were not bought by the Chicago Railways, but were sold to the County Traction Company—the Chicago Railways, believing that the outlying lines under their franchises were a liability rather than an asset, declining to take them over. The new company, the County Traction Company, was formed to work out the destiny of these outlying lines.

"The original capital of \$1,000 was put at that nominal figure pending confirmation of the sale and the delivery of the properties to the County Traction Company. As soon as the properties were so delivered the capital was increased to \$300,000, a sum more commensurate with their values. The original cost of the 52.6 miles of property (including the Cicero power house) was about \$2,000,000, and the scrap or junk value which might be realized if it became necessary to scrap the properties was placed at about \$500,000, although the amount that could be raised if this method of procedure were followed is uncertain."

Albany Southern Railroad, Hudson, N. Y.—The Public Service Commission of the Second District of New York has authorized the Albany Southern Railroad to issue its first-mortgage bonds to the amount of \$52,000. The bonds are to be sold at not less than 85, and the proceeds used for construction expenses in connection with the double tracking and rehabilitation of its property. The directors of the company have declared an initial dividend of 1½ per cent upon the preferred stock of the company, payable on Feb. 1, 1911.

Brooklyn (N. Y.) Rapid Transit Company.—At the annual meeting of the Brooklyn City Railway Frank Lyman was elected president of the company to succeed Edward Merritt, who declined renomination. W. N. Dykman was elected a director to fill a vacancy. Other directors and officers have been re-elected.

Columbus, Marion & Bucyrus Railway, Delaware, Ohio.—At a meeting of the stockholders of the Columbus, Marion & Bucyrus Railway recently an issue of \$100,000 of 6 per cent preferred stock was authorized, the proceeds to be used in the reorganization of the company. The committee in

charge of the reorganization is composed of the following: John H. Caldwell, Peter McCarthy, H. M. Caswell, Joseph A. Powers and G. M. Walker. The reports of the receivers, George H. Whysall and Fred E. Guthery, show that the business of the road increased 58 per cent over the previous year.

Detroit (Mich.) United Railway.—The Detroit United Railway has applied to the Michigan State Railroad Commissioners for permission to issue \$140,000 of bonds to refund outstanding bonds.

Frederick (Md.) Railway.—The Public Service Commission of Maryland has authorized the Frederick Railway to issue an additional \$40,000 of preferred stock to pay for a majority of the shares of the stock of the Frederick Gas & Electric Company.

Lancaster & Southern Street Railway, Lancaster, Pa.—George B. Atlee & Company, Philadelphia, Pa., have exercised the option which they secured recently on the Lancaster & Southern Street Railway.

Meadville & Conneaut Lake Traction Company, Meadville, Pa.—The property of the Meadville & Conneaut Lake Traction Company and the Meadville Street Railway was sold at foreclosure on Jan. 14, 1911, to a committee representing the bondholders of the companies.

Oakland (Cal.) Traction Company.—The stockholders of the Oakland Traction Company have authorized an issue of \$250,000 of serial equipment bonds to cover cars now under construction. The *San Francisco News Bureau* recently said that a letter has been sent to the holders of the preferred stock of the company by H. M. Webster, manager of the financial department of the Realty Syndicate, intimating that dividends will not be paid this year and offering to exchange certificates of the Realty Syndicate for shares of the Oakland Traction Company. The *News Bureau* further said that an agent of F. M. Smith, a director of the United Properties Company of California, the incorporation of which under the laws of Delaware was noted in the *ELECTRIC RAILWAY JOURNAL* of Jan. 14, 1911, page 92, had declared that Mr. Webster had written the letter on his own responsibility. In his letter Mr. Webster said: "There are many sections of Oakland where car lines should be built. There is trackage to improve, street work to be done, car houses to build and rolling stock to buy. This work has to be done and the Oakland Traction Company must do it, although it is going to take millions of dollars. Therefore for a time it is likely that they will invest the entire earnings of the Oakland Traction Company in these improvements, in which case your preferred stock would pay no dividends. Oakland Traction Company stock has been paying 60 cents; we do not want any of the stockholders to be needlessly deprived of their income, and have therefore concluded to offer the following proposition for the time being: Any holder of Oakland Traction Company 6 per cent preferred who wishes to do so may exchange each share of stock for a \$100 Realty Syndicate 6-per cent certificate."

Providence & Fall River Street Railway, Swansea Center, Mass.—The Providence & Fall River Street Railway has failed to pay the coupon due on Jan. 1, 1911, on its issue of \$165,000 of 5 per cent bonds. Arthur W. Clapp, the secretary and treasurer of the company, is reported to have stated that the company will probably be able to meet the payment by March 1, 1911.

Springfield & Xenia Railway, Springfield, Ohio.—The Springfield & Xenia Railway paid an extra dividend of ½ of 1 per cent on Jan. 5, 1911, on the \$300,000 of 5 per cent cumulative preferred stock of the company and the quarterly dividend of 1¼ per cent. This made the total dividend for 1910 5½ per cent, the same as was paid in 1909.

Syracuse (N. Y.) Rapid Transit Company.—The Public Service Commission of the Second District of New York has authorized the Syracuse Rapid Transit Railway to issue its preferred capital stock to the amount of \$1,750,000 at not less than par. The proceeds are to be used to pay and discharge the principal of promissory notes of the company to the amount of \$1,660,000. The remaining \$90,000 is to be used for additions, extensions and betterments.

Washington, Baltimore & Annapolis Electric Railway, Washington, D. C.—The reorganization committee of the Washington, Baltimore & Annapolis Electric Railway and the Baltimore Terminal Company has received deposits of

about 90 per cent of the bonds and stock of the companies in advocacy of the plan for reorganizing the corporations, mention of which was made in the ELECTRIC RAILWAY JOURNAL of Nov. 26, 1910, page 1078.

Dividends Declared

Boston (Mass.) Elevated Railway, 3 per cent.
 Brooklyn (N. Y.) City Railroad, quarterly, 2 per cent.
 Columbus (Ohio) Railway, quarterly, 1¼ per cent, preferred.
 Connecticut Railway & Lighting Company, Bridgeport, Conn., quarterly, 1 per cent, preferred; quarterly, 1 per cent, common.
 East St. Louis & Suburban Railway, East St. Louis, Ill., quarterly, 1¼ per cent, preferred.
 Gary & Interurban Railway, Gary, Ind., quarterly, 1 per cent.
 Grand Rapids (Mich.) Railway, quarterly, 1¼ per cent, preferred.
 Havana (Cuba) Electric Railway, quarterly, 1½ per cent, preferred; quarterly, 1½ per cent, common.
 Mexico (Mex.) Tramways, quarterly, 1¾ per cent.
 Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent, preferred.
 Montreal (Quebec) Street Railway, quarterly, 2½ per cent.
 Pacific Coast Railway, San Luis Obispo, Cal., 3 per cent preferred, 2½ per cent common, ½ per cent common (extra).
 Railway & Light Securities, 3 per cent preferred, 2 per cent common.
 Railways Company General, Philadelphia, Pa., quarterly, 1 per cent.
 Rio de Janeiro Tramway, Light & Power Company, quarterly, 1¼ per cent.
 Seattle (Wash.) Electric Company, quarterly, 1¾ per cent common.
 Union Traction of Indiana, Indianapolis, Ind., 1 1-5 per cent common.
 United Traction Company, Pittsburgh, Pa., 2½ per cent, preferred.
 West Penn Traction Company, Pittsburgh, Pa., quarterly, 1½ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

BATON ROUGE ELECTRIC COMPANY.						
Period.	Gross Revenue.	Operating Expenses.	Net Revenue.	Fixed Charges.	Net Income.	
1 m., Nov. '10	\$9,747	\$5,681	\$4,066	\$1,967	\$2,099	
1 " " '09	9,904	6,608	3,296	1,720	1,576	
12 " " '10	109,338	70,436	38,902	23,128	15,774	
12 " " '09	98,191	68,355	29,836	
BINGHAMTON RAILWAY.						
1 m., Nov. '10	\$27,609	\$17,472	\$10,137	\$9,136	\$1,001	
1 " " '09	25,911	15,909	10,002	8,931	1,071	
5 " " '10	161,217	89,197	72,020	45,691	26,329	
5 " " '09	152,487	84,527	67,960	45,000	22,960	
BROCKTON & PLYMOUTH STREET RAILWAY.						
1 m., Nov. '10	\$8,026	\$6,472	\$1,554	\$1,571	*\$17	
1 " " '09	8,628	6,450	2,178	1,756	422	
12 " " '10	119,955	84,953	35,002	20,393	14,609	
12 " " '09	130,747	91,748	38,999	22,012	16,987	
DALLAS ELECTRIC CORPORATION.						
1 m., Nov. '10	\$22,042	\$74,828	\$52,214	\$24,028	\$28,186	
1 " " '09	121,215	68,780	52,435	27,471	24,964	
12 " " '10	1,449,793	950,039	499,754	312,967	186,787	
12 " " '09	1,307,186	812,326	494,860	337,856	157,004	
HOUGHTON COUNTY TRACTION COMPANY.						
1 m., Nov. '10	\$22,799	\$13,028	\$9,771	\$6,637	\$3,134	
1 " " '09	24,915	13,538	11,367	6,215	5,152	
12 " " '10	312,526	165,641	146,885	78,243	68,642	
12 " " '09	318,716	171,616	147,100	72,024	75,076	
NORTHERN TEXAS ELECTRIC COMPANY.						
1 m., Nov. '10	\$119,263	\$63,309	\$55,954	\$23,878	\$32,076	
1 " " '09	105,253	57,097	48,156	16,189	31,967	
12 " " '10	1,423,321	760,083	663,238	235,700	427,538	
12 " " '09	1,248,516	686,028	562,488	202,248	360,240	
PADUCAH TRACTION & LIGHT COMPANY.						
1 m., Nov. '10	\$21,523	\$11,650	\$9,873	\$7,840	\$2,033	
1 " " '09	20,710	11,319	9,391	6,621	2,770	
12 " " '10	246,334	144,615	101,719	85,140	16,579	
12 " " '09	227,210	132,575	94,635	81,638	12,997	
PENSACOLA ELECTRIC COMPANY.						
1 m., Nov. '10	\$24,427	\$14,328	\$10,099	\$5,067	\$5,032	
1 " " '09	21,176	12,362	8,814	4,509	4,305	
12 " " '10	267,952	157,453	110,499	60,010	50,489	
12 " " '09	245,049	140,443	104,606	52,316	52,290	

*Deficit.

Traffic and Transportation

Decision in Regard to Passes on Electric Railways in New Jersey

The Board of Public Utility Commissioners of New Jersey has decided that the granting of a railroad pass or identification card to municipal employees charged with seeing that ordinances are enforced is not a violation of the act passed by the last Legislature, which prohibits any public utility from bestowing upon any official any discrimination, gratuity or free service. The question was raised as a result of the refusal of the Public Service Railway to issue passes to Joseph Crawford, electrical inspector of the Board of Street and Water Commissioners of Newark, and his assistants. The company held that the law prevented the continued use of the tickets which it had previously furnished to the inspectors. Frank H. Sommer, president of the commission, in his opinion, said in part:

"The municipalities of the State, under powers conferred by the Legislature, have adopted ordinances requiring the payment of a license fee for each street railway car operated. They have issued license certificates evidencing the payment of the fee, and have required the placing of the certificates in a conspicuous place in the cars licensed. Some of them have by contract ordinances provided for the payment to the municipality by the street railways of a percentage of gross receipts. They have further adopted ordinances regulating the operation of cars, providing, among other things, for their maintenance in a cleanly and sanitary condition, their heating and against overcrowding.

"The municipalities adopting these ordinances have created corps of license and other inspectors to ascertain whether their provisions are observed and to enforce them. These inspectors are, for obvious reasons, not uniformed. To ascertain whether the provisions of the ordinances, or some of them, are observed, it is requisite that the inspectors enter the cars. This they have been permitted to do without payment of fare until the enactment of Chapter 41 of the Laws of 1910. This section, so far as it is relevant to the question under consideration, provides as follows: 'No public utility, as herein defined, shall hereafter give, grant or bestow upon any local, municipal or county official any discrimination, gratuity or free service whatsoever, but nothing herein contained shall prevent the free transportation of uniformed public officers while engaged in the performance of their public duties.'

"The company admitting to its cars an inspector in the employ of the municipality without payment of fare to observe whether the provisions of municipal ordinances governing their operation are complied with neither gives, grants nor bestows upon him any discrimination, gratuity or free service whatsoever. It grants no discrimination, for it recognizes the right of free entry of all who in the performance of public duties are obliged to enter the cars for the purpose of observing whether, in their operation, the municipal ordinances are complied with. It grants no gratuity or free service, for it provides no gratuitous or free transportation to such inspector; it admits him solely for the purpose of inspection, and his being carried is a mere incident to the inspection, due to the fact that the detaining of the cars operating upon a schedule for the period of time requisite for inspection might seriously interfere with that adequate service to which the public is entitled.

"It is suggested that under this ruling it will be difficult to distinguish between inspectors entering cars for the legitimate purpose of inspection and inspectors entering cars for the illegitimate purpose of being transported free of charge. The board is not willing to assume that a municipal employee will improperly use an identification card issued to him. The statutes of this State provide for the free transportation of specified public officials within this State. Because of transportation conditions it is possible, particularly on the under-river tubes between this State and the State of New York, to use the identification cards issued under this statute illegally, in interstate transportation. This possible illegal use of cards has at no time been considered a ground for withholding them.

"In the judgment of the board these cards have not been misused. Nor, in its judgment, will identification cards

issued under this ruling be improperly employed. Should a card so issued be misused, the company affected has it within its power to withdraw it, and no just complaint could be based upon such withdrawal."

Blotters Used in an Accident Campaign

The Indianapolis & Louisville Traction Company, Louisville, Ky., is distributing standard-size blotters on which attention is called to the reasons why accidents happen to passengers on interurban cars. The blotter is headed "Most Interurban Car Accidents Happen," and is followed by these reasons:

"Because you persist in getting on or off before the car really stops.

"Because you get off facing the rear of the car.

"Because boys and girls persist in playing in streets which are used by the cars.

"Because you get off and cross behind the car, so as to come suddenly in front of an automobile or a wagon coming from the other direction.

"Because you run after and jump on a car when it is moving.

"Because you persist in riding on the platform or steps of the car.

"Because you often abruptly turn your vehicle when driving, in front of a moving car.

"Because you do not stop, look and listen before crossing interurban tracks at highway crossings.

"The speed of a car is very deceptive, when the observer is near the track. When the car is 1000 ft. away it appears to be moving slowly, but the closer it gets the faster it seems to go. An interurban car goes about 50 ft. per second, or about 35 ft. each time you take a step. Is it any wonder that accidents occur when one tries to cross in front of a moving car?

"With your assistance we feel that travel on our lines can be made safe; without it, we are helpless in accidents resulting from the above causes. It is dangerous around cars and tracks, and, therefore, more than usual care is necessary for absolute safety."

The reasons are of course too terse to extend across the blotter, so they have been arranged in two columns separated by a rule with a rule at the bottom under which, in a space $1\frac{1}{4}$ in. high, is the appeal: "Go the Electric Way" Louisville to Indianapolis and Intermediate Points. Low Rates. Frequent Service." Underneath this in display type is the name of the company.

Physical Condition of Subway Employees

Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, New York, N. Y., has issued a statement in regard to the physical condition of the employees of the subway division of the company, in which he says:

"The report that nearly every employee who started work when the subway was first opened has been replaced by a new man is not true. It is true that our trainmen—by that I mean the guards on our trains—change frequently. But since the subway opened not more than 24 conductors and motormen have been discharged or have given up their positions.

"The reason is that the trainmen who fail to be promoted to conductors or motormen are likely to get offers of other places at better salaries. Those who are promoted stay with the company, and their health is good. Some time ago I caused 100 men employed in the subway to be examined by physicians to learn how their health had been affected in the course of a year. The men were found to be in first-class physical condition, and had increased in weight from 4 lb. to 40 lb.

"Like every railroad, we insist on good physical condition among the new men taken into our employ. Every member of a train crew is examined for a weak heart when he applies for a job. If his heart is not strong, he is not employed. We do not want our employees to fail us in an emergency.

"In addition, our motormen and conductors are examined by physicians at periods of two years. The results of these examinations have shown that their health has, if anything, improved in the course of service. We have a voluntary sick and death benefit association, and the majority of our

employees are members. This association pays to a sick or injured employee a daily sum while the employee is disabled. The records show that more sick men are employed on the elevated lines than on the underground. In fact, we have paid out more than twice as much money from this benefit organization to men employed on the elevated lines who have been sick than to men employed on the subway lines who have been sick.

"Of course it is true that the men employed on the subway lines are, on the average, younger than those on the elevated lines, and consequently they are less apt to become sick. But I do not think that fact is of great importance. We have men on the elevated roads who have held their places more than 30 years."

Order Entered for Reconstruction of Windows in Brooklyn Elevated Cars

As the result of the hearing held before Commissioner McCarroll, of the Public Service Commission of the First District of New York, Nov. 21, 1910, on the motion of the commission to investigate the question of improving and adding to the service and equipment of the Brooklyn Union Elevated Railroad, Nassau Electric Railroad, Sea Beach Railway and the South Brooklyn Railroad, all subsidiaries of the Brooklyn Rapid Transit Company, the commission entered an order on Jan. 11, 1911, against the companies, requiring them to reconstruct the windows of 118 combination cars having arched roofs without deck ventilators. The provisions of the order follow:

"Ordered, That said companies reconstruct every alternate side window in each of said cars used by them respectively, so that said windows shall be divided into two parts, of which the upper part may be raised and lowered or opened in such manner as to allow of better ventilation.

"Ordered, That said companies commence such reconstruction of said windows within 30 days after service upon them of a copy of this order, and that they proceed with such work of reconstruction as rapidly as possible, but in such manner as will not require more than three cars to be out of service at any one time.

"Ordered, That such reconstruction of the windows in all of said cars shall be completed by said companies within four months of the time of service of this order upon said companies respectively.

"Ordered, That within three weeks after service of this order said companies file with the commission a plan or design for the reconstruction of said windows in accordance with the foregoing provisions."

A brief report of the hearing before the commission, on Nov. 21, 1910, was published in the *ELECTRIC RAILWAY JOURNAL* of Dec. 3, 1910, page 1101.

Joint Rate Order in New York

On Jan. 10, 1911, the Public Service Commission of the First District of New York adopted an order which requires that a joint rate shall be established by the Central Park, North & East River Railroad and the South Shore Traction Company, which operates over the Queensborough Bridge and on Long Island, for the transportation of passengers. The order calls upon the companies "to establish on or before Feb. 15, 1911, and thereafter maintain in operation through routes for the transportation of passengers in each direction between the intersection of Tenth Avenue with Fifty-ninth Street, in the Borough of Manhattan, and the eastern terminus of the Queensborough Bridge, in the Borough of Queens, over the Fifty-ninth Street line of said Central Park, North & East River Railroad and the Queensborough Bridge line of said receivers, and on or before said date to establish and put in force a joint rate of fare for each such passenger by the use of a transfer slip, coupon ticket or other sufficient token delivered to each passenger, and to apply said date of fare to the transportation of passengers between the said points and over the lines specified."

A summary of the testimony presented at the informal hearing on Dec. 8, 1910, before Commissioner Bassett, of the Public Service Commission, at which the question of through routes and joint rates between the companies was considered was published in the *ELECTRIC RAILWAY JOURNAL* of Dec. 31, 1910, page 1270.

Advertising a Railway Under Construction

The New York, Westchester & Boston Railway, which is now under construction, has shown through a number of advertisements the large increase in population and in the value of real estate in the Borough of the Bronx, New York, between the years 1900 and 1910, due to a large extent to the electric railway service which has facilitated easy access into the heart of New York City. These advertisements have been entitled "A Lesson in Cause and Effect," and state:

"In 1900 the population of the Bronx was 200,507, the assessed value of its real estate \$138,494,849. In 1910 its population was 430,980, an increase of 230,473, or over 114 per cent; the assessed value of real estate, \$462,704,008, an increase of \$324,209,159, or over 234 per cent."

Through the building of the New York, Westchester & Boston Railway, the same wonderful results are now in the making, the advertisements say, in the upper Bronx and Westchester County. It is the belief of the company that a portion of the line will be in operation by fall, and that the whole road will be completed in about one year.

The train schedule has not yet been decided upon by the company. The local trains will average about 20 m.p.h., while the express trains will make an average of approximately 35 m.p.h. The express stations on the main line will be located at 180th Street, Pelham Parkway, Mount Vernon and New Rochelle, and on the White Plains branch, at Wykagyl, Palmer Avenue and White Plains. Each station will contain a number of stores and more may be added at very little trouble, as fast as conditions warrant.

Companies Will Exchange Transfers.—The Tacoma Railway & Power Company and the Pacific Traction Company have arranged to exchange transfers.

Strip Tickets in Reading, Pa.—It has been decided in the local courts of Reading that the United Traction Company must sell six tickets for 25 cents. An appeal will be taken to the Supreme Court by the company.

Indianapolis & Cincinnati Traction Company to Remove Indianapolis Office.—The office of the Indianapolis & Cincinnati Traction Company, in the Traction Terminal Building, Indianapolis, Ind., will be removed to Rushville, Ind.

University of Illinois to Use Special Train.—The Illinois Traction System is preparing to place an interurban train at the service of the Agricultural Department of the University of Illinois, to be used by the faculty and students in demonstrations and presenting lectures on agricultural subjects at points on the interurban system. The schedule calls for the tour to begin early in February.

Electric Cars Should Have Rear Lights.—An ordinance will be presented to the Mayor and City Commissioners of Kansas City, Kan., providing that all railway cars operated on the streets of Kansas City shall be equipped with red tail lights of not less than 100 candle-power, and shall be lighted by other illuminant than electricity, so that the lamps will burn when the electric current fails.

Interstate Commission Without Power to Require Additional Trains for Commuters.—Upon application of a resident of a suburban station that sufficient trains were not run to and from New York City during the morning and evening hours to accommodate commuters, the Interstate Commerce Commission has held that it is without authority to require the running of three additional trains during such hours.

Bonus Paid Motormen and Conductors.—The Public Service Railway, Newark, N. J., has put into operation its bonus-paying system for new motormen and conductors. Carrying out this plan, the company will pay a bonus of \$10 to each motorman and conductor at the end of his first year as a recognition of his faithful service and as partial compensation for the time lost by the men while learning their new duties.

Changes in Methods of Operation in Owensboro.—The Owensboro (Ky.) City Railroad has adopted the pay-as-you-enter system and stops its cars now on the near side of the street. Passengers enter and leave the cars by the front platform, where the fare boxes are located, as the Owensboro line employs no conductors. The motorman,

by this method, can supervise the entrance and exit of passengers and can also furnish change as desired.

Public Service Commission Orders Transfer Exchange.—The Brooklyn, Queens County & Suburban Railway and the Long Island Electric Railway have been ordered by the Public Service Commission to arrange to exchange transfers on Jamaica Avenue. The two companies have an agreement for the joint use of tracks for a stretch of about 2000 ft. on this avenue, and the law requires that wherever there is such joint use transfers must be exchanged.

Street Railway Commissioner Proposed in Memphis.—As the result of suggestions made by J. A. Riechman, fire and police commissioner of Memphis, Tenn., Thomas Dies, commissioner of utilities of Memphis, is preparing a bill which provides for the creation of the office of street car inspector, the incumbent of this position to be empowered to enter the car houses and in other ways to enforce the municipal ordinances and see that the railways maintain their schedules.

Question of Limiting Car Capacity in Covington, Ky.—In the case of the South Covington & Cincinnati Street Railway against the City of Covington, Ky., to prevent the city from enforcing an ordinance intended to limit the number of passengers to be carried on a car John Shepherd, city solicitor, has filed a demurrer to the petition in the Kenton County Circuit Court, in which he holds that the only way to test the validity of the ordinance is to allow an arrest to be made and a fine to be imposed with the object of appealing the case.

East St. Louis Wants 5-Cent Fare to St. Louis.—The committee of City Council of East St. Louis, Ill., appointed a short time ago to take up the matter of securing a 5-cent fare between St. Louis and East St. Louis, has arranged a meeting with L. C. Haynes, vice-president of the East St. Louis & Suburban Railway. Mr. Haynes said recently that any reduction in the fare would have to come entirely from the revenues of the street railway as the railway has a contract with the bridge company to pay a flat sum for each person carried across the bridge on its cars.

Indianapolis & Louisville Traction Company Advertising.—The Indianapolis & Louisville Traction Company, Louisville, Ky., has adapted to its own uses the effective illustration used by the Bell telephone interests in the current magazines, reproducing the view looking down the railroad track with the advertisement in the center. The following advertisement appeared in a recent issue of the Louisville *Herald*: "The electric way to Indianapolis. Six Hoosier flyers daily, 7:30, 9:30, 11:30 a. m., 1:30, 4:30, 6:30 p. m. Hotel to hotel in four hours; 150 lb. baggage checked free. Fare one way, \$2; round trip, \$3.65. Depot, Third Street, near Walnut."

Opposition to Second Fare.—Refusal of passengers to pay an extra fare between Rutherford and Passaic, N. J., has caused the Public Service Railway, Newark, N. J., considerable trouble recently. The company has stated its reason for the change as follows: "The real cause of this extra fare is the fact that in our franchise granted to the Hudson River Line was a stipulation that if ever this line should be consolidated with what we call the White Line, transfers should be issued. These lines cross in our borough, and if passengers coming south from Hasbrouck Heights, Woodridge, or Carlstadt, on the Hudson River Line, should receive transfers on the White Line, the 5-cent fare would carry them west to Passaic."

Steps Taken to Prevent Accident Among School Children.—The Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, has recently finished a series of talks with about 40,000 school children along its lines regarding the prevention of accidents. The company also distributed 50,000 desk blotters, 9 in. by 4 in., headed "Help Us Prevent Accidents." At the side of the blotter were the words "Do Not," followed by a bracket which inclosed the following: "Play or coast on streets where there is a car track. Cross a street car track without first looking both ways. Cross a street car track if a moving car is in sight. Get on to car while car is moving. Get off of car while car is moving. Lean out of car windows. Face to the rear in stepping off car. Touch or allow anyone to touch any wire."

Personal Mention.

Mr. C. F. Crane has been appointed superintendent of railways of the Eastern Pennsylvania Railways, Pottsville, Pa. Mr. Crane was formerly general passenger and claim agent of the company.

Mr. Chester P. Wilson, who resigned recently as general manager of the Rockford & Interurban Railway, has become associated with J. G. White & Company, Inc., New York, N. Y. For six years Mr. Wilson was general superintendent of the Lackawanna & Wyoming Valley Railroad, of Scranton, Pa.

Mr. W. R. Putnam has resigned as superintendent of the Menominee & Marinette Light & Traction Company, Marinette, Wis., effective Feb. 15, 1911. Mr. Putnam was manager of the Red Wing Gas & Electric Company, Red Wing, Minn., and its successor, the Red Wing Gas, Light & Power Company, from May 1, 1899, to Feb. 1, 1909.

Mr. David Harlowe, traffic manager for the Allis-Chalmers Company, Milwaukee, Wis., has been appointed a member of the Wisconsin Railroad Commission by Gov. F. C. McGovern to succeed Prof. B. H. Meyer, who resigned recently to accept a place on the Interstate Commerce Commission at Washington.

Mr. H. U. Wallace, consulting engineer with offices in Chicago, Ill., has been elected vice president of the Fort Dodge, Des Moines & Southern Railroad, Boone, Ia. Mr. Wallace was graduated from Purdue University and has been connected with the Illinois Central Railroad, J. G. White & Company, Inc., the Wallace-Coates Engineering Company and the Chicago, Lake Shore & South Bend Railway.

Mr. G. N. Lemmon has been appointed electrical engineer of the Michigan United Railways with headquarters at Jackson, Mich. Mr. Lemmon was formerly superintendent of overhead lines of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, and before he served in that capacity Mr. Lemmon represented Sanderson & Porter, New York, N. Y., in construction and power-house work for the Youngstown & Shenango Railway & Light Company at Youngstown.

Mr. R. C. Taylor, who resigned as superintendent of motive power of the Indiana Union Traction Company, Anderson, Ind., in September, 1910, to become master mechanic in charge of the shops of the Illinois Traction System at Granite City, Ill., and who was subsequently appointed engineer of maintenance of equipment of the company, was appointed assistant superintendent of motive power and equipment of the Illinois Traction system, with jurisdiction over outside shops, effective Jan. 15, 1911.

Mr. Elton G. Dunlap, assistant treasurer of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, since August, 1909, has been elected treasurer of the company to succeed Mr. S. C. Rogers, who has resigned to become secretary and treasurer of the Youngstown Dry Goods Company, as noted elsewhere in this column. Mr. Dunlap has been employed by Mahoning & Shenango Railway & Light Company for eight years and has served in almost every capacity in the accounting and treasury departments of the company. For two years previous to August, 1909, he was assistant chief clerk of the company.

Mr. Austin E. Gibson has been appointed local manager of the railway and lighting properties at Owosso and Corunna, Mich., which are under the control of the Michigan United Railways. Previous to his present work Mr. Gibson was in charge of power with the Cleveland Cliffs Iron Company, Negaunee, Mich., and served as operating engineer of the Mexican Light & Power Company; master mechanic of the Southwestern Smelting & Refining Company, Oro Grande, N. M., and maintenance engineer of the Arizona Copper Company, Humboldt, Ariz. He also was in charge of the electrical work of the Shattuck Copper Company and the Denn Copper Company in Arizona.

Mr. M. C. Carpender has been appointed master mechanic of the United Traction Company, Albany, N. Y. Mr. Carpender has been master mechanic of the Hudson Valley Railway, Glens Falls, N. Y., for some time. He entered the service of the United Traction Company about three years ago and the first work he did was to supervise the

strengthening of the track joints of the roadbed throughout the entire system. When the control of the Hudson Valley Railway passed to the Delaware & Hudson Company, which also controls the United Traction Company, Mr. Carpender was made master mechanic of the Hudson Valley Railway and has been located at Glens Falls.

Mr. Frank Arnold, whose resignation as superintendent of the Fort Dodge, Des Moines & Southern Railroad, Boone, Ia., was announced in the *ELECTRIC RAILWAY JOURNAL* of Jan. 12, 1911, will engage in business in Rochester, N. Y., in the commercial line. Mr. Arnold has been engaged in railway work for 30 years. He was with the transportation department of the New York Central & Hudson River Railroad for 18 years. For seven years he was manager of the Oswego (N. Y.) Traction Company. For the last five years he has been superintendent of the Fort Dodge, Des Moines & Southern Railroad.

Mr. Judson C. Clements, of Georgia, ranking member of the Interstate Commerce Commission, was elected chairman of that body on Jan. 13, 1911, in place of Mr. Martin A. Knapp, who is now presiding justice of the Court of Commerce. After serving in the Confederate Army, Mr. Clements practised law. He served from 1872 to 1880 in the Georgia Legislature and then went to Congress for eight years. In Georgia he had a prominent part in passing the railroad legislation of the State, and in Congress he helped to enact the original Interstate Commerce Commission law. In 1892 President Harrison appointed Mr. Clements as a member of the Interstate Commerce Commission and he has since continued in that capacity.

Mr. Hugh O'Neil has been appointed superintendent of power stations of the United Traction Company, Albany, N. Y. Mr. O'Neil has been connected with the United Traction Company for 20 years and was employed by the Albany Railway before the organization of the United Traction Company. He was formerly assistant to Mr. H. A. Benedict, in charge of the power stations and the electrical branch of the service. Mr. O'Neil and Mr. Carpender, whose appointment as master mechanic of the company is noted elsewhere in this column, will assume the duties of the position of mechanical and electrical engineer of the company, from which Mr. Benedict has retired to become connected with the Public Service Railway, of Newark, N. J.

Mr. J. F. Reardon has resigned as general superintendent of the Salt Lake & Ogden Railway, Salt Lake City, Utah. Mr. Reardon was formerly general superintendent of the Lehigh Valley Transit Company, Allentown, Pa. He was born in northern Michigan about 38 years ago and entered street railway work when he was about 17 years old with the Twin City Rapid Transit Company, Minneapolis, Minn., and remained with the company for 10 years. After resigning from the Twin City Rapid Transit Company Mr. Reardon became master mechanic of the Everett Railway, Light & Water Company, Everett, Wash., and later was made superintendent of the company. He resigned from the Everett Railway, Light & Water Company to become connected with the Lehigh Valley Transit Company.

Mr. J. R. Gilhoola, trainmaster of the Père Marquette Railroad, with headquarters at St. Thomas, Ont., has been appointed trainmaster of the Illinois Traction System, with headquarters at Springfield, Ill., to succeed Mr. F. L. Richards, whose appointment as superintendent of the terminals of the Illinois Traction System at St. Louis is announced elsewhere in this column. Mr. Gilhoola began his railroad career as a telegraph operator and has worked for the Rock Island Railroad, Missouri Pacific Railway, Wabash Railroad and the Père Marquette Railroad, filling the positions of train dispatcher, chief train dispatcher and trainmaster. He has practically had charge of the division on which he is trainmaster for the Père Marquette for the last six years. Mr. Gilhoola will assume his duties with the Illinois Traction System on Feb. 1, 1911.

Mr. Archibald B. Millar was appointed secretary of the Pennsylvania State Railroad Commission recently by Mr. E. S. Stuart, whose term of office as Governor of Pennsylvania expired on Jan. 17, 1911. Mr. Millar succeeds Mr. Harry S. Calvert, Pittsburgh, Pa., who resigned some time ago. During the interval between Mr. Calvert's resignation and Mr. Millar's appointment Mr. W. S. Seibert, Pitts-

burgh, filled the office. Mr. Millar was born in Hartford, Conn., on April 16, 1882, and was educated in the public schools of Philadelphia and the Peirce Business College, Philadelphia, from which he was graduated. Subsequently he served as a member of the faculty of the college for three years. In 1900 he entered the service of the Union League of Philadelphia and was assistant superintendent during the term of Mr. Stuart as president of that organization. When Mr. Stuart became Governor of Pennsylvania on Jan. 15, 1907, he appointed Mr. Millar as his private secretary.

Mr. F. L. Richards, trainmaster of the Illinois Traction System, with headquarters at Springfield, Ill., has been appointed superintendent of terminals of the company at St. Louis, with jurisdiction over the line between Edwardsville and St. Louis, and the freight terminals at Twelfth and Lucas Streets, St. Louis, Mo., and the Salisbury yard, also Venice, Madison, Granite City and as far north as Edwardsville. He will also handle all the summer excursion business of the company. Mr. Richards began his railroad career as a telegrapher and resigned as assistant superintendent of the Chicago & Alton Railroad to become connected with the Illinois Traction System. The position of superintendent of terminals of the Illinois Traction System at St. Louis is a very important one, as the company expects to do a heavy passenger business and a large freight business in handling merchandise and coarse freight. Mr. Richards will assume his new duties on Feb. 1, 1911.

Mr. S. C. Rogers has resigned as treasurer of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, to accept the position of secretary and treasurer of the Youngstown Dry Goods Company, Youngstown, Ohio, in active charge of the business management of the company. Mr. Rogers has been connected with the Mahoning & Shenango Railway & Light Company and its constituents for 10 years. He was connected with mercantile business in New York and Chicago before entering the field of public service accounting and finances, and served 19 years with J. M. Young & Company, New York, N. Y., importers of china, glass and fancy goods. For 10 years Mr. Rogers was in charge of the office of this company, and subsequently represented an Eastern manufacturing company for three years as manager of its business interests west of Chicago. Mr. Rogers has always taken an active interest in the affairs of the Central Electric Accounting Conference and the American Electric Railway Accountant's Association, and at the third annual meeting of the Central Electric Accounting Conference, held in Youngstown, on Dec. 10, 1910, he was elected president of the conference.

Mr. J. L. Blake, whose resignation as general manager of the Fort Dodge, Des Moines & Southern Railway, Boone, Ia., was announced in the *ELECTRIC RAILWAY JOURNAL* of Jan. 14, 1911, began railroading on the Des Moines & Fort Dodge Railroad, from Des Moines to Fort Dodge, in 1881, when he was 16 years old. He learned telegraphing at Dallas Center and went from Dallas Center to Des Moines and served in the capacity of telegraph operator, ticket agent and finally chief clerk in the local freight office of the Des Moines & Fort Dodge Railroad for about two years. Mr. Blake next went to Angus, a coal mining camp which produced about 2500 tons daily, and was agent for the Des Moines & Fort Dodge Railroad. He was afterward made joint agent for the Chicago, Rock Island & Pacific Railway and Minneapolis & St. Louis Railroad at Angus and remained there about eight years. Mr. Blake next became connected with the Minneapolis & St. Louis Railroad as traveling freight agent, commercial agent at Minneapolis and assistant general freight agent of the company and continued with the company about 13 years. He has been general manager of the Fort Dodge, Des Moines & Southern Railroad since July 20, 1903. The Fort Dodge, Des Moines & Southern Railroad consisted of 19 miles of road when Mr. Blake entered its employ, whereas now there are 156 miles. Mr. Blake has bought between 600 and 700 acres of land near Perry, Ia., and has had it highly improved and stocked with big horses and short horn cattle and proposes in the future to give his entire attention to the development of this property.

Construction News

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

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

RECENT INCORPORATIONS

***Oakland & Bay Shore Railway, Oakland, Cal.**—Application for a charter has been made in California by this company to build an electric railway to begin at the east end of Shafter Avenue, in Oakland, extending to Thirty-eighth Street, and thence to the west end of the contemplated projection of Seventh Street at the water front. A branch line on Webster Street and various spurs and switches will be built. This proposed line is to be an extension of the Oakland & Antioch Railway. Capital stock, \$500,000. Incorporators: R. H. Miller, Albert J. Kurtmeyer, John R. Selby and Walter Arnstein, secretary, all of Oakland.

***Calumet United Railway Company, Indianapolis, Ind.**—Application for a charter has been made in Indiana by this company to build an electric railway from Michigan City to the State line between Indiana and Illinois at Hammond, connecting Michigan City, Chesterton, Porter, East Gary, Miller, Aetna, Gary, East Chicago, Whiting and Hammond. Capital stock, \$10,000. Incorporators:—James A. Slattery, C. H. Weak, R. W. Grimes, of Philadelphia, Pa., and Thomas K. Bell, H. W. Darling and L. L. Bomberger, of Chicago.

Missoula & Hamilton Railway, Hamilton, Mont.—Application for a charter has been made by this company to build an electric or steam railway from Missoula to Hamilton. Work is to be begun in the spring. Capital stock, \$500,000. Incorporators: H. M. Sloan, F. G. Bennett, R. A. O'Hara and Ira M. Cobe. [E. R. J., Jan. 30, '09.]

***Kamouraska-L'Islet Railway, Quebec, Can.**—Application for a charter will be made by this company to the Legislature of the Province of Quebec, to build an electric, steam or gasoline railway to extend from a point near Ste. Anne de la Pocatière, Kamouraska County, to the Intercolonial Railway station, thence to the National Transportation road to make connection with the Quebec Central Railway. Another branch will go north to Pointe de la Rivière Ouelle and from there to the Rivière Ouelle wharf to connect there with the Intercolonial Railway. Adolphe Stein, attorney.

***Nashville-Gallatin Interurban Railway, Gallatin, Tenn.**—Application for a charter has been made by this company in Tennessee to build a 30-mile electric railway from Nashville to Gallatin. The plans call for four steel bridges 100 ft. long to be part of the necessary construction, and it is expected to begin work in the spring. Connection is to be made with the Nashville Railway for the operation of the interurban cars through Nashville. Transfer arrangements will also be made. H. H. Mayberry is interested.

FRANCHISES

Los Angeles, Cal.—The Los Angeles & Redondo Railway will ask the City Council for a franchise to build its railway within the city limits.

Oakland, Cal.—The Southern Pacific Company, San Francisco, has received a 50-year franchise from the City Council to electrify its Seventh Street line in Oakland.

Oakland, Cal.—The Oakland Traction Company has received a 35-year franchise from the City Council to build its railway over Nineteenth Street, in Oakland.

Stamford Conn.—The New York, New Haven & Hartford Railroad will ask the General Assembly during the coming session for the right to build an electric railway from New Hartford to Barkhamstead, Hartford and Colebrook, following the boundary line of Connecticut and Massachusetts to the highway running from Winsted, Conn., to New Boston, Mass.

Wichita, Kan.—The Wichita Railroad & Light Company, Wichita, has been asked by residents of West Wichita for a new street railway into that part of West Wichita in the vicinity of the Orient Railroad shops. This petition has been presented to the City Commissioners.

Hagerstown, Md.—L. N. Downs and H. L. Kirby, representing the Hagerstown & Clear Spring Railway, have re-

ceived a franchise from the Mayor and City Council to construct an electric railway on Franklin Street from the city limits to Potomac Street, in Hagerstown. This proposed 25-mile railway will connect Hagerstown and Clear Spring, Md., and Mercersburg, Pa. [E. R. J., Dec. 17, '10.]

Springfield, Mass.—The Springfield Street Railway will ask the Council for a franchise to double track Main Street as far as Cherry Street, in Springfield.

Hanover, N. J.—The Pine Brook Electric Railway, Caldwell, has asked the Township Committee for a franchise to build its proposed railway through Hanover. This proposed 10-mile electric railway will connect Pine Brook, Caldwell, Fox Hill and Denville. S. William Kerris, Pine Brook, is interested. [E. R. J., Dec. 24, '10.]

Lakewood, N. J.—The Trenton, Lakewood & Atlantic Railway, Trenton, has asked the Township Committee for a franchise to build its railway into Lakewood over the public highways.

Mineola, N. Y.—The New York & North Shore Traction Company, Mineola, has received from the Board of Estimate an extension of time on its franchise of 6 months, from January 10, 1911, in which to complete its lines between Flushing, Whitestone, Bayside and the city line.

Charlotte, N. C.—The Southern Power Company has received a six months' extension of its franchise for the completion of the two miles of track it is building in Charlotte.

Portsmouth, Ohio.—The Cincinnati, Portsmouth, Pomeroy & Pittsburgh Electric Railway, Cincinnati, has received from the County Commissioners an 18-months' extension of its franchise to build its railway through Portsmouth County. The line will extend from Cincinnati to Pittsburg along the Ohio River valley. A. E. Cox, Huntington, W. Va., president. [E. R. J., July 23, '10.]

Ottawa, Ont.—The Morrisburgh & Ottawa Electric Railway, Morewood, will ask the City Council for a franchise to build its proposed railway along Main Street, Ottawa, connecting there with the Ottawa Street Railway. The line will connect Morrisburgh and Ottawa via Williamsburg, Winchester, Chesterville, Morewood, Orwan, Metcalf and Kenmore. C. M. Willard, Morewood, president. [E. R. J., May 15, '09.]

***Philadelphia, Pa.**—Councilman Byram, representing the Northeastern Street Railway, has asked the City Council for a franchise to build an electric railway into the northeastern section of Philadelphia.

***Philadelphia, Pa.**—Councilman Bryam, representing the B. & R. Rapid Suspension Railway, has asked the Select Council for a franchise to construct an overhead railway having double tracks that will reach Kensington, Frankford, Bustleton, Manayunk and League Island.

***Knoxville, Tenn.**—J. A. Anderson, G. K. Kesterson and associates have received a franchise to build about a mile of extension of the Fountain City line to Greenwood. The Knoxville Railway & Light Company has announced that it will assist in building this extension.

Beaumont, Tex.—The Beaumont Traction Company has received a new franchise from the City Council under which the company promises to expend \$100,000 in betterments.

South Bend, Wash.—J. D. Creary has received a franchise from the City Council to build an electric railway in South Bend and extend it to Raymond. Work will begin in the spring. [E. R. J., Jan. 14, '10.]

TRACK AND ROADWAY

Fort Smith Light & Traction Company, Fort Smith, Ark.—During 1911 this company will build a 4-mile branch of its railway from Van Buren to Fort Smith.

British Columbia Electric Railway, Vancouver, B. C.—This company states that it will construct during 1911 about 23 miles of interurban railway and 15 miles of new track in Vancouver city and suburbs. The improvements will consist in extending the Burnaby line from Sapperton to Vancouver, passing through Hastings and Grandview. Another track will be built from Vancouver to Eburne and the line to Westminster will be double tracked in places and part of this line will be relocated.

Pacific Electric Railway, Los Angeles, Cal.—It is announced that this company will build an extension from

Washington to the mouth of Eaton's Canyon. A bonus of \$35,000 asked by this company has been raised and surveys for this line have been made.

San Diego & El Cajon Valley Interurban Railway, San Diego, Cal.—This company has just finished the grading of 7½ miles of its proposed 65-mile railway to connect San Diego, La Mesa, El Cajon, Bostonia, Lakeside, Morton, San Pasquel, Bernardo and Escondido. G. W. Pursell, San Diego, general manager. [E. R. J., July 9, '10.]

Visalia (Cal.) Electric Railroad.—About 10 miles of track will be built between Lemon Cove and Three Rivers by this company during 1911.

Macon Railway & Light Company, Macon, Ga.—This company expects to extend its railway from Macon to Rivoli, a distance of about 6 miles.

Forest City & Mason City Railway, Forest City, Ia.—Plans are now being considered by this company for building a 30-mile electric railway to connect Forest City, Fertile and Mason City. C. N. Christoferson, Forest City, is interested. [E. R. J., July 2, '10.]

Chicago (Ill.) Railways.—This company is in the market for 15,000 tons of rails.

Alton, Jacksonville & Peoria Railway, Jerseyville, Ill.—This company expects to place in operation, in March, its 17-mile extension from Godfrey to Jerseyville. It has begun work on a 19-mile extension from Jerseyville to the Illinois River via Fieldon. W. R. Heagler, general manager.

Peoria (Ill.) Railway Terminal Company.—This company expects to build a one-mile extension of its tracks in Peoria during 1911.

Indiana & Northwestern Traction Company, Monticello, Ind.—This company has been voted a subsidy tax by the township of Lincoln in aid of the construction of its line through Lincoln. This proposed railway will connect Cedar Lake, Hammond, Crown Point, Lincoln and Chicago. Eugene Purtelle, 222 La Salle Street, Chicago. [E. R. J., Sept. 17, '10.]

Indianapolis, New Castle & Toledo Railway, New Castle, Ind.—It is reported that this company will soon build an extension of its railway from New Castle to Muncie. The right-of-way has been secured and it is expected to begin work in the spring.

***Baldwin, Kan.**—H. L. Murlin, Baker University, Baldwin, is said to be interested in a plan to build an electric railway from Baldwin to Olathe via Black Jack, Edgerton and Gardner.

Louisville (Ky.) & Interurban Railway.—This company has amended its charter so as to extend its railway through Lyndon, Anchorage and Lagrange, also a branch line to Middletown, Eastwood, Simpsonville and Shelbyville. Since the purchase of the Louisville & Eastern Railway by this company, citizens of Shelbyville have been making overtures to secure service through Shelbyville. Owing to a disagreement between the municipal authorities and the railway, the extension was built only to the western limits of the city.

***Madisonville, Ky.**—D. Fowler, Madisonville, is said to be planning to build an electric railway from Madisonville to Ashbysburg, a distance of about 15 miles.

Lafourche Valley & Gulf Railway, Donaldsonville, La.—It is reported that this company has made financial arrangements and that work will begin soon on this proposed 90-mile electric railway to connect Donaldsonville and Leesville on the west bank of Bayou Lafourche. F. M. Welch, Donaldsonville, president. [E. R. J., Dec. 10, '10.]

Hagerstown & Clearspring Railway, Hagerstown, Md.—This company announces that it will let contracts before March 1 for building its railway from Hagerstown to Clearspring, a distance of 12 miles. There will be one steel bridge. Eventually this line will be extended to Mercersburg, Pa. L. N. Downs, Hagerstown, is interested. [E. R. J., Dec. 17, '10.]

St. Paul Railway Promotion Company, St. Paul, Minn.—This company is planning to extend its railway to Winona and La Crosse. W. L. Sonntag, 810 Metropolitan Building, St. Paul, general manager. [E. R. J., Dec. 10, '10.]

Mesaba Traction Company, Virginia, Minn.—This company has completed preliminary work and will begin con-

struction as soon as the weather permits on its proposed 36-mile electric railway to connect Virginia, Eveleth, Gilbert and Hibbing. W. M. Prindle, Duluth, is interested. [E. R. J., Aug. 27, '10.]

Joplin, Oklahoma & Western Railway, Joplin, Mo.—This company is said to have completed surveys and expects to begin construction next month at Welch for its proposed electric railway to connect Joplin, Mo., and Carman, Okla. This line will eventually be extended to Bartlesville. F. M. Overlees, Bartlesville, is interested. [E. R. J., Aug. 16, '10.]

Ogdensburg (N. Y.) Street Railway.—This company will build an extension to Morristown.

Rochester, Corning & Elmira Traction Company, Rochester, N. Y.—This company expects to build 90 miles of track from Rochester to Dansville during 1911.

***Winston-Salem, N. C.**—A. H. Eller and associates are considering the construction of an electric railway from Winston-Salem to Yadkinville. Application will soon be made for a charter. The line will eventually be extended to Elkin.

Ohio Electric Railway Company, Cincinnati, Ohio.—This company has bought from the Norfolk & Western Railway the bridge which spans the Ohio River at Kenova, W. Va., and will replace it with a new structure. The company will extend its line to Hanging Rock, Ohio, to connect with a line operating from Hanging Rock to Coal Grove. Through cars can be operated from Huntington, W. Va., to Ironton, Ohio, and Ashland, Ky.

Oklahoma (Okla.) Railway.—This company will construct two extensions of its railway during 1911. One branch will be from Britton to Edmond, a distance of about 6 miles, and the other from Yukon to El Reno, a distance of 12 miles.

Johnstown & Altoona Railway, Johnstown, Pa.—During 1911 this company will build 32 miles of track between South Fork and Altoona in Cambria County.

Pittsburgh, McKeesport & Westmoreland Railway, McKeesport, Pa.—A 3-mile extension from Blackburn to Herminie will be built by this company during 1911.

Lewisburg, Milton & Watsonville Passenger Railway, Milton, Pa.—This company is now operating cars into Lewisburg, Pa. The Simplex Surface Contact Company has completed the electrification of the Lewisburg & Tyrone branch between Lewisburg and Montandon. The company plans to electrify the section between Lewisburg and Mifflinburg.

Oxford, Cockranville & Parkesburg Electric Railway, Oxford, Pa.—During 1911 this company expects to build 14 miles of railway extending from Oxford to Parkersburg via Hayesville, Russellville, Edenton, et al. Theo. E. Stubbs, Oxford, president.

Philadelphia & West Chester Traction Company, Philadelphia, Pa.—This company is taking steps to build an extension of its Philadelphia & Garrettford line into Media.

Scranton (Pa.) Railway.—This company will reconstruct about 2 miles of track in Scranton during 1911. It will also reconstruct about 12 miles of track in Old Forge, Taylor, Dickson City, Blakely, Archbald, Jermyn, Mayfield, Simpson and Fell.

Montreal & Southern Counties Railway, Montreal, Que.—This company will build during 1911 about 2 miles of track to the Country Club, St. Lambert. It will also build a 13-mile extension to connect Chambly Basin, Chambly Canton and Richelieu.

Memphis (Tenn.) Street Railway.—This company has begun constructing a cross-town line in Memphis and contemplates other extensions during this year.

Nashville Railway & Light Company, Nashville, Tenn.—About 5 miles of new track will be constructed by this company during 1911.

Nashville (Tenn.) Interurban Railway.—This company, now operating 20 miles of track from Franklin to Nashville, is about to extend the line from Nashville to Gallatin. The W. K. Palmer Company, Kansas City, Mo., has been retained as engineers to do all preliminary work and have charge of the construction.

Galveston-Houston Electric Railway, Galveston, Tex.—It is reported that this company will soon let contracts for

grading between Houston and Brays Bayou, a distance of about 20 miles. Mark Lowd, Houston, engineer. [E. R. J., Dec. 10, '10.]

Port Bolivar Iron Ore Railway, Longview, Tex.—The C. H. Sharp Construction Company, Kansas City, Mo., has been awarded a contract by this company to build its 30-mile railway from Longview, Tex., to the iron ore fields in Cass County. L. P. Featherstone is interested. [E. R. J., Jan. 14, '11.]

***San Antonio, Tex.**—A. D. Powers, J. C. Nelson and P. L. Telford are said to be interested in a projected electric railway in San José, near San Antonio.

Pan Handle Traction Company, Wheeling, W. Va.—This company will construct a 3-mile extension from Wheeling to Glennova during 1911.

SHOPS AND BUILDINGS

Los Angeles-Pacific Company, Los Angeles, Cal.—It is reported that this company is considering plans for building a new car house at Santa Monica during 1911.

Philadelphia & Wilmington Traction Company, Wilmington, Del.—It is stated that this company will build a new repair shop having storage room for 35 cars and six tracks.

Chicago, Ottawa & Peoria Railway, Ottawa, Ill.—This company has begun work on its new car house in Ottawa. The cost is estimated to be about \$30,000.

Peoria (Ill.) Railway Terminal Company.—It is said that this company will construct a frame building at the corner of Washington Street and Western Avenue, in Peoria. The cost is estimated to be about \$1,000.

Des Moines (Ia.) City Railway.—This company is considering plans for building new car houses on East Twentieth Street and Walnut Street in Des Moines.

Boston (Mass.) Elevated Railroad.—This company has begun work remodeling the Sullivan Square terminal station in Boston.

Interborough Rapid Transit Company, New York, N. Y.—This company has formally opened its new station on its subway division at 191st Street and St. Nicholas Avenue, Manhattan.

Cincinnati (Ohio) Traction Company.—The old Brighton car house of this company at Harrison Avenue and Patterson Street, Cincinnati, was destroyed by fire Jan. 13. The loss is estimated to be about \$45,000, with \$30,000 insurance. The building was used lately as a storage house for track material.

POWER HOUSES AND SUBSTATIONS

Shore Line Electric Railway, New Haven, Conn.—This company is in the market for one 500-kw. turbine.

Chicago-New York Electric Air Line Railroad, Chicago, Ill.—This company has contracted with the Northern Indiana Gas & Electric Company to furnish power for the Laporte-Gary division. A substation will be built at Goadrum.

Bangor Railway & Electric Company, Bangor, Me.—This company is considering plans for building a new power house at Basin Mills or rebuilding the dam at Veazie.

Winnipeg (Man.) Electric Railway.—It is announced that this company will erect a subsidiary steam power house at Winnipeg. The cost is estimated to be about \$500,000.

Austin (Tex.) Electric Railway.—This company expects to replace its present power house at Austin with a larger structure.

Galveston-Houston Electric Railway, Galveston, Tex.—This company has awarded the contract to Stone & Webster Engineering Corporation Company, 147 Milk Street, Boston, for building its power plant. The structure will consist of an engine-room 72 ft. x 77 ft. and a boiler-room 52 ft. x 92 ft. It will be built of structural steel, with brick and concrete foundation. The machinery and equipment have been purchased and construction has already begun. The cost is estimated to be about \$175,000.

Twin City Light & Traction Company, Centralia, Wash.—This company will expend during the coming year about \$100,000 for improvements, which will include the erection of a new power house.

Manufactures & Supplies

ROLLING STOCK

Easton (Pa.) Transit Company will purchase a number of single-truck car bodies.

North Jersey Rapid Transit Company, Paterson, N. J., will purchase two closed passenger cars.

Du Bois Electric & Traction Company, Du Bois, Pa., it is reported, will order three passenger cars in the spring.

Geary Street Municipal Railway, San Francisco, Cal., is in the market for 200 steel cars of the pay-as-you-enter type.

Central Pennsylvania Traction Company, Harrisburg, Pa., has ordered eight passenger cars from The J. G. Brill Company.

Oakland (Cal.) Traction Company will purchase new rolling stock, \$250,000 in bonds having been issued to cover the cost.

South Covington & Cincinnati Street Railway, Covington, Ky., is reported as being in the market for 20 single-truck cars.

Philadelphia (Pa.) Rapid Transit Company has ordered 15 passenger cars from the Pressed Steel Car Company for the elevated lines.

Detroit (Mich.) United Railways is converting 20 cars into the pay-as-you-enter type, under license from the Pay-As-You-Enter Car Corporation.

Lake Shore Electric Railway, Cleveland, Ohio, has ordered four passenger, baggage and smoking cars from the Jewett Car Company, Newark, Ohio.

Corregidor Island (P. I.) Railroad will order through M. Gray Zalinski, Deputy Q. M. General, U. S. A. Depot, Q. M., Army Building, New York, N. Y., four electric passenger cars and four electric freight cars.

Eastern Wisconsin Railway & Light Company, Fond du Lac, Wis., is in the market for four or five new passenger cars and two snow plows. This company will also order new fenders for the cars now in use.

Boston (Mass.) Elevated Railway, noted in the *ELECTRIC RAILWAY JOURNAL* of Nov. 26, 1910, as having ordered 50 semi-convertible cars for pay-within operation, has specified the following details: These cars will be equipped with four-leaf double-folding doors and folding steps, all four entrances of which will have the same size doors. A double manual control is so arranged that both doors on either platform may be operated by either the motorman or conductor from his respective control stand.

Elmira, Corning & Waverly Railway, Waverly, N. Y., has ordered six passenger and smoking cars from the Jewett Car Company, for which the following specifications have been prepared:

Seating capacity	52	Couplers	Van Dorn
Weight (car body only),		Curtain fix.	Curtain S. Co.
	26,000 lb.	Curtain material.	Pantasote
Bolster centers, length,		Gongs	Dedenda
	26 ft. 4¾ in.	Heating system.	hot water
Length of body.	36 ft. 11½ in.	Headlights.	G. E. arc
Over vestibule.	45 ft. 11½ in.	Push button signal.	Jewett
Width over sills.	8 ft. 2¾ in.	Sanders.	Knight pneumatic
Over posts at belt.	8 ft. 2¾ in.	Sash fixtures.	Edwards
Sill to trolley base.	9 ft. 3 in.	Seats, style.	H. & K. 199A
Height rail to sills.	40 ¾ in.	Seating material.	plush
Body	wood	Step treads.	wood
Interior trim.	mahogany	Trolley retrievers.	Knutson
Underframe	composite	Trolley base.	Nuttall
Air brakes.	Westinghouse	Trucks, type.	MCB
Bumpers,		Wheelguards	Root
	Hedley anti-climber	Special devices, etc,	
Car trimmings.	bronze		automatic trap door

TRADE NOTES

Standard Steel Works Company, Philadelphia, Pa., has moved its Philadelphia offices from the Harrison Building to the Morris Building.

Weir Frog Company, Cincinnati, Ohio, has appointed F. W. Allen sales agent. Mr. Allen recently resigned his

position as superintendent of the Buffalo & Susquehanna Railroad.

Sydney F. Weston, who resigned recently as manager of the New York district for the National Brake & Electric Company, has accepted a position with the New York Cement-Gun Company, with an office at 30 Church Street, New York.

W. H. Whiteside, who resigned recently as president of the Allis-Chalmers Company, Milwaukee, Wis., is to sail from New York on Jan. 21, 1911, with his family on the Caronia, bound for Spain and the Orient, for a holiday of several months.

Sangamo Electric Company, Springfield, Ill., has appointed M. B. Chase New York manager of the company, with an office at 50 Church Street. Mr. Chase up to this time has been connected with the Westinghouse Electric & Manufacturing Company.

Ackley Brake Company, New York, N. Y., has appointed Frederico H. Bragge agent for Argentine Republic, with headquarters at Calle San Martin 201, Buenos Ayres. This company has also appointed Walter Brothers & Company agents for Brazil, with an office in Rio de Janeiro.

Pay-As-You-Enter Car Corporation, New York, N. Y., reports that the Chicago Railways Company has during the past few months placed 278 additional pay-as-you-enter cars in service. Most of these cars were remodeled for prepayment operation at the Pullman Company's plant.

B. & L. Company, Norwich, Conn., has been incorporated with a capital stock of \$50,000 for the purpose of manufacturing all styles of ball-bearings, which have previously been imported from Germany. Otto Bruenauer is president of the company, and B. F. Leavitt, treasurer. The New York office is located at 50 Church Street.

Heywood Brothers & Wakefield Company, Wakefield, Mass., will remove its New York warehouse and offices from 129 Charlton Street to 516-520 West Thirty-fourth Street, about Feb. 1, 1911. The company has erected a 13-story building containing about 300,000 sq. ft. of floor space. This new building will be used exclusively by the Heywood Brothers & Wakefield Company.

Railway Add Bulletin Company, Ft. Wayne, Ind., has been incorporated for the purpose of manufacturing advertising devices and electrical advertising cabinets, for use in railway and interurban stations, and to lease or sell advertising space in these cabinets or devices. The capital stock of the company is \$10,000, and the incorporators are W. C. Millet, M. E. Bates and T. J. O. Dowd.

United States Electric Signal Company, West Newton, Mass., has just completed an extensive addition to its plant. It was found, however, that this addition was not adequate to take care of and promptly deliver the business already on the company's books. Ground has therefore been broken for another addition, which will double the capacity of the plant. New machinery has been ordered to fully equip the new addition when completed.

C-A-Wood-Preserver Company announces that on and after Feb. 1, 1911, its general offices will be located at St. Louis, Mo. The company has also recently established a branch office at 135 Broadway, New York, in charge of J. H. Denton & Company, for New England and New York; the Pacific Coast is handled by the Western Electric Company through its branches at Portland, Seattle, San Francisco and Los Angeles. The office in the Littlefield Building, Austin, Tex., where the main offices of the company have been in the past, will look after business in the Southwest. The branch offices heretofore maintained at New Orleans, Salt Lake City and Chicago will be continued.

Dearborn Drug & Chemical Works, Chicago, Ill., which have distributed their feed water treatment and lubricants through an agency in the Philippines for the past two years, have decided to open their own branch office and warehouse in Manila. F. O. Smolt, who has been connected with mining propositions since his graduation in chemistry from the University of Illinois, in 1891, has become connected with the company, and sailed on Jan. 7, 1911, for Manila, to take charge of this work, under the supervision of E. C. Brown, manager of the foreign department of the company. Mr. Brown has spent most of the past two years in Japan, China and the Philippines, in-

investigating steam plant and railroad conditions in the interests of Dearborn products, and is still there, having made selling connections at Tokyo, Tientsin, Hongkong and Shanghai.

H. M. Byllesby & Company, Chicago, Ill., opened their second annual convention of officers and employees at Chicago, Ill., on Jan. 17, 1911, with an attendance of 250 delegates. The purpose of the association, as stated in the constitution, is "the interchange of ideas and the promotion of acquaintanceship and good feeling among officers and employes." F. H. Tidnam, of Oklahoma City, presided at the sessions, which were held at the Auditorium Annex. At the opening meeting speeches were made by H. M. Byllesby, president of the company, and Arthur S. Huey, vice-president. After a very interesting program, which included the following papers, the convention was concluded with a dinner at the Auditorium Annex, at which time addresses were made by a number of prominent men outside of the organization: "Insurance," by W. E. Higbee, Chicago; "Advisability of Utility Companies Handling Gas and Electrical Appliances," by Samuel Kahn, Fargo, N. D.; "Ornamental Curb Lighting," by B. M. Cowperthwait, Faribault, Minn.; "Effective Illumination," by A. Larney, Oklahoma City, Okla.; "Accounting Statistics," by N. P. Zech, Chicago; "General Station Economies," by Eugene Holcomb, St. Paul, Minn.; "Unusual Engineering Design and Construction," by W. R. Thompson, Chicago; "The Prepayment Gas Meter," by H. H. Hyde, Tacoma, Wash.; "Construction of Hydro-Electric Plants Relative to Economy in Operation," by J. M. Link, Chicago; "Electric versus Horse-Drawn Wagons," by F. H. Tidnam, Oklahoma City, Okla.; "The Effect of Low-Wattage Lamps on the Central Station Industry," by A. F. Douglas, Portland, Ore.; "Progress and Success of the Employees' Investment Club," by R. J. Graf, Chicago; "Late Developments in the Manufacture of Crude Oil Gas," by R. P. Clarke, San Diego, Cal.; "New Business," by D. D. Callahan, Chicago; "District System of Meter Reading," by T. H. Jackson, Mobile, Ala.

ADVERTISING LITERATURE

United Nut Lock Company, Springfield, Mass., has issued a small catalog and price list of "Hugtite" nut locks.

Sangamo Electric Company, Springfield, Ill., has issued a series of bulletins showing the various elements of its mercury-flotation ampere-hour and watt-hour integrating meters.

Graphite Lubricating Company, Bound Brook, N. J., has issued a circular letter calling attention to the merits and the uses to which "Bound Brook" graphite and bronze bushings, which run without oil or grease, may be put.

Under-Feed Stoker Company of America, Chicago, Ill., has issued the January number of the "Publicity Magazine," which is devoted to the interests of the Jones stoker. It contains a description of installations of the Jones stoker abroad and numerous illustrations showing some of the large installations of this apparatus.

Electric Service Supplies Company, Philadelphia, Pa., has recently issued a booklet entitled "Comments on Capital Traction Company, Washington, D. C. Pay-Within Cars," containing a short article on "Platform Riders," and also a report which was made by H. C. Eddy of the District Electric Railway Commission to the Interstate Commerce Commission.

Warren, Webster & Company, Camden, N. J., have issued a pamphlet containing a paper by William G. Snow, chief engineer of the company, entitled "Ventilation in Its Relation to Health." This paper was read at Cornell University, in the course on sanitary science and public health, which is being conducted in co-operation with the New York State Department of Health.

Robert W. Hunt & Company, Chicago, Ill., noted in the *ELECTRIC RAILWAY JOURNAL* of Dec. 10, 1910, as having issued a pamphlet entitled the "Inspection of Rails for Street and Interurban Railways," report that there is a typographical error on page 6, section 4, of the pamphlet. This paragraph relates to the chemical composition and the proper limits for the carbon content should be 0.60 to 0.75 per cent, and not the limits which were shown in the pamphlet.

NEW PUBLICATIONS

Edison, His Life and Inventions. By F. L. Dyer and T. C. Martin. In two volumes. New York: Harper Brothers. 989 pages; illustrated. Price, \$4.

In future generations Thomas A. Edison will undoubtedly be considered as a genius who typified the tremendous progress made in mechanical invention and the application of electricity to the arts in the latter part of the nineteenth and at the beginning of the twentieth century. Mr. Edison's life reads like a romance. He was born in Ohio, but his father moved soon after to Port Huron, Mich., where Edison's boyhood life was spent. Here he early exhibited the zeal for experiment and invention which has characterized his more mature life, and he provided funds for this experimental work by selling newspapers on the trains of the Grand Trunk Railroad. This life brought him in touch with the telegraph offices in the railroad stations and led probably to his becoming a telegraph operator. This turned Mr. Edison's attention to electricity. His first invention of note was an improvement in the electrical stock ticker. The automatic duplex and quadruplex telegraphic inventions of Mr. Edison soon followed, and through them he became acquainted with Jay Gould and other capitalists of the day. In 1875 he began to interest himself in common with a number of other inventors in methods of transmitting and recording speech and later developed the microphone and phonograph. It is interesting at this day to consider the prophecies of that day as to the uses of this latter machine. Only a few of them have been commercially realized. In Mr. Edison's first phonograph the records were made on tin foil, but he soon found that this material would not be satisfactory for the purpose and he substituted a wax cylinder. During his work on telephone development Mr. Edison's mind was constantly working upon the possibility of developing the electric light, and his first lighting patent was taken out in 1878. Then followed a remarkable series of experiments to develop and perfect the filament necessary in the incandescent lamp and a generator for supplying the requisite energy. The first central station lighting plant on Mr. Edison's system, outside of his own laboratory at Menlo Park, was put in operation in England in 1882. The Pearl Street station in New York was installed about nine months later. It would be impossible in this review to give a sketch of the history of all of Mr. Edison's more recent inventions, such as the motion picture machine, the storage battery, the magnetic ore separator and others, but a tabulation indicates a present investment of more than \$6,000,000,000 in 12 industries which are directly founded upon or affected by inventions of Mr. Edison.

No better choice of biographers could have been made because the authors have not only been very closely associated with Mr. Edison for many years but have also been actively identified with the whole field of electrical endeavor. They have thus been able to treat their subject with a wide perspective and in a sympathetic manner.

Dr. Richard C. Maclaurin has presented to the Massachusetts Legislature a strong argument urging an increase in State aid for the Massachusetts Institute of Technology. Dr. Maclaurin states in part: "The institute cannot be maintained unless it receives an additional \$100,000 per annum from the State or elsewhere. It needs this increased income because the cost of maintaining leadership in this field of education has greatly increased. In the 16 years that have elapsed since the State first made its annual contribution of \$25,000 the annual expenditure has increased by \$268,547. This increase has been due in part to the natural growth of the institute itself, in part to the general rise in prices, but more to the increasing recognition by the commercial world of the value of technically trained men to carry on this work." Further claims of the institute, according to Dr. Maclaurin, are that it was "the first school to equip a mining and metallurgical laboratory for the instruction of students by actual treatment of ores in large quantities; the first to establish a laboratory for teaching the nature and use of steam and a laboratory for testing the strength of the materials of construction in commercial sizes, and the first in America to establish a department of architecture. It was also the first in this country to set up distinct and separate courses of study in electrical engineering, in sanitary engineering, in chemical engineering and in naval architecture."