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WHAT IS A REASONABLE RETURN?

An interesting discussion of what constitutes a reasonable rate of return on public utility investments appears in another column in the form of some testimony presented by the Pacific Gas & Electric Company in a San Francisco rate case. It has the merit of disregarding the theory of the subject and of bringing the question down to the actual price which public utilities have to pay for new capital. Since the days of Lycurgus attempts have been made by fiat to reverse the laws of finance, but iron money could not be made a success in Sparta, nor can public utilities sell their securities at a higher price than investors are willing to pay for them. Mr. Hockenbeamer first shows that the company with which he is connected is obliged by law to make certain capital expenditures in extending its service. He then shows that neither it nor other large public utility companies in California with good credit can sell underlying bonds for less than on a 6 per cent basis, and usually the return must be higher. He then shows that, according to the law as well as according to sound finance, stock capitalization should be increased with an increase in the bonded indebtedness. This means that the stock must be sold on a basis of providing a reasonable assurance of a return of 10 per cent. Finally, he shows that this is not an unreasonable profit when the earnings of the national banks show an average annual profit in excess of 9 per cent and the greater hazard of the public utility business is considered.

BURNING THE BOOKS

There is an old rule of criminal law that flight from the scene of a crime establishes a presumption that the fugitive is probably guilty, and certainly not guiltless. It is a rule that appeals to reasoning of the same kind that is likely to convict of wrongdoing those corporation officials who appear on the stand at investigations and say that the books relating to transactions under scrutiny have been burned. This is what has happened in the New Haven investigation. Probably the worst that the burned books could show would be poor judgment in investments or favoritism toward certain financiers at the expense of the New Haven stockholders. But it is safe to say that ninety-nine men out of a hundred who read of the burning of the Millbrook books believe that it was to conceal outright thievery. In matters both more and less serious than this it is always best to let the worst of the truth be known, for the alternative is a general belief in something very much worse than the truth. For the rest, railroad men

who are trying to lead decent lives may well ask, "How long, Oh Lord, how long are disclosures of railroad misdeeds to make life miserable for us all?" We do not know the answer to this question, but we do know that the only policy of right and wisdom is to avoid making new material for disclosures of the future!

THE FAULT AND THE REMEDY

It will be remembered, of course, that the books concerned in the above episode were not those of the New York, New Haven & Hartford Railroad itself but of an affiliated company. Owing to commission activities, the extent to which common carriers can cause a destruction of their records has become quite circumscribed. For example, the 1913 regulations of the Interstate Commerce Commission expressly state that all electric railway corporate and financial books of original and final entry are to be permanently preserved, and the period of retention for all other reports, accounts and memoranda is most specifically outlined. Furthermore, the regulations provide that an executive officer shall be appointed by the board of directors to supervise the permissible destruction. In view of such facts, it may be said that reasonable precautions have been taken to guard against a wanton mutilation and demolition of the books and records of common carriers themselves. Unfortunately, however, the details of financial relations with bankers and other corporations are generally not found on the carrier's books. Just now the attention of the country is fixed on the Newlands interstate trade commission bill providing that no interstate carrier may enter into a contract with another corporation for the disposal or acquisition of securities or the purchase, sale or lease of property if there is an interlocking directorate or managing board. In such a case as the Millbrook Company, however, the public is less concerned with the names of the directors involved than with the exact accounting of the transactions. As early as December, 1911, the Hadley Railroad Securities Commission recommended that the Interstate Commerce Commission "should have the power to investigate all financial transactions and to inquire into the bona fides thereof, and the right to call for the production of books and papers of railroads, construction companies and other companies with which the railroads had financial relations and that from the purchase of supplies to the acquirement of new lines the interest of the directors should be disclosed." It goes without saying that the New Haven investigation will give some such movement as this a decided impetus.

THE KANSAS CITY CYCLE

In our issue of Oct. 4, 1913, we said that Mayor Jost's proposed franchise for the Metropolitan Street Railway of Kansas City would have to traverse a rocky path before it would run the gantlet of miscellaneous approvals and political bickerings in store for it. Later events have proved this prediction only too true. A multiplicity of every conceivable and impossible amendments, designed not to improve the proposed franchise but to make it a football in the spring elections, finally forced the receivers to withdraw from the negotiations in order not to jeopardize the vast interests under their control. Now, with the election over and Mayor Jost returned to office, Federal Judge Hook has ordered the receivers to resume negotiations, and thus once more the cycle is resumed. The property of the Metropolitan Street Railway has been in the hands of receivers since June, 1911, and during this time various efforts have been made to rescue the property from threatened dismemberment and place it on an assured financial and service basis. Up to the present all these attempts have failed, but it is to be hoped that the present negotiations will result in a settlement satisfactory to both the public and the company. The Kansas City case is a shining example of the results of continuous and paralyzing controversies between city and company as a result of a limited franchise. A company operating under such an arrangement is so exposed to the attacks of politicians that effective State regulation under the indeterminate franchise form would be a veritable blessing. It is time that the citizens of Kansas City realized that the issue is not one alone of better service to the city but also of fairness to the security holders of the company, and that in protecting the latter the company needs the thoughtful cooperation of the public, and not its blind antagonism.

ON CONCENTRATING PUBLICITY

During the past three or four years extensive publicity campaigns have been waged by electric railways. Perhaps, the most significant kind were those in which the companies published statements of the amounts spent annually for different kinds of equipment. However, as the arguments were addressed to the community at large, the result was often as ineffective as other scattering shot because the attention of the reader was directed to general rather than to individual improvements. Would it not be well to supplement a city-wide publicity campaign by references to the work done and money spent in particular neighborhoods? For example, in one large city the local railway has equipped several of its routes with a new type of car which cost from \$7,000 to \$8,000 each. If the riders on these routes were informed that every car was the equivalent in cost to a fine one-family suburban house, they would have a decidedly tangible idea of what the railway was doing for them. Again, a sub-station is frequently an installation common only to a few lines. In that event, some good publicity might be obtained by stating the cost of the outfit required to maintain good schedules and car lighting on the outly-

ing divisions specified. In another recent instance, the sum of \$4,000 had to be spent to replace a double-track branch-off at a certain corner after only five years of service. Here is an opportunity to blazon the fact that the railway will have to carry 80,000 passengers merely to pay for a single piece of special work at the intersection of two routes. If news of this domestic character was made known by means of chatty car announcements to the passengers of the line affected, the public would be likely to appreciate the cost of good service more directly than by references to the expenditures on the system as a whole.

ANALYSIS OF SERVICE AND ACCIDENT COSTS

Without doubt, one of the biggest questions before the American railway at present is to prove to its public that the service given is fully commensurate to the rate of fare and the amount of traffic. It is not so difficult to do this in the case of isolated lines where the unfavorable operating conditions are appreciated even by the layman, but how can the public be convinced as regards electric railway systems generally that crowded cars during a few hours a day do not spell a twenty-four-hour profit? A way out of this dilemma is suggested by the frank publicity methods of the Scranton Railways, as described by its superintendent, P. T. Reilly, before the last meeting of the Pennsylvania Street Railway Association. In the case quoted elsewhere in this issue the Scranton Railways demonstrated to the public by way of the daily press that it had actually lost money on the peak-load business which had resulted from a great religious revival. Of course, a general statement of this kind would have been greeted with derision by those who had seen the crowded cars going to and from the tabernacle on a two-minute headway. But the traffic conditions were analyzed and described with such care by the railway that no room was left for disbelief. Surely this is real publicity for, and fair dealing with, the public. And we shrewdly suspect that Mr. Reilly's demonstration that peak loads do not always add to the net earnings will surprise many an optimistic operator who is too eager for park, baseball or other business which may be located away from the beaten trails of traffic.

The same paper contains some noteworthy mathematical proof on the accident-saving value of experienced car men in addition to the publicity data on peak loads, which has just been mentioned. To be sure, every thoughtful operator will admit that the average man who has gone through the painful experience of one accident is far less likely to repeat than the recruit who may be hired to supplant him. Not many railways, however, have gone to the trouble of proving this fact in dollars and cents. Mr. Reilly's company has done so with results that bear a lesson to the manager who will permit his transportation division superintendents to cut down the number of the higher-waged platform men from motives of false or superficial economy. The Scranton figures show that the annual accident expense accounts of the one-year, two-year, three-year, four-

year and four-year plus platform men are respectively \$236.81, \$146.63, \$100.61, \$95 and \$48.47. If we assume that the wage increase per year is 1 cent more per hour, then the annual raise in wages for 3600 hours is only \$36. In all but one of the classifications given, this amount is less than the savings in accident costs produced by more platform experience. But the savings are still greater if we consider that \$50 to \$100 is spent to train a man merely to operate a car and that months will elapse before the new man reaches his highest efficiency in controller and brake manipulation. Thus to the slogan of "Safety First" may be added that of "Safety Pays."

A GREAT RAILROAD MAN ON GOVERNMENT OWNERSHIP

Nearly all discussion of government ownership of railways is, on the one side, by advocates of this policy, and on the other side by interested and biased opponents. A grateful relief from arguments of both of these types is found in a statement in a recent issue of the *Outlook* by Sir Thomas Shaughnessy, president of the Canadian Pacific Railway. Sir Thomas has no government ownership problem of his own, so he may not be charged with self-interest. He, as a railroad man, is happy because from the first the railways and the government of Canada have maintained a sort of partnership that has conserved the interests of the public as well as those of the carriers. And he thinks we shall be happier in our transportation relations when we realize that "government ownership or private ownership is not the fundamental thing. The fundamental thing is honest service on one side and honest compensation on the other."

This is really the conclusion of Sir Thomas's remarks. To start with, he clears the air by showing that government ownership is not a principle of democracy but a question of pure expediency. Will government ownership secure better service and secure it more cheaply or as cheaply as at present? This, he claims, is the real question to be considered, and calmly considering it he marshals four points against and four points in favor of the proposition.

Against the idea he places these considerations: That government ownership does not move with the promptness or enterprise of private ownership; does not show the same economy; is less responsive to business demands as to service and rates, and involves the "sinister possibilities" of adding 1,500,000 government employes to the federal payroll. Whether or not the latter consideration is an important one Sir Thomas does not know because he is doubtful as to whether or not we have really finished with corrupt government. Had he been less kind he might have pointed out that at the present moment the presence of Mr. Bryan in the State Department and of Mr. Daniels in the Navy Department indicate what degree of adaptability and training would be required of the man who might preside over the railways of the United States under government ownership. Because one of these gentlemen was a successful lec-

turer and an unsuccessful candidate for President he was thought to be well fitted to handle our foreign relations. Because the other gentleman was a fairly successful newspaper publisher and a friend of Mr. Bryan he was selected for the highly specialized duties of directing the navy. On the same line of reasoning a "secretary of transportation" might be a clergyman or an astronomer.

But to return to Sir Thomas. In favor of government ownership he includes these considerations: It would, by socializing some twenty billions of railroad property, limit our "enormous and distressing inequalities of wealth"; railway investment would lose its speculative character; unfair discrimination would disappear, and railway development and rate adjustment would proceed with reference to the maximum development of the country as a whole, rather than be governed by the needs or the profit-making possibilities of any section. These are the four favorable considerations that are balanced against the four drawbacks of government ownership. We are not so certain as Sir Thomas seems to be that an administration that changes every four years would preserve that nice adjustment of railway development that he speaks of, but admitting that this would be the case the matter is not, as it is put here, one for heated advocacy or denunciation, but for weighing upon grounds of expediency.

Evidently with some current facts of railway history and the trend of regulation in mind, Sir Thomas concludes his interview with this sapient comment: "Clearly, the interests of the public must rank first; but the very fact that the public accepting the service is also to be final authority in the matter of compensation would make it as unfair and improper to have that compensation established at a figure below its value, to the detriment of the shareholders, as it would be if the transaction were between two business men of recognized integrity."

The most radical railway bairer can take as little exception to this statement as can be taken to the summing up of the municipal ownership proposition as outlined above. This also is a position so rational that it is one to which all can repair: "I shall be satisfied to see your railways go under government ownership if you calmly and deliberately think best that they should, although it seems to me that your control over them under your present arrangements is comprehensive and sufficient. But my main hope is, as I said before, not so much for the sake of your railways as your national spirit, that you will get through to the end of your problem, whatever that end may be, with full justice to all, and without petulance or bad temper."

While we believe that the common sense of the American people and their traditional sentiment in favor of individualism instead of collectivism will triumph in the end, we expect that there will be more agitation in favor of government ownership of railroads and of municipal ownership of street railways before there is less. The hearing which occurred in Washington this week and is reported in this issue is significant in this connection.

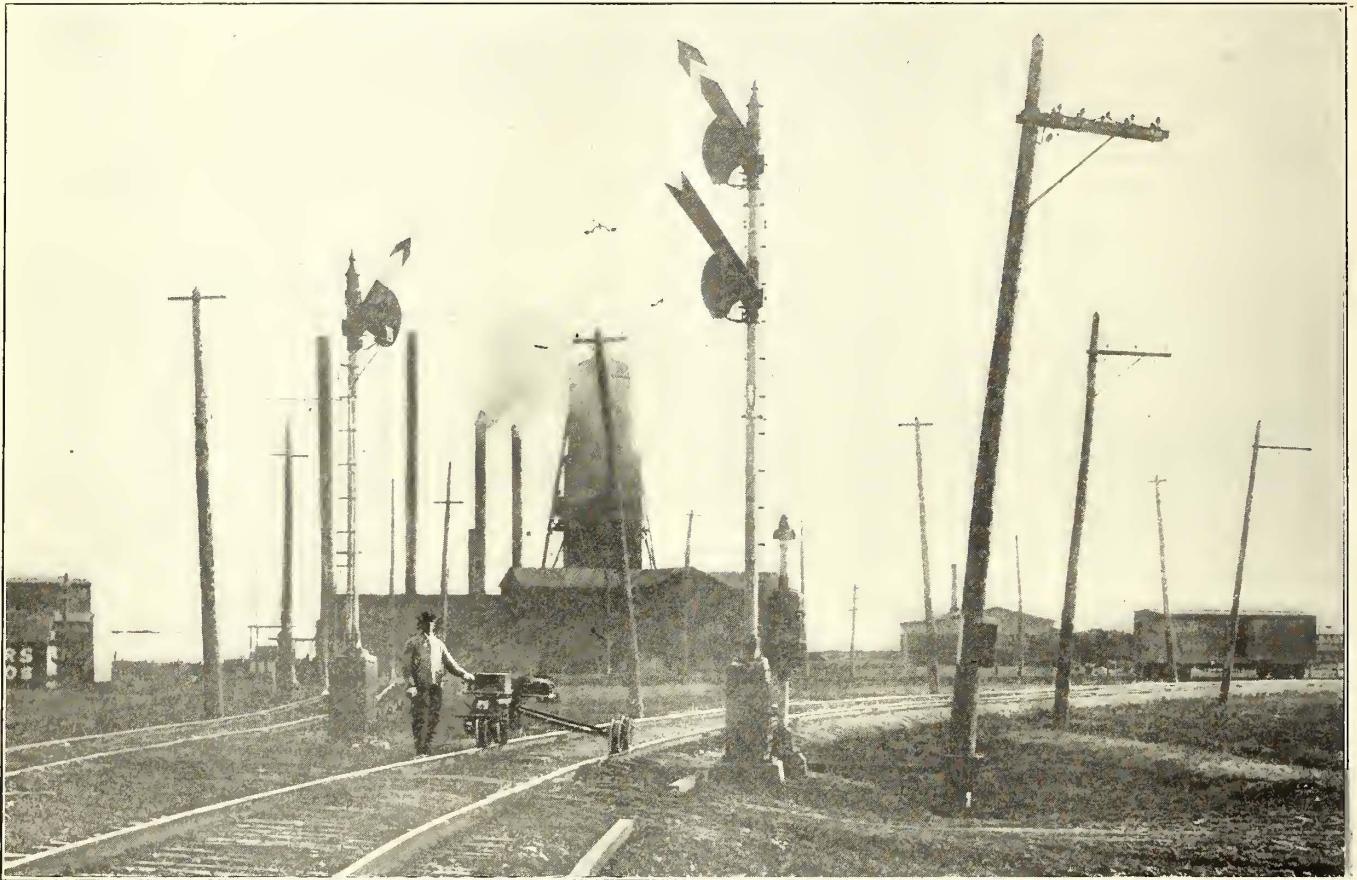
Signal Maintenance on Illinois Traction System

On This Interurban System Automatic Block Signals of the Track-Circuit-Controlled Type Have Been in Operation for Three Years, and an Account Is Given of the Maintenance Organization and Costs

The first installation of track-circuit-controlled, automatic block signals on the Illinois Traction System was placed in service exactly three years ago. Since then various other sections of track have been equipped until, at the present time, all dangerous localities have been fully protected, and by the end of this year the entire main line between St. Louis and Springfield will be provided with track-circuit signals in addition to those already installed between Springfield and Peoria. Owing to the relatively long time that these signals

direction of movement. Preliminary sections in every case are at the south end of the block, and telephones are provided at the distant signals at the beginning of each preliminary as well as at the sidings for the purpose of permitting trains which may stop before entering the preliminary to call up the dispatcher from that point.

Telephones are provided also at all sidings in unsignalled territory where operation is carried on by train order. The telephone line is double, one line being used



Illinois Signal Maintenance—Signal Maintainer with Gasoline Speeder That Is Used for Traveling Between Signals

have been in operation the methods of maintaining them have been established upon a permanent basis, and the following outline of the company's organization and practice will serve as a guide to other interurban roads which have made more recent installations.

SIGNAL EQUIPMENT

As shown by the accompanying map every section of the whole system has its quota of signals. In all there are 95.6 miles of protected track in operation in which are included 183 track-circuit-controlled signals. The short sections indicated upon the map as being protected are isolated curves or sidings where meets are frequently made.

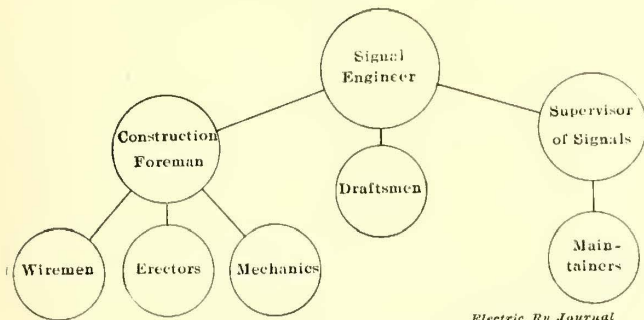
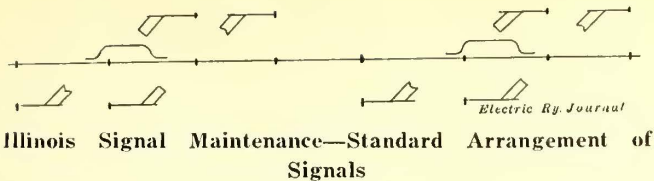
The signals at sidings are arranged in accordance with a standard system as shown in the accompanying diagram. Distant signals are provided for every home signal. In general all sidings are double-ended and the first car approaching the siding takes it regardless of

exclusively for train orders and the other for railway business. Originally the entire line was operated by train order with the assistance of the telephone.

On the division between Danville and Springfield where there are no particularly long sections of continuously signalled territory practically every siding is furnished with a telephone booth upon which is a Blake signal controlled by the dispatcher. These dispatcher's signals are also installed in some cases on the line between St. Louis and Peoria, but they are being rapidly displaced by the introduction of the track-circuit signals. There are also several types of contact signals at various points in cities through which the line operates at slow speed, but no contact signals are used on the main line outside of city limits.

In general, sidings are located between $1\frac{1}{2}$ miles and 2 miles apart, and the line is single track except in certain sections within city limits.

The present organization of the signal department



Illinois Signal Maintenance—Organization Chart

is shown graphically in the accompanying chart. In charge of the department is the signal engineer, John Leisenring, and to him report the draftsmen, the construction foreman for new work and the supervisor of signals for maintenance work. Construction work is an important feature as new work is going on all of the time. At present the construction forces are installing signals from a point a few miles north of Carlinville to Springfield.

Under the supervisor of signals, who is in direct charge of repair work, are five signal maintainers. These employees were developed from telephone repairmen, and all of them were originally employed in the telephone work on the system before the automatic block signals were installed. All of them still make telephone repairs in the field although a considerable part of this work is being gradually replaced by field work on the automatic signals.

In addition to the employees shown on the chart there is a telephone repairman, who spends the major part of his time in repairing various pieces of defective telephone apparatus which have been replaced by the men along the line. In addition he is responsible for the field work on the telephones between Springfield and St. Louis. This employee is entirely separate from the signal maintenance department, although he reports to the signal engineer. However, he has been trained in signal maintenance and is able to fill in when any of the regular signal maintainers are off duty. His work in connection with the repairs to telephone apparatus was developed on account of the fact that it was originally the custom to replace defective telephones with complete new ones so that a large amount of slightly damaged telephone apparatus was at one time on hand in the shops of the company. The present telephone repairman has eliminated the necessity for this, and the only telephone material kept on hand is that necessary to make quick replacements of damaged or defective parts.

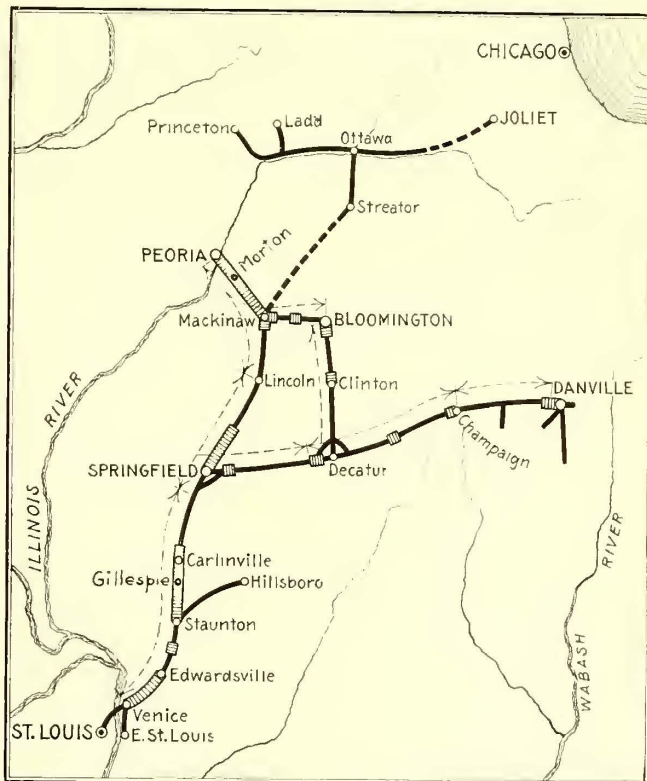
Each of the five signal maintainers is located on a clearly defined district and is responsible for all telephones and signals within its limits. The five districts are shown on the accompanying map of the system, the dotted lines and arrow heads showing the extent of each. The maintainer for the southernmost division on the main line between St. Louis and Peoria is located at Gillespie about halfway between St. Louis and Springfield, and the maintainer for the district north of this is located in Springfield, the district taking in also a part of the line to Danville to a point within a few miles of Decatur. The district south of

Peoria which extends to Lincoln and includes the branch to Bloomington has a maintainer with headquarters at Morton. At Decatur is a fourth maintainer whose district extends to Champaign on the west and to Bloomington on the north, and at Danville is the fifth maintainer whose district covers the west end and branches of the Danville line.

The various districts have been arranged on the basis that one mile of telephone, including the two wires, is equivalent to one signal whether the latter is of the track-circuit type, the dispatcher's type, or the trolley-contact type. On this basis each maintainer is responsible for the equipment listed below.

The maintainer at Gillespie has charge only of eighty-three track-circuit-controlled signals. The maintainer at Springfield has seventy-six miles of telephone line, nineteen track-circuit signals and twenty-four dispatcher's signals, making a total of 119 equivalent miles. At Morton the maintainer has 65 route miles of telephone line, forty-three track-circuit-controlled signals and two trolley-contact signals, making a total of 110 equivalent miles. At Decatur the maintainer is responsible for 108 route miles of telephone line, eighteen track-circuit-controlled signals, twenty-nine dispatcher's signals and four trolley-contact signals, making a total of 159 equivalent miles. The maintainer at Danville is responsible for 62 route miles of telephone line, seventeen track-circuit-controlled signals, twenty-six dispatcher's signals and eight trolley-contact signals, making a total of 113 equivalent miles.

It will be noticed that the maintainer at Gillespie has considerably less equivalent territory than the others, but this district is a particularly hard one to cover on account of the large number of signals and their wide separation. This district, between St. Louis and Springfield, is the one upon which the telephone repairman is located, and the latter takes care of all of the telephone work. This involves 100 route miles of telephone line. The telephone repairman also maintains twenty dispatcher's signals within the district.



Illinois Signal Maintenance—Map Showing Protected Sections of Track

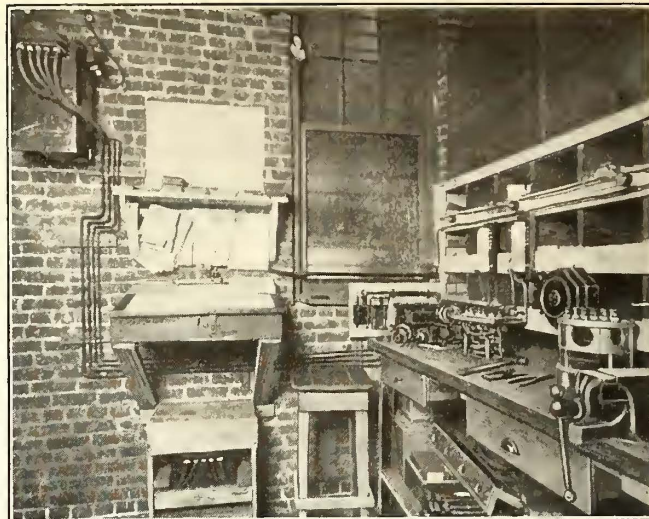
It is planned in the near future to change the title of the telephone repairman to that of signal maintainer and to divide the territory into two approximately equal parts, giving each one of the two men now employed on it a single section of track for his work. The change will, of course, materially reduce the time spent in traveling from place to place. It should be said that the automatic signals will extend over the whole division between St. Louis and Springfield by the end of the present year. At this time, as explained above, the force of signal maintainers will have to be increased by one man.

It is interesting to note that the introduction of automatic block signals on this system has involved only the addition of one man to the force. The original organization required to keep the telephones in repair consisted of five telephone inspectors. However, notwithstanding the large increase in the block signal territory all of the work is now kept up by five signal maintainers and one telephone repairman.

MAINTENANCE METHODS

The signal maintainers do practically all of their work in the field. They have been trained to make all classes of repairs by themselves, even including blacksmithing, although there is very little work of this nature. Most of the repairs are either electrical in character or else consist in making adjustments and replacements of apparatus. For making replacements approximately \$3,500 worth of material is kept on hand at the headquarters of the various maintainers. This stock consists of extra relays, motors, transformers, lightning arrestors and miscellaneous repair parts. A considerable number of the defective pieces are repaired by the maintainers at their various headquarters, but some have to be sent to the manufacturer for reconstruction if the damage is extensive, for example, such as would require the complete rewinding of a coil. The cost of the work done by the manufacturer during 1913 for the whole system amounted to approximately \$175.

A regular inspection of every signal on the whole line is made once each month. At this time the signal



Illinois Signal Maintenance—Interior of Maintenance Shop at Morton

is inspected throughout and the apparatus cleaned, oiled and adjusted as necessary. Any parts found defective are replaced or repaired as required, and the whole operating mechanism receives a thorough test. By this method of monthly inspections it is found that very little difficulty develops between times. In fact, the necessity of frequent, thorough inspection is obvious if it is desired to reduce signal failures to a minimum.

Each one of the signal maintainers is furnished with a No. 28 Fairbanks-Morse gasoline speeder to enable him to get quickly from place to place in case of breakdowns of the signal system. Such trouble is extremely limited, and even lightning damage has been found to be very slight in character. One or two small transformers and several relays have, however, been somewhat injured by lightning, but all of these were repaired in place. A lightning arrestor and a fuse are installed in every connection from the line wire to the signal apparatus, and this has provided such thorough protection that it is now not even customary to make special trips after thunderstorms unless some trouble is actually reported.

Signal blades are painted once each year, the method of procedure being to keep a number of spare blades in stock and to replace the old blades with the newly painted ones. The old blades are painted at the signal maintainer's leisure at his headquarters and are then put into stock and used as required. The company has been experimenting with a number of different paints, but thus far no standard has been adopted for general use.

Signal lamps are replaced only when they are burned out, two lights being installed in multiple for each blade so that one may go out without leaving the signal dark. However, it has been found that with the electric-arc headlights used on the interurban cars of this system the signal blade is visible at night for a distance sufficient to provide ample warning of its position. The lights are therefore largely a matter of precaution, needed only in case the electric headlight on a car should go out.

COSTS AND PERFORMANCE

The cost of labor chargeable to maintenance of automatic signals alone, including supervision, amounts to about \$385 per month for the 183 signals operated during the past year. The division of costs shows an actual maintenance charge on automatic signals



Illinois Signal Maintenance—Signal Operating Mechanism Exposed for Repairs

amounting to \$271.50 per month, and this covers approximately two-thirds of the time of the signal maintainers, the remainder of their time being devoted to maintenance of the telephones and the dispatcher signals. This makes a unit cost for labor alone amounting to \$17.80 per blade per year. In addition there is a charge for material amounting to \$4.40 per blade per year, giving a total unit cost for labor and material of \$22.20 per blade per year. Included in this is the before-mentioned cost of work done by the manufacturer amounting to about \$1 per blade per year.

The unit cost per blade per month for labor and material ranged from \$1.39 in July of last year to \$2.38 in February of last year. None of these figures includes the cost of current for the operation of the signals. This amounts to approximately 95 cents per blade per month.

The total number of signal movements during the last year amounted to 3,034,478 and the percentage of perfect operation during the year was 99.968 per cent.



Illinois Signal Maintenance—Interior of Telephone Repairman's Shop

In connection with these figures it should be recorded that on the Illinois Traction System a signal failure is charged for each train that is improperly stopped by a signal regardless of how or why the signal happens to be in stopped position. A broken line wire or power off the line is charged against the signal just as would be a failure of the operating mechanism. If power is off the entire line and a train stops at each signal along the whole route, a failure is counted for each stop made by the train. It will thus be seen that the definition of signal failure used in this case is a very broad one and involves the necessity for a high degree of reliability in case a good record is made.

During the year of 1913 out of the 3,000,000 signal movements only four false indications were given. These are included with the other failures going to make up the percentage of perfect operation, but owing to the fact that they are of much more serious import than the ordinary failure they are here recorded separately.

For the purpose of checking the attention paid by trainmen to the signals surprise tests are conducted twice each year. These surprise tests are made by putting out signal lights, dropping signal blades just in

front of a moving train after it has approached the signal under a clear indication, removing the blade from the signal entirely, and having the signal held in stop position by a maintainer who is working upon it and then giving a hand signal to proceed. Unless proper consideration is accorded to the unusual conditions the motorman is invariably disciplined. The results obtained thus far in the surprise tests which have been carried out have been, however, uniformly satisfactory, and practically no failures have been found in observance of rules on the part of the trainmen.

NEW CEDAR RAPIDS INTERURBAN

The Iowa Railway & Light Company, Cedar Rapids, Iowa, is just completing the first section of an interurban line extending eastward from Cedar Rapids. The line is practically completed to Mt. Vernon, and the larger part of the grading has been done between Mt. Vernon and Lisbon. Lisbon is 17 miles east of Cedar Rapids. It is reported that the line eventually will connect Cedar Rapids with Davenport.

The new line has exceptionally generous construction standards. It is built on a private right-of-way, 108 ft. wide, and although it extends through heavy rolling country, the grades have been kept low by doing a large amount of cutting and filling. All bridges are of permanent fireproof construction. The largest structure is a 140-ft. through truss, spanning the right-of-way of the main line of the Chicago & Northwestern Railroad. Shorter spans include through girders and concrete slabs. For supports most of the bridges have concrete piling.

The track is laid with 70-lb. rails, bonded with A. S. & W. "twin-terminal" bonds of No. 0000 capacity. Where the line passes through the street of Mt. Vernon, a high T-rail is being used, supported by Carnegie steel ties imbedded in concrete.

The distribution system is designed for 1200-volt trolley operation. Current is supplied by the central station in Cedar Rapids which also feeds the Cedar Rapids and Iowa City division. Plans are under way for changing the distribution of the latter system from 600-volt to 1200-volt operation. Current is distributed by a 33,000-volt transmission line carried on "wish-bone" arms at the tops of the trolley poles. When the road has been completed, the sub-stations will be located about 16 miles apart. At present, and until 1200-volt operation is begun, a portable sub-station located at Mt. Vernon feeds the extreme end of the trolley wire.

The trolley wire is catenary supported. The wire itself is No. 0000 capacity, and it is supplemented by a No. 0000 feeder. The catenary messenger is "copper clad." This latter kind of wire was used for the messenger, both to increase the conductivity and to assure long life to the mechanical support for the running trolley wire. The overhead catenary fixtures are of General Electric manufacture.

The catenary construction is carried through the small towns, being supported by heavy tubular steel poles and cross-spans.

The McGuire-Cummins Manufacturing Company recently delivered two cars to this company. These cars are of all-steel construction, 58 ft. long x 9 ft. 10 in. wide. They are equipped with M. C. B. radial couplers, and the bodies are mounted on McGuire-Cummins No. 70-A high-speed interurban trucks. Each car has four 205-B G. E. motors.

In its rolling stock equipment as well as in the construction of the roadbed, overhead and in the location of the route, the new eastern extension of the Iowa Railway & Light Company's interurban system contemplates heavy freight as well as high-speed service.

Cost of Money to California Public Utilities

An Analysis of the Conditions Under Which the Public Utility Companies in California Are Required to Raise New Capital—The Cost of Money—The Necessity of an Adequate Rate of Return

Some interesting testimony on the cost of money to California public utilities is found in the affidavit made by A. F. Hockenbeamer on March 2, 1914, in the case of the Pacific Gas & Electric Company vs. the City and County of San Francisco in the United States District Court for the Northern District of California, Second Division. Mr. Hockenbeamer has been connected with the Pacific Gas & Electric Company since Feb. 1, 1908, as comptroller, treasurer and vice-president, and previous to that time for three years was connected with N. W. Halsey & Company, bankers, New York.

RAISING OF NEW CAPITAL REQUIRED BY LAW

Mr. Hockenbeamer's affidavit says that the company is compelled under the law of the State to render satisfactory and adequate service and to extend its facilities to all residents within its territory who may be within 100 ft. of its main or distribution lines. The penalty for neglecting to do this within ten days after an application for service is \$50, and \$5 per day thereafter. The possible aggregate of such damages can be understood from the fact that during the calendar year 1913 the company connected 15,350 new customers to its distribution system within the city and county of San Francisco, and 28,452 to its entire distribution system.

The capital expenditures required for such connections were, of course, not limited to the cost of connections, and meters, but the company from time to time was obliged to enlarge its entire plant. Other capital expenditures become necessary when the company is required by law to place underground its street lines and various supply systems or to make other improvements. For various purposes the company has been obliged to spend during the past eight years more than \$54,000,000 for capital purposes, and as a matter of self-preservation it must keep its system modern and efficient. For some years to come it will probably have to find between \$5,000,000 and \$10,000,000 new capital. It must also, according to the terms of its mortgages, secure money for its sinking fund payments to the extent at present of approximately \$800,000 a year and later of \$1,813,000 a year.

MARKET QUOTATIONS ON BONDS NOT A MEASURE OF RATE OF RETURN

The affidavit then says that public utility companies cannot sell their securities on as low an interest rate as municipalities or well-established steam railroads, and that the market quotations of their bonds do not correctly indicate the cost to the utility of the new capital required in the growth and development of its enterprise.

Where a company has to find a market for an average of approximately \$10,000,000 of new securities per annum, like the Pacific Gas & Electric Company, it is not practicable to obtain its new capital through the sale of securities in small amounts directly to investors. It must dispose of them at wholesale to investment bankers who have the necessary capital or credit to pay for the bonds in cash when delivered. The cost to the public utility companies of marketing their bonds in this way, including the compensation to trustees under the mortgages, fees of counsel, commissions paid to bankers and official fees required under the law to be paid to the Railroad Commission of California, is considerable, and it amounts rarely to less

than 5 per cent and frequently is 10 per cent or more of the par value of the securities thus sold.

DISTINCTION BETWEEN BONDHOLDERS AND STOCKHOLDERS

The affidavit then says that a distinction should be made between (a) what is a reasonable and fair rate upon investments made by a corporation in acquiring or directing or operating its properties for public purposes, and (b) the rate of interest at which the public utility corporation can borrow a limited portion of the capital necessary in the conduct of its enterprises.

There is also a fundamental difference so far as the rate of return to be permitted between the stockholders and the bondholders of public utilities. The former are partners in the enterprise, while the latter are merely creditors. The former assume all the risks of the business while the latter merely loan money secured by the stockholders' property, and the rate of return which would be attractive to a bondholder would not tempt investors to engage as owners in the same line of business. The affidavit then quotes several instances of prices at which it has sold its obligations during the past three or four years. When capital for investment purposes was normally abundant a thirty-year general and refunding mortgage 5 per cent bond sold on a basis of about 6.1 per cent annual return if held to maturity. Later, some securities of this same issue could not be sold on that basis. Other securities with a shorter term were sold on a basis of a considerably higher rate of return.

The accompanying table of issues of bonds of gas and electric companies in California from March 23, 1912, to Dec. 13, 1913, shows the names of the issuing utilities, title of the bond, the annual rate of interest, the minimum sale authorized by the commission, etc., and the approximate yield if held to maturity. This rate of return, of course, does not indicate the rate which must be allowed to utilities to give them a sufficient margin of profit, over and above such interest rates, to establish their credit and the consequent ability to dispose of these securities, nor does it include any of the expenses incident to the issue and sale of these securities, nor does it show the rate which must be allowed to the owners as distinguished from the creditors of the company. The list is not a list of selected bonds, but it embraces fifty issues authorized by the commission during the first twenty-one months of its existence, a period of varying degrees of stress and ease in the money market.

These bond issues have a total par value of \$48,086,035. Of this total \$10,892,000, or 23 per cent, representing those best secured, were authorized to be sold at prices netting the purchasers 5.34 to 5.92 per cent per annum; \$26,955,500, or 56 per cent, were authorized to be sold to net the purchasers from 6 per cent to 6.96 per cent per annum, and \$10,238,535, or 21 per cent, were authorized to be sold to net the purchasers from 7 per cent to 10.75 per cent.

UTILITIES MUST ISSUE STOCK AS WELL AS BONDS

Public utilities cannot conduct their enterprises entirely on borrowed capital—that is, on money raised through the sale of bonds. The amount of property pledged for the security of a bond must exceed in value the face amount of the bond. This is a generally recognized principle. The laws of California prohibit savings banks from loaning money on investments in ex-

cess of 60 per cent of their market value, and it is customary in public utility mortgages to limit the par value of the bonds sold to provide improvements to less than the actual cost of these improvements. The affidavit quotes clauses of this kind in the mortgages of the different utility companies, and the principle has been indorsed by the railroad commission.

COST OF STOCK MONEY OF PACIFIC GAS & ELECTRIC COMPANY

The Pacific Gas & Electric Company has \$10,000,000 of 6 per cent cumulative preferred stock and \$32,109,300 of common stock. Dividends at the rate of 6 per cent per annum have been paid on the preferred stock for a number of years, and the net earnings of the company are in excess of the sum required to meet these dividends. Although this stock is widely distributed, being held by more than 1200 investors at the present time, it is selling at about \$87 per share, or on a basis to net the investors 7 per cent. This quotation represents dealings between investors. If it were possible for the company to increase the authorized issue of this stock or to create a new issue equally good for investment purposes and to sell such an issue in amounts commensurate with its needs of money for additions, improvements and betterments it would probably have to do so on a basis to net the purchasers not less than 7½ per cent. The common stock has paid dividends at the rate of 5 per cent from Dec. 15, 1911, to March 15, 1913. During this period the company has sold \$3,000,000 par value of this stock at \$58 per share net. At this price the return to the purchasers is more than 8.6 per cent.

The prices at which stock of other California public utility corporations has been issued with the authority of the railroad commission are quoted in the affidavit. In most cases they are based upon a yield per annum of 7½ per cent or more.

SURPLUS FROM OPERATION NECESSARY FOR CONFIDENCE

The affidavit then says that the price at which securities for new capital can be sold depends on the confidence of the investors in the certainty of return on such securities, and this confidence in turn depends upon the net profits which the enterprise makes or may be able to make. If the company does not show a rate of growth in its net profits commensurate with all additional capital invested, or if its own profits decline or remain stationary, its ability to raise new capital becomes impaired, and if its net profits are only barely sufficient to pay bond interest its bonds become speculative and can be sold only at a great sacrifice in price. This principle is so well recognized by both investors and bankers that it is customary to insert in the mortgages of public utility bond issues provisions that make the amount of bonds that may be issued dependent on the net profits of the utility and assure, as far as possible, a certain fixed relation between the amount of interest charges of the utility and of its net earnings available for the payment of such interest. A number of such provisions are quoted in the affidavit, and in some cases the net profits for a given term available for bond interest is required to be at least twice the amount of the interest on all the outstanding bonds. In other cases the proportion is one and three-quarters or one and one-half times the interest charge.

NOTES TO TABLE

San Diego Consolidated Gas & Electric Company—First Mortgage Bonds. These bonds are secured by an absolute first mortgage on all property of the San Diego Consolidated Gas and Electric Company. Further bonds may be sold only for 75 per cent of the cost of improvements when net earnings equal at least double the interest charges. A renewal fund is provided, to which must be paid an amount equalling 3 per cent of outstanding bonds from 1910 and 5 per cent from 1915 to 1938. Profit and loss statement for the year ended Dec. 31, 1912, shows net earnings of \$511,767.01 and bond interest of only \$159,002.82. This must therefore be regarded as an exceptionally high-grade first mortgage public utility bond. The later entries referring to these bonds show subsequent authorizations by the Railroad Commission of sales of bonds of this issue to yield 6.21 per cent.

San Joaquin Light & Power Corporation. The first entry shows that the company was permitted to sell its first and refunding bonds on a 5.80 per cent basis. This utility was subsequently authorized by the Railroad Commission to sell additional bonds of the same issue on a 6.50 per cent basis.

Western States Gas & Electric Company—First and Refunding Mortgage Bonds. These bonds may be issued for betterments and improvements only at 75 per cent of cost and only when net earnings for twelve months preceding have been at least twice the fixed charges on all bonds outstanding and contemplated to be issued. Sinking fund amounts to ½ per cent semi-annually of outstanding bonds from Dec. 1, 1912, to June 1, 1914, inclusive, 1 per cent semi-annually from Dec. 1, 1914, to June 1, 1919, inclusive, and 1½ per cent thereafter to maturity. They are secured by a first lien on all of the property of the Western States Gas & Electric Company subject only to a prior lien of a portion of an underlying closed issue of \$419,000. Net earnings for year ended April 30, 1913, reported as \$514,659, interest charges \$216,806, balance over interest charges \$297,853. This must therefore be regarded as an unusually good bond. As shown in the last entry the Railroad Commission authorized bonds of this issue to be sold on a basis of yield of 6.35 per cent per annum.

Southern California Edison Company—General Mortgage Bonds. These bonds may be issued to reimburse the company for not more than 75 per cent of the cost of improvements, providing net earnings for the preceding year are equal to at least one and three-fourths times the interest charges on all bonds issued and to be issued. Annual sinking fund of 2 per cent of all bonds outstanding under this mortgage and underlying mortgages began in 1910. Net earnings reported for twelve months to Sept. 30, 1913, were \$2,295,924, as against total interest charges of \$793,358, a balance over interest charges of \$1,502,566. This must be regarded as an exceptionally high-grade public utility bond.

Great Western Power Company—First Mortgage 5's. These bonds are selling in the open market at a fraction over 80 per cent of their par value, at which price they yield to the purchasers thereof, if held to maturity, approximately 6½ per cent per annum. Affiant has been informed, and believes, that these bonds have not been sold by the utility in question.

Los Angeles Gas & Electric Corporation—First and Refunding 5's. The bonds of this issue may be issued to cover only 75 per cent of the cost of improvements, extensions, etc., but only when net earnings for the preceding year shall have been one and three-fourths times the interest charges on all bonds outstanding and those applied for. An annual sinking fund of 2 per cent of outstanding bonds began July 1, 1910. The net earnings of this utility for the year 1912 were reported as \$1,876,620, with interest charges of \$396,405, leaving a balance after interest of \$1,480,215. This must be regarded as a high-grade public utility security.

Names of Issuing Utilities	Description of Bonds	Unexp'd Life of Bonds, Years	Total Par Value Authorized by Commission	Date Authorized by Commission	Sale Price Authorized by Commission	Approx. Yearly Yield to Investors if Held to Maturity, Per Cent
Holton Power Co.	F'st & Ref. 6%	39	\$300,000	7-3-12	.80	7.9
Indian Valley E. L. & P. Co.	First 6%	40	81,535	8-23-12	.80	7.9
Mt. Whitney P. & E. Co.	First M'tge 6%	27	250,000	10-18-12	.95	6.39
Northern Cal. P. Co. Con.	Deb. Notes 6%	5	500,000	8-14-12	.96	6.96
Pacific G. & E. Co.	Gen'l & Ref. 5%	29	5,000,000	9-14-12	.85	6.09
San Diego Cons. G. & E. Co.	First M'tge 5%	27	250,000	9-4-12	.94	5.43
San Joaquin L. & P. Corp.	F'st & Ref. 5%	38	925,000	10-26-12	.87	5.80
Santa Barbara G. & E. Co.	First M'tge 6%	29	5,000	9-7-12	.95	6.38
Santa Maria G. & P. Co.	6%	15	50,000	7-30-12	1.00	6.
Southern Cal. Util. Co.	6%	30	10,000,000	11-13-12	.9675	6.24
Southern Counties Gas Co.	First M'tge 6%	29	47,000	10-14-12	.85	7.23
West Coast Gas Co.	6%	40	100,000	11-5-12	.80	7.9
Western States G. & E. Co.	F'st & Ref. 5%	28	351,000	6-7-12	.875	5.92
Western States G. & E. Co.	F'st & Ref. 5%	28	600,000	9-20-12	.875	5.92
West Coast Gas Co.	First M'tge 6%	40	250,000	11-5-12	.80	7.9
Indian Valley E. L. & P. Co.	Notes 7%			8-25-12	1.00	7.
Imperial Valley Gas Co.	First M'tge 6%	17	154,600	1-8-13	.80	8.12
Western States G. & E. Co.	F'st & Ref. 5%	28	397,000	1-10-13	.885	5.84
Southern Cal. Edison Co.	Gen. M'tge 5%	27	2,500,000	1-27-13	.92	5.58
San Diego Cons. G. & E. Co.	First M'tge 5%	26	204,000	2-11-13	.95	5.34
City Electric Co.	First M'tge 5%	25	833,000	2-24-13	.84	6.25
Southern Counties Gas Co.	First M'tge 6%	28	5,500	3-1-13	.85	7.2
Great Western Power Co.	First M'tge 5%	33	4,411,000	3-11-13	.90	5.56
Los Angeles G. & E. Corp.	F'st & Ref. 5%	26	900,000	4-10-13	.945	5.38
Sacramento Natural Gas Co.	First M'tge 6%	23	193,000	4-24-13	.95	6.39
Mt. Whitney P. & E. Co.	First M'tge 6%	26	250,000	4-25-13	.95	6.40
Southern Counties Gas Co.	First M'tge 6%	28	8,000	5-3-13	.85	7.2
Pacific G. & E. Co.	Debenture 6%	10	5,030,000	5-15-13	.95	6.69
Southern Counties Gas Co.	First M'tge 6%	28	4,000	6-11-13	.85	7.2
San Diego Cons. G. & E. Co.	First M'tge 5%	26	180,000	6-30-13	.85	6.21
Beaumont Gas & Power Co.	Notes 8%	5	5,000	7-2-13	1.00	8.
Economic Gas Co.	First M'tge 5%	28	270,000	7-10-13	.83½	6.35
Santa Barbara G. & E. Co.	First M'tge 6%	28	100,000	7-10-13	.95	6.39
California Tel. & L. Co.	First M'tge 6%	30	350,000	6-17-13	.94	6.42
San Joaquin L. & P. Corp.	F'st & Ref. 5%	37	1,776,000	7-12-13	.80	6.50
Southern Counties Gas Co.	First M'tge 6%	28	75,000	8-6-13	.85	7.2
Western States G. & E. Co.	F'st & Ref. 5%	27	354,000	8-30-13	.885	5.83
Western States G. & E. Co.	F'st & Ref. 5%	27	75,000	10-2-13	.825	6.35
Midland Counties Pub. Serv. Co.	First M'tge 6%	40	1,559,000	10-1-13	.92	6.55
Pacific G. & E. Co.	Gold Notes 6%	1	7,000,000	9-24-13	.955	10.75
Sonoma Valley L. & P. Co.	First M'tge 6%	30	30,000	9-30-13	.825	7.4
Amador Light & Power Co.	First M'tge 6%	16	12,000	10-2-13	1.00	6.0
Hemet-San Jacinto Gas Co.	First M'tge 6%	13	3,000	10-8-13	.825	7.1
Napa Valley Electric Co.	First M'tge 6%	17	20,500	10-14-13	1.00	6.0
San Diego Cons. G. & E. Co.	First M'tge 5%	26	27,000	10-29-13	.85	6.21
Coast Valleys G. & E. Co.	First M'tge 6%	38	114,000	10-30-13	.90	6.75
San Diego Cons. G. & E. Co.	First M'tge 5%	26	41,000	11-14-13	.85	6.21
California Tel. & Light Co.	First M'tge 6%	30	100,000	11-21-13	.94	6.46
Mt. Whitney P. & E. Co.	First M'tge 6%	26	250,000	12-5-13	.95	6.40
Coachella Val. Ice & E. Co.	6%	31	300,000	12-13-13	.80	7.6

Public utilities can obtain capital only in competition with the demands for capital in other lines of business. As the demand for capital in other enterprises in California is large, many of the public utilities have had to seek capital in the Eastern States and in countries of Europe, and this condition has contributed to the difficulties of securing new capital and has increased the cost of doing so.

PROFITS IN THE BANKING BUSINESS

Quotations are then made from the annual report of the Comptroller of the Currency dated Dec. 1, 1913, in which statistics were given of the earnings of all the national banks of the country. The net earnings totaled \$160,980,084, and dividends were paid to the amount of \$119,906,050, or at the rate of 11.4 per cent as against an average of 11.01 per cent during the prior five years. Dividends based on capital and surplus averaged 6.75 per cent for the year, but the net earnings to capital and surplus were 9.06 per cent. The per cent of dividends to capital in the different divisions of the country were: New England, 8.61 per cent; Eastern States, 12.16 per cent; Southern States, 11.21 per cent; Middle Western States, 10.52 per cent; Western States, 15.08 per cent; Pacific States, 11.94 per cent.

The affidavit calls attention further to the fact that the failure of national banks has averaged less than 12 per annum since 1865, and that among the businesses devoted to the service of the public there is no cleaner, safer and more easily liquidated business than that of banking under the national bank act. On the other hand, the property of the gas and electric enterprise is irretrievably placed in the service of the public and the owners cannot, if they will, liquidate the affairs of the corporation and distribute its assets. Moreover, the financial, engineering, operating and commercial management of such enterprises is constantly beset with hazards and difficulties arising from financial stringencies, from competition with other forms of energy, from actual and potential competition of other like utilities, from the actual and potential competition of municipally owned utilities, from the diminution of earnings through the improvement of lamps and current consuming devices, from the constantly growing burden of taxation, from the constantly increased cost of labor and continual demands by organized labor for higher wages, from changes in the processes of manufacture, from regulation of rates, etc. The speaker believed that if under government regulation capital in banking was permitted the profits mentioned, the gas and electric enterprises of the State should certainly not be limited to any smaller rate of return.

SUMMARY

Mr. Hockenbeamer summarizes the statements in his affidavit as follows:

"1. That the law compels constant expansion of plaintiff's facilities and corresponding increase in its investment.

"2. That plaintiff must raise from \$5,000,000 to \$10,000,000 of new capital per annum for new construction, and additional large sums for the payment of maturing obligations and other purposes.

"3. That market quotations on bonds do not measure the cost to utilities of borrowed capital.

"4. That plaintiff's stockholders are entitled to a greater return on the value of their property than the mere cost to them of borrowed capital.

"5. That it has cost plaintiff from 6.1 per cent to 10.75 per cent per annum to borrow money on secured obligations, exclusive of necessary expenses.

"6. That in twenty-one months the Railroad Commis-

sion of California authorized the issuance and sale of more than \$37,000,000 of secured obligations of California gas and electric corporations at prices making the cost to these utilities of the money so borrowed from 6 per cent to 10.75 per cent per annum.

"7. That plaintiff must obtain a large proportion of its new capital from stockholders.

"8. That the best price at which plaintiff was able to sell \$3,000,000 of its stock was on an 8.6 per cent basis of yield.

"9. That the Railroad Commission of California has authorized various gas and electric utilities to sell an aggregate of \$3,327,500 par value of preferred stock on a basis of yield of 7.5 per cent, and \$3,000,000 of common stock on a basis of yield of 7.74 per cent.

"10. That there must be a substantial margin of earnings in excess of interest and dividend requirements to make stocks and bonds salable and to provide for other necessary charges against net earnings.

"11. That the utilities of California must offer their stocks and bonds in competition with thousands of other investment securities and must make them conform to the standards of safety demanded by investors.

"12. That California utilities cannot raise the required new capital in the home market owing to other demands and to the many other profitable avenues of investment open to such home capital.

"13. That capital in large amounts is safely employed in the business of banking under the national bank act at an average annual profit in excess of 9 per cent.

"14. That, owing to severe competition capital employed in the electric light and power business in San Francisco is exposed to unusual hazard and uncertainty of return."

CONCLUSION

In his conclusions Mr. Hockenbeamer expresses the opinion that unless his company is able, and is permitted, to derive net profits from the operation of its business equivalent to at least 8½ per cent per annum upon the money invested or to be invested in its enterprise, it will be unable to obtain the additional capital necessary to carry on its business.

He is also of opinion that the capital employed by the company in its electric business in the city and county of San Francisco could not, under existing conditions, be persuaded to embark in its enterprise without the reasonable assurance of a return of at least 10 per cent per annum.

LAUBAN-KÖNIGSZELT SINGLE-PHASE LINE

Experimental operation of the electrified Lauban-Königszelt line of the Prussian-Hessian State Railways in Silesia is now under way. On March 14 the 80,000-volt transmission from the power station at Mittelsteine to the substation at Niedersalzbrunn was connected up electrically for the first time. During the two weeks following the transformers, oil switches and other apparatus were baked out as a preliminary to the opening of service on April 1 between Niedersalzbrunn to Bad Salzbrunn. Trial trips have also been made on the section between Niedersalzbrunn and Conradsthal. The tests are being conducted with a triplet type of articulated car, the center body of which carries a pair of pantographs. In a special trial on April 7, this triple unit hauled two steam-type trailers.

Two ball clubs will be put in the field by the Metropolitan Street Railway, Kansas City, Mo. One of the teams will be comprised of general office employees, while the other will be made up of shop attachés. The uniforms will be provided by the company.

Third Avenue Railway Truck-Overhauling Shop

The Writer Describes the Course of Truck Wheel and Axle Overhauling and Gives Some Figures on Time and Cost of Truck Handling

BY A. R. JOHNSON, ASSISTANT TO SUPERINTENDENT OF EQUIPMENT THIRD AVENUE RAILWAY SYSTEM

Owing to the fact that the Third Avenue Railway, New York, had increased its number of passenger cars operated from 800 in 1909 to 1050 a day in 1913, with a corresponding rise to about 5,000,000 car miles a year, it became necessary for our company to change the general plan of its truck repair shop. Originally jib cranes and air hoists had been placed alongside of a gallery onto which the cars are run from the carhouse in front of the shops. The cars were then jacked up by a 20-ton traveling crane, and the trucks were removed and lowered to a single track in the truck repair shop.

The increase in the number of cars has made it necessary to install an additional track for truck overhauling. The jib cranes and hoists have also been shifted from the side of the gallery and placed between the two overhauling tracks, as shown in an accompanying view. This change relieves the large crane by enabling the men to use the hoists in removing motors and wheels from trucks on both tracks. The displaced motor repair shop was then installed in the cellar of the truck repair shop as described in the *ELECTRIC RAILWAY JOURNAL* for March 21.

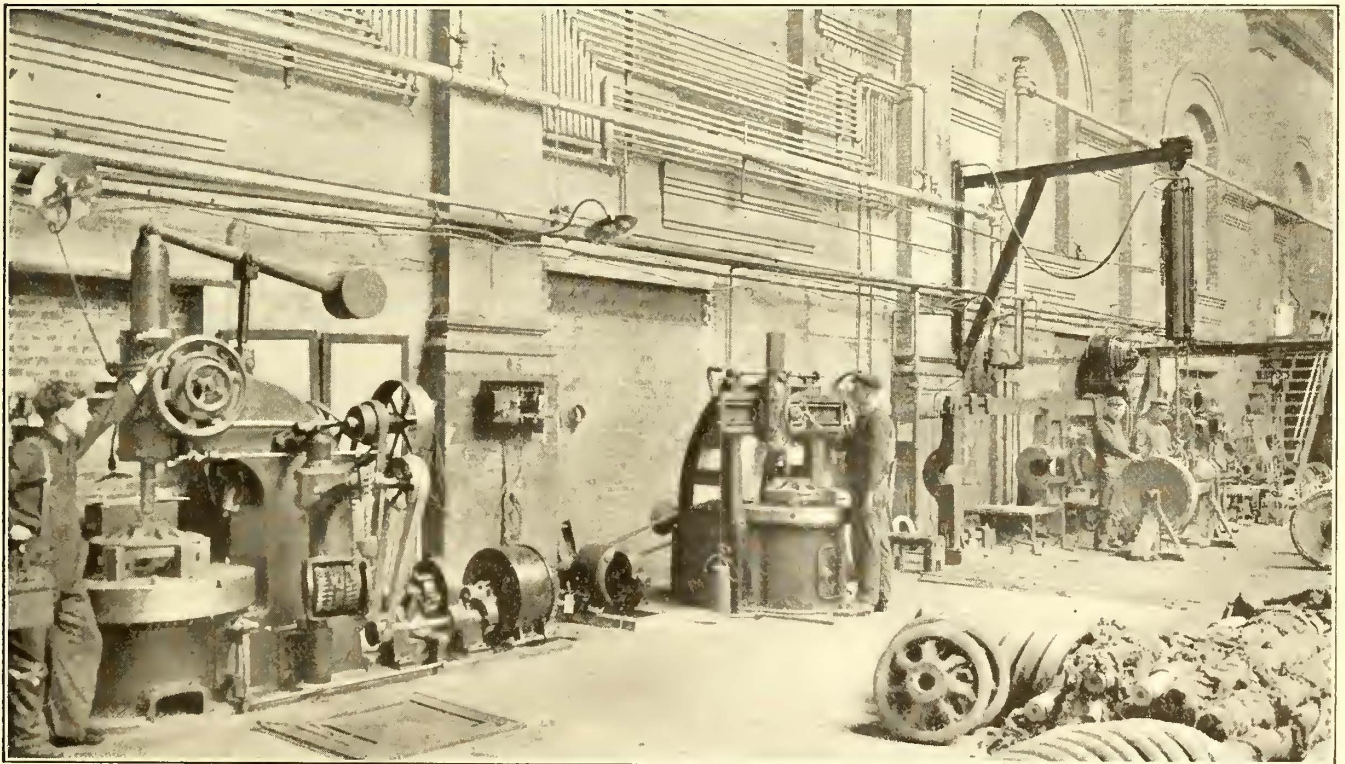
This shop insures abundant space for the truck and compressor overhauling of six cars a day, the present schedule. The jacking up of cars on the gallery and the removal of trucks onto the truck shop floor permit the equipment attached to the under part of the car body to be entirely exposed and easily accessible, thus aiding the inspection of loose parts and other defects. When cars are run onto the gallery two men require about twenty minutes each, with the aid of the large crane, to jack up the cars, disconnect the trucks and

deposit the latter on either of the overhauling tracks. Two men then strip the truck of motors, wheels, etc., the wheels being deposited by the crane alongside of the wheel lathe while the motors are lowered into the electrical shop, all within one hour.

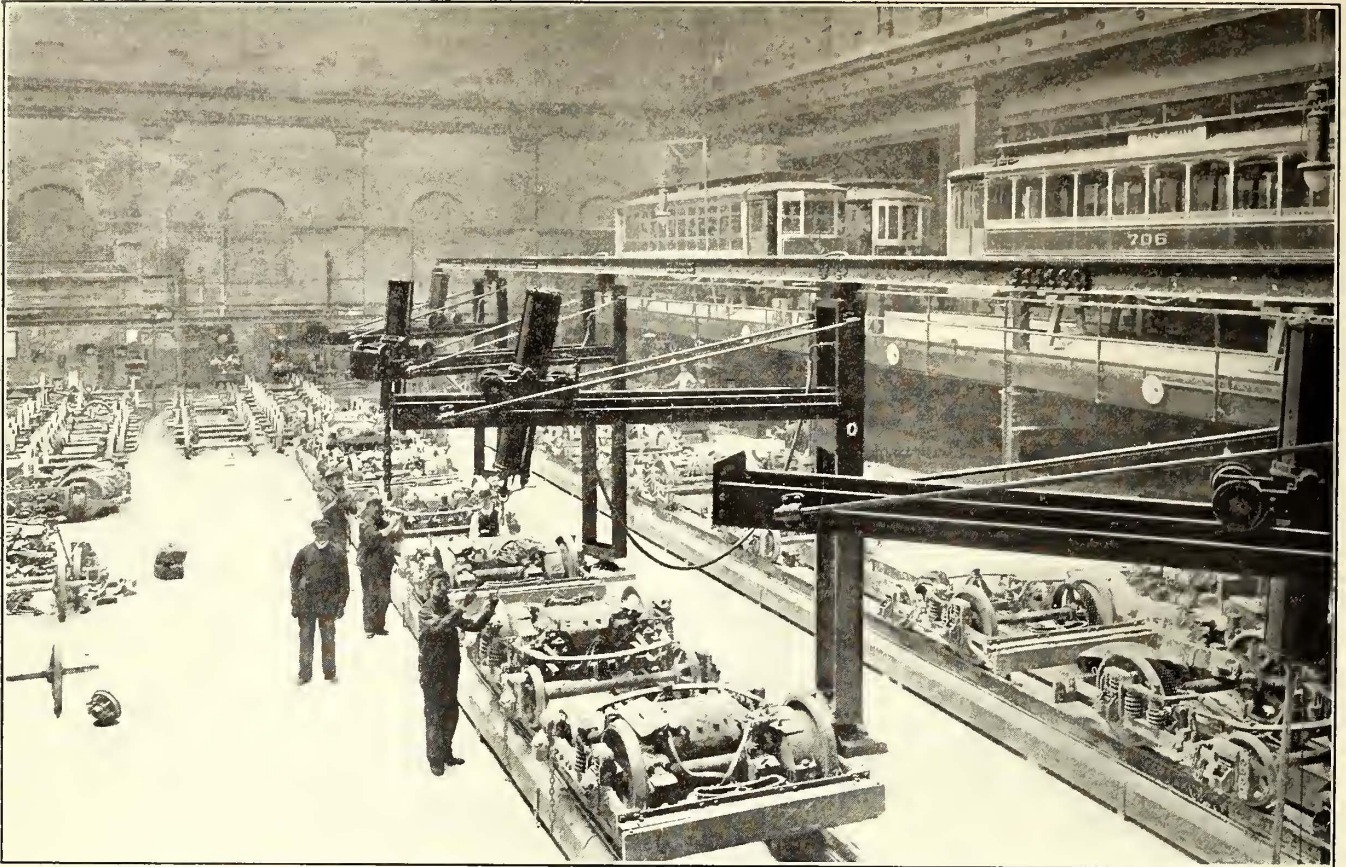
The wheel lathe is of Niles-Bement-Pond type with individual motor drive like all of the other tools in the shop. It is set up at the end of the overhauling tracks, and on it one man will average twelve pairs of steel wheels a day. The lathe is fitted with cutters of Jessop's "Ark" high-speed steel. The same material is used also on the axle lathe and boring mill. In addition to this, Jessop's carbon tool steel is used for chisels, punches and dies. The tools next the lathe are two boring mills, a Niles-Bement-Pond 300-ton wheel press, which presses in one hour on an average of four pairs of pony wheels or in one day the wheels and gears of approximately twenty driver axles. The axle turning lathe is mounted in front of a boring mill. Pony and other cast-iron wheels are handled at the opposite end of the shop by means of a Hampden grinder. This tool grinds from fourteen to twenty pairs of wheels a day. It is fitted with an adjustable bearing, which permits it to take journals up to 6½ in. and wheels from 18 in. to 36 in. in diameter. This tool was described in the *ELECTRIC RAILWAY JOURNAL* for May 25, 1912.

Among the tools in other parts of the shop is the Acme bolt-cutting and threading machine, here illustrated, which has reclaimed thousands of dollars from the scrap pile, besides enabling the men to obtain quickly whatever bolts are necessary for their work.

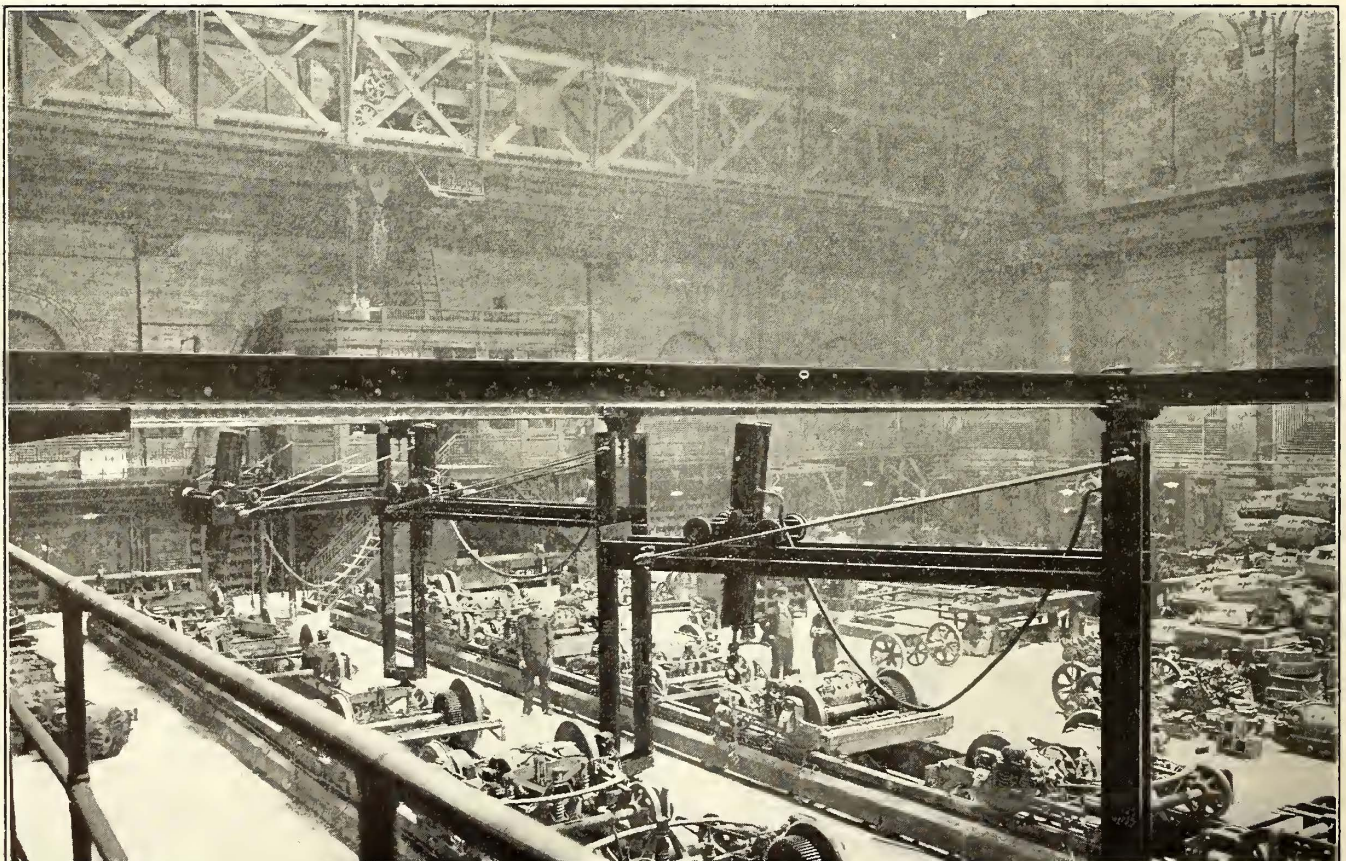
The high-speed drill illustrated was furnished by Montgomery & Company, New York. This machine is



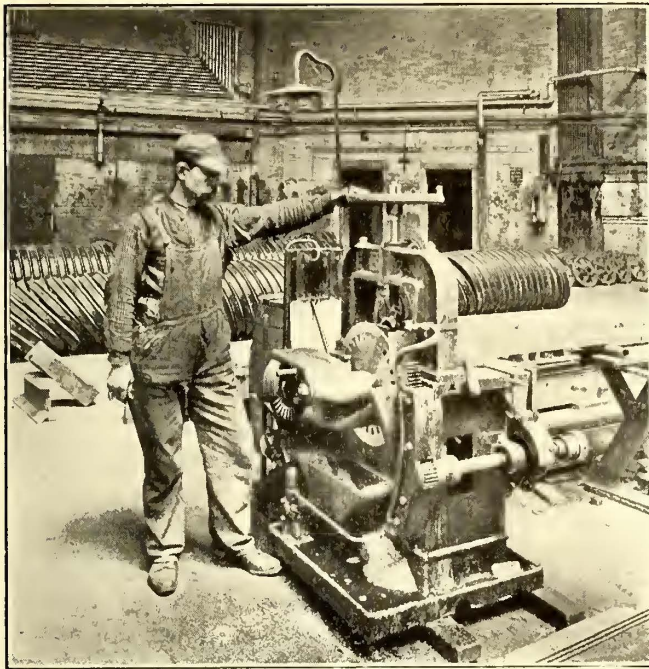
Third Avenue Truck Shop—Boring Mills and Wheel Press



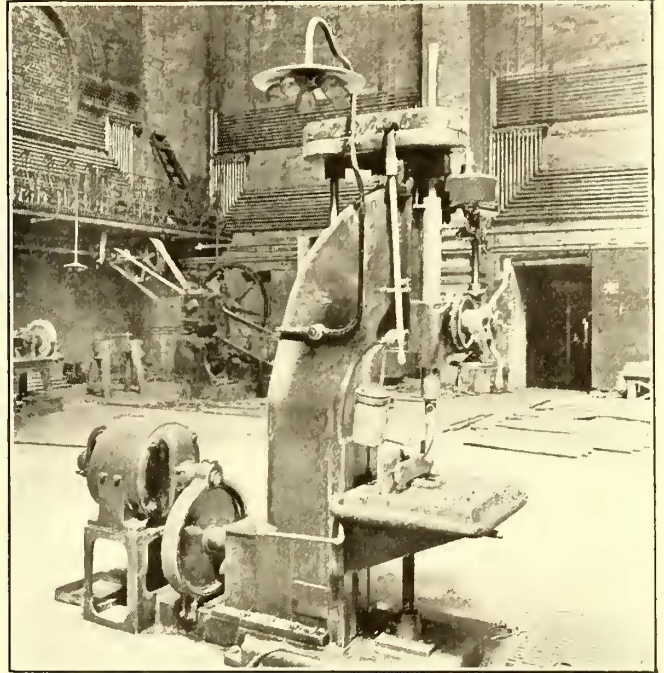
Third Avenue Truck Shop—General View Looking Toward the Wheel and Axle Tools at the Rear—Also Showing Use of Jib Cranes



Third Avenue Truck Shop—General View Looking Toward Carhouse and Showing Air-Operated Jibs Alongside the Gallery Where Car Bodies Are Raised Off of the Trucks



Third Avenue Truck Shop—Cold Saw for Cutting Rails



Third Avenue Truck Shop—Drill for High-Speed Steels

capable of drilling holes of from $\frac{1}{4}$ in. to 2 in. in diameter. It is located next to the blacksmith shop, the door of which can be seen in the background. The air-compressor overhauling department is situated under the gallery onto which the shopped cars are brought.

The motor overhauling shop is conveniently situated in a room immediately under the truck repair shop. It is reached by way of two stairways, while a large opening in the floor of the truck shop permits the crane to be used for all transportation of heavy parts. This shop also adjoins the electric welding room.

The truck shop is accessible from the side street via a large door which is used principally for the delivery of wheels, axles and other heavy material and also for hauling away scrap. All rails which are to be cut up into "dutchmen" for use by the track department are taken through this door into the truck shop to the Higley rail saw illustrated. This tool is capable of cutting twenty-five lengths of 9-in. rail a day.

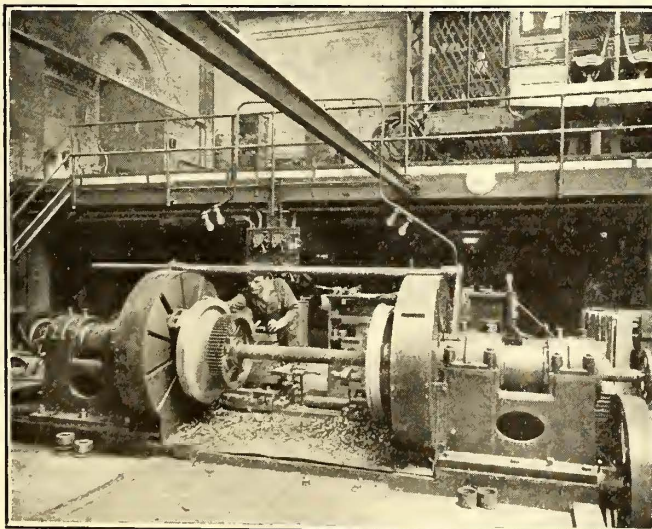
SHOP MANAGEMENT

From an economic standpoint, it is very essential to

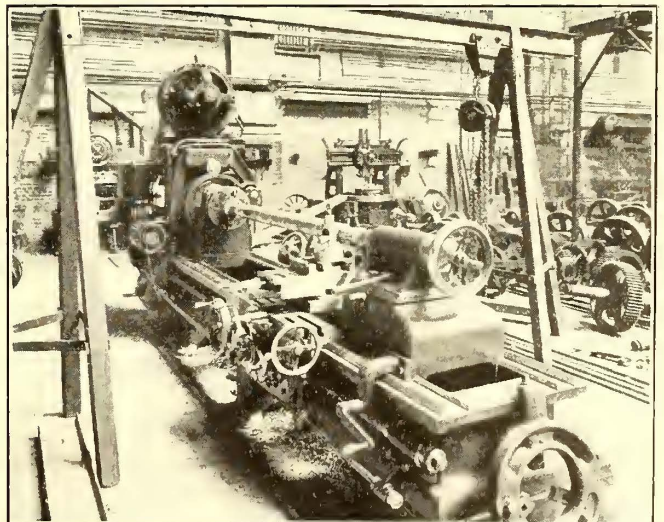
have the general overhauling foreman anticipate as far as possible the required amount of material on hand for the repairs of the trucks so that little time will be lost in waiting for material. For this reason, one man is assigned to the task of getting all material from the general storeroom, thus avoiding the need for any man to leave his work. This man also brings whatever parts need repair to and from the blacksmith shop or welding plant.

When a car has been thoroughly overhauled by the several departments, it is run out into the carhouse by way of the gallery. Here it is examined again by a general inspector. This checking system has proved very satisfactory, for during its use for the past six years not one car has been "pulled in" because of faulty overhauling.

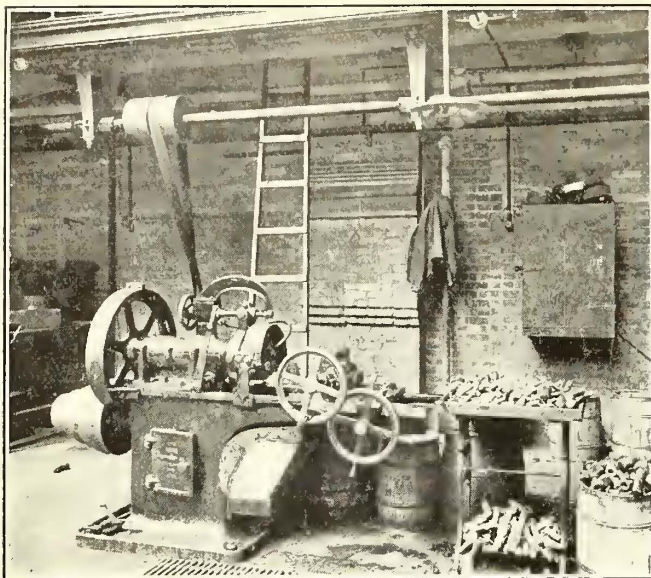
Two men are assigned to overhaul each truck, making four men per car. In the case of the Brill 22-E truck, the time taken for depositing the truck and stripping it of motors and wheels averages approximately six hours at a labor cost of \$2.50. The 39-E truck, which is most used on our system, costs much less. Thus,



Third Avenue Truck Shop—Wheel Lathe



Third Avenue Truck Shop—Axle Lathe



Third Avenue Truck Shop—Bolt Renewing Machine

two men average eight hours to strip and reassemble a 22-E truck complete at a cost of \$3.36, while the same two men can handle the 39-E truck in six hours at a cost of \$2.52.

THE A. E. R. A. FARE RESEARCH BUREAU

Brief mention was made in the *ELECTRIC RAILWAY JOURNAL* of May 9, 1914, page 1037, of the organization of the bureau of fare research of the American Electric Railway Association. Elsewhere in this issue the appointment of Frederick W. Doolittle as director of the bureau is announced. The objects of the bureau as reported by the committee on the cost of transportation service to the 1913 convention are as follows:

1. The determination of the factors affecting the cost of passenger service, including investment, investment charges, operating expenses, length of haul and traffic density and the distribution to member companies of the results of these studies as far as they are complete, the whole to be developed in as simple language as the subject permits.

2. The assembling, statistical compilation and distribution of various operating data now being received by the secretary of the association.

3. The assembling, statistical compilation and distribution of financial operating results of member companies.

4. The study of unusual conditions affecting either the rate of fare received or the operating expenses of electric railways and the distribution of the results of such study.

5. The providing of a source of authentic, accurate and detailed compilation relating to the economics of the subject of rates of fare on which member companies may draw when in need of such information.

There is a marked difference of opinion as to the definition of fixed and variable cost factors which go to make the basis of fare-rates. Many of the problems affecting these things are analogous for railroads and electric and gas companies, as has been brought out in various rate cases, and one of the duties of the bureau will be to assemble such plans of expense apportionment as have been accepted by courts and commissions where cost of service was in question.

The application of units of comparison for determining operating costs is another matter about which there has been much disagreement. While many roads

use the same system of accounts, practically no attempt has been made to standardize the units to be applied in the analysis of such accounts. Because of errors in the choice of units of comparison, very often the entire conclusions of analysis are open to question. It will be one of the first duties of the bureau to standardize these units in order that the data compiled from the reports of commissions and member companies may be uniform.

The bureau is also to investigate the question of depreciation as affecting the return upon the investment or value for rate-making purposes. Traction valuations made by courts and commissions will be analyzed, comparisons of unit costs, comprising the physical valuation made, and the work of determining the extent of accrued depreciation of overhead expenses and other mooted questions in rate cases inaugurated by various committees of the association will be carried on.

The question of the method of assembling costs in order to determine the paying length of haul will be gone into with the idea of arriving at a correct method of determining the facts. Data will be gathered and analyzed in order to secure, if possible, a method for estimating and discounting future operating conditions. The transfer question, including the effect of transfers in stimulating traffic, the experience with universal and continuous transfers and the cost of transfers, is another subject which the bureau will consider. Data on the cost of rush-hour service will be compiled by the bureau from the experience of electric railways and will be made available for use to the association's members. Rapid transit, interurban and suburban rate readjustments and the recent tendencies of the valuation decisions of the Cleveland and Toledo fare situations are some of the other subjects which will properly come under the scope of the bureau.

NEW PARK FOR INSULL PROPERTIES

The southern Indiana Insull properties have been particularly active this season in furthering business-getting enterprises. The latest thing is the improvement of a twenty-four acre tract on Silver Hills, a series of knobs near the Ohio River to the southwest of New Albany, Ind. This tract has been cleared and needed shelters constructed and park benches, etc., added. It has been named Silver Hills Grove and it is advertised as "Nature's Own Park, 300 Feet Above the Ohio River." The lines of the Louisville & Northern, Louisville & Southern Indiana and the local Jeffersonville and New Albany lines, as well as the electric lighting plant of the Insull interests, will profit by the business that results. The calendar of the companies is signed for practically all of the summer with dates for Sunday school, lodge and other picnics. Another enterprise encouraged by the same interests is Glenwood Park, between Jeffersonville and New Albany. It is the scene every summer of the meetings of the Glenwood Chautauqua, and, like the Silver Hills Grove venture, draws a very large part of its patronage over the Insull lines from Louisville, Ky., which is just across the Ohio River.

INTERSTATE CLASSIFICATIONS OF ACCOUNTS

Advices from Washington say that the new Interstate Commerce Commission classifications of accounts are awaiting the approval of the commission. The effective date of the new classifications will be July 1, 1914, but it is impossible to state now the exact date when the classifications will be promulgated.

Spring Meeting Pennsylvania Association

At This Meeting of the Pennsylvania Street Railway Association P. T. Reilly of Scranton Presented a Paper Entitled "Transportation Comments," and Cecil G. Rice of Pittsburgh One on "Accident Analysis"

The spring meeting of the reorganized Pennsylvania Street Railway Association was held at the Board of Trade Building, Harrisburg, on May 12 and 13. The meeting was attended by about 100 delegates from every part of the State, the largest attendance in many years. The first regular session was opened at 2.30 p. m. on Tuesday with President C. L. S. Tingley in the chair.

GOVERNOR TENER'S REMARKS

The first order of business was an address of welcome by Governor John K. Tener. Mr. Tener said that from what he knew of Pennsylvania street railway men, their deliberations would result only in good for the community. He remarked jokingly that his connection with the street railway business went no further than that of being a stockholder in several lines, but he did not know much about the technical details. He did appreciate fully, however, the great advances which had been made in the improvement of electric railway transportation. He regarded the Public Service Commission as the go-between of the State government and of the railways. Certainly the present executive, the majority in the House and in the Senate would not determine upon any drastic measure or endeavor to put through any bill that would work hardship on the electric railways.

The minutes of the previous annual meeting were then read. The constitution and by-laws were adopted as approved by the executive committee.

PRESIDENT'S ADDRESS

The next order of business was the address of the president, C. L. S. Tingley. Mr. Tingley presented a short retrospect of the history of street railway transportation in Pennsylvania beginning with the charter granted on April 4, 1854, to the Frankford & Southwark Philadelphia City Passenger Railway. He showed by quotations from the statutes how a great body of street railway law had been built up from the first simple enactments.

In much the same manner Mr. Tingley traced the technical development of the electric railway, and he put particular stress on the rapid obsolescence of the successive types of equipment used by the present electric street railways.

In his judgment the government cannot treat the public utilities as it treats private enterprise. The answer to this question must be "No," for the government fixes the rate at which the public utility sells its service and may thereby prevent the recouping of development losses. On the other hand, the private enterprise fixes its own rates and in the event of competition preventing adequate returns may pocket its loss and go out of business, whereas the public utility must perform its public duty and continue to furnish service whether it makes a profit or no.

The public is composed of all the people, and in that public are included not only the consumer but also the investor, and the investor is just as much entitled to the beneficent influence of government as is the consumer. To quote from a recent address by Charles A. Prouty:

"Many persons seem to hold the opinion that the government in dealing with monopolies like the railroad owes nothing to the investing public. *Caveat emptor*

(Let the buyer beware)! Such has never been my thought. The investor is a necessary part of the well-balanced State and is often in need of protection from public authority. It is the duty of the government, within reasonable limits, to see to it that the would-be investor is not hoodwinked in the making of his investment and that the value of his investment when once made is not improperly destroyed."

This is a doctrine which all regulators of public service would do well to bear in mind, especially in view of the facts with respect to the railway industry which will be disclosed by the records of the Bureau of Railways in this State and which will unquestionably be written large in the records of our Public Service Commission. The facts are that a very large majority of the street railways in Pennsylvania have never made any return to their owners and in all probability some of them never will. Their only justification for existence is that they perform useful public service in their communities, without which their communities would languish and stagnate.

He did not agree with Mr. Prouty, however, that the expression "unearned increment" could be applied to the increase in the value of a railway's right-of-way because of the growth of the city which it served. He asked, would Philadelphia, Pittsburgh, Scranton, Reading, Harrisburg and other towns be teeming, thriving centers of population to-day if it had not been for the foresight, the nerve and the enterprise of the projectors of the public utilities of the Commonwealth of Pennsylvania?

The electric railway business had entered upon a new era in the State of Pennsylvania. The last Legislature in its wisdom had created a commission to regulate and supervise the electric railway industry. This commission could be an instrumentality of great good or it could be an instrumentality of tyranny and oppression. He believed it will be the former. While there were many things in the law creating that commission which personally he would like to see changed, yet they were mostly questions of detail. On the whole he believed that the law was good.

The governor had given them commissioners of whom the State might well be proud. They were men of broad and highly educated minds, men of integrity and standing and before whom no man need fear to stand and argue for his rights. They were, however, largely uninformed as to the details of the electric railway business, and it was up to the railway men, by a fair, free and frank discussion of all matters which come before them to educate them in the intricacies of the electric railway industry; and this education must not stop with the commission. The people must also be educated to deal justly with public utilities.

There had been much outcry against the lobby, but no man had the right to point the finger of scorn at the man who in a lawful and open manner petitions the Legislature for what he believes to be his right. The public must be educated on that line. What is more important still, the public must be educated to select fit men to sit in the halls of legislation. The public utilities of Pennsylvania to-day were asking nothing but justice and fair dealing, they were asking nothing but a right to live and get a reasonable return upon the money invested in their property, but they were asking that they should be protected in that right. They

should, therefore, endeavor to see to it that the electorate in their home communities select men of intelligence and integrity to represent them in the Legislature, men who will not be influenced to do that which is unjust or inequitable simply because there appeared to be a momentary popular clamor for the doing of that thing, men who will leave to the body which the State has created the adjustment of all matters of detail with respect to the electric railway business, men who will not take snap judgment and pass hasty and ill-considered legislation affecting electric railway interests vitally, and who will legislate only when the commission advises them that it has not sufficient powers in the laws already upon the statute books.

TREASURER'S REPORT

H. M. Stine, secretary and treasurer, reported the receipts and expenditures of the association for the six months ending May 5, 1914, as follows: Balance last report, \$1,471.96, plus dues and membership fees, including a balance of \$264.91 from the absorbed Keystone Club, \$2,206.87; expenditures, \$660.84; balance in treasury, \$1,546.03.

TRANSPORTATION COMMENTS

The next order of business was a paper entitled "Transportation Comments," by P. T. Reilly, superintendent of transportation Scranton Railways. Mr. Reilly first discussed relations with the public. Street railways were now recognized as public utilities and their operators were considered public servants. The legislative enactments of city, county and State and the demands of labor union representatives all expressed the voices of the people. Hence it was more necessary than ever for the street railway operator to be acquainted with his public and to give that public a proper knowledge of railway problems.

The passenger wanted safety, courtesy and at least reasonable convenience. These requirements were met to a wide degree by selecting careful and competent platform men. It was the practice of his company to pay no attention to letters of introduction or recommendation, but to size up a man even before handing him an application blank.

With regard to demands for more service, Mr. Reilly said it was the duty of the operator to educate his public about the financial side of the business. The American people were disposed to treat fairly those who were honest with them. A superintendent could not call the people into his office, give them seats and tell each individual why certain schedules were not maintained, why certain business was unprofitable or why more cars were not operated, but he could reach all of them through the public press.

EXPLAINING SERVICE COST TO THE PUBLIC

As a concrete example of effective publicity, Mr. Reilly mentioned the recent Billy Sunday revivals at Scranton. At first, it was the general impression of most Scrantonians that the extra business of the street railway in taking the crowds to and from the tabernacle was very profitable. Toward the end of the revival campaign, however, the newspapers were presented with the figures on the business derived from this source. The data were published and commented on freely, and the public learned that the company had actually lost money on this short-peak traffic. The reasons for a loss instead of a gain were due to the following conditions:

The tabernacle was located in Scranton on a double-track line about $1\frac{1}{2}$ miles from the center of the city. It seated about 9000 people and accommodated about

12,000 in all. The afternoon business did not amount to much except on Mother's Day and the day on which Dr. Sunday preached on "The Second Coming of Christ." The evening crowds were always so good that on many occasions thousands of persons were turned away. The night crowds started for the tabernacle about 5 p. m., and the rush was on during the 6 o'clock peak load. On week days the company operated a two-minute service on the tabernacle line commencing about 12.30. On Sundays it operated a somewhat more frequent service, commencing about 8 a. m. and continuing until it was time to stall the cars. Many of the people who attended the services were aged persons, and the railway found that a more frequent service than a car each two minutes caused congestion because this amount of time was consumed in unloading and crossing cars over a temporary portable crossover near the unloading point. After the afternoon service the company ran six extra cars, and after the evening service fifteen extra cars were stalled in front of the tabernacle and scheduled for different sections of the city.

From the beginning of the campaign, many of the churches were closed, and the theater business, shopping trade and general afternoon and evening travel fell off considerably. Travel converged largely on the tabernacle line, and about 30 per cent of this business was on transfers. For some time preceding and during the campaign many cottage prayer meetings were held. As these meetings were confined to small areas, people would walk to them instead of riding somewhere else. A close analysis of the traffic led the railway to conclude that little new business was created by the Sunday campaign. The same people or nearly an equal number would have been riding somewhere else if Dr. Sunday was not in Scranton. On the other hand, the railway would not have been compelled to furnish so much additional car service to accommodate the patrons. If the tabernacle had been located in a central place which would require no extra car service outside of additions to main lines some new money would have come to the railway, but when located on a side line some distance from the center of traffic the extra expense more than balanced the new business created by the revival.

Dr. Sunday was in Scranton fifty days, namely, from March 1 to April 19, inclusive. He conducted two services each week day, except Mondays, and three services on Sundays. The newspapers estimated the total attendance at 675,000. The railway carried 264,470 cash fares and 56,046 transfers. The total receipts from the tabernacle business amounted to \$16,025.80, while the extra car service furnished amounted to 7631 hours. On taking the expense of management, general expenses and other items not directly connected with the operation of these cars, the cost of extra service was found to amount to \$9,163.20. Estimating one-third of the travel as new business (and, in Mr. Reilly's judgment, this estimate was high) the company's loss amounted to \$3,921.27.

Mr. Reilly said that his company found that it paid to keep the public informed on what it is doing. It never tried to conceal anything, whether good or bad, from the newspaper representatives. In his opinion the feeling now existing against railroads was largely due to the fact that railroads did not talk to the people, while their enemies were continually going about raising and creating all the trouble they could.

LABOR PROBLEMS

During the past decade a new force had arisen with which the street railway superintendent had to contend. This force was the labor union. The day had

gone by when loyalty to his company stood in the way of the employee to loyalty to his union. This change had been brought about by conditions which had resulted in heavy increases in wages and better working conditions to all classes of labor. The Scranton company's practice in dealing with the union question was to settle any controversy where possible, first with the individual affected, or second, with the grievance committee. The final step was arbitration. In connection with arbitration, it was the policy of the union to ask that each side chose one man and that these two men chose a third. If they could not agree on a third man, he was to be appointed by one of the judges, the governor or some one else. Mr. Reilly's judgment was that to have two men on each side was a better plan. The company should be careful in agreeing to empower any other agency to appoint a fifth arbitrator. In the present trend of times, strikes were both unprofitable and unpopular for the persons who were responsible for them. It was his opinion that no strike could be successfully conducted against a street railway when the company was disposed to be fair with its employees and to see that proper newspaper publicity was used to bring its standpoint before the public. Of course, a stopping point as in wage increases, must some day be reached, but before that time arrived labor unions would be regulated by law and persons who inaugurated a strike or lockout that affected a public service company would have to deal with the law and the courts.

ACCIDENT-SAVING VALUE OF OLD EMPLOYEES

When a man is employed by the Scranton Railways every possible means is used to educate him to the company's methods and to keep him in the service. The last thing it did was to discharge him. An old employee was rarely discharged. The company found it very unprofitable to do so. Mr. Reilly had compiled figures on Scranton Railways accidents for six years, with the following striking results:

- 58.4 per cent of all accidents occurred to men in their first year of service.
- 24.3 per cent of all accidents occurred to men in their second year of service.
- 7.1 per cent of all accidents occurred to men in their third year of service.
- 5.8 per cent of all accidents occurred to men in their fourth year of service.
- 4.1 per cent of all accidents occurred to men in the service more than four years.

The average annual cost of damages for a first-year service man was \$236.81; for a second-year service man, \$146.63; for a third-year service man, \$100.61; for a fourth-year service man, \$95, and for men in the service more than four years, \$48.47. These figures showed conclusively that it did not pay to discharge the older men in the service unless it was absolutely necessary to do so.

COURTESY

In conclusion, Mr. Reilly said that in conducting a street railway, the superintendent had to encounter the necessity of having "one-hundred point men" on his cars. "A hundred-point man" had been described as "One who does not listen for insults nor look for slights; who carries a civil tongue in his head; who is polite without being fresh; who is moderate in his habits; a man who is willing to learn. Men having these requirements differ very much in ability, but this is always true: they are safe men to deal with whether drivers of drays, motormen, clerks, cashiers, engineers or presidents of railroads." The motto of Marshall Field was: "The customer is always right." This was

not a bad motto to get into the minds of street railway conductors. When a conductor got into the natural habit of disputing or taking issue with patrons, he was not working in the interest of his employer. The man who did not work for his employer's interest was not worthy of his job. The company endeavored to impress this fact on the minds of its men.

In brief, let the street railway superintendent strive for peace—peace with his own employees and with the public, for peace was the soil in which prosperity grew.

Following Mr. Reilly's paper, the question box was presented but was held over for discussion at the Wednesday morning session. Mr. Senter, Philadelphia, reported on the subject of car jacks. The railway representatives had recommended to the Public Service Commission that the jack should be of sufficient capacity to lift one-fourth the weight of the car. The subject was still under advisement by the commission. The question of sanitary drinking cups for cars is also before the commission. The meeting was then adjourned.

TUESDAY NIGHT ENTERTAINMENT

At 8 o'clock Tuesday evening, F. E. Elwell, representing B. L. Van Shaick, Philadelphia, gave a demonstration at the Board of Trade Building of the Pathéscope, a portable moving picture outfit with non-inflammable films. The Pathéscope displays a film only 20 per cent smaller than standard in reels up to lengths of 400 ft. As examples of what could be done with this small machine Mr. Elwell displayed films of the ice, coke, sugar and cheese-making industries.

QUESTION BOX

The first order of business at the Wednesday morning session was a discussion of the question box. Galvanized steel pipes and steel-wire hoisting cable soldered to the web of the rail were among the methods recommended to prevent corrosion of grounds. One member had asked whether a gage for use with bond compressors was available, and it was the general opinion that such a gage was highly desirable. As to the question of how electric railways could get the most revenue from their car advertising concessions, one member expressed the opinion that the rate for advertising should bear some fixed proportion to the earnings instead of being on a flat-rate basis over long periods. Messrs. Heindle, Wilmington and Rockwell, Pottsville, said that personally they would like to see the cars free from all kinds of commercial advertising. Mr. Rockwell stated that in the earlier days of the industry cars carried big outside signs and banners, but these had been discarded for both esthetic and safety reasons. He also believed that advertising on a commission basis was the most profitable to the railway.

In response to the question about track work, Mr. Alden, Pennsylvania Steel Company, stated that renewable centers were now so made that they could be replaced from the top without disturbing the paving. As a general rule, if a company operated 100 miles of track or more it could afford to employ special work maintenance men and then it would pay to use renewable hard center work; but on the properties of smaller companies solid work would often be better because the best results from renewable centers depended on proper maintenance.

In reply to a query about Mazda Lamps, Mr. Green, York, said that three years ago he had begun the use of such lamps on several city cars and they were now being installed on suburban cars. It was customary on his system to use the lamps for three months in signal service and then to place them in the cars. In this way, of course, the lamps burned out where they could

be readily replaced. Mr. Phillips, Pittsburgh, informed the members that the equipment committee of the American Electric Railway Engineering Association was making a detailed study of car lighting. His own experience was that the tungsten lamp was not particularly economical but it certainly did improve the illumination of the cars. Referring to the question about how many cars a man should be able to clean in a day, Mr. Phillips pointed out that this number varied widely according to local atmospheric and industrial conditions. Thus, when he was in Cleveland one man cleaned twenty-three cars a day whereas in Pittsburgh the record is only nine.

ADDRESS BY MR. CATTELL

James Cattell, city statistician, Philadelphia, was introduced during a suspension of the discussion on the question box. Mr. Cattell made a most eloquent and optimistic address which was all the more impressive to his audience because of his advanced years. He had seen Philadelphia grow from a city of 70,000 to one of 350,000 homes, and he ascribed a great deal of the credit for this growth to the street railway. Every twenty-four hours the trolley cars of Philadelphia ran ten times the circumference of the earth, 250,000 miles, and all of this mileage was made within the municipal limits of Philadelphia. Fifty years ago forty-five minutes was required to ride from Camden Ferry to the Pennsylvania station at Broad Street; to-day, it took ten minutes to make the same trip. The still greater traffic improvements in sight would make it possible to go almost anywhere in Philadelphia in ten to fifteen minutes. Such transportation facilities were of incalculable advantage to manufacturers and the working class. Mr. Cattell also spoke entertainingly of the currency and tariff questions. At the conclusion of his address, he was tendered a rising vote of thanks on motion of C. B. Fairchild, Jr., statistician Philadelphia Rapid Transit Company.

ANALYSIS OF DAMAGE CLAIMS

Cecil G. Rice, superintendent claim department Pittsburgh Railways, then presented the paper on "Analysis of Damage Claims," which is abstracted herewith:

Literally a claim presupposes a right to make the demand or request. Practically speaking, a claim for damages for personal injuries or loss of property is merely an allegation of indebtedness and does not become a liability until proved. I undertake to state as facts that the popular belief that a traction company is easy prey for professional fakers is a mistaken one, and that such of the professionals as once existed have become almost extinct.

It may be interesting to give a thought to the reason for the prejudice and suspicion which heretofore existed in connection with claims adjusting. From the time when the early English kings first granted a right or franchise conferring certain privileges upon such of their subjects as would pay the price until more or less recently, it was considered proper to grant perpetual franchises to public and quasi-public utility corporations. Had it not been for such grants our present commercial and economic development might have been but a vision. On the contrary, I venture to assert that had these corporations been compelled to pay a fair price for the privileges, the corporations would have been far better off. It was this apparent giving of something for nothing that caused the seemingly favored corporations to be singled out as fit subjects from which to get something if it could be secured without regard to the how of it. That was the fault of the public. Then the plan of paying John Doe for the killing of a cow (although

by killing said bovine Mr. Doe may have been saved incinerating charges) was developed as a means of secretly reimbursing John for past services or influence. That was the fault of the corporations. Later, as legitimate claims were presented there developed a class of adjusters who read law from city directories, who palmed off a careless conductor as a son who had just married and would lose his job unless the injured person would waive any claim for damages, and who did other things equally reprehensible. That was the fault of the claim agent.

It is small wonder then that the public became prejudiced and suspicious. This attitude has not been easy to overcome, although the cause for it was long since removed. The new era dawned when claim adjustment was placed on a purely business basis. Claim costs are in reality a fixed charge the same as depreciation, taxes, power and the many other things which eat up the profits of an extra-hazardous industry. No longer does the claim adjuster quake and tremble when a claimant appears. System has taken the place of hazard, fairness has replaced fraud, equity unseated injustice, and the claim adjuster has taken his proper place among the higher officials of the electric railway transportation world as an honest, dignified, responsible and respected individual. It may be that he is still the most criticized, but only because the least understood.

In this State the damages recovered in suits entered against traction companies barely equal the expenses of the courts, lawyers' fees and the other charges. Surely this evidences progress and a wholesome divorce for all time from the old order of things. The fact remains, however, that if two street cars collide and passengers are maimed or injured, it is merely a question of cancelling the resultant liability. A release is wanted and it must be paid for. Other claims may be a question of fact for the jury, not clearly liability. Often it is advisable to buy this claim on an underwriting basis. If the operating men are as efficient in preventing accidents as the progressive claims men are in preventing fraud and adjusting legitimate claims, there should be many pages of the "Injuries and Damages" ledger available for income tax records.

Principals are more receptive before an accident than afterward. Therefore, there are six things of which the claims man and those who co-operate with him honestly seek to convince the public, namely:

First—If an accident occurs the principal should not depend solely on the conductor to make a report, but should secure the number of the car, number of motorman or conductor, the exact location and the time of the accident.

Second—If any personal injury or property damage results for which the principal feels he was not to blame, and intends to make a claim, he should report the accident to the claim department, together with the names of his witnesses, and give every assistance in making an investigation of the facts.

Third—The adjustment of claims is purely a business proposition and should be handled on the same basis as any other allegation of indebtedness.

Fourth—Any legitimate claimant who makes a reasonable demand can secure a satisfactory disposition of his claim without the assistance of an attorney.

Fifth—Only two classes of people need bring suits against the railway companies, namely, (a) Persons entitled to something but who want more than they are entitled to; (b) Those who are entitled to nothing but who want something anyway.

Sixth—Remember, we seek your co-operation to prevent accidents to yourself and to others.

While burdensome, the carrier's duty is clearly de-

fined and is for the most part reasonable and practicable. It is assumed that when a passenger boards a street car and pays a fare he enters into a contract with the company upon whose car he rides. The company is not made an insurer of its passengers. It does not guarantee him freedom from any and all injury. The assumed contract does, however, require the company to transport the passenger to his destination without injury which could have been prevented by the exercise of the highest degree of care, skill and human foresight on the part of its agents. Because the means and appliances of transportation are under the sole direction and inspection of the carrying company, such company is held responsible for any injury to passengers resulting from defects. The company is responsible for the acts of its agents within the scope of their duty only. To support a claim for damages, four things must be determined in each instance, and viewed according to the circumstances:

First—Was a duty owed the principal by the company?

Second—Did the company fail to perform that duty?

Third—Was the failure to perform the duty owed the proximate cause of an injury or loss to the principal?

Fourth—Was the principal free from contributory negligence?

It will be noted that no inconsiderable task is thus mapped out for the director of claims, particularly when it is remembered that each fact must be considered "according to the circumstances," and that facts cannot be unearthed for the mere asking. In a large claims department this work is handled by the clerical, investigation, medical, adjustment and litigation claims bureaus, each working separately, yet in harmony. They have fixed principles to guide them, such as:

Maximum accuracy, utmost expediency, absolute fairness, persistent courtesy, minimum consistent expenditures and perfected co-operation and efficiency.

With the obtainable facts at hand the claims may then be divided as follows: *First*—*a*, personal injury; *b*, property damage. *Second*—*a*, women; *b*, men; *c*, minors. *Third*—*a*, liability; *b*, question of facts; *c*, no liability. *Fourth*—*a*, litigated; *b*, current.

It is now that the adjuster is confronted with his most difficult task—that of determining a limit of settlement, no settlement, or suit. Intuition, judgment and facts are massed against his six vulnerable points of attack. They are:

First—Personality of the principal.

Second—Actual and probable pecuniary losses and expenses.

Third—Duration of disability, total and partial.

Fourth—Character and strength of defense to liability.

Fifth—Influences which may control principal's course.

Sixth—Policy.

First—At this point the personality of the principal is far more important than the facts of the accident. In reality the adjustment is with the principal, not of the claim. No two claims nor no two principals are alike, for which reason the value of injuries cannot be made standard. Judgment must be guided by the particular facts in each individual case, but character, capacity and capital are fundamental considerations. Other controlling facts are too numerous to list.

Second—The losses and expenses are readily susceptible of accurate computation. Just as a grocer or manufacturer receives an invoice of goods shipped him checks their receipt, price, condition and quality, so the adjuster must list each and every item, adding to or taking value from the claim. This is largely a matter

of mathematics, the results of the investigation made being his rule.

Third—The medical bureau is depended upon to furnish correct diagnosis and prognosis. The advances in this semi-exact science makes the opinion of the doctors reasonably certain, provided they observe and keep in mind the principal's environment, temperament and social status.

Fourth—It is necessary to go behind the written statement of the witnesses accurately to determine their value, the occupation, appearance, permanency of residence and honesty of the witness each wielding an influence. Usually witnesses have four periods: The "egotistical," when they insist they saw everything clearly and know exactly how the accident happened; the "unreasonable," in which they refuse to "get mixed up" in any case in court and declare they have forgotten what did occur; the "reasonable," in which they admit their recollection is clear and that it is their duty to testify to the facts as they know them; and the "confused," wherein the rapid-fire questions of the attorney for the plaintiff, the dignity of the judge, the gaze of the spectators, and his own self-consciousness combine so to confuse as to leave the witness merely an exhibit.

Influences which control the principal's course are: *a*, The advice of an unscrupulous doctor, desirous of building up a big bill without considering the best interests of his patient; *b*, the soliciting lawyer, like a disease germ, burrowing for an opportunity to inject his putrid personality into an otherwise respectable business transaction; *c*, the neighborhood informant who knows of "a woman who once got some money in court after her claim had been declined," or of another woman who "got an attorney to sue for \$10,000," the informant being ignorant of the fact that only about 2 per cent of the amount sued for is recovered in court; *d*, the dishonest juror who says: "Well, boys, how much?" rather than "Now let's consider the facts."

Sixth—Questions of policy constantly arise and sometimes overshadow the matter of liability. The injured man with a large family, the ignorant foreigner or the teamster deprived of a livelihood by the destruction of his dray, though clearly the result of their own negligence, slip in under this heading at times and are reimbursed more in the nature of a gratuity than damages.

With a decision arrived at the astute adjuster does not allow the overwhelming odds to deter him, but confidently, fearlessly, consistently and diplomatically proceeds to the accomplishment of the desired ends. Having shown his resourcefulness and progressiveness by embodying in his preliminary work the highest business ethics, scientific management and efficiency, he now turns to the oldest yet least understood of the sciences, psychology, the science of the mind. How he does it is too detailed for description, but what he seeks to accomplish and the successive steps taken are these: To overcome prejudice, to inspire confidence, to analyze and reduce to a business basis, to create a desire, to cause a determination and to satisfactorily close the transaction.

When the adjuster has relieved the mind of doubt and animus and created a feeling of gratification by having set right and made amends for possible wrong or injury done, then only has he most successfully terminated the matter in hand.

MISCELLANEOUS BUSINESS

Before the close of the meeting, Mr. Vickery, Pennsylvania Steel Company, and Mr. Parsons, Westinghouse Electric & Manufacturing Company, spoke on what the manufacturers could do to advance the interests of the Pennsylvania Street Railway Association.

Mr. Vickery mentioned the recent organization of the Manganese Track Society and described how it was co-operating with the Maintenance of Way Association toward the attainment of higher standards in special work manufacture and maintenance. Mr. Parsons thought it would be a good plan to have a manufacturer's representative on such committees where their advice would be of service. He also suggested that at each meeting of the association some manufacturer be invited to present a paper on the latest developments in his line.

President Tingley thanked Messrs. Vickery and Parsons for their suggestions. He said that the Pennsylvania Street Railway Association would certainly be glad to co-operate with its new members, the manufacturers and supply men, on committees and in other ways.

The meeting was then adjourned for luncheon at the Harrisburg Club and for a trip to the frog and switch department of the Pennsylvania Steel Company.

TREATMENT OF RAILROAD TIES

A paper on this subject was read by W. F. Goltra of Cleveland at a meeting on May 8 of the Central Railway Club. Mr. Goltra said that at the close of the year 1903 there were twenty-seven tie-treating plants in operation, with an aggregate capacity of 21,350,000 ties per annum, or its equivalent in timber and other material, while at the end of the year 1913 there were ninety-four plants with an aggregate capacity of 109,441,000 ties per annum. Thus, while the number of treating plants has quadrupled, their capacity has quintupled during the past decade. In 1913, 36,250,000 ties received preservative treatment, being 25 per cent of the entire number purchased by the steam and electric railways during that year. During the same year 100,000,000 gal. of creosote oil and 25,000,000 lb. of zinc chloride salts were used in the treatment of wood by the treating plants in the United States.

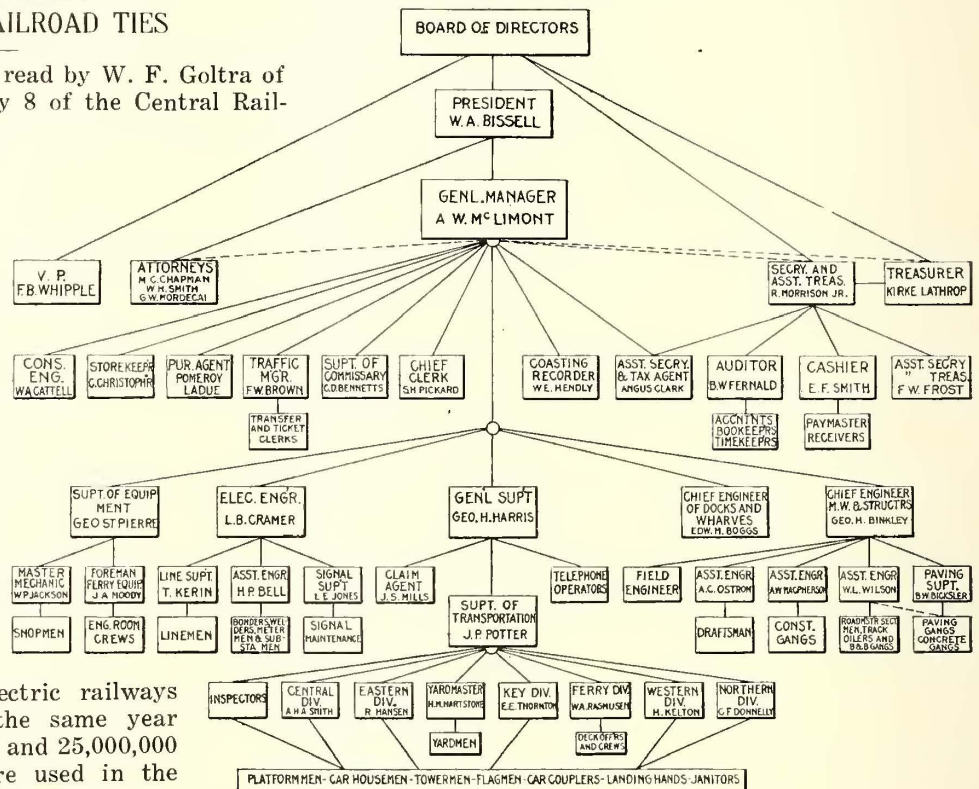
Mr. Goltra says that while there is no doubt as to the beneficial results secured by treatment, there is some doubt as to what woods ought to be treated, as to what preservative treatment should be given, the effect of climatic and other conditions, the cost of different preservatives delivered at the plant, the manner of seasoning and preparing for treatment, the supply and price of timber, the amount and weight of traffic over a given line, the use or non-use of tie-plates, the weight of rail, etc. He therefore recommended to the members of the club the importance of further study of timber preservation.

The provisional plans for the electrification of the Buenos Ayres (Argentina) Great Southern Railway have recently been approved, on condition that the work be completed by December, 1915. It is proposed to work the urban zone electrically, which would connect the Buenos Ayres Great Southern Railway with the Anglo-Argentine tramway system.

ORGANIZATION CHART, SAN FRANCISCO-OAKLAND TERMINAL RAILWAYS

The ELECTRIC RAILWAY JOURNAL of Dec. 6, 1913, contained an organization chart of the San Francisco-Oakland Terminal Railways as then constituted. A. W. McLimont was appointed general manager early in January of this year, since which time a number of changes have been made in the organization and personnel as shown in the accompanying diagram.

One of the most important changes is that the mechanical and electrical department has been divided between a superintendent of equipment and an electrical engineer, each with the subdivisions indicated. In examining the diagram it is interesting to note that the company has established a department for handling all matters in connection with the use of coasting recorders. The ferry personnel of the company are not in one department but are distributed among the mechanical and operation divisions of the railway. The signal work



Organization Diagram, Oakland

is under the jurisdiction of the electrical engineering department instead of the department of maintenance and structure. It is notable also that the latter department does paving direct instead of letting it out on contract. The claim agent reports to the general manager through the general superintendent. The company maintains an internal telephone system, the operators of which report directly to the general superintendent.

EXHIBITORS AT THE SAN FRANCISCO EXHIBITION

According to G. W. Danforth, chief of the department of machinery Panama-Pacific Exposition, great interest is being taken by manufacturers in the exhibit. Subscriptions have been entered for most of the space in Machinery Hall. Some of those whose names have been given out to the press are: General Electric Company, Sangamo Electric Company, Edison Storage Battery Company, Chisholm & Moore Manufacturing Company, Cincinnati Planer Company.

All-Steel Cars for the Michigan Railway

The Cars for This New, 2400-Volt, Third-Rail Line Possess Many Remarkable Features in Design, Including the Use of Folding Steps for the Center-Entrance, an Observation Compartment at the Front End, and the Complete Elimination of Wood from the Construction

The first car for the Michigan Railway Company, the new 2400-volt third-rail line in eastern Michigan, has recently been completed by The J. G. Brill Company and shipped to the General Electric Company for installation of the electrical equipment. The car, which is a sample of the twenty all-steel units that will comprise the original equipment of the new line, is a remarkable one in many respects, and it presents numerous features of striking originality in design fully commensurate with the fact that it will be operated by current from a third-rail charged at 2400 volts, the highest third-rail voltage ever attempted.

The new line, which extends over an air-line route between Kalamazoo, Mich., and Grand Rapids, Mich., a distance of approximately 50 miles, has been referred to in past issues of the *ELECTRIC RAILWAY JOURNAL* during the progress of construction. It is now approaching completion and will be placed in operation late in the autumn of the present year. A branch between Montith, Mich., and Allegan, Mich., is included in the present construction plans, as is also a line eastward to Battle Creek, Mich.

Connecting these cities a high-speed service is to be given, the permanent way as well as the rolling stock being installed in accordance with the highest grade of steam railroad standards. On the main line between Kalamazoo and Grand Rapids, an hourly service of one and two-car trains will be maintained. The limited trains will make the 50-mile run in an even hour, including probably two stops. This will give an average sustained running speed of approximately 55 m.p.h., an operating standard that is unprecedented for the steam roads with which the new line will compete. The local service will have a schedule time of 1 hour and 45 minutes for the 50 miles, giving a schedule speed of nearly 29 m.p.h., although stops will be made at intervals of approximately 2 miles.

The route between Kalamazoo and Grand Rapids will parallel the tracks of the Grand Rapids & Indiana Railway, and the service to Allegan and Battle Creek will compete with that offered by one of the Michigan Cen-

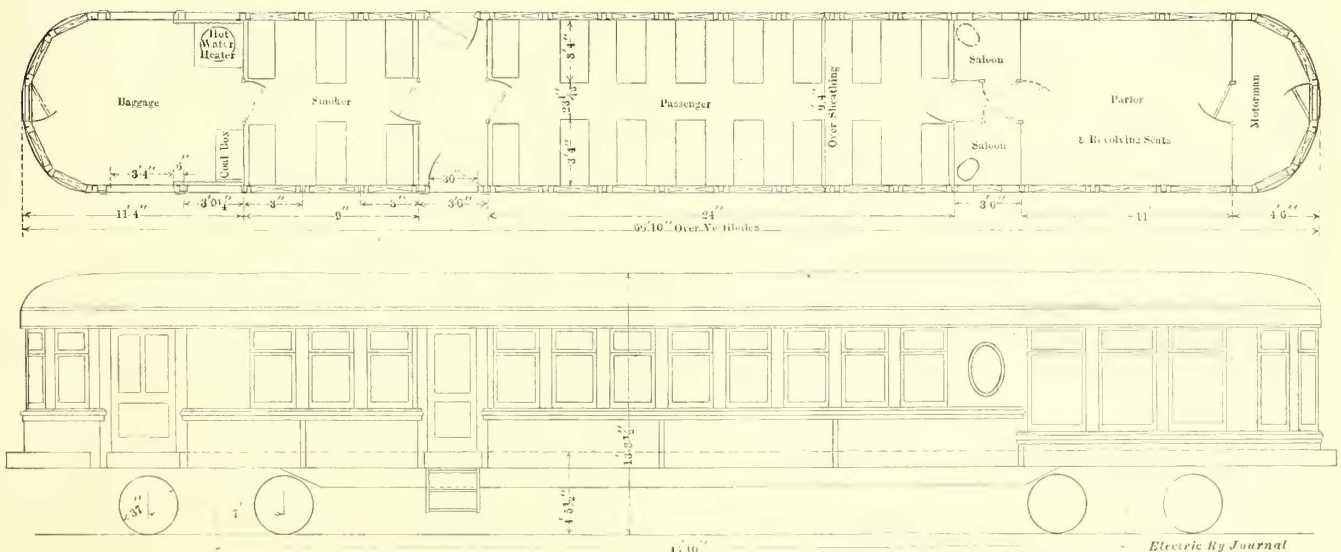
tral lines. Competition with these steam railroads, however, will not be confined to passenger traffic, but will cover time-freight and express business as well, and in view of the limited length of the trains that will be operated, at least during the early operating period, the cars for the line are to be universal in character so that all classes of business may be accommodated. This is perhaps the most striking feature of the car that has just been completed, as it is provided with a parlor-observation compartment and an express and baggage compartment in addition to the spaces for passengers and for smokers that are customary in interurban equipment.

GENERAL FEATURES OF DESIGN

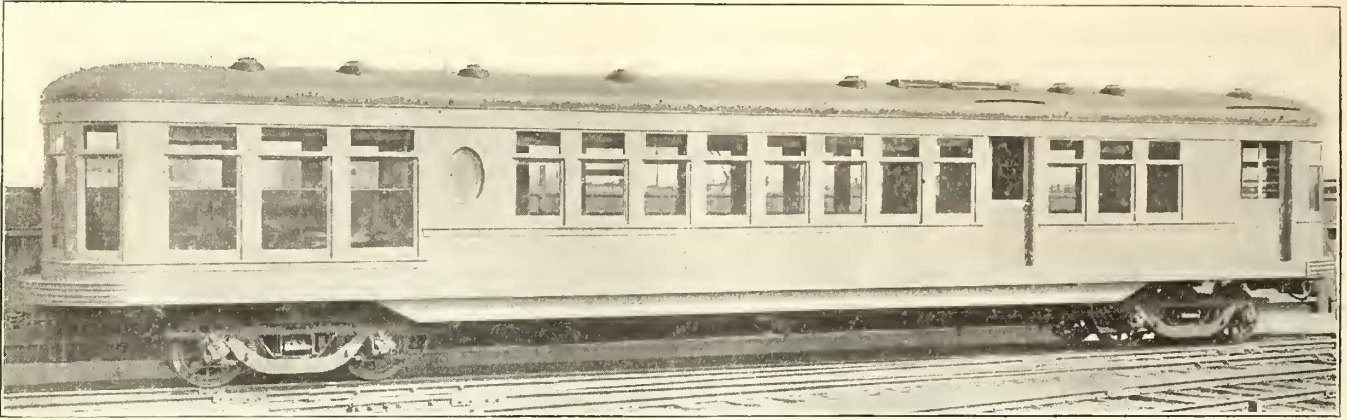
The arrangement of these four compartments is unique. Contrary to the usual custom the parlor observation compartment is at the front end of the car and the baggage compartment is at the rear. A small vestibule for the motorman is provided in front of the parlor-observation compartment, the two spaces being separated by a plate-glass partition, with the glass extending down to within a few inches of the floor. The front windows of the motorman's vestibule also extend down to this level, the passengers in the parlor compartment thus being enabled to see the track ahead of the car without leaving their seats.

Between the parlor-observation compartment and the regular passenger compartment there is a 2-ft. passageway, and on either side of this passage is a saloon. Between the passenger compartment and the smoking compartment is the main entrance space which is a transverse passage 4 ft. wide, doors being provided at each side of the car. At the extreme rear of the car is the baggage compartment, in which is located a heater, together with a coal box and a cabinet for lanterns and markers. The dimensions of the various compartments are shown in the accompanying line cut.

The illustrations show that the main entrance, which is at about one-third of the length from the rear end, is not provided with steps. This unusual condition is



Michigan Cars—Plan and Elevation Showing General Arrangement



Michigan Cars—General View Showing Door Arrangement and Large Observation Windows of Front End

due to the fact that most of the station platforms with which the new line will be equipped are of the raised type commonly in use upon rapid transit systems. However, at the entrance door on each side of the car there will be installed a set of swinging steps which can be moved out into position available for use when the car makes a stop at a point not provided with a raised platform. These steps are to be three in number, giving four risers up to car-floor level. The first rise, or that from the ground to the lowest step, will be 16 in., and the other three will be 12½ in. each. The steps have been designed by the mechanical department of the Michigan United Traction Company, and they will be applied at its shops at Albion, Mich. While the car is running the steps, which are hinged from the side girder, are swung out of the way under the bottom framing.

In addition to the main entrance doors there is provided a baggage door on each side of the baggage compartment. The latter doors, when opened, slide behind corrugated iron linings. There are also doors at both ends of the car, one leading into the motorman's compartment and the other providing additional entrance facilities to the baggage compartment. Double windows with raising lower sash are installed throughout, ex-

cept at the front end where the large plate-glass windows are located.

The interior finish of the car is without exception of agasote or steel. No wood of any description is used, making a thoroughly fireproof interior.

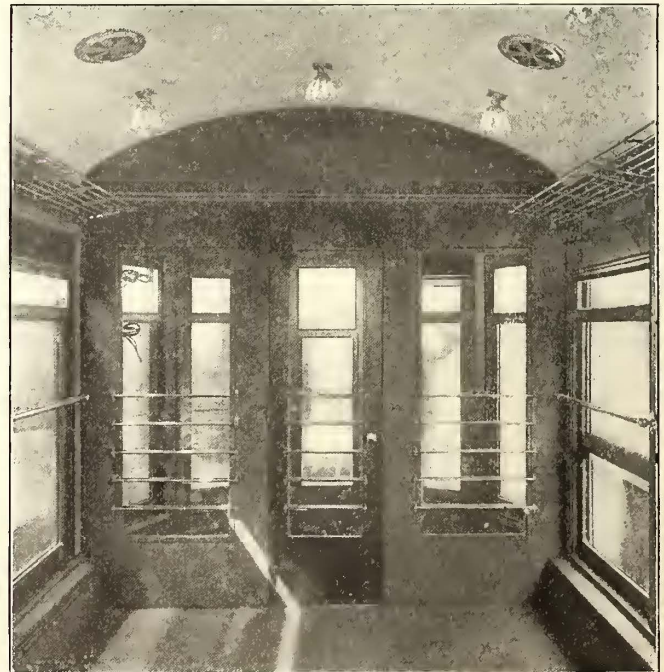
EQUIPMENT

The heating system is of the hot-water type and pipes are provided along the sides of the car near the floor, being supplied with hot water from a Peter Smith heater in the baggage compartment. These pipes extend around the motorman's vestibule at the extreme front end of the car so that the observation compartment is protected from cold drafts during periods of very low temperature. Lighting for all of the compartments is provided by rows of incandescent lamps over the seats, the observation compartment having an extra row of lights along the center. The lamps are provided with frosted reflectors to diffuse the light. This lighting system is to be operated direct from the 2400-volt line, as the lamps and wiring are insulated for that voltage.

The seats are of the "Walkover" type and they are covered with imitation leather in the smoking compartment and with plush in the passenger compartment.



Michigan Cars—Interior of Passenger Compartment with Seats Removed, Showing Arrangements of Lights and Heating Coils



Michigan Cars—View from Observation Compartment at Front of Car, Showing Low Windows of Motorman's Vestibule

The seats in the observation compartment are all of the revolving type, five of them being standard Pullman chairs.

Ingenious folding drinking fountains of the sanitary type have been installed at each side of the short passageway between the observation compartment and the passenger compartment.

The floor is of composition, and air space is provided below it to deaden noise and eliminate dust by introducing sheets of corrugated iron between the floor beams about 3 in. below the surface of the floor. The roof is of the plain arched type with a 1/16-in. steel sheathing, steel carlins and 3/16-in. agasote head lining. Sixteen Brill ventilators are installed on it, adjustable registers being provided in the head lining beneath each one.

The car is carried on a pair of Baldwin trucks with 37-in. wheels and 8-ft. wheelbase which are spaced on 46 ft. 10 in. centers. The trucks are equipped with the Baldwin roller side-bearings and they are designed for carrying inside hung motors on each side of the bolster as four-motor equipments are to be installed. Tomlinson radial couplers operated by chains carried out to handles at the sides of the car have been adopted and these swing on a radius of 5 ft., being supported on a carrier bar of 3-ft. 5-in. radius extending for practically a full semicircle at the ends of the car. This has been necessitated by the fact that the cars had to be designed to operate in trains around curves of 35 ft. radius.

The motor equipment as well as the air brakes are to be furnished by the General Electric Company. Owing to the fact, however, that the equipment is to operate on 2400-volt third-rail system not all of the details have yet been decided on, and for this reason no information regarding them is available at the present time, aside from the fact that four 140-hp, 1200-volt motors connected in pairs in series, together with multiple-unit control, will be installed on each car.

DETAILS OF CONSTRUCTION

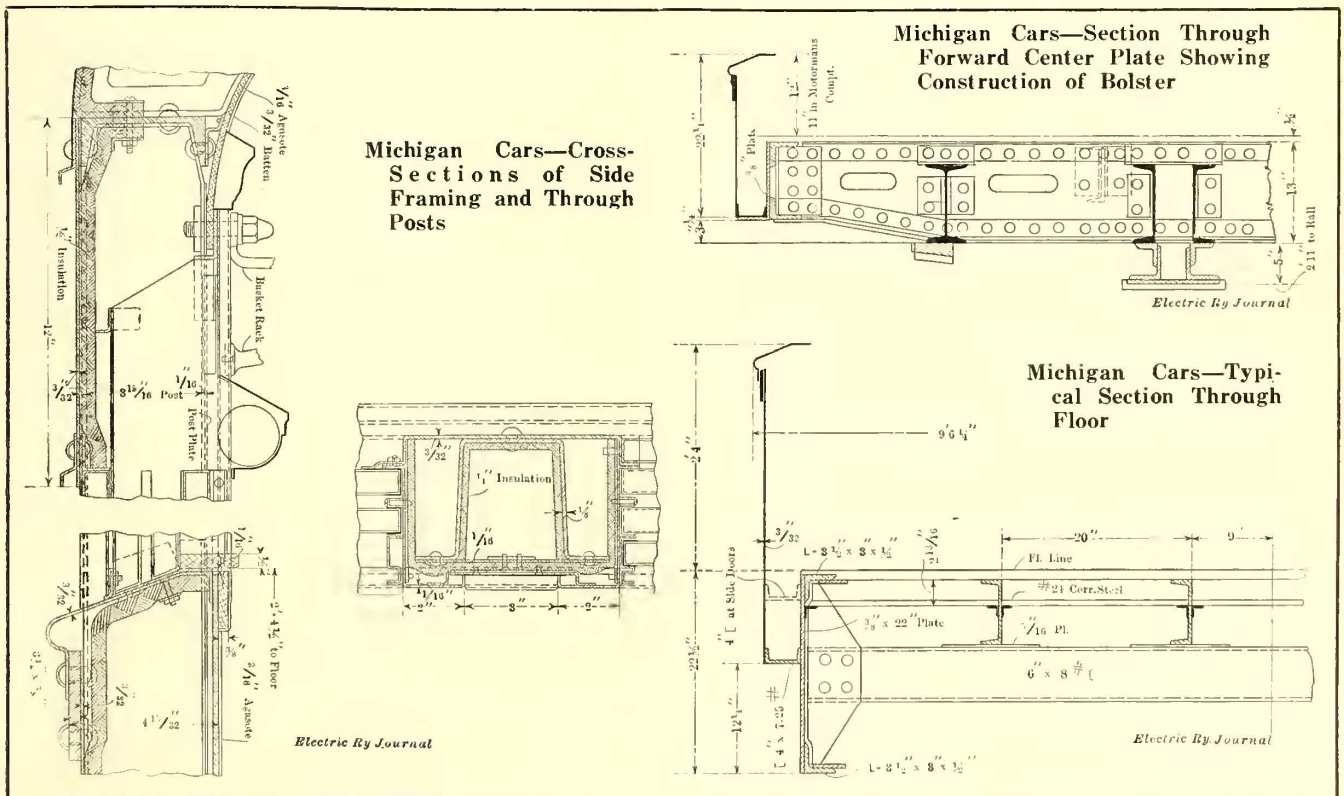
The car in general is of the side-girder type, and be-



Michigan Cars—Rear View of Car Showing End and Side Doors of Baggage Compartment

tween trucks the bottom framing is used only to carry the direct load from the floor. The bolsters are of the built-up type, but they are double, one transverse member such as is shown in the accompanying illustration being located 21 1/8 in. on each side of the center plate, which is carried on a pair of 10-in. channels extending between the two bolster members. These bolster members are also tied together at a point midway between the center and the side of the car by 10-in., 25-lb. I-beams.

The main supporting member of the car consists of a 3/4-in. plate which extends for the full length of the car and is framed into the crown pieces at the ends.



Michigan Cars—Cross-Sections of Side Framing and Through Posts

Michigan Cars—Section Through Forward Center Plate Showing Construction of Bolster

Michigan Cars—Typical Section Through Floor

Electric Ry Journal

Electric Ry Journal

Electric Ry Journal

Between the bolsters this takes the form of a fish-belly girder 22 in. high, but at the ends its height is reduced to 10 in. The bottom framing is made up of transverse 6-in., 8-lb. channels at 3 ft. 4½-in. intervals that are riveted to the side girders and act as crossings underneath the longitudinal floor sills, the latter being 7-in. channels. Upon the longitudinal channels the floor is directly supported, and, as previously mentioned, a sheathing of No. 24 corrugated steel is introduced about 3 in. below the floor for an air space underneath it.

The side posts are attached to the outside of the ¾-in. plate that forms the side girder, the latter being reinforced at the inside with 3½ in. x 3 in. x ½ in. angles. The posts, therefore, act as spacers, which necessitates the location of the side sheathing at a distance of approximately 4 in. outside of the side girder. This unusual construction is another unique feature of the car as the side sheathing is connected to the side girder only through a 4-in. channel, with the flanges up, at the bottom of the posts. This channel extends along the approximate center line of the side girder. The side sheathing is 3/32 in. thick. Insulation consisting of ½-in. of sheet cork is fastened inside of the side sheathing below the belt rail and inside of the letter board and the roof. The letter board, as shown in the accompanying illustration, is made up of 3/32 in. steel plate. It is riveted to the 1/16 in. steel roof. The steel carlins rest on a 4-in. channel, with the flanges up, that is riveted to the tops of the side posts. The head lining is of 3/16-in. agasote, as is also the side lining below the belt rail. The posts are U-shaped and are made of ⅛-in. steel with a cork lining. Across the open side of the U is riveted a post plate of 1/16 in. steel. To the outside of the posts is riveted the framework for the window guides, which is pressed out of 3/32-in. steel, and across the inside of this is attached a pressed steel lining that sheaths the inside of the post.

This side construction is maintained throughout the whole length of the car. At the ends, however, the posts are replaced with T-bars. The vestibule radius is 5 ft. 11 in. with a 3-ft. 4-in. radius at the corners. The crown pieces are made up on a 4-ft. 8-in. radius and are therefore semicircular in contour, this being made necessary to provide for the swinging of the coupler when operating the car around curves of 35-ft. radius.

GENERAL DIMENSIONS AND WEIGHTS

The length of the car over all is 66 ft. 10 in. with a 13-in. extension at each end for the crown pieces. The trucks are spaced on 46-ft. 10-in. centers. The width over all is 9 ft. 6¼ in., although the width over the sills or side girders is only 8 ft. 7 13/16 in. This is accounted for by the fact that the side posts are attached outside of the sills, necessitating a space between the sills and the sheathing. The weight of the body complete with couplers, but without wiring or electrical equipment but including foundation brake rigging and pipe, amounts to 65,200 lb. This includes 3000 lb. for seats and 2200 lb. for heater and piping. The motors and control battery will weigh approximately 31,600 lb., and the air-brake compressor and brake equipment will weigh 2200 lb.

The seating capacity is fifty-two, eight seats being provided in the observation compartment, thirty-two in the passenger compartment and twelve in the smoking compartment.

The trucks, complete with gears but without motors or other electric equipment, weight 32,000 lb., giving a total weight of the car and truck of 92,000 lb., and as the estimated weight of the electrical equipment is 33,800 lb. the total weight of the car will be approxi-

mately 131,000 lb., giving a weight per passenger of 2500 lb. notwithstanding the fact that the seating capacity is materially reduced on account of the 11-ft. baggage compartment at the rear end.

"SAFETY FIRST" CAMPAIGN AT BUFFALO

The "safety first" campaign recently inaugurated by the International Railway, Buffalo, N. Y., with the aid of Mayor Louis P. Fuhrmann and the municipal authorities, is meeting with the most gratifying aid from the English, German and Polish newspapers of Buffalo and co-operation from the railway company's employees, owners of vehicles, the Automobile Club of Buffalo and other commercial organizations. Thomas Penney, general counsel International Railway Company, is chairman of the so-called "municipal safety first committee." He is being aided by many of the most prominent and public-spirited men in Buffalo, who have been appointed members of the committee by Mayor Fuhrmann. L. H. Stickle of the claim department of the International Railway, is secretary of the committee. The general committee is divided into thirteen standing committees as follows: Schools and playgrounds, boy scouts, church and civic bodies, public institutions other than schools, vehicular and pedestrian traffic, structures and pavements, street railways, explosives, fireworks and firearms, hazardous trades, legislation, publicity, finance and membership.

Every street car carries dasher notices of the campaign. Some of them state: "Safety First—It never pays to take a chance." Others read: "Stop, Look, Listen—Safety First—Do it the right way."

All of the railway poles carry alternately the words, "Stop, Look, Listen," or "Safety First" painted upon them in white letters. Banners like those used in election campaigns will also be used. Lecturers have been allowed to go into the schools to teach the school children to be careful and think of "safety first."

Addresses are being given by members of the safety first committee and employees of the International Railway safety bureau to various business organizations, clubs, etc. With the aid and co-operation given by the members of the Taxi Drivers' Union, the Automobile Club of Buffalo and the Motorcycle Club of Buffalo, it appears as if the movement will be a great success. For instance, the automobile folk are distributing 50,000 circulars on the rules of the road, and 2000 "safety first" streamers will be carried on wagons.

At the request of Chief Counsel Penney of the International Railway, Dr. William H. Tolman, director of the American Museum of Safety, New York, spent three days in Buffalo during the week of April 27 to deliver nine lectures. He congratulated the city upon the ramifications of its movement by taking in not merely the street railway but all forms of vehicular traffic upon the city streets. Superintendent Michael Regan of the Police Department has sent out a message to every precinct captain instructing the police to enforce the traffic ordinances and to keep children off the streets and from catching on behind moving vehicles. Officers in charge of each precinct will be held responsible for avoidable accidents. The seven days beginning May 3 have been designated "safety first" week, during which interval an endeavor will be made to preach the crusade to everybody in Buffalo.

The provincial authorities of Milan, Italy, have sanctioned the scheme for the electrification of the Milan-Saronno Railway. The question of electrifying the steam railway between Rome and Tivoli is under consideration.

Arguments Against Public Ownership in District of Columbia

Clarence P. King and Thomas N. McCarter Condemn Plan to Enlarge Governmental Activities and Declare that Congress Has No Right to Repeal Contract Without Payment of Fair Value, Including Values for Franchises

The District committee of the House of Representatives held a hearing at Washington, D. C., on May 13, on the Crosser bill providing for municipal ownership of the street railways in the District of Columbia. Extended testimony was given by Clarence P. King, president of the Washington Railway & Electric Company, and Thomas N. McCarter, president of the Public Service Corporation of New Jersey. At a continuation of the hearing on the following day, Norman McD. Crawford, president of the Reading Transit & Light Company, discussed the subject with particular reference to conditions in foreign cities.

ARGUMENT OF MR. KING

Mr. King made the opening argument. He said that the companies in the District operate directly under an act of Congress and are really the children of that body. Congress directed that horse cars be abolished. As a result of this action, the company experimented with the cable, compressed air and storage batteries before it finally decided on and introduced the fine system of underground conduit under which it now operates. The underground conduit was introduced long in advance of any other city, and to-day Washington is the only city, excepting New York, that has this system. The system was installed long before the property could possibly earn any return on the cost.

In 1898, before the consolidated operation began, there were ten small companies, and people were obliged, Mr. King said, to change cars several times in order to make many trips, involving payment of several fares. This was very unsatisfactory. With glowing prospects for the future, capitalists purchased the various companies and began to do business through a holding company. The enterprise was unprofitable; the mortgage was foreclosed and the old stock was wiped out. In 1900 Congress again gave a great deal of consideration to the question. The result was a grant of authority for the issue of stock and bonds and a plan under which millions of dollars were invested. The city of Washington had benefited to the extent of many millions of dollars from the additional investment of capital made at that time. All things considered, Washington has, Mr. King declared, the lowest rate of fare of any city in the United States.

EMPLOYEES AND STOCKHOLDERS

Mr. King took up the situation from the standpoint of the 2000 employees and 2000 stockholders. Wages had been increased from time to time and other benefits given. Among these he mentioned the profit-sharing plan, the medical department, the pension system, the relief association for death and sick benefits, the loan system, rest rooms, the library, and such other matters as the Christmas entertainment and annual outing. Holders of the preferred stock waited for some years for a return and did not receive any until December, 1904. The first dividend on the common stock was paid late in 1909. All dividends paid on the entire outstanding stock from the beginning of the operation of the present company to the beginning of 1914 averaged 2.8 per cent per annum on the total par value.

In discussing the operation of the municipal water works of the city, Mr. King said that if private water works had been conducted in the same way they would have gone into the hands of a receiver long ago. In order to illustrate conditions in other cities, he showed photographs of broken poles and wires in Cleveland during a heavy storm in that city. This condition, he said, would not be tolerated in Washington. Answering some of the arguments presented at previous hearings, Mr. King said that New Orleans people had not heard of the reported municipal street railway in that city. No one knew whether the short municipal line built by the city in San Francisco would pay. The commercial prospects were not taken into consideration. He also declared that the conditions existing in Glasgow would not be tolerated in Washington. The plan to tax the city for the expenses of operation and to let people ride free he characterized as sublime, Utopian and Arcadian.

VALUE OF THE PROPERTIES

Mr. King also answered the argument presented in one address that the street railways could be reproduced for \$20,000,000. He showed that the market value, as of April 30, of the outstanding securities of the companies, based on the street railway properties, was \$47,798,000, as compared with a par value of over \$51,000,000. These figures were compiled at a time when all securities were very much depressed and also just after agitation on the subject of municipal ownership of the properties. Congress authorized the issue of the existing stock fifteen years ago, and, notwithstanding the large increase in gross revenues, no additional stock has been put out in the ensuing years. Mr. King declared that the property is worth more than the amount of the outstanding capitalization. If the properties could be bought for \$55,000,000 or \$60,000,000, the proposition to carry passengers for nothing or at a lower rate of fare would dissolve into thin air.

Mr. King declared that he found no fault with the principle of regulation, but that he did criticize the suggestion to give the commissioners complete control of properties. No street railways of any real importance are owned and operated, he added, by the municipality, although there may be a few "jerk water" roads. He quoted Halford Erickson, member of the Railroad Commission of Wisconsin, on the failure of municipal public utilities in that State to introduce proper methods of accounting.

EFFECT OF REORGANIZATION

In showing the development of the Washington Railway & Electric Company, Mr. King said that under the plan of reorganization the bonds and stock of the holding company were surrendered. For each bond there was given \$550 in preferred stock, \$550 in 4 per cent bonds and \$200 in common stock. Holders of the original bonds had paid par for each \$1,000 thereof. The securities received for each \$1,000 bonds are worth now about \$1,054. Of the stockholders, 1100 are women. Mr. King emphasized the fact that the change in type of construction was ordered by Congress, which gave practically a contract and franchise without limit.

In any valuation of the property, the history of the company from horse-car days would have to be taken into consideration. Other elements to be considered, he said, were the facts that the company is a prosperous concern, that great future growth is probable in Washington and that costs of development have been heavy.

TESTIMONY OF MR. McCARTER

Mr. McCarter, in introducing his discussion of the subject, said that he did not own a share of stock or any financial interest in either of the companies in the District. Although a lawyer by profession, he has been exclusively occupied for the last eleven years as president of the Public Service Corporation of New Jersey. He appeared before the committee because he conceived it to be his duty to give his views and utter a word of warning in regard to what he considered the dangerous experiment the members of the committee were considering.

PUBLIC UTILITY OFFICIALS AND PUBLIC WELFARE

Mr. McCarter said he would frankly state that his expert knowledge came from his connection with the company for the last eleven years and his practice at the bar for ten years previous when his time was given largely to the representation of companies of the same character. Over and above that, however, Mr. McCarter declared that he was an American; that he thought he was a good citizen and that he had the welfare of his country at heart. Of course, the views of men were likely to be biased by their life activities, but he resented the idea that a public utility official could not be interested in the public welfare of his country.

Answering a question from one of the members of the committee, Mr. McCarter said that he was not sure but that it was an unpatriotic thing for the government to introduce the parcel post. It would have been more patriotic if it had acquired the stock of the express companies at a fair valuation; although he held this opinion, he said that he did not own any express stock.

Mr. McCarter, in continuing, said that his first thought regarding the situation is that the whole scheme of municipal ownership is un-American. It was not suited to the form of government devised by our forefathers and handed down for generations. It would mean bureaucracy galore. It would mean that the government would take on an enormous army of men, and would also mean ultimate operation of the country by the government through this enormous army. The subsidiary companies of the Public Service Corporation of New Jersey had 12,000 employees and served 2,000,000 of the 2,500,000 people in New Jersey. If the same proportion held good throughout the country, there would have to be added to existing government or municipal employees from 600,000 to 750,000 men.

A member of the committee said that the federal government now employs 471,000 people.

BUREAUCRATIC RULE AND EVILS

Such an increase in the army of Government employees, Mr. McCarter declared, would mean bureaucratic rule, with all of its attendant evils. This was foreign to our conception of government and must work evil in the long run. It would be very disastrous to have scattered all over the country so large a percentage of people who would regard events from the standpoint of government operation. It would mean an enormous number of men engaged in politics. Mr. McCarter said that he thought this particular objection was not so

applicable to the District of Columbia as to the country at large. He thought, however, that the government should not start in Washington a precedent that might be so far-reaching as any action on this subject would be likely to be. The continuation of private ownership under modern regulation was decidedly preferable to embarkation on the sea of municipal ownership.

Mr. McCarter added that he knew that there had been scandals and cases of exploitation which should not have been permitted and which could not be permitted in the future. He thought that such developments could not take place now. There is, he declared, a very high-grade body of men engaged in the operation of public utilities at the present time. Such exploitation as occurred in the past could not possibly take place where State commissions existed. The speaker did not appear as an apologist for matters of this kind that had occurred in the past. However, since the development of the so-called scandal attendant on the failure of the Metropolitan Street Railway in New York, he knew of nothing of the kind that had gone on in the public utility industry.

THE LESSER EVIL

Mr. McCarter said that he did not want to be understood as saying that if there was water in the securities that necessarily condemned the companies. Men who had the hardihood to embark on experiments before the industries became standardized were entitled to profits as pioneers greater than a mere interest rate of return on the investment. The securities were issued under forms of law recognized and approved. Though there may have been evil in their issue, it would be a lesser evil to recognize the existing situation and securities now than to attempt to repudiate them. Mr. McCarter quoted the report of the Hadley Securities Commission in support of his statement on this point.

In the valuation of properties, Mr. McCarter said that the capital outstanding should be taken as a fair element. The courts would settle ultimately the principles of valuation. It would not be possible to depart from their decisions and everyone was bound to respect them. If Congress sought to condemn the properties, it would have to determine first the physical value. One way of doing this would be to fix the cost of reproduction. Another way would be to make a fair estimate of the cost of the property, based on the development of the art, with recognition of the fact that the companies could not have been expected to write off, from year to year, the costs due to the rapid development of the art.

Morally, the valuation should include out-of-date equipment. Mr. McCarter said that he thought that the public did not expect a company to continue to operate with old equipment. No company could keep pace with the progress of the art without destroying old equipment.

OVERHEAD CHARGES

After determination of the physical value, overhead charges should be calculated. These were just as much a part of the physical cost as the rails and other structural elements. There should be provision for promoters' profits, interest during construction, engineering services, contingencies, etc. The overhead charge would add approximately 20 per cent to the physical cost. The next step was to determine the development cost, or going value. This factor represented the money that was not made during the early and lean years. All authorities, including the higher courts, recognized this as a just element of value. Sometimes

this amount could be proved, sometimes it must be estimated. The New Jersey Board of Public Utility Commissioners added 30 per cent structural value to cover development cost. This value recognized the fact that all enterprises had lean years and permitted the capitalization of the difference between what was actually earned and what would have been earned, and also that a completed railway ready for business was worth more as an integral whole than the different parts segregated into individual elements.

If capitalization was not taken into account, the only test, Mr. McCarter continued, was the fair value of the property devoted to the public use. One of the members of the committee asked if this element of cost would not be destroyed in the case of a failure and reorganization of the property. Mr. McCarter replied that the present owners came into possession of the title by proper legal methods and that if the losses of their predecessors were part of the value of the property, they came into possession of that just as much as of the physical property. Perhaps the moral view would lead to the acceptance of the capitalization as the test.

FRANCHISES PERPETUAL IN WASHINGTON

At the commencement of the afternoon session, Mr. McCarter said that conditions in Washington were different from those in Cleveland, where, before the passage of the last ordinance, franchises had expired and the rights to operate were therefore limited. In Washington the franchises were perpetual. A perpetual franchise, the speaker said, is a right given by a proper government authority to a corporation or individual to construct or operate in perpetuity at a charge of a fair return on the value of the property devoted to the public use. The right to alter, amend or repeal an ordinance did not give the right to abrogate a contract. As a leading case, Mr. McCarter cited that of the Broadway Railroad in New York.

In addition to structural cost and development cost in case of the valuation of the Washington properties, Mr. McCarter said that a franchise value must be added. He cited as cases bearing on this point, *Monongahela Navigation Company vs. United States*, 148 U. S.; *Omaha vs. Omaha Water Company*, 218 U. S., and *Old Colony Trust Company vs. Omaha*, 230 U. S. The law is, he said, that there is a limitation on the power of the Legislature to alter or repeal, even though there is a reservation in the franchise. The right to revoke the charter of a company might exist, but the franchise could be sold by the company or a receiver. If the legislating body failed to fix a definite time for duration of the contract, in the opinion of Mr. McCarter, it created a perpetual franchise. Limitation of the life of the corporation did not limit the life of the franchise.

Representative Crosser asked if Mr. McCarter thought that there was no possibility of extinguishing the rights of the corporation if the legislating body failed to name a definite life for the franchise.

Mr. McCarter said that the public could protect itself through the rate-making power or through condemnation of the property.

BURDEN OF MUNICIPAL DEBT

Continuing his discussion, he cited the Consolidated Gas Company case as an illustration of an allowance for franchise value. The cost of acquisition would be an enormous sum of money. An experiment in municipal ownership would be a doubtful venture, and if cities throughout the country embarked on it the result would be an enormous increase in municipal indebtedness. It was best for all prudent men to consider whether it

would not be wise for the country to assume such a burden. Mr. McCarter gave statistics for the development of municipal indebtedness, showing that since 1880 State debts had increased about 100 per cent and municipal about fourfold, while the bonded debt of minor civil divisions had increased almost as much as municipal indebtedness. The existing capitalization of electric roads, \$4,708,568,141, meant an appalling addition to already large financial burdens.

Municipal governments, Mr. McCarter declared, had enough to do now. The national form of government in this country has been a marked success. Municipal governments had not achieved the same success and were, speaking generally, failures. There had been many evils in municipal management, including graft and corruption. To turn over public utilities to municipalities would add fuel to the fire and would be the most dangerous kind of economic policy. Mr. McCarter commended to his audience the book by Yves Guyot, the French economist on "Where and Why Public Ownership Has Failed."

CAN REPEAL CHARTER BUT NOT FRANCHISE

Members of the committee raised again the question of the right of Congress to repeal the franchises in the District of Columbia. Mr. McCarter repeated his conclusion that a reservation gave the right to revoke the charter, but not to repeal the franchise. It did not, he said, give the right to take away property granted under the act. Any other interpretation would mean that no capital could be raised on a franchise, because no one would advance a dollar if the right to operate might be taken away the next day. The public could protect itself by seeing that the companies obeyed the law and did not charge exorbitant rates. Answering an argument from one of the members of the committee, Mr. McCarter said that the indeterminate franchise was a different form of contract and meant the right to operate during good behavior. He said that he was not trying to be controversial, but was trying to give his opinion of the law as he understood it.

One expert had declared that if properties were owned and operated by the municipality, extensions could be built without reference to the question of whether or not they would be profitable. Mr. McCarter said that a municipality would be harassed for extensions and that there would be demands for shorter hours, the danger of strikes and the labor situation generally as a serious factor. He believed in paying fair wages and said that his company had done it. The companies should not be allowed to exploit the public. The solution of the entire problem was private operation under regulation. Commissions should be supervisory, rather than managerial. They should supervise the issue of securities.

REPRISAL SHOULD NOT BE EXACTED

What to do with the past, Mr. McCarter continued, is another question. Everybody stood by and let securities be issued without protest under forms of existing law. All were struggling to get on the band wagon at the time the old conditions existed. If legislative bodies sought now to exact punishment for what was done in the past, they would not reach the persons that were responsible. Securities were in the hands of investors, including widows and orphans. The committee was dealing with a very serious problem. If the figures of railroad capitalization and value assumed by Senator LaFollette were correct, any purchase by the government on the terms outlined by him would be the most gigantic mistake in the history of the country. There was no household that would not suffer from such a policy.

Mr. McCarter said that thirty years ago no one knew that electric railroads would be a success. He was not sure that they were a success now. It was very hard to earn dividends with a straight 5-cent fare. One improvement in the art succeeds another with lightning-like rapidity. Changes in power, cars and rail have developed rapidly. The men who developed the properties were entitled to a profit. As an example of a project which had been of great public benefit but had not paid a profit on the cost of the enterprise Mr. McCarter cited the Hudson River tunnels. He said that Congress should go a little slow in changes affecting business. The business community has had many rough shocks and was still having them. Business was on a better plane morally, and Mr. McCarter said that he was glad of it. He thought that the public realized that so far as railroads and public utilities were concerned the opportunities for improper conduct had been reduced to a minimum. He thought that the average return on street railways was under 5 per cent. His company was paying, at the present time, nearly 7 per cent for new capital.

During examination by members of the committee, Mr. McCarter criticised the accounting methods of municipalities, which do not show whether or not the operations are conducted at a profit. He discussed at length the Public Service Gas Company case which is now in the courts. While the New Jersey commission did not allow for franchise value in this case, it allowed a return of 8 per cent on the value fixed. Mr. McCarter thought that companies could not obtain capital to develop new enterprises unless they had a return of 8 per cent on the money invested.

ELECTRIC RAILWAYS DIFFICULT TO OPERATE

The street railway was the most difficult of any utility to operate. A water utility was on the border line between those classes of utilities which were best operated privately and those which were normally the function of the municipality. While Mr. McCarter did not believe the municipalities should own gas properties, he thought that municipal ownership of such properties was more practical than of electric lighting plants or street railways. The street railway was difficult for any one to manage satisfactorily. It was in the public eye all the time. It was the last facility that the public ought to undertake to manage.

ASSOCIATION TO BE REPRESENTED

Gen. George H. Harries, past-president of the American Electric Railway Association and E. B. Burritt, secretary of the association, were among those who attended the hearing. General Harries told the committee that the association would like to be heard on the bill. A hearing for this purpose has been announced for May 21.

TESTIMONY OF MR. CRAWFORD

Norman McD. Crawford, president of the Reading Transit & Light Company, testified before the committee on May 14. He outlined strong objections to the municipal ownership of street railways and said that privately owned roads could be operated more successfully.

Municipal ownership meant bureaucracy, Mr. Crawford said. Paternalism crept in because of the tendency of the municipality to extend its business to other affairs which should not be municipalized. Municipal ownership, Mr. Crawford added, is not sound public policy. It had not been a success generally and he advised against it in Washington.

Mr. Crawford referred to his trip in Europe as an expert for the National Civic Federation to study various phases of municipal ownership. He said that in Great Britain he was associated in his study of the subject with J. H. Woodward. He and Mr. Woodward studied the municipally owned systems of tramway in Glasgow, Manchester and Liverpool and the London County Council system. They also studied the private tramway properties in London, Dublin and Norwich.

An occurrence in the history of one company was discussed by Mr. Crawford. In this case, Parliament refused to pass a bill granting a franchise for a street railway because the president of the company had made concessions to one town on the road which Parliament believed were not justified.

In explaining that on account of local conditions no interurban lines were found in England similar to those that exist in this country, Mr. Crawford declared that the territory between Liverpool and Manchester would furnish a satisfactory traffic for a system of this character.

The witness also talked about the competition for municipal lines developed by motor-buses. He said that A. L. C. Fell, chief officer of the London County Council tramway system, came to this country some years ago to investigate street railway matters and would not permit much of the information secured by him to be published. He feared that if the information should be made public, the opposition motor-bus lines would make use of his data to the detriment of his system.

An illustration of the effect of municipal ownership on capital expenditure was cited by Mr. Crawford, who said that in one instance \$20,000,000 was spent, of which only \$1,886,000 was chargeable directly to the road. The rest was used in other operations, replacement of houses, etc.

In answer to a question from a member of the committee as to why management by the cities could not be made successful, Mr. Crawford said that there was no monopoly in brains but that politics interfered with the independence of the operating staff. In submitting data on the results of operation, Mr. Crawford said that thirteen systems showed no profit under municipal ownership while thirty-five showed only a slight profit. The witness said that he had never seen better street railway service than was given by the companies in Washington.

HANDY TIME-TABLE FOR EMPLOYEES

The International Railway Company is issuing its new time-tables for the Buffalo & Lockport division of a very convenient form. It is of the bellows type and is inclosed in pasteboard covers 9½ in. long by 2½ in. wide and fits easily in the pocket. When open the time-table is 21½ in. long, but being in the bellows form the conductor or motorman can look up any single train with one hand without opening it entirely. The time-table was prepared under the direction of E. H. Henning, superintendent of interurban lines International Railway at Niagara Falls.

The Commercial Club of Clinton, Ia., has purchased an electric railway sprinkling car by popular subscription in order to carry out the terms of an agreement entered into between the city and one of the local electric railways. It was found when the time came for the city to carry out its part of the agreement to purchase such a car to be manned and operated by the company that the city had no appropriation out of which the purchase could be made.

Center-Entrance Cars for Richmond

These Cars are Operated on Suburban Lines—The Fare-Box Pedestal is Combined with Supporting Rails, the Framing Has Some Unusual Protective Features, and Route Number Destination Signs Are Used

The Virginia Railway & Power Company, Richmond, Va., has recently placed in service twenty center-entrance cars, built by the Cincinnati Car Company and furnished with the prepayment devices of the Prepayment Car Sales Company. As the lines over which the cars are operated extend into the suburbs, the conditions of passenger entrance and exit are so moderate that the doorway is only 3 ft. 10 in. wide, and no division rails are used. Radical features such as ramps or low wheels were also considered unnecessary for the character of the service. The following paragraphs describe the

drop-platform cars, to secure an anti-climber effect and to prevent wagon wheels from scoring the sides of the car. The side girder is built up of 3/16-in. plate. A thinner plate would have served, but it was desired to have it thick enough to avoid buckling and to resist bending from side impacts. The ends of the car are almost perfect circles, a form which enables the car to operate with maximum clearances for a given length. The cross-sills are 3-in. 5.5-lb. I-beams, except that 6-in. channels are used to form the boundaries of the well. At the ends, the underframe is braced with 3-in. 4-lb.



Richmond Center-Entrance Car—Ready for Train Operation

general features of this design, the details being presented in the accompanying drawings and half-tones.

GENERAL DATA

It was specified that the car body without trucks, operating equipment and load should not weigh more than 21,000 lb. It seats sixty-four passengers and will carry a total of 125 passengers with comfort. The principal dimensions are as follows: Length over the bumpers, 50 ft. 3/8 in.; width over all, 8 ft. 4 7/8 in.; height from rail to underside of side sill, 34 1/4 in. with 33-in. wheels; height from rail to top of trolley board, 11 ft. 10 7/8 in.; distance between truck centers, 25 ft. 10 in.; truck wheelbase, 4 ft. 10 in., and width of aisle between cross-seats, 23 in. The limiting curve for operation has a center radius of 30 ft. The successive steps are as follows: 15 1/4 in. from the pavement to the tread of the folding step at the center entrance; 14 in. from this step to the floor of the well, and 9 1/2 in. from the well to the main floor level.

FRAMING

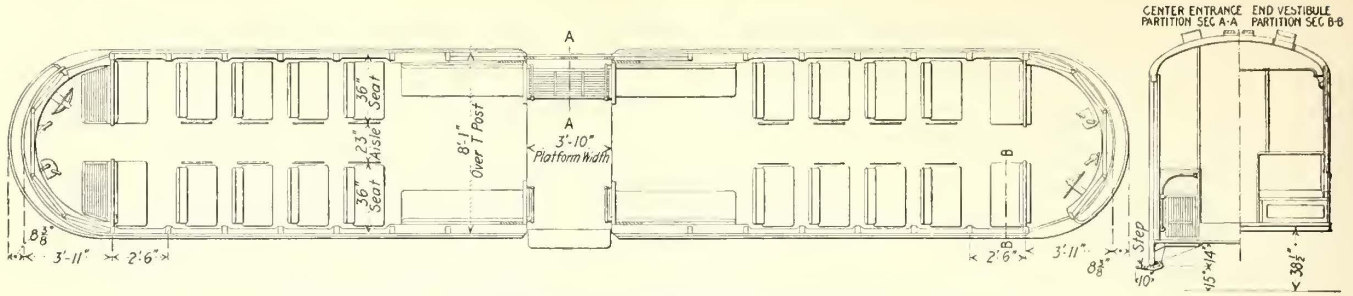
The details of the underframe and sides are so thoroughly shown in the accompanying drawings and bill of materials that it is unnecessary to refer to them at length. The principal constructional feature is the use of a welded 5-in. 6.5-lb. side-sill channel, which is broken only at the center-door openings. The flanges of this channel are turned outward, as in the Richmond

reinforcing channels. The side posts throughout are T members which usually are placed 30-in. centers except at the center doors where the spacing was cut down to 9 3/4 in.

The roof is formed as an ellipse, and its steel carlins are covered with 3/8-in. agasote. The duck canvas is held all the way around the car by a screwed half-oval iron, which prevents side-wipes from tearing the duck and also prevents the pole rope from wearing through the duck at the ends. The same half-oval acts as a drip rail for the windows. The vestibule hoods are also formed of 3/8-in. agasote covered with duck, but the inner side is not painted and decorated as in the body of the car. Each car carries twelve Garland roof ventilators which are designed to exhaust at least 2000 cu. ft. of air every 4 miles with the car traveling at the rate of 4 m.p.h.

The bolsters are of the built-up type with open-hearth steel plates. The top and bottom member are each 7/8 in. x 9 in., and the cast-iron filler blocks are fitted with side bearings with wrought-iron rub plates. The bumpers at each end of the car are formed by 5-in. steel channels on top of which a sheet-steel guard is set at an angle of about 30 deg.

The interior finish including all doors and moldings is of cherry. The side sheathing between the posts is faced with 3/16-in. agasote and a heat-insulating filler of cork 3/4 in. thick. The flooring is of red "Flexolith" laid on "Ferro-inclave" galvanized iron, as shown.



Richmond Center-Entrance Car—Seating Plan and Sections Through Car

The top sash of the fourteen arched windows on each side is stationary, but the lower sash may be raised to various heights not exceeding 26 in. These windows are fitted with Dayton sash locks and anti-rattlers. The center sash of the motorman's compartment is arranged to drop completely while the three other windows have drop sashes. It is thus possible to have sashes open all the way around the car, which is a most desirable feature for warm weather. The seating plan shows five pairs of cross-seats in each half, congestion alongside the well being minimized by longitudinal seats 5 ft. 6 in. long. The seats are hinged to the panels which bound the well and are used alongside the idle center door. Furthermore, each back of the two cross-center door seats nearest each cab is furnished with a second seat which is available when the cab is not in service. The fixed seating is of Hale & Kilburn rattan while the movable seating is of slat construction.

THE CENTER DOORS AND THEIR OPERATION

Each side of the car is fitted with mutually-operating double-sliding doors with a step which folds within the clearance lines. The doors and step are operated electro-pneumatically from push buttons in the conductor's pedestal. A special feature of this power mechanism is that in opening, the steps fold down first and then the doors open. In this way reckless passengers are prevented from jumping off. Conversely, during the closing operation, the step folds up when the doors are still 3 in. apart. The closing of the door is automatically announced to the motorman by means of a signal light on his dasher. As in other modern center-entrance cars, the car cannot start while the doors are open nor can the doors be opened while the car is in motion. The usual push-button buzzer system is installed for the use of the passengers.

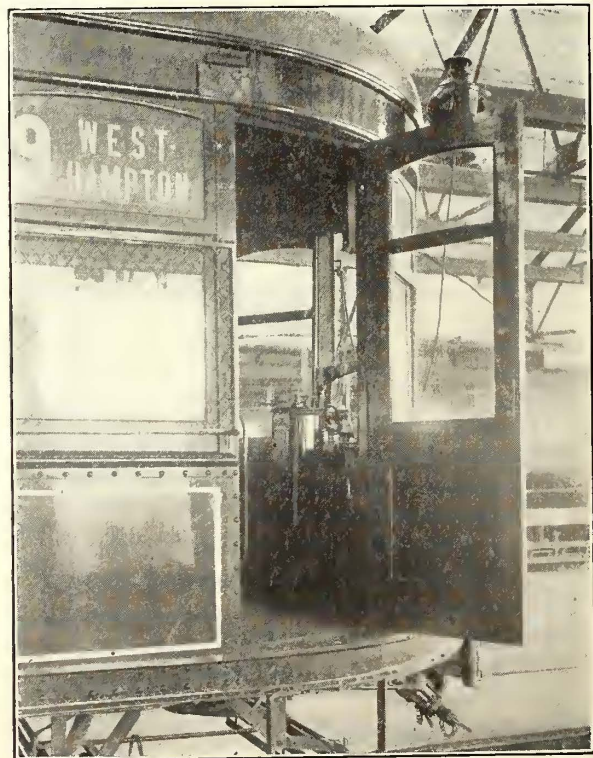
There are no grab handles or other hand-holes outside of the car, but the passenger can support himself by grab-handles set in the panels which bound the well. These oxidized brass handles are of the rather unusual form illustrated and were suggested by Charles Remelius, who was then with the Cincinnati Car Company. The vertical stanchions on the panels and the conductor's pedestal, which is built up of tubing and looks like a turnstile, give further means of support for the passenger at the doorway.

The pedestal is furnished with three push buttons to provide for the opening and closing of the doors and for the signal to the motorman. The throw of a three-way snap switch determines the sides on which the doors should operate for the desired direction of running. The cash box is carried in the center of the pedestal, and all fares are rung up on a register which is mounted over one of the center doorways.

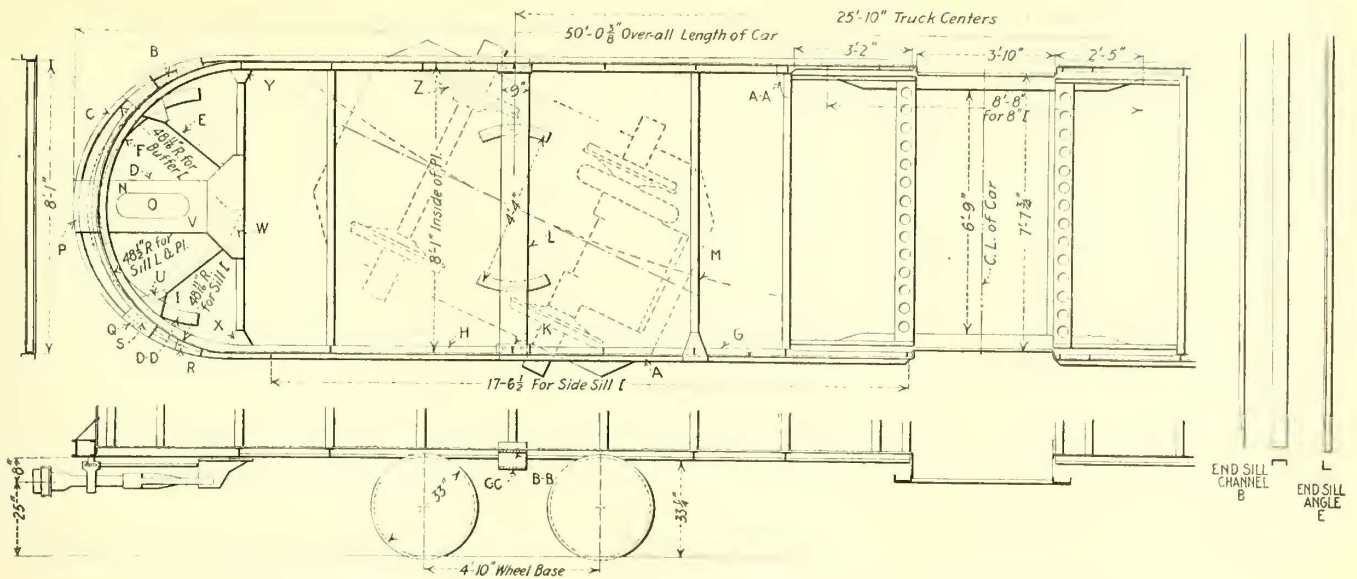
An expensive, built-up cab for the motorman has been avoided. He is separated from the passenger compartment merely by a curtain which is drawn down to the top of the cross-seat backs directly behind him. The motorman enters his compartment by means of a separate door. This door can be opened only with the reverse handle of the controller, which has a square hole for that purpose, so that the motorman cannot leave the car without taking his reverse handle along. The illustration of the motorman's cab also shows the convenient location of the switch rod. This is placed in a



Richmond Center-Entrance Car—Combined Fare-Box Pedestal and Handhold



Richmond Center-Entrance Car—Separate Door of Motorman's Cab



Richmond Center-Entrance Car—Half Plan and Elevation Showing Framing

2-in. pipe which is flanged to the floor. In this location the rod is never in the way of passengers, is most accessible for the motorman and is not likely to cause breakage of gages. The motorman obtains access to the roof by way of an iron-ladder step at the center-entrance doors.

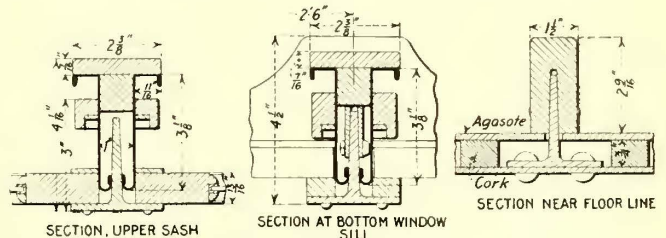
APPARATUS

The car is mounted on Brill 51-E-1 trucks with M. C. B. journals. The equipment includes the General Electric Company's MK control for single or train operation as desired; four GE-203 motors; Peacock brakes with Pittsburgh brake handles; GE air brakes with CP-27 compressor and quick-action release in application and with emergency features; Anderson automatic slack adjusters; pneumatic sanders of the Electric Service Supplies Company, Van Dorn No. 31 couplers, H-B wheel guards and Dayton headlights. All wiring except for buzzers is in iron-armored conduits. All lighting, air compressor, heating and miscellaneous circuits are con-

trolled from a 12-in. x 12½-in. slate-base switch panel which is mounted in an asbestos-lined cabinet in one of the end cabs.

SIGNS

With these new cars the Richmond company has begun the use of route number signs. These signs are of two kinds, as follows: the one in the front vestibule

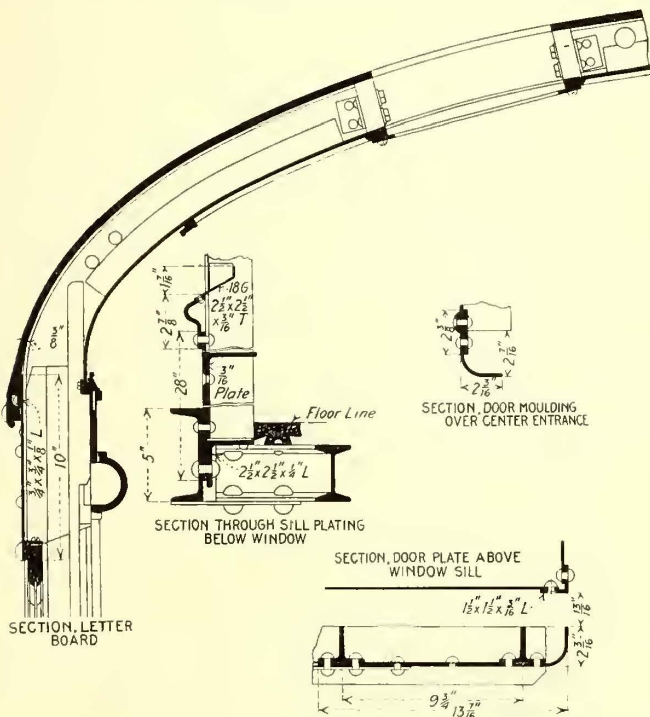


Richmond Center-Entrance Car—Typical Sections

sash displays a route number which is 9 in. high; the one in the upper sash of the window alongside the motorman's door carries the usual route names in addition to the number. The signs are of the Hunter type and are carried in a spot-welded-steel box, painted white inside and illuminated with tungsten lamps.

The *Daily Consular and Trade Reports* contains statistics from the report of the Liverpool Corporation Tramways for 1913 which show that year to have been unusually prosperous, the number of passengers carried being 144,085,927, as against 134,449,967 in 1912, an increase of 7.2 per cent. The receipts in 1913 were \$3,298,907, as compared with \$3,071,106 in the preceding year, a gain of 7.4 per cent. The record of miles run was 13,442,605, against 12,590,408 in 1912, an advance of 6.8 per cent. The average earnings per car mile for 1913 amounted to 24.5352 cents, as against 24.3933 cents for the preceding year; an increase of 0.1419 cents per mile. The traffic receipts, car-mile earnings and number of passengers carried were the highest ever recorded in Liverpool Tramways history.

The total revenue for the year 1913 amounted to \$3,470,131, and operating costs, including rental of leased lines, were \$2,198,037. After apportionment to interest, sinking fund, repayment of loans, reserve, renewal and depreciation accounts and contribution in aid of the general taxes, the net profit for the year was \$750,234, an increase of \$98,813 over 1912.



Richmond Center-Entrance Car—Side, Roof and Floor Sections

TESTIMONY AT WASHINGTON ON PUBLIC UTILITY HOLDING COMPANIES

The clause of the Newlands trade regulation bill which relates to holding companies was discussed before the interstate commerce committee of the United States Senate at Washington, D. C., on May 12 by representatives of public utility holding companies. Those who appeared at the hearing were Bernard Flexner, representing the Middle West Utilities Company, of Chicago; Charles K. Beekman, of Beekman, Menken & Griscom, representing the United Gas & Electric Corporation and the American Cities Company, and Stuart G. Gibboney, of Barber, Watson & Gibboney, New York, representing Bertron, Griscom & Company and William P. Bonbright & Company, Inc.

TESTIMONY OF MR. FLEXNER

Mr. Flexner, who was the first witness, described the Middle West Utilities Company, a Delaware holding company. He cited as an example of a subsidiary company engaged in interstate business the Twin State Gas & Electric Company, which transmits electrical energy across State borders.

In the operations of the holding company various instances had arisen where the communities served desired to permit the consolidation of competing companies. In such cases competition would be destroyed. The absolute purpose in such a consolidation is to rid the community of competitive conditions. In some cases actual consolidation might not be possible owing to the existence of an outstanding stock interest, so that instead of a conveyance there might be substituted the holding company feature.

Discussing the general subject of State regulation, Mr. Flexner said that it has been recognized uniformly by the commissions that the way to regulate is to avoid competition between utilities of one class in each community. Of the thirty existing State commissions, nineteen or twenty in express terms permit the acquisition of stock of operating companies and the transfer of franchises with the approval of the commissions. Gas and electric lighting companies in the same district are generally recognized as competitive forms of business.

Mr. Flexner said that where the entire situation is subject to regulation by a State commission there is ample protection for the public interest. Congress might very easily legislate on this subject in such a way that a particular State might feel that it had acted in the interest of a particular community. So far no court of last resort has held that a holding company owning securities is engaged in interstate commerce.

Referring to Section 12 of the bill, Mr. Flexner said that, while he was in entire sympathy with what the committee has in mind, it appeared to him that the committee might consider the ways in which the various States have handled the question. These States, instead of tying the hands of their commissions, have provided that securities should be issued on terms subject to their approval. The bill gives no leeway to a commission. It is not always possible to sell stock at par. Although not urging the issue of stock for no consideration, Mr. Flexner urged that power be lodged with the commission to say what price should be required. Generally stock is sold at a discount of 10 to 15 per cent.

ARGUMENT OF MR. GIBBONEY

Mr. Gibboney referred to the brief filed with the committee and also to a brief filed with the judiciary

committee of the House of Representatives in regard to the bill on the same subject pending before that committee. These briefs are supported by appendices quoting from the utterances of prominent authorities, including Mr. Wilson before his election as President. The briefs are signed by Mr. Gibboney and Barber, Watson & Gibboney, of New York; Mr. Flexner and Ralph D. Stevenson, of Chicago, and H. Alexander Smith, Daniel W. Knowlton and George B. Hatch, of Colorado Springs, Col.

Supporting the argument in the briefs, Mr. Gibboney asked for the insertion of a clause definitely excepting public utility holding companies from the operation of the bill. He argued that regulation by State commissions has been effective and has been largely the answer to the demand by the public for municipal ownership and operation. Through the law enacted by New York State in 1907 under the direction of Governor Hughes the entire cry for municipal ownership was allayed.

Under the New York statute competitive lighting companies may be brought together by permission of the commission through a holding company. Texas does not permit such a form of combination. The States are not uniform in their ruling as to whether gas and electric companies are competitive. It would work great harm for the federal government to interfere in this situation.

Of over \$8,000,000,000 of capital employed in public utilities, \$5,500,000,000 is held through holding companies. As an instance of the possible effect of legislation, Mr. Gibboney cited the Appalachian Power Company. This company operates in two States. The States were in a better position to regulate within their borders than Congress.

Mr. Gibboney declared that a great advantage of holding companies is that they were able to take broken-down plants and develop them with money raised in larger cities or abroad. Over \$300,000,000 of holding company securities were sold in Europe last year. With such capital the holding companies improved service and reduced rates of operating companies. They averaged the risk of the small investor. Investors would not buy securities of plants situated in small towns, while they would buy securities of holding companies controlling many small plants.

Continuing, Mr. Gibboney declared that in his judgment the United States Supreme Court would hold that practically all public utility holding companies were engaged in interstate commerce. He figured that about 20 per cent of the holding companies had properties that were actually engaged in commerce between the States. An Idaho company conducted operations in three States. Mr. Gibboney suggested that the following exception be added at the conclusion of Section 13 of the bill:

"These sections shall not apply to corporations acquiring or holding the stock of, or engaged in the business of conducting, a public utility which is subject to State regulation, other than common carriers as defined in the act to regulate commerce, approved Feb. 4, 1887, and the amendments thereto."

MR. BEEKMAN ON HOLDING COMPANIES

Mr. Beekman explained the scope of operation of the American Cities Company and the United Gas & Electric Corporation and said that these two companies were typical of all others. They were essentially investing companies. They were not controlled by a large moneyed interest, but their ownership was scattered through the holding of their securities in small lots throughout the country and in Europe. Such com-

panies were not controlled by cliques of bankers, but banking houses advised in their operations.

In the last few years the United Gas & Electric Corporation had acquired various properties in the West that had not been able to set aside replacement funds. They were living on their capital and were getting in worse condition. The holding company put the operating plant in good physical and financial condition and introduced proper accounting so that the subsidiary company stopped living on principal. Mr. Beekman explained the financing of holding companies and their subsidiaries.

For instance, the New Orleans Railway & Light Company, a subsidiary, had to spend a large amount of money for improvements required by the city. The holding company guaranteed the notes, and these obligations were sold partly in this country but largely abroad. In 1913, in order to meet absolute capital requirements, the subsidiary companies of the American Cities Company and of the United Gas & Electric Corporation had to issue \$14,000,000 of securities. These were to provide for the actual necessities of enlargement due to the development of the business. The financiers made scarcely anything out of the transaction. It would be found, said Mr. Beekman, that small profits, if any, had been made by public utility holding companies in financing subsidiaries.

Mr. Beekman, continuing, said that the price of gas and of electrical energy had gone down steadily. Street railway rates had not gone down, but the service had been extended. The rate of fare was so low on street railways now that it could not be reduced further. Replying to a question as to the low-fare cities in Ohio, Mr. Beekman said that the operating officials in his organization felt that a day of reckoning for those properties was coming. Some of the combined operating companies furnishing different classes of utility service lost on the street railway business but gained in the electric and gas departments. The street railways had to meet the labor problem and were unable to raise fares in order to overcome the effect of higher wages. Reliance had to be placed on the combination of the different classes of service.

The cost of financing would be greater without the holding company, Mr. Beekman said. The local companies had poor credit and were unable to discount bills. Holding companies bought in enormous quantities at prices from 10 per cent to 15 per cent less than small local companies secured. They got the benefit of trade discounts. In addition, they were able to borrow money at lower rates.

MEETING OF MISSISSIPPI ELECTRIC ASSOCIATION

A most successful meeting of the Mississippi Electric Association was held in Meridian, Miss., on April 27, 28 and 29. There were six regular sessions, at which papers on lubrication, boiler economy, tungsten lamp manufacture, etc., were read. The following officers were elected at the last session of the association: President, A. H. Jones, McComb City; vice-president, Charles Hays, Columbus; secretary and treasurer, H. F. Wheeler, Hattiesburg; executive committee: R. B. Claggett, W. F. Gorenflo, E. B. Booth, Charles Hays, A. B. Paterson, A. H. Jones and R. H. Smith. It was decided to hold the next meeting of the association at Hattiesburg, Miss., on April 12, 13 and 14, 1915.

The Illinois Traction System has shown remarkable growth in its freight traffic. In 1908 the system had 250 freight cars of all classes, whereas at the present time it has 851. There are also twenty-two grain elevators on the system which, with the exception of one or two, it serves exclusively.

COMMUNICATIONS

SOLID AND MANGANESE STEEL SPECIAL TRACK-WORK EXPERIENCE

THE CINCINNATI TRACTION COMPANY

CINCINNATI, OHIO, May 9, 1914.

To the Editors:—

I have read with a great deal of interest the article in the JOURNAL of May 2, on "Chicago's Experience with Solid and Insert Manganese Special Track Work" and find a great many points in common with our experience in Cincinnati. For a time we contemplated installing solid manganese switch pieces in special work, but after observing the failures in Chicago, we concluded to do nothing along this line, and have continued to use the inserts. Consequently we can make no local comparisons between the solid and insert type.

We find out greatest trouble in 90-deg. crossings where the inserts loosen quite readily, and eventually the receiving frog points crumble away or else hammer badly. Where the angles are more acute we rarely find loose plates and only slight cupping, even after service of several years. We also find that where cast-steel arms abut rolled-steel rails, even where perfect joints have been made, frequently the cast steel will cup at the receiving end. Where mate points crumble, however, we have found this to be due primarily to bad gage rather than to faulty material. We have tried with great success the electric welding of worn-out frog points but at no point where the conditions are as heavy as in the layout described below.

At one intersection we installed a layout in 1910 with cast-steel switch pieces and manganese inserts, on which, up to the present time, we have not spent a dollar in repairs. A careful inspection does not develop any appreciable cupping nor any signs of crumbling. Incidentally there is no loosening of plates—all angles are less than 90 deg., however. This work under operating conditions is used by an average of 192 wheels per hour during eighteen hours of the day, with an average of 547 tons per hour during the same period. This is at a point in the layout where the greatest travel occurs.

It may be well to note that all of our special work is laid in and on solid concrete construction with wooden ties. Most of the steel has been laid with the cars operating and the concrete afterwards pick tamped until no movement was visible in the work.

E. H. BERRY, Engineer of Roadways.

PACIFIC ELECTRIC RAILWAY COMPANY

LOS ANGELES, CAL., May 5, 1914

To the Editors:

In a general way the life of manganese steel work on our lines was anticipated to be of a certain length, based upon an assumed car service, but the car service and weight of equipment have increased to such an extent as to render original assumptions valueless. Except in two or three cases the solid manganese work has given us much better satisfaction and longer life than the hard center type of construction, and we have had no "chipping" of castings except when we cross steam road rail.

Our change to the "boxed-in supported flangeway type," or channel construction, was made in order to get a more uniform distribution of the metal in castings and to obviate the bending of castings at intersections, which tended to crystallize the metal and cause cracks and breakage. That this was successful is proved by the fact that we have had no breaks on this type of crossing in the past three years, whereas we have had two failures in the past eighteen months where

intersections were not supported. It may be that the climate in Chicago has something to do with the trouble of chipping, but I fail to see why it pertains to manganese steel alone. This feature should be referred to the manufacturers and chemists.

I am inclined to think that failures of manganese castings are due more to the quality of the steel used and the treatment in manufacture than to any other cause. It has occurred to me that there should be a standard specification governing manganese metal as regards manganese, carbon, phosphorus and sulphur contents. If there is such a standard specification I have not seen it. I have, however, seen specifications by different manufacturers, and there is a wide difference in them. Where possible there should be a record of the contents, design and service of each piece of work to be compared, as this is the only way to obtain a test of any value. Some of the manufacturers are doing this, and in the course of a year or so we should have the results of their observations, which will go a long way in tracing out our present difficulties.

E. C. JOHNSON, Assistant Chief Engineer.

[NOTE: The "boxed-in supported flangeway type" of construction, mentioned by Mr. Johnson as in use on the lines of the Pacific Electric Railway Company, was described on page 273 of the issue of this paper for Aug. 16, 1913.—EDS.]

MINNEAPOLIS STREET RAILWAY COMPANY

MINNEAPOLIS, MINN., May 11, 1914

To the Editors:

The writer has read the articles in the *ELECTRIC RAILWAY JOURNAL* on the subject of solid and insert manganese special track work and has been much interested in your presentation of the subject.

It has been the experience of the Twin City Lines that the renewable insert manganese special work has been fairly satisfactory. We have considered that it was more economical to use this type of work in our tracks rather than the solid manganese. We have had but a limited number of pieces of solid manganese, and our opinion, as above, is based largely on the results of the Chicago experience which we have taken some pains to watch upon the occasion of different visits to Chicago in the last few years.

We have found in our tracks that the insert manganese pieces first failed at the corners of frogs and angles. These failures would in most instances have been sufficient to condemn the whole piece if it had been of solid manganese. In many of the insert manganese pieces we have been able to renew the broken piece at a comparatively small expense. Hence, we have concluded that the insert type of work was more economical for our conditions.

For several years we have used in railway and steam crossings either cast or rolled manganese work with very good results so far, and expect to continue the use of this type of construction for steam crossings.

GEORGE L. WILSON, Engineer Maintenance of Way.

ELECTROLYSIS MITIGATION

NEW YORK, May 7, 1914.

To the Editors:

I have noted with interest Prof. Albert F. Ganz's letter on the subject of "Electrolysis Mitigation" appearing in your issue of April 25, and observe in this as in all his published utterances that simplicity and clearness of diction which goes so far to make plain to the reader even subjects which are themselves complicated or difficult of easy explanation.

Responding to your invitation to comment on the article I would advise that many engineers who have devoted their attention to electrolysis mitigation have

come to believe that often a judicious application of the return-feeder system will produce effective results. However, it is by no means free from objection, and a danger lies in this as in all other situations where attention is concentrated too much on one object without proper regard for others which may be more important. For example, while it is proper to say that the insulated return-feeder system does not take the current out of the rails entirely, it must be remembered that for a large part of the return circuit the system does substitute insulated copper conductors, costing in the neighborhood of 15 cents per pound and not otherwise necessary, for uninsulated steel rails, costing about 1½ cents per pound and which must be used anyhow, not to mention the surrounding earth, which costs nothing. When we remember that the rail conductor capacity of a double-track trolley line laid with 100-lb. rails and properly bonded is approximately equivalent to 5,000,000 circ. mils in copper conductors, and that in many soils this rail conductor capacity is materially increased by the earth, it will be seen that the substitution of insulated return feeders of as great conductivity as the conductors which they replace will in general be commercially impracticable, and that smaller conductors with heavier losses must be accepted. The heavier the feeder losses the lower will be the electromotive force impressed upon the car motors and the slower the city schedule speeds possible; also there will be a corresponding increased cost of power, sometimes considerable, due to the additional feeder losses. If the cost of installing the required additional copper be very heavy, as it readily may and frequently will be, perhaps without showing anything like an adequate return, the matter may assume a very serious aspect.

It is easy to say, of course, and it has been said with vigorous iteration by some of those whose metallic structures were threatened with electrolytic damage, that it is the duty of the street railway company to protect foreign structures at any cost to themselves or to the character of the service which they render to the public, and that no obligation lies on those owning such structures to themselves take any precautions whatever. It is human nature to try to shift all possible difficulties and the burden of overcoming them to the other fellow. However, without attempting to discuss, much less to decide, the questions of law or of equity involved, on both sides of which there is much to be said, I regard it as economically wrong and highly repugnant to the principles of true engineering to advocate or approve any plan which tends to impair a public service for private gain, and especially so without a due weighing of the offsetting benefits and when other methods not open to this objection and costing less money to provide can be applied.

The insulated return-feeder system, while having much merit is only one remedy for the disease, and to prescribe, or to leave the impression that we intend to prescribe, this one remedy in all cases is a doctrine comparable with that of a physician who prescribes a well-known remedy for a complicated physical ailment before he has attempted to diagnose the symptoms or has even seen the patient. A logical procedure would seem to be first to study the conditions existing in any situation; next, to determine the most effective and economical remedy for whatever troubles may be found to exist without reference to the divided ownership of the properties affected, and then, last of all, to decide upon the duties and responsibilities of the several owners thereof.

At the invitation of the American Institute of Electrical Engineers there has been created a national committee to consider the subject of electrolysis. Delegates have been appointed by the American Institute of Elec-

trical Engineers, the American Electric Railway Association, the American Railway Engineering Association, the American Gas Institute, the Natural Gas Association of America, the Natural Electric Light Association, the United States Bureau of Standards and the American Telephone & Telegraph Company.

This committee is undertaking to collect and compile facts regarding electrolysis troubles to find out what has been done towards mitigation, both in this country and abroad; to consider all phases of the question and to attempt, so far as may be practicable, to establish certain basic ideas and possibly make certain suggestions intended to harmonize conflicting interests and to make more easy the solution of electrolytic difficulties when and as they may hereafter arise. Up to the present time the work of this committee has not progressed far enough to warrant anyone in announcing any conclusions with reference to methods to be employed which have in fact not even been foreshadowed in the committee's deliberations.

Electrolysis is known to be a complicated disease. Its manifestations are many and diverse, and a method of mitigation which might be the best possible remedy in any one case might also be an economic crime in another. Therefore, I would deprecate any premature general advocacy of particular remedies as tending to create false impressions in the public mind and possibly to defeat the objects for which the committee was created and for which it is so earnestly striving. Similarly, it seems to me unwise to now engage in an engineering debate in the technical journals on the comparative technical merits of the various possible methods of mitigation.

CALVERT TOWNLEY.

THE NEAR-SIDE STOP IN CHICAGO

CHICAGO, May 8, 1914.

To the Editors:

I notice the inquiry of Mr. Lyne in your issue of May 9 in regard to the comparative number of accidents with the near-side and far-side stop, but so many factors enter into the question that any figures which may be compiled will not be very significant. Thus, the recent period of unrest among the teamsters in this city was accompanied by an increase in the number of collisions of cars with teams, due undoubtedly to the fact that the minds of the teamsters were upon the question of wages rather than upon their work. The seasons of the year also affect the number of accidents.

Some of the points in favor of the near-side stop, however, as demonstrated in Chicago, are evident. Formerly, the cars used to make two stops at all street intersections in the downtown district, the stop at the near-side being simply so that the motorman could see whether the street was safe to cross, while the one at the far side was to receive and discharge passengers. But with a car with an open rear platform, passengers often attempted to board and alight during the short stop on the near side. Now that the near-side stop has been adopted, boarding and alighting accidents have become much less frequent, in fact, with the near-side stop and fully closed car, I understand that all accidents of this kind have been practically eliminated.

All traffic in the downtown district is controlled by police officers, consequently the point made by Mr. Lyne in regard to reckless drivers does not arise. But in the outlying districts, where the traffic is not so regulated, it is difficult to understand why vehicle drivers should become more reckless under the near-side-stop plan. Their usual method of procedure when approaching a crossing seems to be to consider their chances of beating the car across the intersection. If their judgment is good, they are successful; if not, there is a collision.

With the near-side stop this choice does not occur to the same extent, that is, the hazard is reduced directly, according to the number of stops made on the near side.

The matter is of greater importance from the standpoint of reducing accidents than of reducing damages. The courts here have generally held that if a teamster should drive across a track thinking a car would stop and it did not, he is guilty of contributory negligence, and he cannot collect damages from the company. Even where it has appeared that prospective passengers were at the intersection but failed to signal and the car did not stop and a collision occurred, the court has decided against the person driving the vehicle.

An old Chicago ordinance provided for a near-side stop at all boulevard crossings even before the near-side stop ordinance was adopted. At such points drivers have the right to assume that the cars will always stop, and they do. With the present near-side stop ordinance it is also required that automobiles stop immediately in the rear of a car making the near-side stop, provided they are moving in the same street and in the same direction as the car. This, too, is a safety measure, not only to boarding and alighting passengers, but to the intersecting street vehicular traffic.

CHICAGO READER.

ASSOCIATION NEWS

President Brush of the Transportation & Traffic Association has appointed a committee of six to consider the subject of standards for car loading. The committee consists of R. B. Stearns, Milwaukee; H. C. Doncker, Newark; F. T. Wood, New York City; Horace Lowry, Minneapolis; E. J. Dickson, Buffalo; W. H. Sawyer, New York City.

Chairman Bedwell, of the committee on buildings and structures of the Engineering Association, has appointed the following sub-committees: Fire protection rules: R. C. Bird, chairman; H. E. Funk. General specifications and form of contract, C. F. Bedwell, chairman; W. B. Ingham and L. C. Datz. Power house construction (new subject), C. R. Harte, chairman; T. H. Frank, F. H. Miller, H. G. Salisbury.

The committee on standard classification of accounts has lost two members by resignation as both have left the electric railway field. They are W. B. Brockway, of Ford, Bacon & Davis, and F. E. Smith, comptroller Chicago Railways. No announcement has been made of their successors on the committee.

The subcommittee on lightning protection of the committee on equipment of the Engineering Association has sent out a data sheet, covering the question of car wiring, choke coils, lightning arresters, and other matters connected with the protection of cars from lightning. Twenty-five questions in all are asked.

The committee on federal relations has received information from an authoritative source which indicates that interurban railways are to be exempted from the provision of the bills now before Congress, providing for the use of steel cars in interstate transportation. The committee has been informed that the House of Representatives' subcommittee of the committee on interstate and foreign commerce has decided to make this change. This conclusion was reached after the hearings given to the committee on federal relations as reported in the ELECTRIC RAILWAY JOURNAL.

J. K. Choate, vice-president J. G. White Management Corporation, has accepted the appointment of co-chairman of the Transportation & Traffic Association's side of the joint committee on transportation accounting. The association is also represented by B. E. Tilton, Syracuse, N. Y., and E. D. Reed, Chattanooga, Tenn.

Equipment and Its Maintenance

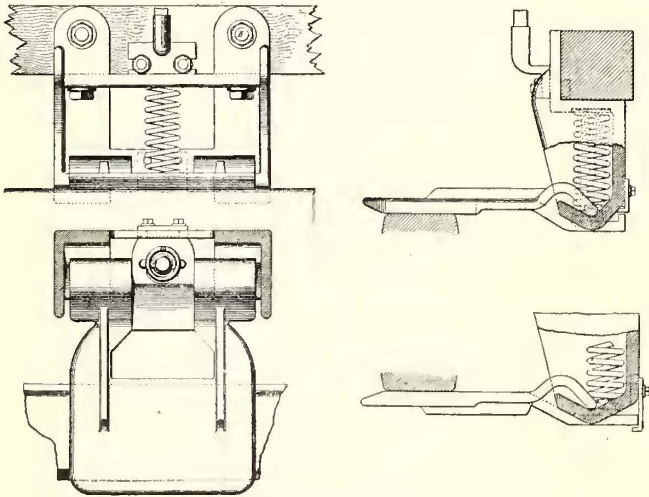
Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

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

A DETACHABLE CONTACT SHOE

BY R. R. POTTER, SUPERINTENDENT OF EQUIPMENT NEW YORK, WESTCHESTER & BOSTON RAILWAY

I have read with interest the article on "Contact Shoes" by C. W. Squier in your issue of May 2. I note



Views of Contact Shoes of Over-Running and Under-Running Types

that he calls attention to several faults in various types of contact shoes. To correct these defects, I patented several years ago the detachable shoe illustrated in the accompanying drawing.

As will be seen no machine work is necessary, no

the device on the shoe beam. With the type of shoe shown a minimum amount of space is required with the result that trouble from short-circuits between the shoe hanger and truck support are greatly reduced. A wear strip could be attached to the surface of the shoe, but as no machine work is required on the castings their cheapness does not warrant the use of a wear plate.

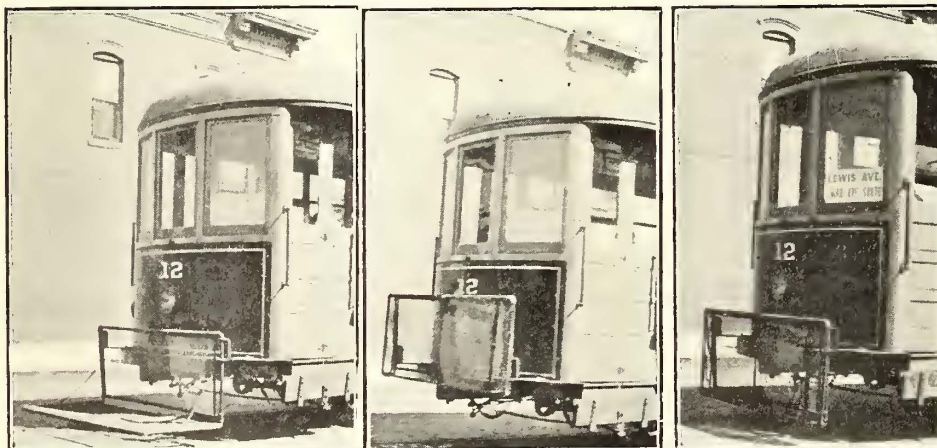
The tension or pressure of the shoe on the rail is regulated by the position of the spring in relation to the pivot or bearing points and may be set at any reasonable amount. If the spring is placed back of the line of bearing, the outer end of the shoe is caused to rise and it then becomes suitable for use on an under-running rail. In case both an underrunning and over-running shoe is desired, two pivot points are used. The ease of replacement of this shoe is a point in its favor as it may be replaced in a few seconds with the use of the hands only. It has been adapted and is used on the Hudson & Manhattan Railroad, New York, and the Northwestern Pacific Railroad, San Francisco.

A HOME-MADE FENDER

BY JOHN JOHNSTONE, GENERAL SUPERINTENDENT BILLINGS TRACTION COMPANY

The writer has recently designed and constructed for use on all cars of the Billings (Mont.) Traction Company the fender which is illustrated herewith in three different positions and in a detailed drawing. The complete fender is easy to handle, as it weighs only about 50 lb., and it is cheap to construct. The cost of the material was approximately \$10.50, while the labor per fender can be placed at, say, \$4. For instance, the writer made one himself in one day of eight hours. A description of the fender follows:

The frame of the fender is made of 3/4-in. black iron pipe covered with heavy netting. This framing is joined at the corners with 3/4-in. black iron fittings. The folding feature is obtained by loosely fitting the lower part of the fender through a 3/4-in. to 1-in. "T," the 3/4-in. pipe of the lower frame having plenty of play to permit folding. The hook for fastening the fender when folded is made of 5/16-in. round iron and serves to hold the parts firmly in position. The pair of cotter pins shown 6 in. above the 3/4-in. "T" in the lower part of the upright fender are used to hold the fender in position when raised.



Fender of Billings Traction Company in Normal Position for Use

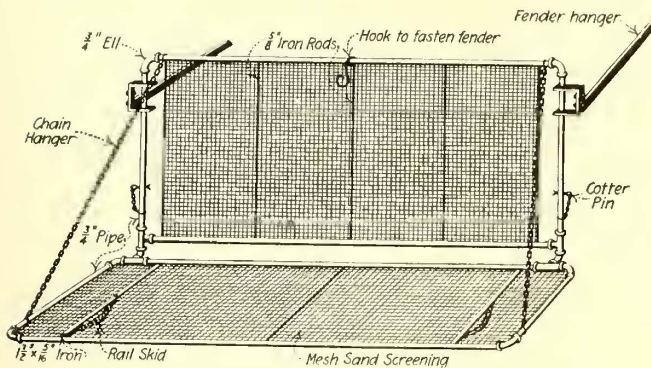
Fender Folded and Raised in Order to Clear Coupler

Fender Folded as for Carhouse Storage

lubrication is required and no shunts are used; also in case an obstruction is met the shoe is easily pulled out of place and not broken, and may be used again. An important item is the saving in the space required by

In service the fender is hung 6 in. above the rails by means of 2-in. x 1-in. x 12-in. hangers. It is secured to the top of the bumpers with 1/2-in. bolts. It can be raised above and clear of the drawhead, thus avoiding

the cutting of holes in the netting to allow for two-car operation. To prevent the fender catching on anything that may be protruding above the level of the rails we use rail skids which are fastened under the fender, one at each side above the rails. Furthermore, the fender hangs 2 in. in front of the bumper and can be swung



Construction of Home-Made Car Fender

to any side when rounding a curve so that the fender on the car ahead will not interfere in any way with the car behind. In general there is no possibility that fenders will be torn by catching any obstruction. The complete equipment is finished to a neat appearance by painting it with black turpentine asphaltum.

NEW TYPE OF HEATER

Oskar Stegemann in a paper read before the Electrical Society of Berlin describes a novel type of electric car heater used in Berlin. It consists of a metallic tube made from nickel-steel ribbon bound in helix form so as to form a tube. These resistor tubes are arranged vertically so as to produce a movement of the hot air upward in the tube. With this system it is possible to produce the desired temperature within a few minutes. A heater of this kind of 500 watts weighs 4.5 kg (9.9 lb.), and fifteen such heaters are used in one car on the Berlin tramway system.

EQUIPMENT DEFECTS—THE CONTACT PLOW

BY C. W. SQUIER, E. E.

The collection of electric current from a conduit railway system has many difficulties not encountered with a third-rail or overhead trolley system. The chief source of trouble is the plow, which is used to collect the current from the conductor bars in the conduit and transmit it to the car. The method and apparatus is perhaps not as generally understood as those for the third-rail and trolley, due no doubt to the fact that the collector is located underneath the car, where it is hidden from view to a large extent.

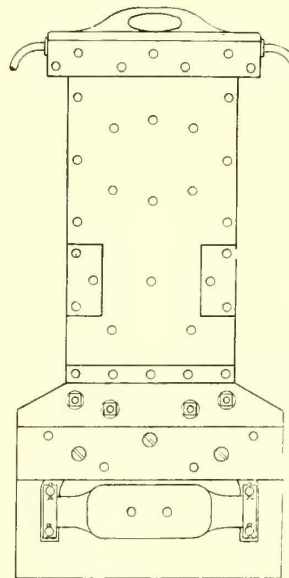
The plow as used in this country consists of two contact shoes made of chilled cast iron. The shoes are provided with flat-leaf steel springs to keep them in contact with the conductor bars and supply the necessary pressure for properly conducting the current. These springs also provide the necessary flexibility to take care of irregularities in the alignment of the conductor bars or slot and also the side motion due to wheel play. The springs are fastened to a wooden bottom or insulating apron, which in turn is fastened to the plow head by thin steel plates. The electrical connection from the shoes to the car is made by fuse leads which connect the shoes to the main leads, and these in turn are connected to the car wiring by connectors. The fuse leads give protection from short-circuits in the plow and upper

wiring. The leads through the plow are necessarily thin due to the narrowness of the street slot, which is usually not more than $\frac{7}{8}$ -in. wide. No. 4 or No. 6 flexible wire is sometimes used by flattening this out below the plow head and reinsulating it. Solid copper strips are also used, these being insulated by a high-grade rubber compound. The steel plates which connect the apron to the plow head protect the leads from injury. Wearing plates of very hard steel are added to these to take the severe wear caused by the slot edges.

Several methods are used for supporting the plow from the truck. One method consists of hanging the plow on short hangers so that it may be able to drop without danger of being damaged if the car should take a wrong switch or jump the track. All methods provide for lateral movement so as to take care of any irregularities in the alignment of the slot and track rails; also to provide for the side play of the truck wheels between the gage limits.

One of the troubles experienced with the plow is found in the springs. These are subjected to severe strains because they are compressed and released very quickly and with great force when the car goes over a gap in the conductor rails as at a crossover. The failures are increased by careless handling of the controller at such points for the car is often run over them with the power on, resulting in the breaking of a heavy arc by the plow contacts which are attached to the springs. The arc carried to the springs heats them to a point which takes the temper from the steel and causes weak springs. In turn the weak springs produce further trouble because the contacts make poor connections to the conductor rails, thus drawing a continuous arc which burns the conductor rail, blows the fuses and often destroys the wood base of the plow.

There are also some cases where the flat conductors become grounded primarily on account of mechanical troubles. Occasionally the malleable iron wear plates riveted onto the side plates of the plow where they slide through the slot become worn thin. In this case the friction of the plow sliding through the slot heats and weakens the insulation of the conductors to the breakdown point.



Contact Plow

Defective switches or plow guides in the slot often make the car go down one track while the plow starts down the other track. The natural results are bent and grounded plows, bent plow bars and broken yokes. Cars off the track cause more than ordinary delays for invariably the plow is bent so badly that the services of the emergency crew are required to get the plow out of the slot. A channel rail defect no worse than a bad joint will tear the springs off of all the plows which pass over that rail, often disabling ten or fifteen cars at a time.

Heavy rains and thaws cause increased labor in keeping the plows in good condition for frequently the plows are practically under water and get wet throughout. This necessitates the daily removal of all the plows on the system to replace them with dry ones, and to dry all the wet ones so slowly that the wood base will not crack. The fact that the channel rail slot is a low point in the

street makes it the receptacle for everything carried along by water on a rainy day, and even for the treasures of the small boy. Although this slot is cleaned daily, pieces of dirt, wire and other foreign objects find their way into the slot, damaging the plow by causing short-circuits or by obstructing it.

PAY-AS-YOU-ENTER SUBWAY OPERATION OF PHILADELPHIA RAPID TRANSIT COMPANY

In the Philadelphia subway all except two of the stations have been provided with Dayton self-registering fare boxes during the last three months, and the ticket sellers' booths and ticket-chopping machines have been eliminated. The entrance to the station platforms have been provided with railings of horseshoe shape, and between each pair of passageways a fare box has been mounted. Behind the fare box stands a fare-collector, whose duties are equivalent to those of a conductor on a pay-as-you-enter car, as he makes change for entering passengers and sees that no one passes the fare box without depositing a nickel. A gate that slides across the entrance to the platform is installed, and during the non-rush hours this gate is partly drawn so that all except two of the passageways, served by one fare box, are closed up. During the rush hour the gate is withdrawn and one or more extra men collect fares.

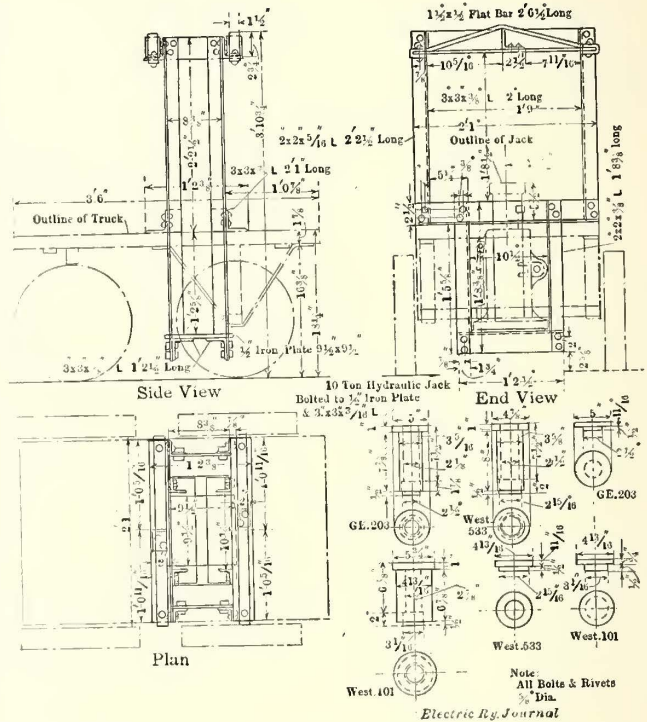
MONTREAL ARMATURE BEARING PRESS

BY KEITH MACLEOD, MONTREAL TRAMWAYS

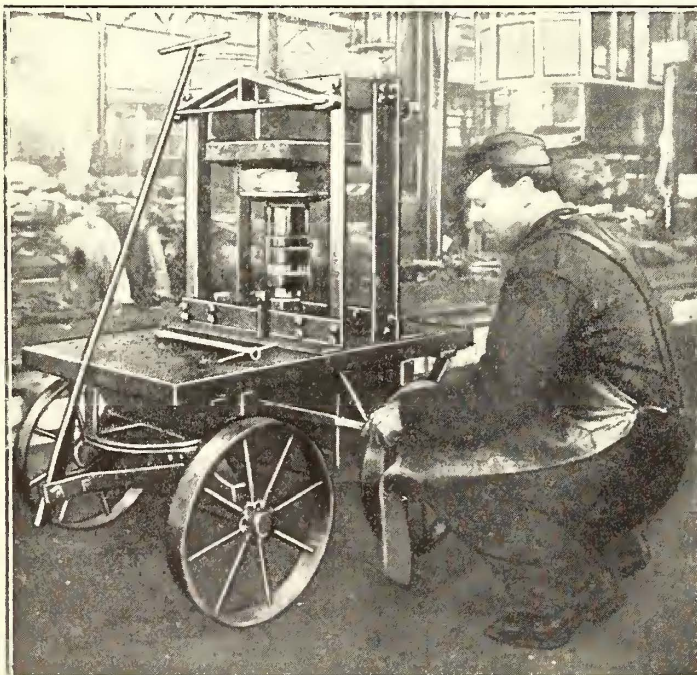
One of the most economical improvements in railway motor design has been the use of solid housings for armature bearings. The change from the old method of clamping the bearing between two separable parts has resulted in the elimination of a host of troubles with bearings and incidentally with armatures and fields. The changing of the newer bearing is much more difficult, however, unless the proper equipment is provided. Within the limits of even the best machine shop practice the variation in the press fits will involve differences of several tons in the necessary pressure for assembly or removal. Add to this the effect of salt during the winter months in rusting iron linings, and the car-house problem of renewing bearings becomes serious. The illustrations show how the Montreal Tramways

handle this detail of motor maintenance. A four-wheeled truck is equipped with a Watson-Stillman "low" hydraulic jack of 10-ton capacity on a light angle-iron framework let through the platform, the jack being placed so that the operating handle and relief key are in easily accessible positions. Long and short plugs to fit the various types are provided for pushing bearings out of and into housings. Of course the press can be used for other light work requiring a uniform pressure, such as rebushing brake levers, etc., but the principal use is for armature bearings. It has proved very successful so far, the 10-ton capacity being ample for all motors.

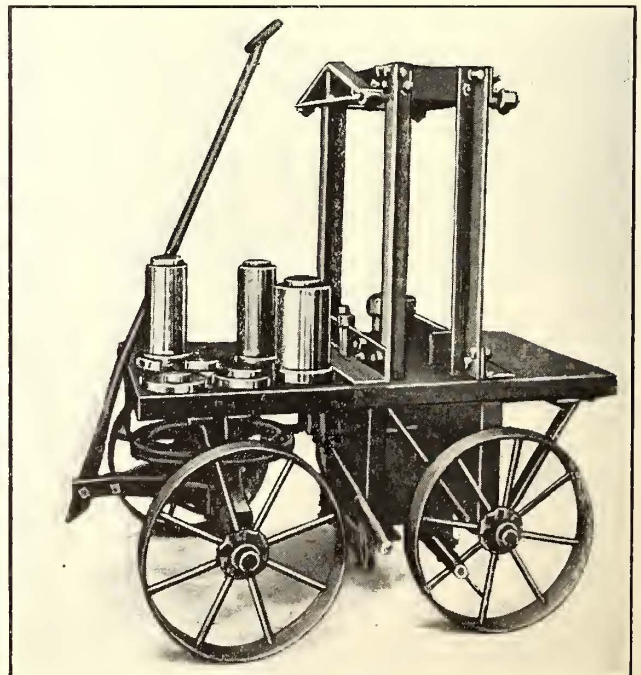
This method is so much safer and less laborious than the old way of using a sledge hammer that the press is becoming quite popular with the shopmen.



Montreal Bushing Press and Attachments for Different Types of Motors



Montreal Bushing Press in Service



Montreal Bushing Press Complete

OVERHEAD PROBLEMS—FEEDERS, FEED TAPS AND LIGHTNING ARRESTERS

BY CHARLES RUFUS HARTE, CONSTRUCTION ENGINEER THE CONNECTICUT COMPANY

In city work the municipal tendency to force underground everything possible often relieves the overhead department of one of its troubles. Elsewhere the feeders are a nuisance, unsightly and imposing heavy stresses, often at points where guys or other forms of assistance are out of the question.

The "weatherproof" coatings are standard. Where the lines run through trees such insulation has some value in its early life, but the best is subject to pretty rapid deterioration and some lasts barely long enough to get it up on the poles. City authorities, however, have great confidence in such insulation—perhaps it would be better to say have great fear of its absence—and a suggestion that bare feeder be used is rarely taken kindly in spite of the obvious evidence on the poles as to the lack of permanency of "weatherproof."

As against twig contact, weatherproofing as long as it lasts will usually prevent short circuits. However, where boughs of any size touch or are very close to the feeder they soon rub through to the copper unless some form of protection is employed. Ordinarily this is whitewood molding, grooved to fit the cable, well painted or, still better, well treated with carbolinum or similar preservative. The two parts are held together by wrappings of wire, since nails and screws are very apt to go wild and reach the conductor metal. For some reason with the condition of negative feeders and positive track there seems to be a much greater tendency to ground through trees than with the usual arrangement. In one case where the ordinary tree molding failed very satisfactory results were obtained with two 1-in. x 4-in. strips of treated wood, held about 4 in. apart by porcelain cleats through which the feeder was threaded.

A few engineers call for porcelain feeder insulators, but for the majority the present-day glass is good enough, particularly if composition is used at points of heavy stress. For very heavy stress an excellent practice is the use of double arms with eyebolts for spacers, the feeder itself not being cut but anchoring to the eyebolts through short pieces spliced in. It is still better to anchor through a cable clamp which should be attached to the conductor itself and not over the insulation. To be in keeping, if the feeder is covered the clamp and the metal at the live end of the strain insulator should be well taped. The pulls should be balanced as nearly as possible, and in addition the ends of the arms should be guyed to meet any unusual twisting tendency from gusty wind, unequal sleet loads or a broken wire.

Trolley wire is sagged with reference to its safe mechanical strength, but the larger feeders can be safely stressed far beyond the capacity of any but special supports, while for appearance—and to prevent swinging together if negative returns are in the group—all feeders on a given line should have the same sag, regardless of size. Luckily these requirements are not opposed for the same metal. The values in the following table for copper or aluminum, as the case may be, will serve for bare or covered and sizes from No. 0000 to 2,000,000 circ. mils. If installed at 60 deg. Fahr. the sags remain very nearly the same at all temperatures; if installed at either extreme there is a little difference for different sizes at the other extreme, but not enough to cause any trouble. The table sags are for 100-ft. spans; for other spans the correct sags are equal

(length of span)
to
10,000
times the sag given in the accompanying table.

Temp., Deg. Fahr.	SAGS FOR FEEDERS FOR DIFFERENT TEMPERATURES	
	Copper Feeder, In.	Aluminum, In.
0	10	5
30	13 1/2	10
60	17	16
90	20 1/2	21 1/2
120	23 1/2	26

Bare aluminum has but one-half the weight of bare copper of the same resistance; in the covered cables the difference is less, for the covering material is the same and the aluminum is of greater diameter than its copper equivalent. This makes easier and cheaper handling and greater radiating surface in case of overload heating for the lighter metal, but the price is apparently figured to keep the two on a parity. Those who have used aluminum seem well pleased with it, but the equally satisfactory behavior of copper and its longer record gives the latter a decided advantage.

Feeder is best run out from a reel so mounted on a flat car or wagon that it can turn freely as it travels along. Where it is necessary to keep the reel at one point and to pull the feeder "on end" snatch blocks of ample size should be used at each support. A careful watch should be kept lest the cable jam and the covering or even the conductor itself be injured. The blocks preferably should be hung above the arm on which the feeder is to go. It is at best an awkward proposition to pass a heavy feeder around the end of a crossarm, and if a feed tap or similar run on that side has been overlooked, the English language can hardly do justice to the occasion, not to mention the trouble and expense resulting.

There is no particular difficulty in splicing feeder or in tying it to the insulators, but existing lines throughout the country show how little good work is done. Solid feeder happily is fast joining the has-beens, but there is still quite a little aloft which must still remain for some time. A connector sleeve twisted or soldered on or the good old Western Union makes the best treatment. The latter joint is made by baring some 24 in. of the ends to be spliced. Lay the bared ends side by side but pointing in opposite directions; twist together the middle 12 in. giving four complete turns; twist the remainder of each end tight on the standing part, and finally, sweat full of solder and tape.

Stranded feeder should be joined either by a sleeve or by a "sunburst" splice. The first, of which there are several good types, consists essentially of a body with conical pockets in which the cable ends are inserted, wedged open and sweated full of solder. The sunburst splice, which is more easily made than described, is started by stripping the ends for 24 in., unlaying each for 18 in., and cutting out the central strand at the end of the unlayed portion. The cables are then put together with the ends of the center strands in contact, and the outside strands of each end interlaced and then laid straight along the standing part of the other end. One outside strand is then served over the remainder; the next is started at the end of the first and served on the balance; and so till the last strand serves on the standing part alone. The other side is similarly treated, the splice sweated full of solder and taped. As in all solder work, great care should be taken that the "sweating" is done at just the right temperature.

Feeder should be top tied on tangents, and side tied on the outside of the insulator at angles, using No. 6 soft drawn wire in 16-in. lengths of the same metal as the conductor. For top tie loop one wire around the insulator neck, twist once under feeder, then bring ends

up, one either side and wrap on in opposite directions and away from the insulator, crossing alternately, finally giving ends a twist together on top. Put a similar tie on the opposite side.

For side tie use one piece of wire, looped around neck and twisted once together under cable. Bring up the ends outside the feeder, serve each on for four turns, bring together behind the insulator and twist together. The cable side of the insulator is front.

Such construction details should be a part of every

inventive effort has been expended, but many of the resulting devices are not unlike one tested by the writer a few years ago. Weighing six times as much as a commercial 1 3/4-in. wood strain and costing ten times as much, it developed barely two-thirds the breaking strength. Ingenuity can better be directed toward the reduction of the stresses to limits which permit the use of commercial strains. Occasionally, however, an unusually long span with limited headroom results in very heavy stresses which cannot be avoided. For such

CONDUCTOR TABLES—BARE STRANDED COPPER CABLES

Circ. Mils of Conductor	STRANDS OF CONDUCTOR		Diameter of Cable Overall	Area of Actual Conductor	STRENGTH OF CABLE				LOADING PER LINEAL FT.			
	Number	Diameter			Hard Drawn		Soft Drawn		Cable Alone	Cable, With One-half In. Ice Coat	Wind at 8 Lb. per Sq. Ft.	Resultant Cable, Ice and Wind
					Ultimate	Allowable Equals One-half Ultimate	Ultimate	Allowable Equals One-half Ultimate				
	In.	In.			Sq. In.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
2,000,000	91	0.1432	1.630	1.569	90,500	45,250	48,100	24,050	6.205	7.543	1.754	7.744
1,750,000	91	0.1387	1.526	1.365	80,000	40,000	42,100	21,050	5.429	6.702	1.684	6.910
1,500,000	91	0.1284	1.412	1.178	68,900	34,450	36,000	18,000	4.654	5.855	1.608	6.072
1,250,000	91	0.1172	1.289	0.982	58,200	29,100	30,100	15,050	3.878	5.002	1.526	5.230
1,000,000	61	0.1280	1.152	0.785	45,900	22,950	24,000	12,000	3.100	4.138	1.435	4.380
950,000	61	0.1248	1.123	0.746	43,900	21,950	22,800	11,400	2.915	3.965	1.416	4.210
900,000	61	0.1215	1.094	0.707	41,700	20,850	21,700	10,850	2.790	3.792	1.396	4.040
850,000	61	0.1181	1.063	0.669	39,500	19,750	20,500	10,250	2.635	3.617	1.375	3.870
800,000	61	0.1145	1.031	0.628	37,200	18,600	19,200	9,600	2.480	3.442	1.354	3.698
750,000	61	0.1109	0.998	0.589	35,700	17,550	18,100	9,050	2.325	3.267	1.332	3.528
700,000	61	0.1071	0.964	0.550	32,900	16,450	16,800	8,400	2.172	3.092	1.309	3.358
650,000	61	0.1032	0.929	0.510	30,700	15,350	15,600	7,800	2.015	2.913	1.286	3.184
600,000	61	0.0992	0.893	0.471	28,400	14,200	14,400	7,200	1.860	2.735	1.262	3.013
550,000	37	0.1219	0.853	0.432	25,500	12,750	13,200	6,600	1.703	2.553	1.236	2.837
500,000	37	0.1162	0.813	0.392	23,200	11,600	12,000	6,000	1.548	2.377	1.209	2.667
450,000	37	0.1103	0.772	0.352	21,100	10,550	10,800	5,400	1.393	2.193	1.181	2.491
400,000	37	0.1040	0.728	0.314	18,900	9,450	19,600	4,800	1.239	2.010	1.152	2.317
350,000	37	0.0973	0.688	0.275	16,600	8,300	8,400	4,200	1.083	1.824	1.119	2.140
300,000	19	0.1256	0.629	0.236	13,800	6,900	7,200	3,600	0.926	1.635	1.086	1.963
250,000	19	0.1147	0.574	0.196	11,600	5,800	6,000	3,000	0.772	1.446	1.049	1.786
211,600	19	0.1055	0.528	0.166	9,900	4,950	5,000	2,500	0.653	1.299	1.018	1.630

CONDUCTOR TABLES—TRIPLE BRAIDED WEATHERPROOF STRANDED COPPER CABLES

Circ. Mils of Conductor	STRANDS OF CONDUCTOR		Diameter of Cable Overall	Area of Actual Conductor	STRENGTH OF CABLE				LOADING PER LINEAL FT.			
	Number	Diameter			Hard Drawn		Soft Drawn		Cable Alone	Cable, With One-half In. Ice Coat	Wind at 8 Lb. per Sq. Ft.	Resultant Cable, Ice and Wind
					Ultimate	Allowable Equals One-half Ultimate	Ultimate	Allowable Equals One-half Ultimate				
	In.	In.			Sq. In.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
2,000,000	91	0.1482	2.000	1.569	90,500	45,250	48,100	24,959	7.008	8.579	2.000	8.809
1,750,000	91	0.1387	1.906	1.365	80,000	40,000	42,100	21,050	6.193	7.705	1.937	7.945
1,500,000	91	0.1284	1.781	1.178	68,900	34,450	36,000	18,000	5.380	6.813	1.858	7.064
1,250,000	91	0.1172	1.656	0.982	58,200	29,100	30,100	15,050	4.508	5.863	1.771	6.124
1,000,000	61	0.1280	1.531	0.785	45,900	22,950	24,000	12,000	3.674	4.950	1.687	5.230
950,000	61	0.1248	1.468	0.746	43,900	21,950	22,800	11,400	3.503	4.745	1.645	4.922
900,000	61	0.1215	1.437	0.707	41,700	20,850	21,700	10,850	3.332	4.549	1.625	4.831
850,000	61	0.1181	1.406	0.669	39,500	19,750	20,500	10,250	3.162	4.360	1.604	4.645
800,000	61	0.1145	1.375	0.628	37,200	18,600	19,200	9,600	2.992	4.170	1.583	4.461
750,000	61	0.1109	1.343	0.589	35,100	17,550	18,100	9,050	2.822	3.977	1.562	4.272
700,000	61	0.1071	1.312	0.550	32,900	16,450	16,800	8,400	2.650	3.789	1.541	4.090
650,000	61	0.1032	1.250	0.510	30,700	15,350	15,600	7,800	2.443	3.543	1.500	3.847
600,000	61	0.0992	1.234	0.471	28,400	14,200	14,400	7,200	2.235	3.325	1.489	3.556
550,000	37	0.1219	1.156	0.432	25,500	12,750	13,200	6,600	2.064	3.105	1.437	3.421
500,000	37	0.1162	1.108	0.392	23,200	11,600	12,000	6,000	1.894	2.908	1.405	3.230
450,000	37	0.1103	1.062	0.352	21,100	10,550	10,800	5,400	1.724	2.705	1.375	3.035
400,000	37	0.1040	1.031	0.314	18,900	9,450	9,600	4,800	1.553	2.515	1.354	2.856
350,000	37	0.0973	0.968	0.275	16,600	8,300	8,400	4,200	1.345	2.267	1.312	2.620
300,000	19	0.1256	0.921	0.236	13,800	6,900	7,200	3,600	1.174	2.067	1.281	2.431
250,000	19	0.1147	0.875	0.196	11,600	5,800	6,000	3,000	0.985	1.849	1.250	2.232
211,600	19	0.1055	0.812	0.166	9,900	4,950	5,000	2,500	0.800	1.624	1.208	2.024

lineman's early education, but it is astounding how many there are calling themselves line foremen who cannot either splice or tie properly. In double-arm work these are the men who can be counted on to set the arms square with the line on one side instead of splitting the angle. So mis-set, the strain comes all on one pin, thwarting the purpose of the double-arming.

To meet the heavy pulls of large feeders some little

conditions the extra heavy strains which have been developed for steam road catenary, although designed for far higher voltages, will generally prove best, the fact that they are commercial or at least semi-commercial material giving better delivery and cost than a strain for lower voltage but of special design.

The accompanying tables give the factors necessary in calculating the mechanical elements of such spans on

the basis of an ice load increasing the diameter of the cable by 1 in., and a wind pressure of 18 lb. per sq. ft. of surface. This will meet conditions in almost all localities, for while sleet is sometimes heavier, and wind pressures sometimes greater, the two rarely occur in combination. Local conditions should be carefully in-

values shown in the table. Occasionally feeder is spliced with a thin, short sleeve giving full conductivity but anything but full mechanical strength. It is only wise to require that the mechanical integrity be guaranteed.

FEED-IN PRACTICE AND LIGHTNING ARRESTERS

In line with the general tendency to simplification feed-in points now employ the conductor as a portion of the span, obviating the older practice of paralleling the span by the feed tap. A regular line ear is used, soldered to the trolley to insure proper contact, and carried either by a Grover type suspension or by a feed yoke. The former, which is practically an uninsulated bronze round top hanger, can be moved along the span for lining up. However, the yoke soldering to the feed tap seems more logical as a feeding device where good contact always should be assumed.

Where lightning arresters are used they should be connected to the feed tap close to its attachment with the feeder. Great care should be taken to insure that the "ground" is really such; a poorly grounded arrester has little, if any, protective value.

Where the earth is permanently damp a pipe or rod can be driven from the surface, but if there is any question, conditions should be developed by digging. While there are many patent grounds and many companies have patterns of unpatented devices, nothing is better or cheaper than a flat coil containing about 40 ft. of bare solid No. 4 copper wire embedded in a couple of bushels of charcoal to hold the moisture. Incidentally, the moisture should "belong." The practice, not unknown, of trying to reform a dry hole by carting water to it from a distance is not entirely to be commended.

There is a division of opinion as to whether or no lightning arresters should be connected to the rails as well as to earth. The principal argument in favor is that such treatment insures a good ground. It is usually quite practicable to secure the desired results by the drive pipe, coil, plate or the like. If this special ground is good, a direct connection between it and the rails is a bid for trouble from stray current; if the special ground is not good it is useless anyway. In either case the connection, to many engineers, seems unnecessary if not positively harmful.

IMPROVEMENTS IN INSERT SPECIAL WORK

The Pennsylvania Steel Company has recently made some improvements in its design of Manard steel insert special work as shown in the accompanying illustration. These changes consist briefly in increasing the area and thickness of the insert, in eliminating the ribs which formerly were on the bottom of the plate and in changing the angle of application of the renewable bolt used in holding the plate in place.

In connection with areas, the size of the insert has been increased from 12 in. x 12 in. to 13 in. x 13 in. on 90 deg. crossings, an increase of 17.3 per cent. For smaller angles the area is not increased in the same proportion, as it is not considered necessary, but is larger than heretofore. At the same time the thickness of the Manard piece for street railway work is increased to 3 in. for all angles. Experience of the steel company leads to the belief that this will give much greater life to the work and reduce the tendency to pound down.

The purpose of eliminating the ribs from the bottom of the plates is to insure a better bearing surface on the spelter. The company says that presence of these in the past has sometimes prevented an even flow of spelter between the iron and the center, while their usefulness in preventing any lateral movement is questionable. An additional advantage in eliminating the

CONDUCTOR TABLES—TRIPLE BRAIDED WEATHERPROOF STRANDED ALUMINUM CABLES

Circ. Mils of Conductor	STRANDS OF CONDUCTOR		Diameter of Cable Over-all	Area of Actual Conductor	STRENGTH OF CABLE			LOADING PER LINEAL FT.		
	Number	Diameter			Hard Drawn		Cable Alone	Cable, With 1/2 In. Ice Coat	Wind at 8 Lb. per Sq. Ft.	Resultant Cable, Ice and Wind
					Ultimate	Allowable Equals One-half Ultimate				
3,180,000	61	1.875	1.249	31,600	15,800	2,070	3,562	1,917	4,045	
2,782,500	61	1.813	1.190	30,300	15,150	1,977	3,430	1,875	3,909	
2,385,000	61	1.781	1.124	28,800	14,400	1,877	3,310	1,854	3,794	
1,987,500	61	1.750	1.051	27,400	13,700	1,779	3,193	1,833	3,680	
1,590,000	61	1.719	0.999	26,000	13,000	1,683	3,077	1,813	3,571	
1,515,500	37	1.688	0.937	23,200	11,600	1,586	2,961	1,792	3,461	
1,431,000	37	1.563	0.874	21,800	10,900	1,489	2,785	1,708	3,267	
1,351,500	37	1.531	0.812	20,400	10,200	1,390	2,666	1,688	3,155	
1,272,000	37	1.500	0.749	19,000	9,500	1,293	2,550	1,667	3,047	
1,192,500	37	1.469	0.687	18,500	9,250	1,197	2,434	1,646	2,938	
1,113,000	37	1.438	0.624	16,200	8,100	1,100	2,217	1,625	2,749	
1,033,500	37	1.344	0.562	14,800	7,400	0,994	2,152	1,563	2,660	
954,000	37	1.250	0.500	13,400	6,700	0,886	1,983	1,500	2,486	
874,500	37	1.188	0.437	10,900	5,450	0,772	1,832	1,458	2,341	
795,000	37	1.031	0.375	9,500	4,750	0,657	1,615	1,354	2,107	
715,500	19	1.000	0.312	8,100	4,050	0,544	1,487	1,333	1,997	
636,000	19	0.938	0.264	6,300	3,150	0,460	1,363	1,298	1,882	

CONDUCTOR TABLES—BARE STRANDED ALUMINUM CABLES

Circ. Mils of Conductor	STRANDS OF CONDUCTOR		Diameter of Cable Over-all	Area of Actual Conductor	STRENGTH OF CABLE			LOADING PER LINEAL FT.		
	Number	Diameter			Hard Drawn		Cable Alone	Cable, With 1/2 In. Ice Coat	Wind at 8 Lb. per Sq. Ft.	Resultant Cable, Ice and Wind
					Ultimate	Allowable Equals One-half Ultimate				
3,180,000	61	1.462	1.438	1,249	31,600	15,800	1,462	2,679	1,625	3,133
2,782,500	61	1.393	1.406	1,190	30,300	15,150	1,393	2,591	1,604	3,047
2,385,000	61	1.359	1.124	1,124	28,800	14,400	1,317	2,485	1,573	2,941
1,987,500	61	1.328	1.061	1,061	27,400	13,700	1,243	2,392	1,552	2,851
1,590,000	61	1.281	0.999	999	26,000	13,000	1,171	2,290	1,521	2,749
1,515,500	37	1.250	0.937	937	23,200	11,600	1,098	2,195	1,500	2,658
1,431,000	37	1.203	0.874	874	21,800	10,900	1,025	2,095	1,469	2,559
1,351,500	37	1.156	0.812	812	20,400	10,200	0,950	1,990	1,438	2,455
1,272,000	37	1.109	0.749	749	19,000	9,500	0,877	1,888	1,406	2,354
1,192,500	37	1.063	0.687	687	18,500	9,250	0,805	1,787	1,375	2,255
1,113,000	37	1.016	0.624	624	16,200	8,100	0,732	1,684	1,344	2,155
1,033,500	37	0.969	0.562	562	14,800	7,400	0,658	1,587	1,313	2,060
954,000	37	0.906	0.500	500	13,400	6,700	0,585	1,469	1,271	1,943
874,500	19	0.859	0.437	437	10,900	5,450	0,512	1,366	1,240	1,845
795,000	19	0.781	0.375	375	9,500	4,750	0,439	1,244	1,188	1,720
715,500	19	0.719	0.312	312	8,100	4,050	0,365	1,131	1,146	1,610
636,000	7	0.656	0.264	264	6,300	3,150	0,310	1,037	1,104	1,515

vestigated, however, and heavier loads used if there is any likelihood of their occurrence. The effect of a resulting failure warrants the cost of preventing it. The effect of the conditions assumed on the rest of the system is always an important factor. If, for example, a supplying transmission line is involved, there is no use making the feeder line from the substation any more stable so far as continuity of service alone is considered.

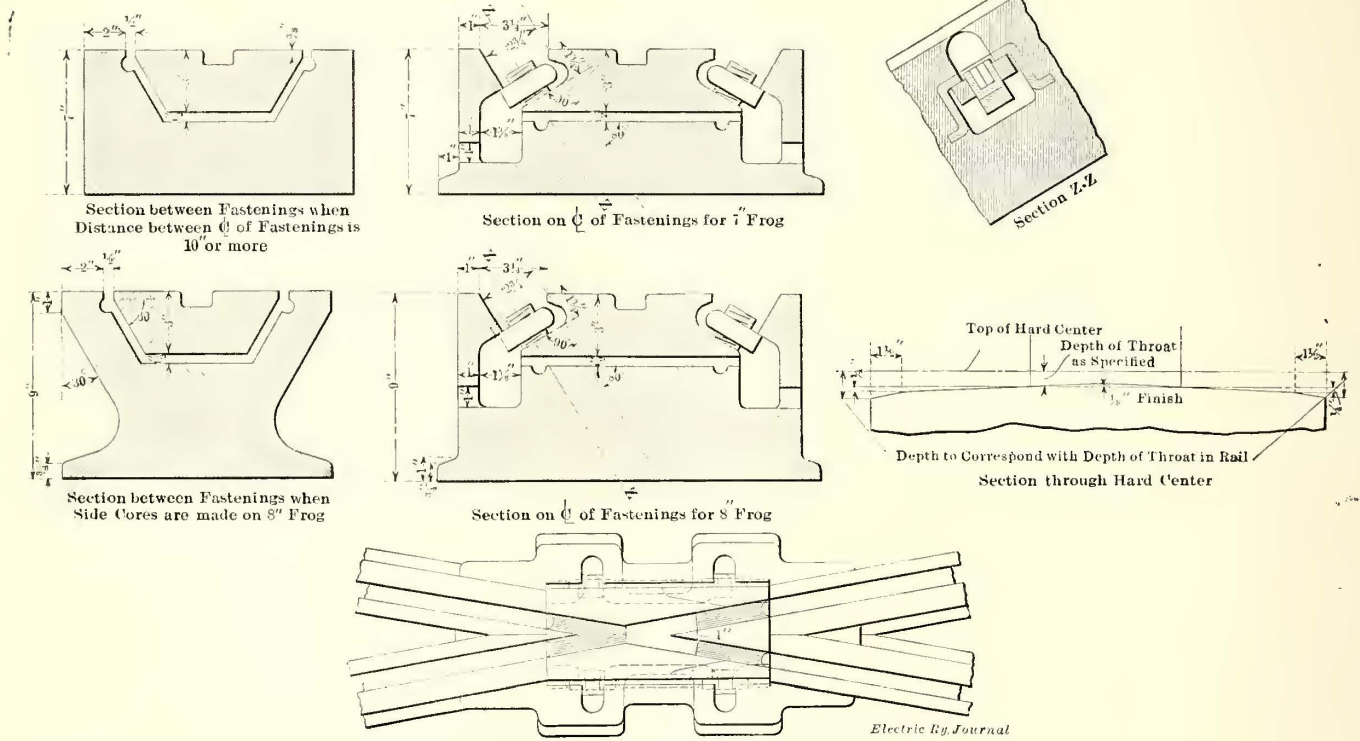
Commercial feeder will usually give the breaking

ribs lies in the fact that the bearing of the center at the point of application of the bolt is larger than heretofore. Formerly the lugs on the casting which received the end of the bolt had to be dropped down below the level of the bottom of the casting. In the new center, the entire bottom surface is in one plane in order to distribute the load uniformly over a large area. All centers will be speltered, the thickness of the spelter being $\frac{1}{2}$ in.

The final change of importance is in the angle of application of rapid renewable bolts. Formerly, the bolts were applied at an angle of 45 deg. to the vertical. The improvement consists in changing this angle to

PRIZES FOR AIR-BRAKE STORY

The Westinghouse Air Brake Company, Pittsburgh, Pa., has announced a series of six prizes, aggregating \$2,000, for the best written narratives of air-brake performance in actual service for any period covered by the life of the art. The prizes are as follows: First prize, \$1,000; second prize, \$500; third prize, \$300; fourth prize, \$150; fifth prize, \$100; sixth prize, \$50. The stories must be true and must be written either from practical experiences or personal observations of the writer or from information obtained at first hand from railroad men who actually know the facts. Cor-



Plan and Sections of Improved Type Insert Special Work

one of 30 deg. to the vertical. This means that the force holding the center in position is applied more nearly vertically and the manufacturers believe that it will result in the bolts maintaining a constant downward pressure and in staying tight.

EXPERIMENTAL TRAIN ON BERLIN STADTBahn

The Prussian State Railways are planning to place in experimental operation on the Dessau-Bitterfeld line a specimen train which has been designed for the Berlin Stadtbahn electrification. The train includes twelve short-coupled trail cars of the standard Stadtbahn type, arranged for use as two independently operated halves when necessary. The motive equipment consists of a head-end locomotive with two driving axles and a pusher locomotive of similar type. The driving axles are furnished with a geared jackshaft connected to the single motor. The current collectors are carried on the car next to each locomotive. This car also contains the motorman's cab, which is available for passengers when not in service. The cars are equipped with air brakes, electric light and electric heating. The total seating capacity of the twelve cars is 600, and their weight when carrying a maximum passenger load is 290 metric tons. The collectors take single-phase current at 15,000 volts and transmit it to the locomotive transformers, which lower it to 200 to 600 volts.

rect names, dates, places and persons should be used so far as possible, but fictitious substitutes may be employed, provided this is so stated in transmitting letters and the fundamental facts related have actually occurred. Each contestant may use his own style of expression, use railroad dialect, if desired, and illustrations, if thought advisable.

There is no limitation as to the time when the facts given in the story may have occurred, but naturally these facts will be of larger interest if covering recent years and particularly if they apply to present standard forms of Westinghouse brake equipment. The stories will be judged primarily upon the convincing character of the narrative as to the value of the air brake; originality; striking or unusual features; accuracy of facts given; relation of the story to present-day conditions; concise expression and brevity.

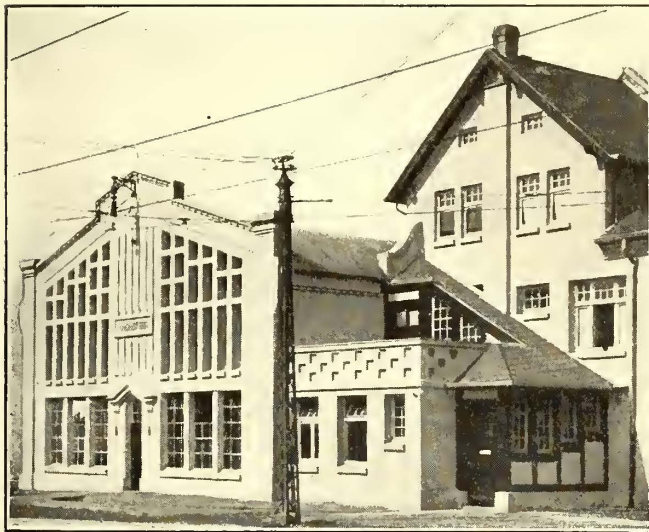
The contest is open to bona-fide employees of any railroad in the United States, operating regular traffic schedules. No stories should be more than 2000 words in length and must be written on one side of the sheet only and preferably typewritten. The name and address of the writer must not be shown on the manuscript but in the transmitting letter. The committee of judges will be three persons not associated in any way with the Westinghouse interests. Each story should be addressed to the judges, room 2121, 165 Broadway, before Aug. 1, 1914.

AN ARTISTIC GERMAN SUBSTATION

The modern utility structures of German electric railways are notable for the effort made to design them in harmony with and even superior to the surroundings. This end is not attained necessarily by using costly materials but rather by exercising good taste in the outlines and in the window divisions. An interesting example of recent construction is the substation built at Bottrop-Osterfeld by the Recklinghausen Street Railways.

This station is two stories high. The lower floor has large windows of conventional form, but in the upper section the windows are set back to give the massive effect of long, monolithic straight lines. This form of architecture is now very popular in Germany for theaters, libraries and other classes of buildings, whether for artistic or utilitarian uses. The dwelling contiguous to the station is the residence of the substation attendants. It is provided with a separate entrance from the street.

The station equipment was furnished by the Siemens-



Outside View of Substation at Bottrop, Germany

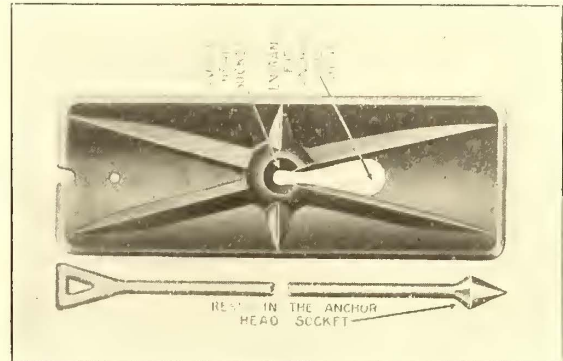
Schuckert Company. The main floor contains the rotary converters, the switchboard, all d.c. equipment and the remote control gear for the high-tension oil switches. The transformers for the rotaries are placed behind the switchboard but they are mounted on wheels to bring them within range of the station crane when necessary. The second floor contains all high-tension switches, measuring transformers, a.c. busbars and lightning protection equipment.

PUBLIC SERVICE COMMISSION REPORT

According to the third annual report of the Public Service Commission of Washington for the period from Dec. 1, 1912, to Nov. 20, 1913, the commission considered more than 800 cases during this period. There were 440 informal complaints filed. The tariff orders numbered 259, grade crossing orders 73, other formal orders 49, and 12 electric company cases. During the year about \$20,000,000 worth of properties were valued. The most important of these were the Pacific Power & Light Company, some of the subsidiary companies of the Puget Sound Traction, Light & Power Company and the Gray's Harbor Railway & Light Company. The commission announces that during the ensuing year it expects to complete appraisals and rate investigations of the Washington Water Power Company and the Puget Sound Traction, Light & Power Company.

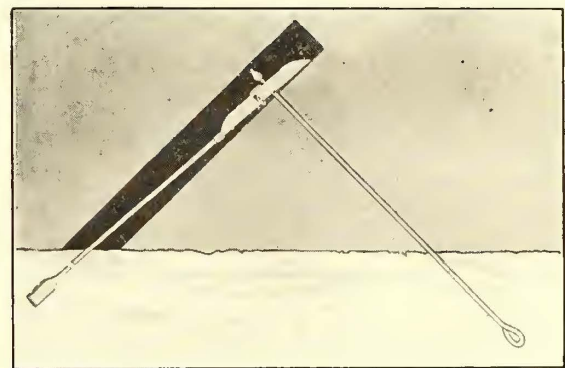
TWO-PIECE ANCHOR BEARING AGAINST UNDISTURBED EARTH

Guy anchors are usually of one piece, designed to be set with the pull-rod in the strain position, but they differ in the method of installation and in the manner of transmitting the strain from the anchor to the surrounding earth. However, the anchor recently placed on the market by the Chance Manufacturing Company,



Parts of Non-Creeping Anchor

Centralia, Mo., involves a new principle for manufactured anchors although it resembles the dead-man in that the anchor plate bears on undisturbed earth. In order to accomplish this, the new anchor, known as the "Never Creep," was made in two pieces—a pull-rod and an anchor plate. The anchor hole in the earth is bored with an ordinary 8-in. auger, and as near at right angles to the line of strain as conditions will allow. The depth of the hole varies with the length of the rod used. After the hole is dug, the pull-rod is driven through the undisturbed earth to the center. The anchor plate is then lowered into the hole and set on the end of the pull-rod by means of a special hook casting fastened to the end of a tamping bar. The slot in the anchor plate is tapered so that it will slip over the end of the pull-rod without difficulty. When the plate is released it assumes a position in which the anchor head socket engages the head of the pull-rod, holding both securely in place. It is asserted that this anchor has a greater holding power



than a dead-man of the same area, and at the same time it is much more quickly and easily installed. It has an advantage over other types in that the strain is against undisturbed earth. The manner of attaching the pull-rod to the anchor plate is also considered advantageous because there are no threads, consequently the entire pull-rod section is available for anchor strains.

W. B. Strang, Overland Park, Kan., president of the Missouri & Kansas Interurban Railway, has issued a pamphlet "The Benefit District Plan for Building Interurban Railways."

News of Electric Railways

Toledo Negotiations Abandoned

Negotiations between the Council franchise committee at Toledo, Ohio, and Henry L. Doherty, representing the Toledo Railways & Light Company, were abandoned on the evening of May 12, when it was found that absolutely no progress had been made toward an agreement on the rate of fare. Mr. Doherty informed the committee that he had made the best proposition possible on the rate, and that as the committee still seemed determined to insist upon a flat 3-cent fare it appeared useless to spend further time in negotiations.

City Solicitor Thurstin told Mr. Doherty that the committee would like to include in its report to the Council a statement of the lowest flat rate of fare he would accept for the company. Mr. Doherty said that he could not agree to any fixed rate unless the city would surrender control of operation. These two phases of the business were interdependent and the company could not undertake to fix the fare with control in the city's hands. The franchise proposed by Mr. Doherty, as revised at the conferences during the week ended May 9, provided that both control of operation and fares be placed in the hands of the City Council, the rate for a five-year period to be fixed after a year's trial at 3 cents under a commission to be named by the city.

Before the meeting on May 12 closed Attorney Tracy asked that the committee in its report set forth all of the provisions upon which an agreement had been reached and that Mr. Doherty's proposal be made a part of such report, so that the entire matter might be properly placed before that body. He asked further that Mr. Doherty be heard by Council when the report is made. Mayor Keller expressed doubt as to whether any progress would be made by this course.

Councilman Sievert appeared before the committee and declared in favor of the Doherty plan. At the same time he asked the committee to make a favorable report on the plan. He said: "I think that this proposal is fair; in fact, the fairest that has ever been made to the city. I do not think there is a man here who can show that a 3-cent fare would be profitable. I should like to see the committee take a definite stand for this proposal and report it favorably to the Council. I think that if the Doherty plan were submitted to the people to-day they would adopt it."

At the same meeting Assistant City Solicitor Schlatter asked Mr. Doherty what would prevent the company from making such representations to future councils as would induce them to grant too high a rate of fare, in case Mr. Doherty's plan were put into effect. Mr. Doherty replied that it would always be possible to trust the people and every act would be subject to a referendum. Mr. Schlatter continued to argue, however, that after the expiration of one year at a rate of 3 cents, the remainder of the franchise period would be uncertain. City Solicitor Thurstin added that future councils might be friendly to the company. Mr. Doherty said that he was willing that the franchise should require every fare revision to be submitted to a referendum.

It is possible that the franchise committee will submit its report to the Council on the evening of May 18, but more probable that it will be presented a week from that time. It is believed that the committee fears a protest from the business interests for refusing to accept what seems to them to be a just proposal. On the other hand, some of the men interested in the company do not believe the business men will take a hand in the matter. While the business men are in sympathy with the policy which the company has adopted, they have not been active so far in trying to bring about an agreement. Progress toward an understanding between the company and the city would probably have been made if the business interests had participated actively during the negotiations and tried to show the committee good reasons for testing the company's proposition.

When the committee makes its report to the Council, Mr. Doherty will ask the privilege of presenting the company's side of the case, and he will urge the Council to consider the proposed franchise further on the ground that the difference between the city and company should be adjusted at the earliest possible moment.

It is said that the Municipal League will at once start petitions for a referendum vote on a municipal ownership ordinance. The company will probably take like action with respect to the present franchise proposition, but not until the nature of the proposed municipal ownership ordinance is known. It is not anticipated that the company will have any trouble in securing a sufficient number of names to a petition for a referendum. Under such conditions the franchise could be put before the people within a very brief period.

A conference between the committee and representatives of the company was held on the evening of May 8, but little was done except to discuss the question of fare.

One feature that has attracted great attention is the publicity campaign carried on by Mr. Doherty and the company. The city's representatives declare that the educational forum in the newspapers is not fair. The political followers of the administration are particularly averse to the heading "So the People May Know," but the only plausible objection to the campaign which has been advanced is that the company's money is paying for the publicity.

In speaking of this matter Mr. Doherty said that for years there had been loud complaints because the affairs of corporations were not given publicity, but when the broadest and clearest explanations of all questions pertaining to the Toledo company were placed where everyone could see and read, protests followed. Mr. Doherty said:

"The settlement of the Toledo franchise trouble will be a most important matter to public utilities companies all over the United States, and especially to street-railway companies. Franchises are expiring in many places and questions similar to those at Toledo are likely to arise elsewhere. We can strengthen the situation, if this contest is settled properly, or we can weaken it, if the reverse is true. That is the reason I am willing to leave my other interests and spend so much time and effort in Toledo. I expect to remain in Toledo until some definite conclusion is reached."

Mr. Doherty said that time will be allowed to work out all the problems and give the people an opportunity to get a thorough grasp of every detail of the situation.

The Blade Printing Company, Toledo, is preparing to publish all the matter used in the publicity forum in pamphlet form, on account of the demand for the matter. These pamphlets will be supplied by the company mentioned in connection with the Toledo *Blade*.

Kansas City Franchise Negotiations Reopened

The receivers for the Metropolitan Street Railway, Kansas City, Mo., met with the Council franchise committee and other representatives of the city on May 7 for the purpose of resuming negotiations looking toward an extension of the franchise of the company. After a short discussion, an adjournment was taken until May 11. Frank Hagerman, attorney for the receivers, reviewed the former negotiations and outlined the financial situation of the company, stating that \$23,000,000 of mortgages were due and the court could not stave off foreclosure any longer unless an early adjustment was in prospect. Referring to the former franchise negotiations, he stated the receivers had withdrawn because it was apparent some of those interested were attempting to make political capital of the franchise proceedings. Mayor Jost stated he would send a copy of the franchise draft to the Missouri Public Utilities Commission at Jefferson City for any suggestions members might care to volunteer.

An agreement to begin immediate work on the laying of tracks on Twenty-fourth Street, between Main Street and Grand Avenue, as a portion of the routing plan to the new Union Depot, was reached. The company agreed to lay the track under the peace agreement, which eliminates the provision that any competing company may use three blocks of the track of the Metropolitan Street Railway. The city reserved the right to revoke the authority to operate on Twenty-fourth Street if the Metropolitan system is dismembered before the expiration of the franchise.

The Kansas City Commercial Club, at a recent meeting, authorized President H. A. Fitch to appoint two members

to act with himself as the franchise committee of the organization, and to attend all conferences between the city and the Metropolitan Street Railway.

Some Legal Aspects of Regulation

The series of lectures before the public utility section of the finance forum of the West Side Y. M. C. A. in New York was concluded on May 11, with an address by Charles F. Mathewson, of Krauthoff, Harmon & Mathewson, on "Some Legal Aspects of Regulation of Public Service Corporations." Mr. Mathewson cited many authorities and said that hours might be consumed in the discussion of any one of the many subjects to which he would refer. He alluded particularly to the Consolidated Gas case in New York. This is the case of William R. Wilcox and others constituting the Public Service Commission of the First District of New York vs. the Consolidated Gas Company of New York. It was decided by the United States Supreme Court on Jan. 4, 1909. While this case was not a complete victory for the company, certain principles enunciated in the decision were of the greatest value in all similar cases involving the regulation of rates and prices.

Mr. Mathewson said that all business was more or less under supervision or regulation and referred particularly to the police powers. He quoted from both the fifth and fourteenth amendments of the Constitution and from state constitutions. The trade commission bill now pending in Congress conferred particularly broad powers on the commission. The definition of a public service corporation had not been finally fixed by the courts and there was no telling how the present interpretation in regard to such corporations might be extended in the future. In this connection fire insurance companies had recently been included under the designation of public service corporations as interpreted by the courts. Special legislative committee investigations were particularly pernicious. The Stevens legislative committee of 1905 in New York State attempted within a few months to determine and pass upon the value of many companies. A public service commission or like body could proceed in a similar case at leisure and was well equipped to carry on such work.

Perhaps the paramount question in connection with appraisals was the value of the operating company's plant. The second most important question was the value of the intangible property. No uniform rate of return was applicable to all cases. The market value of the securities of a company was no test as to the proper rate of return. Accounting was extremely intricate. Mr. Mathewson had never known of a case where the books of a corporation showed the real property value. In successful companies money was usually put back into the property through improvements whereas unsuccessful companies frequently capitalized their improvements. The cost of reproduction new frequently equalled the original cost and had come lately to be accepted as a fair criterion of the worthy of a property. He thought that in most cases the federal valuation figures would be antedated before the valuation had been completed.

In speaking of development expenses Mr. Mathewson referred to the Twenty-eighth & Twenty-ninth Streets Crosstown Railroad, New York, which expended \$1,285,000 in experiments with compressed air as a possible means of motive power on its lines. This expenditure was part of the price of development and due allowance should be made for it in any consideration of the company's affairs. He also quoted at length from the recent Kings County case in regard to going value. The value of physical property and the going concern value had to be ascertained separately. The recent Passaic gas case was also referred to by Mr. Mathewson. In the Consolidated Gas case the Supreme Court held that less than 6 per cent return would be confiscatory. This company had practically a complete monopoly and the court regarded it as extremely unlikely that competition would develop in the future.

Cases of returns as fixed by the courts which were quoted by Mr. Mathewson were the Cumberland Telephone case 7 per cent, Minnesota rate case 7 per cent, Des Moines Water case 8 per cent, Queensboro Lighting case 8 per cent, and the Kings County Lighting case 7½ per cent. Mr. Mathewson contended that 8 per cent was a fair return on any

investment in New York. He also referred to the setting aside by the court of the decision of the Railroad Commission of Wisconsin in the Milwaukee fare case.

A serious mistake was frequently made in assuming that a decrease in the price of a service would be more than offset by an increase in the use of the service. Even if the decrease in the cost of service to the consumer did result in a large increase in business extra capital would have to be put back into the property to meet the increased demand. Mr. Mathewson knew of no rate reduction that had worked materially to the benefit of the company. He said that the subject of depreciation had never been fairly before the Supreme Court. In the Minnesota rate case the question came before the court only incidentally.

Accounting Between City and Company in Chicago

Barrow, Wade, Guthrie & Company, public accountants, have reported to City Comptroller Traeger of Chicago in regard to the methods of keeping the books of the Chicago City Railway under the provisions of the 1907 franchise ordinance. In concluding their report the accountants say that various expenses charged to capital account appear to them to be proper charges to operating expenses, that certain payments made out of the renewals and depreciation fund appear to be proper charges to operating expenses and that the present system of adjustment of interests on deposits might be changed to the interest of the city. It is also pointed out that fines and expenses which are inflicted on the company on account of violations of the city ordinance are included with other payments made by the company before the city participates in the division of the net earnings of the company.

Bion J. Arnold, chairman of the Board of Supervising Engineers, Chicago Traction, is reported to have said that the board is planning to inquire into at least three of the items criticized by the accountants in their report. These items include \$16,000 paid out in connection with the proposed subway plan, certain payments to the Commonwealth Edison Company and the payment of more than \$7,000 income tax out of the partnership account between the company and the city instead of out of the company's own funds. Mr. Arnold issued a statement in which he said in part:

"The accountants have brought out no new points, as most of them have been thoroughly discussed and passed upon by the board, and the board's rulings concurred in by the passage of the ordinance of Nov. 13, 1914. The other points raised by the accountants, such as the disposition of the income tax, were under consideration by this board before the accountants pointed them out, and no decision has as yet been rendered by the board regarding them."

It is generally regarded that the controversy over the accounting as accepted by the Board of Supervising Engineers and rejected by the Mayor and his followers is a purely political move. The Mayor is believed to feel injured because the Board of Supervising Engineers did not support him and his comprehensive subway plan. The Council and the board have been working in conjunction in these matters. On the other hand the Mayor appears to have lost his control of the Council, particularly the local transportation and the terminal committees. It is doubtful whether the Mayor's influence will result in any action by the Council.

Successful "Safety First" Campaign in Dallas

C. V. Cosby has completed a satisfactory course of lectures among the trainmen of the Dallas (Tex.) Electric Corporation on the subject of "safety first." "Safety first" lapel buttons are to be distributed to all employees of the Dallas Consolidated Electric Street Railway, Metropolitan Electric Street Railway, Rapid Transit Railway and the Dallas Electric Light & Power Company, all controlled by the Dallas Electric Corporation, as an ever-present reminder of the principles of the movement. Later a "safety league" is to be formed. The "safety first" buttons are attractive in appearance. The design comprises a triskelion in the center of a circular white field surrounded by a black border, on which appears the motto "safety first" in gold letters.

The New Haven Inquiry

In connection with the inquiry into the affairs of the New York, New Haven & Hartford Railroad, a sharp controversy developed on May 13 between Joseph W. Folk, general counsel for the Interstate Commerce Commission, and Attorney General MacReynolds. The commission earlier in the week summoned to Washington William Rockefeller, Louis Cass Ledyard, George F. Baker and George W. C. Miller. Mr. MacReynolds wrote the commission on May 12 suggesting that the members consider very carefully the effect of the proposed examination of Charles S. Mellen, former president of the New Haven Railroad, and E. D. Robbins, counsel for the company, upon any criminal prosecution which the government might desire to institute hereafter. Mr. Folk declared on May 13 that he intended to put Mr. Mellen on the witness stand on May 14, contending that Mr. Mellen as a witness telling the truth would be a thousand times more valuable than Mr. Mellen could possibly be as a defendant. He said:

"The great question before the American people to-day is to secure honesty in the management of the railroad systems of the country. The revelations already brought to light in this investigation, and the further disclosures that Mr. Mellen and other witnesses can make, should be of immense value, and result in legislation that will cause it to be just as grave a crime to plunder the public through a corporation as it is now personally to rob an individual."

On the same day the commission, through Mr. McChord, announced that the hearing in the New Haven investigation would be resumed on the morning of May 14 without any change in the original plan. This action was unanimously concurred in by all the members of the commission.

The proceedings before the commission on May 8 were very short. Charles F. Linsley, Meriden, Conn., who was one of the directors of the Billard Company, was the first witness. He had never taken any active interest in the company. He became a director to accommodate Mr. Billard and acted according to Mr. Billard's directions. Birdsey E. Case, an attorney of Hartford, was also examined on May 8.

At the hearing on May 11 Timothy E. Brynes, the former vice-president of the New Haven Railroad, testified regarding the disbursement of approximately \$400,000 among legislative lobbyists, publicity promoters, lawyers, special agents and advertising men for helping to "create sentiment" favorable to the New Haven. The first witness on May 11 was George D. Phippen, treasurer of the Boston Railroad Holding Company and treasurer's agent of the New Haven Railroad, stationed at Boston.

At the hearing on May 12 Louis Cass Ledyard, a director of the New Haven and chief counsel for the Morgan interests, defended the late J. P. Morgan in answering an attack upon the financier by William B. Lawrence, a Boston lawyer. Mr. Lawrence said that he was a "victim" of the New Haven management to the extent of \$1,500,000 and charged that a deal in Boston & Maine stock had been engineered in the interests of the Morgan combination.

The most interesting feature of the hearing on May 14 was the testimony of Charles S. Mellen, former president of the New York, New Haven & Hartford Railroad, relating to the acquisition by the New Haven road of a large number of shares of stock issued by the New York, Westchester & Boston Railway, now operating a high-speed electric railway out of New York. This stock, according to Mr. Mellen, was redeemed through due bills given by him to the late Thomas E. Byrnes, former chief of the New York detective bureau. Mr. Mellen had never been able to find out to whom the due bills were given, although the bulk of them had been redeemed for about \$150,000. In Mr. Mellen's opinion, the Westchester shares had been "scattered in the hands of people of what you may call influence," the inference being that the distribution of due bills was effective in securing modifications in the franchise of the New York, Westchester & Boston Railway. The Westchester stock which was redeemed through the medium of Mr. Byrnes was according to Mr. Mellen "worth about ten cents a pound." The hearing was adjourned until May 19 in order to make it possible for Mr. Mellen to gather papers which the commission wanted and to permit the commission to examine the documents furnished by Mr. Mellen.

Exhibits of Northern White Cedar Association

An exhibit of Northern white cedar products was held from April 30 to May 9, inclusive, by the Northern White Cedar Association, at the Coliseum, Chicago, Ill. At the exhibit were displayed telephone poles of northern white cedar that have been in actual service for fifty years, ties for twenty-nine years and posts of high quality. Another exhibit will be held at the Grand Central Palace, New York, N. Y., from May 21 to 30, inclusive.

The object of this association is to establish grades of poles, posts, ties and shingles which will be standard and to maintain those grades so that the purchaser may be assured of procuring material suitable for his purposes. The association also looks after the interests of its members in the establishment of minimum carload weights and railway rates of freight. A traffic department is sustained within the association to handle, for the members, all matters pertaining to freight rates, railway claims and tracing of cars.

Intercollegiate Debate on Municipal Ownership

On the afternoon of May 11 a debate was held at Stevens Institute, Hoboken, N. J., between Stevens Institute and Cornell University on the subject of "Municipal Ownership and Operation of Public Utilities." The judges, C. W. Baker, editor of *Engineering News*, and F. R. Hutton, rendered a decision in favor of Cornell. B. P. Goldman, the representative of Sibley College, Cornell, based his affirmative case upon three points—that public utilities are natural monopolies; that regulation has proved inefficient and ineffective, and that municipalities have a financial advantage in dealing directly with public utilities. Mr. Goldman stated that the only way to treat public utilities was as functions of the city government, and that the only logical step was for municipalities to adopt the more direct method of municipal ownership.

Charles A. Colvin, the Stevens representative, on the negative, took as his point of view that of the consumer as the receiver of service and as the citizen, and based his case upon the proposition that municipal ownership would result in an increase rather than decrease the service per unit cost. Moreover Mr. Colvin declined to present any comparative data in regard to the efficiency of private or municipal ownership, on the ground that comparative figures were of no value unless each case was thoroughly examined to show that items such as taxes, depreciation, and interest were taken into account under analogous conditions. The true test of municipal ownership was whether the city could rent the utility and receive a greater return than was possible under its own operation. This debate—the first one of its kind between the two colleges—was inaugurated this year with a view of giving the engineering students concrete forensic practice in the presentation of facts and data to a critical audience.

National Foreign Trade Convention

The call for the National Trade Convention to be held in Washington on May 27 and 28, under the auspices of the American Manufacturers' Export Association, the American Asiatic Association and the Pan-American Society proceeds from a realization that the foreign trade is now at a point where its future is vital to the country's prosperity. The general committee is headed by Lloyd C. Griscom, former American ambassador to Italy and Japan. Secretary Redfield of the Department of Commerce at Washington will open the convention. The importance of foreign trade to the railroads will be the subject of a paper by Fairfax Harrison, president of the Southern Railway. The Illinois Manufacturers' Association was asked to designate the manufacturer to treat of the situation in the Middle West and nominated its president, H. G. Herget, for the duty. E. C. Simmons, head of one of the largest hardware houses in the country, will deal with a similar topic. E. N. Hurley, vice-president of the Illinois Manufacturers' Association, who recently headed a party of sixty Illinois manufacturers in a trip to South America and who investigated South American banking and credits for the Department of Commerce, will make an address on the Panama Canal and Latin-American trade opportunities.

Alba B. Johnson, president of the Baldwin Locomotive Company, will handle the possibilities of stimulating American exports by a larger use of raw materials from partially developed countries. James A. Farrell, president of the United States Steel Corporation, will be active in the convention. All papers will be distributed to the delegates in advance of the convention. It is expected that the delegates will study the papers and engage in the discussions.

Injunction Granted in Omaha.—The District Court at Omaha, Neb., has granted an injunction restraining the city from enforcing the ordinance requiring the Omaha & Council Bluffs Street Railway to sell seven tickets for 25 cents recently voted on under the initiative and referendum law.

Plans for Electrification of Burlington Section.—It is stated that the Illinois Central Electric Railway, which operates from Lewistown to Canton, Ill., and other points in Fulton County, may arrange with the Chicago, Burlington & Quincy Railroad for running electric cars from Lewistown to West Havana over the tracks of the steam railroad.

Subway System Suggested for Detroit.—At its last meeting the Detroit Street Railway Commission passed a resolution to the effect that a subway system is the solution of the rapid transit and congested traffic problem in Detroit and it was agreed to get all possible information on the subject. A resolution was also passed providing that all surface lines constructed in the future shall be built by the commission. This action does not interfere in any way with the extensions which have been agreed upon between the city and the Detroit United Railway, work upon which has been started.

Conference on Uniform Accounts.—The committee of the Missouri Electric, Gas, Street Railway & Water Works Association appointed to consider the question of a uniform classification of accounts for all members, except street railways, met in Kansas City on May 6 and 7, with J. M. McShane, statistician for the Missouri Public Utilities Commission. Philip J. Kealy, of the Kansas City Railway & Light Company, presided as chairman. A dozen members were present. The tentative classification will be presented to the Missouri Association at its annual meeting on May 21.

Cars to Be Equipped for Fire Fighting.—Albert Patten, superintendent of the Topeka (Kan.) Railway, has proposed that two cars of the company be equipped with fire-fighting machinery and the plan probably will be adopted by the city commissioners. Mr. Patten pointed out that the company's lines run through the thickly populated sections of the city and that the street railway equipment would therefore be available where the conflagrations were likely to be unusually dangerous. An ordinance providing for the changes probably will be introduced by the city commissioners in the immediate future.

New Franchise Under Consideration in Findlay.—The Toledo, Bowling Green & Southern Traction Company proposed at a meeting of the City Council at Findlay on May 8 to exchange its franchise which expires in 1915 for a new 25-year grant under which it will reduce the cost of street lighting to \$55 per arc light per year, pave the street between the tracks and 18 in. on the outside and reduce the price of current for commercial purposes from 8 cents to 6.65 cents per kw-hr. The city desires to pave Main Street, but the company insists upon a new franchise before it will agree to pave its right-of-way.

Massachusetts Senate Favors Municipal Ownership Report.—The Senate of Massachusetts has passed to be engrossed the resolution providing that the Public Service Commission shall furnish the Legislature of 1915 with certain information relative to public ownership of street railways, this information including the amount invested in street and elevated railway lines; also an estimate of cost to the commonwealth of acquiring the same by eminent domain; also an opinion as to what proportion of such cost could be properly assessed upon real estate to be benefited by such acquisition. The resolution now goes to the House.

Changes Recommended in Kansas Utility Law.—A committee appointed by the recent Kansas Legislature to recommend changes in the present public utilities commis-

sion act met at Topeka, Kan., on May 8. Among the subjects discussed at the meeting were extension of the jurisdiction of the commission, the basis of rate making, accounts, reports, franchises, stock and bond issues, and a uniform classification for public utilities. J. M. Kinkel and James Cable, of the present Kansas Public Utilities Commission, attended the meeting and advanced suggestions. Ernest Hogueland, secretary of the last commission, also attended.

Record Verdict in Accident Case.—A jury in the Supreme Court at White Plains, N. Y., on May 8, decided that the New York, New Haven & Hartford Railroad should give Oscar Fried \$75,000 damages as a recompense for the loss of both his arms. The injured man sued for \$150,000. While working on a strut holding the catenary bridge, which supports the high tension wires of the electric system in Mount Vernon, Dec. 8, 1913, Mr. Fried came in contact with a wire carrying 11,000 volts. Counsel for the railroad moved that the verdict be set aside on the ground that it was excessive and that Thomas J. O'Neill, attorney for Fried, had not elected whether he would sue under the State or under the federal statute. Justice Morschauer reserved decision.

Straight Five-Cent Fare Rejected in Trenton.—The Commissioners of the city of Trenton, N. J., have adopted a resolution holding that the reasons advanced by the Trenton & Mercer County Traction Corporation for desiring to abolish the sale of strip tickets are insufficient and they have directed City Counsel Bird to take any action necessary before the Public Utility Commission should the matter be referred by the company to that body. The company desired to substitute straight 5-cent fares, with transfer privileges, for the system of selling six tickets for 25 cents. In return for the establishment of the straight 5-cent fare the company agreed to purchase ten new double-truck cars yearly until seventy had been added to the system; to establish a waiting room in the center of the city; to develop a package express and to inaugurate a pension system for the benefit of its employees.

Brooklyn Subway Section Contract Awarded.—During the week ended May 9 the Public Service Commission for the First District of New York executed a contract with the Cranford Company for the construction of a part of the Eastern Parkway subway in Brooklyn. The Eastern Parkway subway will be operated by the Interborough Rapid Transit Company as an extension of the existing subway. The route begins at the present subway terminus, at Atlantic and Flatbush Avenues, Brooklyn, and runs through Flatbush Avenue and Eastern Parkway to Buffalo Avenue, whence there will be an elevated extension through East Ninety-eighth Street and Livonia Avenue to New Lots Avenue. The section covered by the Cranford contract lies in Flatbush Avenue between St. Marks Avenue and Prospect Park Plaza, and will be mostly six-track construction. The contract price is \$2,225,519. Work on this section will begin on May 23.

Illinois Commission Orders Track Elevation.—Regardless of the position taken by Counsel for the Chicago & Oak Park Elevated Railroad, which is now in the hands of receivers, the Illinois Public Utilities Commission has issued an order instructing the company to elevate that portion of its tracks now on the surface. In its order the commission instructs the elevated railroad to file plans with the commission for its approval, before July 1, 1914. Within sixty days after the plans have been approved track elevation work must be started, and until the tracks are finally elevated the trains must stop at every street intersection, and proceed by signal only. If the receivers for the road refuse to comply with the order, all trains beyond Laramie Avenue, or the end of the elevated structure, will be prohibited from running. The order of the commission will be submitted by the company to Federal Judge Carpenter and his instructions will be obeyed.

Chairman's Opinion on Inquiry Into New York Commission.—Chairman Van Santvoord of the Public Service Commission of the Second District of New York, has issued a statement in answer to the proposed investigation of the commission by the State department of efficiency and economy on complaints filed by citizens of Buffalo that the commission acted improperly in granting authority to begin business to the Canadian American Power Company. After

stating that action on this application was taken before he came into the commission, the chairman concludes: "If I could seriously believe that the statement intends to convey the idea that an investigation of the commission had been undertaken and would be pressed because the commission declined to comply with demands of the department of efficiency and economy to investigate certain complaints or to decide a pending application, I would quite as seriously suggest that such action or threat might properly be taken before the grand jury."

Service Resumed on Pennsylvania Road.—The Webster, Monessen, Bell Vernon & Fayette City Street Railway, Charleroi, Pa., reported on May 11 that its cars were in regular operation and that the regular schedule was being maintained. The strike of the employees was brought about by the refusal of the officers of the company to recognize the Amalgamated Association. There was a local union among the employees which was recognized by the company, but that body was not affiliated with the Amalgamated Association. The men also had a working agreement with the company which did not expire until May 1, 1914, but on the refusal of the officers of the company to recognize the Amalgamated Association the men declined on April 23, 1914, to report for work. The differences between the men and the officers of the company are still unsettled, no concessions having been made by either side. The statement that a corps of the State constabulary had been called was incorrect, and the company has placed no guards on its cars. The company operates a 9-mile suburban line.

Abrogation of Existing Contracts for Increased Rates.—Judge Mathews of the Superior Court of Georgia has rendered a decision upholding the right of the Public Service Commission acting under order of the Georgia Railroad Commission to abrogate existing contracts for electric power and to charge an increased rate. The power company defended its right to make a demand for increased rates by setting up an order of the commission that the contract in question, executed on July 18, 1912, and similar contracts be abrogated and that maximum rates be fixed. The plaintiff in the case denied the power of the commission to abrogate a contract already legally made, but the court held that such contracts were made subject to the law then in existence giving the commission power to fix rates and prevent discrimination. The court decided, therefore, that the power company was bound by the rulings of the commission as to maximum and also as to discriminatory rates, and that the consumer also must yield to the same authority when the commission condemned any contract either in contemplation or in actual existence as discriminatory and therefore regarded by the commission to be opposed to public policy.

Office Building of Birmingham Railway, Light & Power Company Destroyed by Fire.—Two employees lost their lives on May 8 in a fire which completely destroyed the office building of the Birmingham Railway, Light & Power Company, Birmingham, Ala. The two employees, W. M. Childress and H. H. Keyser, were killed by jumping from upper floors to the pavement below, in order to escape the flames. The fire is thought to have originated in some waste paper in the basement of the building. General Manager J. P. H. de Windt said Saturday morning that most of the important books and papers in the claims and auditing departments were in the safe and are supposed to have escaped the ravages of the flames. Private papers of all the officials were destroyed. Early Saturday morning temporary quarters were opened in the old Jefferson County Bank Building, which had been tendered the company by the bank officials. The old Gilreath office next to this building on Twenty-first Street is also being occupied temporarily. President Ford, General Manager de Windt, and the auditing, treasury and railway departments will be located in these buildings. The engineering department will also be in the old bank building. Insurance on the building occupied by the Birmingham Railway, Light & Power Company, which was owned by Judge W. M. Walker, amounted to a total of \$50,000. Insurance on schedule amounted to \$132,600, of which \$36,200 was a total loss. This was on furniture and fixtures, \$22,000; electrical stock, \$8,900, and gas stoves, \$5,300.

PROGRAMS OF ASSOCIATION MEETINGS

American Railway Association

The spring session of the American Railway Association will be held at the Biltmore, Madison and Vanderbilt Avenues, Forty-third and Forty-fourth Streets, New York, N. Y., on May 20, at 11 a. m. Reports will be presented by the following committees: The executive committee; the committee on transportation; the committee on maintenance; the joint committee on automatic train stops; the committee on relations between railroads; the committee on the safe transportation of explosives and other dangerous articles; the committee on electrical working, and the committee on nominations. The election of a president and a first vice-president will take place at this meeting. Two members of the executive committee, three members of the committee on transportation, three members of the committee on maintenance, three members of the committee on relations between railroads and three members of the committee on nominations are to be elected.

International Congress at Budapest

The preliminary program of the convention at Budapest this year of the International Street & Interurban Railway Association has just been published. The subjects to be considered by the delegates are as follows:

"The Effect of New Transportation Systems on the Development of Cities and the Social Conditions of the Community; the Proper Basis for Fares and Transfers and the Effect of Reduced Fares on Travel," by Mr. Duval-Arnould of the Paris Municipal Council and Dr. Kuhles of the Munich Municipal Council.

"Rail Corrugation," by Mr. Busse, chief engineer of the way and structures of the Great Berlin Street Railway, and Mr. Resal, manager of the Bordeaux Electric Railway & Omnibus Company.

"Study of the Best Shape of Rails and Tires to Give a Minimum Wear on the Curves; the Use of Manganese and other Special Rails for Curves," by Mr. Bacqueyrisse, chief engineer of the General Omnibus Company, Paris, and Mr. Minorini, manager of the Municipal Tramways of Milan.

"Ball Bearings and Roller Bearings for Motor Cars and Trail Cars," by Mr. Largiader, manager of the Zurich Municipal Tramways, Mr. Schoerling, chief engineer of the Hanover Tramways, and Mr. Tobias, superintendent of shops of the Budapest Tramways.

"Training of Motormen, Conductors and Inspectors, the Collection of Fares and Accounting for Receipts," by Mr. Noirfalise, general manager of the Liégeois Tramways, and Karl Roethy, chief inspector of the Budapest Tramways.

"Methods of Trans-shipment of Freight from Narrow-Gage Railroads to Standard-Gage Railroads," by Mr. Sapin, manager of the Paris Central Railway & Tramway Company, Paris, and of the Ekaterinoslav Tramways Company.

"Joint Operation of Lines with Several Franchises," by Mr. Carnevali, chief engineer of the Turin Tramways Company.

"Self-Propelled Cars," by Mr. Hamelink, formerly manager of the Netherlands Tramways, and Mr. De Soignie, manager of the Mosane Tramways which are operated in Ardenne.

"Underground Conduit Construction for Feeders," by Mr. Sekutowicz, operating manager of the Lyons Tramways.

"Direct-Current Distribution at Several Potentials for Electric Railway Service," by Mr. Sieber, manager of the Nuremberg-Fürther Tramways.

"Relative Merits of Various Methods of A.C.-D.C. Conversion," by Mr. Dalrymple, manager Glasgow Corporation Tramways, and Mr. Sarrat, engineer of the Empain Syndicate, Brussels.

"Passenger Stations, Stop Signs, Destination Signs and Car Advertising," by Rodolphe de Weck, manager of the Freiburg Tramways and president of the Swiss Interurban Railway Association.

Financial and Corporate

ANNUAL REPORTS

Stock and Money Markets

May 13, 1914.

In the trading on the New York Stock Exchange to-day the balance of the net changes showed a loss too small to be regarded as significant. Liquidation of New Haven has apparently come to an end. The total dealings in New Haven to-day consisted of one sale of four shares. Rates in the money market to-day were: Call, 2 per cent; sixty days, 2½ @ 2¾ per cent; four months, 3¼ per cent; six months, 3 @ 3¼ per cent.

In the Philadelphia market to-day Rapid Transit advanced to 17¼ and Union Traction sold at 44¾. Lehigh Valley Transit common sold at 17½ and the preferred at 30½.

The Chicago market was narrow and dull to-day. The principal bond transactions were in Chicago Railways and Chicago City issues.

The Boston market to-day developed an improved tone and trading became more active on the advance which followed the opening.

In the Baltimore market to-day small sales were recorded of United Railways & Electric and Washington, Baltimore & Annapolis preferred. The bond sales totaled \$44,400, par value.

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

	May 6	May 13
American Brake Shoe & Foundry (com.)	87	86
American Brake Shoe & Foundry (pref.)	132½	133
American Cities Company (com.)	32	29
American Cities Company (pref.)	62	61½
American Light & Traction Company (com.)	345	340
American Light & Traction Company (pref.)	106½	107
American Railways Company	37½	37¾
Aurora, Elgin & Chicago Railroad (com.)	32½	32¾
Aurora, Elgin & Chicago Railroad (pref.)	76	76
Boston Elevated Railway	79	79
Boston Suburban Electric Companies (com.)	7	7
Boston Suburban Electric Companies (pref.)	*63	a55
Boston & Worcester Electric Companies (com.)	*6¼	*6¼
Boston & Worcester Electric Companies (pref.)	36	36
Brooklyn Rapid Transit Company	92¼	91½
Capital Traction Company, Washington	100¾	100
Chicago City Railway	135	135
Chicago Elevated Railways (com.)	20	20
Chicago Elevated Railways (pref.)	65	65
Chicago Railways, ptcptg., ct. 1.	92½	98
Chicago Railways, ptcptg., ct. 2.	31¾	33
Chicago Railways, ptcptg., ct. 3.	5	5
Chicago Railways, ptcptg., ct. 4.	2	2
Cincinnati Street Railway	102	102½
Cleveland Railway	104	104
Cleveland, Southwestern & Columbus Ry. (com.)	a4	*4
Cleveland, Southwestern & Columbus Ry. (pref.)	a30	*30
Columbus Railway & Light Company	13	13
Columbus Railway (com.)	53	53
Columbus Railway (pref.)	79½	79½
Denver & Northwestern Railway	63	*63
Detroit United Railway	a80	a80
General Electric Company	146¾	145½
Georgia Railway & Electric Company (com.)	120	119½
Georgia Railway & Electric Company (pref.)	86½	86½
Interborough-Metropolitan Company (com.)	14¾	14¾
Interborough-Metropolitan Company (pref.)	62½	62¼
International Traction Company (com.)	40	*40
International Traction Company (pref.)	85	*85
Kansas City Railway & Light Company (com.)	18	18
Kansas City Railway & Light Company (pref.)	37	37
Lake Shore Electric Railway (com.)	6	6
Lake Shore Electric Railway (1st pref.)	92	92
Lake Shore Electric Railway (2d pref.)	22	22
Manhattan Railway	130¼	131¼
Massachusetts Electric Companies (com.)	10	10
Massachusetts Electric Companies (pref.)	57	59
Milwaukee Electric Ry. & Light Co. (pref.)	95	95
Norfolk Railway & Light Company	25½	25½
North American Company	75¾	76½
Northern Ohio Traction & Light Co. (com.)	a70	70
Northern Ohio Traction & Light Co. (pref.)	101	101
Philadelphia Company, Pittsburgh (com.)	40	39¾
Philadelphia Company, Pittsburgh (pref.)	38½	38½
Philadelphia Rapid Transit Company	14½	17
Portland Railway, Light & Power Company	50	50
Public Service Corporation	112	112
Third Avenue Railway, New York	41½	41
Toledo Traction, Light & Power Co. (com.)	a20	20
Toledo Traction, Light & Power Co. (pref.)	a70	70
Twin City Rapid Transit Co., Minn. (com.)	105	104½
Union Traction Company of Indiana (com.)	11½	11½
Union Traction Company of Indiana (1st pref.)	*75	*75
Union Traction Company of Indiana (2d pref.)	14	*14
United Rys. & Electric Company (Baltimore)	26¼	26½
United Rys. Inv. Company (com.)	15¼	15
United Rys. Inv. Company (pref.)	42½	42
Virginia Railway & Power Company (com.)	50	a53
Virginia Railway & Power Company (pref.)	94	94
Washington Ry. & Electric Company (com.)	86½	86½
Washington Ry. & Electric Company (pref.)	82¾	84¼
West End Street Railway, Boston (com.)	67	67
West End Street Railway, Boston (pref.)	86	85½
Westinghouse Elec. & Mfg. Company	74½	74
Westinghouse Elec. & Mfg. Co. (1st pref.)	120	120

* Last sale. a Asked.

Chicago Railways

According to the sixth annual report of the Chicago (Ill.) Railways, the comparative income statement for the fiscal year ended Jan. 31, 1914, and for the preceding period is as follows:

	1914	1913
Income:		
Passengers	\$19,243,056	\$17,709,205
Special cars	4,597	4,806
Mails cars	38,238	31,489
Advertising	100,000	100,000
Rent of equipment	7,902	12,545
Rent of buildings, etc.	7,239	8,024
Sale of power	46,163	60,413
Interest on deposits	91,102	61,361
Miscellaneous income	136,418	88,934
Gross income	\$19,674,715	\$18,076,777
Expenses:		
Maintenance way and structures	\$644,337	\$738,174
Equipment	722,549	682,862
Renewals	1,575,208	1,446,142
Power	1,991,090	1,852,719
Operation of cars	5,176,464	4,881,644
General	1,425,318	1,410,693
Expense investment real estate	23,678	39,309
Taxes (estimated)	813,159	676,959
Total expenses	\$12,371,803	\$11,728,502
Balance	\$7,302,912	\$6,348,275
Deduct interest at 5 per cent on valuation	3,928,580	3,778,449
Net income	\$3,374,332	\$2,569,826
Division of net income:		
City of Chicago, 55 per cent	\$1,855,883	\$1,413,404
Chicago Railways, proportion of income from joint operation:		
Interest allowance on valuation of property	\$1,518,449	\$1,156,422
Interest on bank balances	3,928,579	3,778,449
Interest on treasury securities	161,734	122,775
Miscellaneous income	93,479	90,653
	175,000	840
Gross income	\$5,877,241	\$5,149,139
Deductions:		
Interest accrued on:		
First mortgage bonds	\$2,478,944	\$2,297,750
Consolidated mortgage bonds	1,830,572	1,817,919
Purchase money mortgage bonds	162,920	162,920
Collateral and funding notes		24,900
Current liabilities	1,121	
Sinking fund reserve accrued	250,000	250,000
Corporate expenses and adjustments	157,297	120,574
Total deductions	\$4,880,854	\$4,674,063
Net income	\$996,387	\$475,076

To the net income of \$996,387 shown by the above statement there was added a surplus at the beginning of the period of \$435,511, giving a total of \$1,431,898. From this there was deducted interest on adjustment income bonds of \$100,000, dividends on participation certificates No. 1 of \$852,864, and dividends on participation certificates No. 2 of \$248,600, or a total of \$1,201,464, leaving a balance at the end of the period of \$230,434.

During the accounting period the passenger revenues increased 8.6 per cent, interest on deposits 48.4 per cent, miscellaneous income 53.2 per cent, whereas the income from the sale of power decreased 23.6 per cent. The gross income for the period showed an increase of 8.8 per cent. The expenses for maintenance of way and structure decreased 12.7 per cent, but the expenditures for maintenance of equipment increased 5.8 per cent, the renewal expenses 7.4 per cent and the estimated taxes 20.1 per cent. The total expenses increased 5.48 per cent. The percentage of operating expenses to gross income was 50.75 in 1914 as compared to 53.14 in 1913; taxes, 4.13 per cent in 1914 and 3.74 per cent in 1913, and the reserve for renewals 8 per cent in each period, giving a total of 62.88 per cent in 1914, and 64.88 per cent in 1913. Interest on plant value as compared to gross income was 19.97 per cent in 1914 and 20.9 per cent in 1913, and the net divisible income was 17.15 per cent of gross income in 1914 and 14.22 per cent in 1913.

The passenger car mileage in 1914 was 62,807,503 as compared to 59,276,772 in 1913 and the mail car mileage 206,736 in 1914 and 188,575 in 1913, or comparative totals of 63,014,239 and 59,465,347. The revenue passengers carried increased from 355,518,500 in 1913 to 385,451,459 in 1914, and the transfer passengers from 256,408,891 in 1913

to 273,456,205 in 1914, or from 611,927,391 in 1913 to 658,907,664 in 1914.

In addition to the annual report the company has published under date of April 30 a report of H. A. Blair, president of the board of directors. According to this, the amount added to the capital account of the company during the past accounting period as shown by the certificates issued by the Board of Supervising Engineers, Chicago Traction, was \$3,487,490, which, added to the total capital account as of Jan. 31, 1913, gives a capital account on Jan. 31, 1914, of \$80,975,950. The total cost of rehabilitation, re-equipment, extensions and additions to the last-named date as determined by the board equals \$50,196,076.

It is stated that the unification agreement which went into operation Feb. 1, 1914, has been attended with a great many difficulties but that these are gradually disappearing and general results to date amply justify the unification of the operation of the city lines. All the pending litigations brought against the Chicago Railways based upon the claim that it was liable for the debts of the Chicago United Traction Company and its constituent companies have been ended. These litigations referred more particularly to an alleged liability upon the 4½ per cent thirty-year gold bonds of the Chicago Consolidated Traction Company, purporting to be guaranteed by the Chicago United Traction Company. The three mandamus cases brought by Oak Park, Maywood and River Forest to compel the company to exchange transfers with the County Traction Company have been terminated in favor of the Chicago Railways by a denial of the writs in each case.

Union Traction Company of Indiana

The statement of income, profit and loss of the Union Traction Company of Indiana, Anderson, Ind., for the year ended Dec. 31, 1913, is as follows:

		Per Cent
Revenue from transportation:		
Passenger	\$2,080,110	84.34
Baggage	10,549	00.43
Parlor, chair and special car	7,144	00.29
Mail	690	00.03
Express	91,481	03.70
Milk	22,839	00.92
Freight	196,862	07.97
Switching revenue	193	00.01
Total	\$2,409,868	97.69
Revenue from operation other than transportation:		
Station and car privileges	\$7,942	00.32
Parcel room receipts	1,262	00.05
Storage	12	00.00
Rents of tracks and terminals	11,824	00.48
Rent of equipment	2,935	00.12
Rent of buildings and other property	6,518	00.26
Power	20,773	00.85
Miscellaneous	5,698	00.23
Total	\$56,964	02.31
Total operating revenue	\$2,466,832	100.00
Operating expenses:		
Way and structures	\$291,493	11.80
Equipment	165,064	06.68
Traffic	19,976	00.81
Conducting transportation:		
Superintendence	24,291	00.98
Power	216,784	08.77
Operation of cars	433,248	17.63
General and miscellaneous	311,161	12.60
Extraordinary flood expense charged in 1913	20,700	00.84
Total operating expenses	\$1,482,717	60.11
Net operating revenue	\$984,115	39.89
Taxes	102,360	
Net operating revenue less taxes	\$881,755	
Other income	51,797	
Gross income	\$933,552	
Deductions from gross income (bond and other interest, discount and rentals)	858,858	
Net income	\$74,694	
Dividends on Union Traction Company of Indiana first preferred	50,000	
Surplus for year	\$24,694	

The total operating revenue for 1913 was \$2,466,832 as compared with \$2,308,649 in 1912, an increase of 6.8 per cent. The total operating expenses for 1913 were \$1,482,717 as compared with \$1,335,841 in 1912, an increase of 10.9 per cent. The net income for 1913 was \$74,694, while that

for 1912 was \$126,592, a loss of \$51,898. This loss was chiefly accounted for by the disastrous spring flood and the street railway and the teamsters' strikes in Indiana later in the year. The operating expenses for the year included \$291,493 expended upon maintenance of way and structures and \$165,064 expended upon maintenance of equipment, which, together with \$20,700 charged as the 1913 portion of the flood expense, made an aggregate sum expended on maintenance of \$477,257. This amount equals 19.32 per cent of the gross earnings for the period and is equivalent to about \$1,256 per mile of road operated.

The amount charged for additions and betterments during the year was \$344,912, this being in addition to \$37,209 advanced during the year to the Traction, Light & Power Company and \$41,879 expended on account of sinking funds. The largest and most important single item included in the above charges for additions and betterments was that of \$159,342, covering ten all-steel interurban combination passenger, smoking and baggage cars. Other important items were \$48,193 for additional automatic block signals covering 32.41 miles of the company's lines; \$25,900 for station sites and \$23,356 for improvements in power distribution.

The 1913 flood inflicted great damage upon the property of the company, particularly in the case of the interurban lines. In rehabilitating the property the company endeavored to improve conditions so as to prevent a recurrence of injury from such a cause. Bridges and grades were raised and widened and the foundations of piers and abutments were deepened and strengthened. The total charges caused by the flood amounted to \$88,001, of which \$70,918 was chargeable against maintenance. Of this amount \$20,700 was included in the operating expense for 1913 and the remainder was placed in a suspense account to be charged off in three similar annual instalments.

The report states that earnings and temporary loans should not and cannot be relied upon to provide all the funds necessary for capital expenditures from year to year and that provision should be made to meet the bonds and other obligations of the company as they fall due. The time when this situation must be met has been hastened by the flood and strike losses during the year, and it appears urgent to consider the authorization of a general and refunding mortgage which will provide for taking up the Union Traction Company of Indiana and the Indiana Northern Traction Company and other underlying bonds and also provide additional bonds to be used, under proper restrictions, for additions, betterments and other corporate purposes.

The number of passengers carried during the year was 18,313,721, divided 9,712,348 for interurban lines and 8,601,373 for city lines. The freight handled amounted to 74,803 tons and the express carried, exclusive of United States express, 6,792 tons. The total mileage of cars for the year was 8,033,526, of which 6,373,022 was for interurban lines and 1,660,504 miles for city lines.

Taxation of Public Service Corporations

The Annual Tax Association has just published the report of the committee on the taxation of public service corporations which was submitted at the annual meeting of the Association held in Buffalo, October, 1913. This committee was composed of Charles J. Bullock, professor of economics, Harvard University; F. N. Whitney, tax attorney, Western Union Telegraph Company; C. C. Plehn, professor of political economy, University of California; Samuel Lord, tax commissioner of California; S. F. Howe, State tax commissioner of Kansas; H. G. Hayes, professor of political economy, University of Michigan, and G. G. Tunell, Atchison, Topeka & Santa Fé Railway.

The report of the committee, which was prepared by Professor Bullock, considers the following three questions: (1) Should public service corporations be subject to special heavy taxation because they hold franchises of great value? (2) Does effective regulation of public service corporations necessary to equalize taxes of public service corporations with the taxation of other business or property? (3) Should taxation of public service corporations be governed by the general rule of equality? The committee rejected the first and second theories on the ground that effective regulation completely alters the incidence of special taxes upon monopolies and at the same time removes the evil

which has led to the demand for such taxation. The committee held that equality should be the controlling principle in governmental affairs and that in none is it more necessary than in the matter of taxation.

The committee discussed and approved the doctrine of classification and held that "without classification real, as distinguished from formal, equality is absolutely unattainable." "The taxation imposed upon public service companies should be the same as that imposed upon property subject to the full rate of State and local taxation." The committee was clearly of the opinion that equality does not require ad valorem taxation but that taxes upon gross receipts or other specific taxes can be adjusted from time to time so as to make them substantially equivalent to the rates imposed upon all unclassified property.

The committee closed its report as follows: "Whether public service corporations are taxed at local or at average State rates they should be subject to the true and not the nominal rates of State or local taxation. So long as undervaluation of their property continues, therefore, we hold that either the valuation of public service corporations should be made on the same basis as that of other property, as is the practice in a few States, or that the corporations should be taxed at the true rate imposed upon other property, as is the practice in Wisconsin. Better still would be the eradication of the evil of undervaluation of property by the local assessors, as it is now attempted in Kansas, Arizona, Colorado and New Mexico; but this must necessarily be the work of time and in the interim public service corporations are entitled to fair play."

The announcement is made that the eighth annual conference of the Annual Tax Association is to be held on Sept. 8-11 in Denver, Col. This convention is composed of three delegates appointed by the Governor of each State. Among the sessions to be held are one on the subject of the income tax and one on the subject of efficiency in government.

Suit Threatened to Enforce Interest Payments on Income Bonds

Holding that the New York (N. Y.) Railways has been earning a surplus sufficient to pay interest on the adjustment bonds issued to security holders of the Metropolitan Street Railway in the reorganization, the New York Life Insurance Company has called upon the Farmers' Loan & Trust Company, as trustee under the mortgage, to take action against the company to compel payment on the bonds. Darwin P. Kingsley, president of the New York Life Insurance Company, says in his letter to the Farmers' Loan & Trust Company:

"An investigation which has been made of the New York Railways' gross earnings since Jan. 1, 1912, and of the legitimate deductions therefrom, will disclose that the said company has realized an amount of net income in each year more than sufficient to pay the 5 per cent interest on these bonds, and that it is illegally withholding from the bondholders an amount of interest due them as follows: For the period ending June 30, 1912, 1.73 per cent; for the period ending Dec. 31, 1912, 0.25 per cent; for the period ending June 30, 1913, 0.864 per cent; for the period ending Dec. 31, 1913, 0.155 per cent.

"The New York Railways has defaulted in the payment of interest on these bonds at the end of each semi-annual period since the bonds were issued in so withholding interest, and has acted, and is acting, in direct violation of the provisions of the mortgage, which provides the amount of interest payable on these bonds and the method of computing net income from which such interest is payable.

"The company's semi-annual statements of income show that it has set apart in each period a reserve fund for injuries to persons and property which is not only grossly in excess of the amount necessary to meet the requirements, but also is not computed in accordance with the express provisions of the mortgage in relation thereto.

"Such statements further show that these reserves are not being used for the purpose for which they were created, but that expenditures on account of injuries to persons and property occurring in past periods are being made from current earnings, and that such reserves are allowed to accumulate, to the detriment of the bondholders, and in violation of the provisions of the mortgage."

Mr. Kingsley asks the trustee to take appropriate action against the New York Railways to compel an accounting of the business done and net profits received by the company for each half-yearly period since Jan. 1, 1912, to set aside the approval by the bondholder directors of the statements rendered by the company, if such approval has been given, and to compel the payment of the full 5 per cent interest on these bonds as earned. The letter concludes:

"This company is ready and offers to furnish such security and indemnity against the costs, expenses, and liabilities to be incurred in bringing suit, as shall be satisfactory to the trustee."

Scranton & Wilkes-Barre Traction Bonds Offered

Perry, Coffin & Burr and N. W. Harris & Company, Boston, Mass., are offering first refunding 5-per-cent gold bonds of the Scranton & Wilkes-Barre Traction Corporation at 95½ and interest yielding 5.28 per cent. The bonds are dated July 1, 1913, and are due on Aug. 1, 1951. They are callable on any interest date at 105 and interest. These bonds are subject only to a prior pledge to secure \$888,000 of underlying bonds, for the exchange and retirement of which a like amount of the bonds of this issue is reserved. The mortgage provides for a cumulative sinking fund which requires the deposit with the trustee on Nov. 1, 1917, and annually thereafter until maturity, of a sum not less than one-half of 1 per cent of the aggregate amount of the bonds both issued and reserved for refunding. Money so deposited must be used for the purchase of these bonds and the bonds so purchased will continue to draw interest for the benefit of the sinking fund. It has been calculated that this fund will retire at least \$1,215,000 of bonds. The total authorized first refunding issue is \$3,000,000.

American Water Works & Electric Company, Pittsburgh, Pa.—At a meeting of the board of directors of the American Water Works & Electric Company on May 8 the following permanent officers were elected: H. H. Porter, president; Stuart H. Patterson, New York, vice-president and treasurer; Harry E. Towle, Boston, secretary. J. H. Purdy, Pittsburgh, was appointed assistant to the president. An executive committee was named consisting of President Porter, Samuel Insull, Guy E. Tripp, A. H. Wiggin, J. D. Mortimer and H. H. Pierce. The executive, financial and operating offices of the company will be located in New York City.

Binghamton (N. Y.) Railway.—The statement made public on May 2 by G. Tracy Rogers, president of the Binghamton Railway, in regard to the conclusion of the deal by which the Scranton & Binghamton Railroad takes over the Binghamton Railway follows: "The Scranton & Binghamton Railroad completed its purchase of the Binghamton Railway on May 2 and formal transfer of the property was made. No changes in the officers, directors and operating forces of the company have as yet been made. The local company was represented at the transfer by G. Tracy Rogers, president; ex-Senator George E. Green and Thomas J. Keenan. The Scranton & Binghamton Railroad was represented by R. W. Day, general manager; S. B. Michael, assistant treasurer, and C. R. Bedford, attorney for the purchaser." References to this purchase were made in the *ELECTRIC RAILWAY JOURNAL* of Jan. 17, 1914, Feb. 7, 1914, and March 7, 1914.

Central Park, North & East River Railroad, New York, N. Y.—Justice Vernon M. Davis of the Supreme Court of New York has dismissed the suit brought by minority stockholders of the Central Park, North & East River Railroad against former directors of the company to recover \$2,000,000 damages. The suit was also brought against the Metropolitan Street Railway, but the court held that there was no cause for action except against the Belt Line Company. It was also held that action against Mortimer L. Schiff is barred by the statute of limitations because he served as a director only between 1902 and 1903.

Chicago (Ill.) Railways.—The *Chicago Examiner* says: "The plans of the Chicago Elevated Railways for refinancing its \$30,000,000 note issue which matures on July 1 next, will shortly be presented to the Illinois Public Utilities Commission. It is understood that securities of three different

classes will be issued, including first mortgage 5 per cent bonds of the Northwestern Elevated Railway, debentures and short term collateral trust notes."

Elmira Water, Light & Railroad Company, Elmira, N. Y.—Bodell & Company, Providence, R. I., announced on May 11 that the entire issue of 7 per cent cumulative first preferred stock of the Elmira Water, Light & Railroad Company recently offered by them had been sold. The stock was offered at 103 and interest, yielding 6.80 per cent. The total issue was \$850,000. There are now outstanding in addition to the \$850,000 of first preferred stock \$1,000,000 of 5 per cent second preferred stock, \$1,000,000 of common stock and \$5,000,000 of 5 per cent bonds. Provision has been made to retire a further \$307,000 of bonds of the Chemung Gas Company at 105 on July 1. Merrill, Oldham & Company, Boston, Mass., are offering at 92½ and interest, yielding 5.45 per cent, their block of \$617,000 of first consolidated mortgage 5 per cent bonds of the Elmira Water, Light & Railroad Company, due on Sept. 1, 1956. The total amount authorized under this mortgage is \$5,000,000, of which \$2,948,000 is at present outstanding. The balance, \$2,016,000, is reserved to retire prior liens. The mortgage is therefore now closed except for refunding purposes.

Georgia Railway & Power Company, Atlanta, Ga.—The \$6,860,000 of Georgia Railway & Power Company first refunding mortgage 5 per cent forty-year sinking gold bonds, recently purchased by Drexel & Company, Philadelphia, are being offered at 92½ and interest in Chicago and the West by Kennett, Cowan & Company, as Western members of the syndicate. The bonds also are being offered in New York by Kissel, Kinnicutt & Company, and in Boston by E. H. Rollins & Sons.

Kansas City Railway & Light Company, Kansas City, Mo.—The committee representing holders of the first lien refunding 5 per cent gold bonds of the Kansas City Railway & Light Company, due on May 15, 1913, and holders of certificates of deposit representing such bonds announces that it has arranged for the payment on May 15 next at the office of the New York Trust Company of 5 per cent interest on the bonds from Nov. 15, 1913, to May 15, 1914.

Massachusetts Electric Companies, Boston, Mass.—The Massachusetts Electric Companies proposes to sell \$1,045,000 of 4 per cent bonds of the Boston & Northern Street Railway and the Old Colony Street Railway.

New York (N. Y.) Railways.—Milo Roy Maltbie of the Public Service Commission of the First District of New York was to hold a hearing on May 14 on the question as to whether the commission shall require the New York Railways to restore to its reserve for injury and damage claims \$33,984 which had been transferred to its surplus account. The proceedings involved the question as to the jurisdiction of the commission, inasmuch as the company's officials take the stand that the question of the reserve is an optional matter with the company and solely within its discretion. The commission charges that the change that was made is in violation of the rules prescribed by the commission for uniform systems of accounting by railroad companies.

Ocean Shore Railroad, San Francisco, Cal.—The Ocean Shore Railroad has called an assessment of \$5 a share, delinquent June 6, sale day Aug. 4. The company has outstanding \$3,856,950 of stock and no bonds. The last assessment, which amounted to \$2.50 a share, was levied in April, 1913.

Philadelphia Company, Pittsburgh, Pa.—Stockholders of the Philadelphia Company of record of April 15 will vote on June 15 on reducing the authorized capital stock of the company from \$73,400,000 to \$69,433,400, such reduction to be in the preferred 5 per cent shares.

Springfield (Ill.) Consolidated Railway.—W. F. Workman has been elected a director of the Springfield Consolidated Railway to succeed H. T. Willett.

Toronto (Ont.) Railway.—Stockholders of the Toronto Railway of record of May 11 are to be permitted until June 1 to subscribe at par for \$1,000,000 of new common stock of the company to the extent of one share of new stock for every eleven shares of old stock now held. The proceeds of this issue are to be used for general purposes.

Dividends Declared

Baton Rouge (La.) Electric Company, 3 per cent, preferred.

Central Arkansas Railway & Light Corporation, Hot Springs, Ark., quarterly, 1¼ per cent, preferred.

Columbus Railway & Light Company, Columbus, Ohio, 75 cents.

Federal Light & Traction Company, New York, N. Y., quarterly, 1½ per cent, preferred.

Northern Texas Electric Company, Fort Worth, Tex., quarterly, 1¼ per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, MAINE						
Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Mar., '14		\$62,498	*\$31,047	\$31,451	\$17,470	\$13,981
1 " " '13		58,130	*27,595	30,535	17,374	13,161
12 " " '14		776,310	*354,444	421,866	207,782	214,084
12 " " '13		724,050	*327,273	396,777	202,951	193,826
CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.						
1m., Mar., '14		\$87,550	*\$56,490	\$31,060	\$27,676	\$3,384
1 " " '13		93,157	*56,997	36,160	24,226	11,934
12 " " '14		1,202,708	*715,389	487,319	308,253	179,066
12 " " '13		1,103,348	*663,330	440,018	274,352	165,666
CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO						
1m., Mar., '14		\$30,310	*\$16,154	\$14,156	\$11,167	\$2,989
1 " " '13		27,981	*15,214	12,767	10,421	2,346
3 " " '14		83,937	*49,181	34,756	32,785	1,971
3 " " '13		80,624	*47,805	32,819	31,120	1,699
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.						
1m., Mar., '14		\$242,732	*\$71,499	\$171,233	\$80,000	\$91,233
1 " " '13		121,122	*12,839	108,283	30,000	78,283
12 " " '14		2,780,103	*657,542	2,122,561	910,000	1,212,561
12 " " '13		1,385,308	*157,203	1,228,105	360,000	868,105
EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.						
1m., Mar., '14		\$227,929	*\$142,774	\$85,155	\$55,919	\$29,236
1 " " '13		216,077	*120,983	95,994	49,713	46,281
12 " " '14		2,736,341	*1,675,519	1,060,822	600,227	460,595
12 " " '13		2,503,497	*1,389,618	1,113,879	582,025	531,854
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO						
1m., Mar., '14		\$105,452	*\$70,868	\$34,583	\$35,299	†\$714
1 " " '13		93,746	*63,171	30,574	34,954	†4,380
3 " " '14		300,961	*203,169	97,792	105,642	†7,850
3 " " '13		283,937	*188,569	95,368	104,829	†9,461
LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.						
1m., Mar., '14		\$127,713	\$73,644	\$54,169	\$57,429	\$3,260
1 " " '13		134,065	70,715	63,350	46,070	17,280
12 " " '14		1,777,314	890,928	887,286	621,555	265,731
12 " " '13		1,605,113	796,732	808,381	522,704	285,677
MONONGAHELA VALLEY TRACTION COMPANY, FAIRMONT, W. VA.						
1m., Mar., '14		\$77,506	\$28,906	\$48,601	\$25,236	\$23,365
1 " " '12		71,998	24,645	47,353	24,106	23,247
3 " " '14		225,813	86,649	139,164	76,348	62,816
3 " " '13		206,381	71,269	135,112	72,310	62,802
NEW ORLEANS RAILWAY & LIGHT COMPANY, NEW ORLEANS, LA.						
1m., Feb., '14		\$600,289	*\$302,227	\$298,062	\$205,470	\$92,592
1 " " '13		587,137	*283,907	298,230	190,343	107,887
2 " " '14		1,234,710	622,821	611,889	410,490	201,399
2 " " '13		1,194,629	598,502	696,127	381,723	314,404
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO.						
1m., Mar., '14		\$274,198	*\$168,811	\$105,388	\$50,331	\$55,057
1 " " '13		227,146	*147,406	79,739	45,214	34,525
3 " " '14		793,165	*494,979	298,185	149,824	148,361
3 " " '13		687,181	*427,785	259,396	135,082	124,314
PORTLAND (MAINE) RAILROAD.						
1m., Mar., '14		\$74,798	*\$51,131	\$23,667	\$22,038	\$1,629
1 " " '13		73,943	*60,931	13,012	10,298	2,714
12 " " '14		1,037,467	*666,515	370,952	218,046	152,906
12 " " '13		997,252	*698,774	298,478	123,381	175,097
PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.						
1m., Mar., '14		\$547,393	*\$280,263	\$267,130	\$177,185	\$89,945
1 " " '13		544,896	*276,148	268,748	160,998	107,750
12 " " '14		6,763,416	*3,322,134	3,441,282	2,067,420	1,373,862
12 " " '13		6,677,595	*3,295,576	3,382,019	1,820,883	1,561,136

*Includes taxes.

†Deficit.

Traffic and Transportation

Oregon Fare Cases

At the hearing before the Railroad Commission of Oregon on May 4 on the application of the United Railways, Portland, for an increase in the passenger rate between Portland and Linnton from 5 cents to 10 cents and a table of valuation showing the reproduction cost new and the depreciation was presented as follows:

	Repro- duction cost, new	Depreci- ated to
Portland Industrial line.....	\$201,312	\$166,643
Non-operating property	22,228	18,393
Passenger Line—		
Portland-Linnton	46,033	38,067
Portland-Linnton, common to freight and passenger	241,336	202,697
Linnton-Wilkesboro	1,439,328	1,284,629
Mt. Calvary line	59,522	54,313
Telephone lines	11,130	8,168
Rolling stock	131,588	111,636
Right-of-way and operating real estate.....	57,212	57,212
Non-operating real estate.....	36,741	36,741

To allow for a more complete presentation of the valuation data of the Oregon Electric Railway properties hearings in both the Linnton and the Garden Home cases have been continued until May 18. The Oregon Electric Railway and the United Railways are owned by the same interests. The plea of the Garden Home people is that they are being discriminated against by being charged more than 5 cents, when the people of Linnton, which is farther from Portland than Garden Home, travel for 5 cents. Pending the solution of the Linnton rate case action on the application of residents of Garden Home and intermediate points on the Oregon Electric Railway for a reduction in the rate to and from Portland to a flat 5-cent basis is being delayed.

Man Plays Hero in Effort to Secure Work

A confession which has been secured by the officers of the Columbus, Delaware & Marion Railway, Delaware, Ohio, discloses a very peculiar scheme which was used to secure employment with the company. On April 29 the dispatcher at Delaware was called by telephone just as the 9.03 p.m. car was about to leave for Columbus. The person calling said that his name was Bickle, and that about 2 miles south of Delaware two men were tearing up the tracks. C. C. Moyer, chief train dispatcher of the company, was notified and ordered the southbound train to proceed to the scene of the attempt to wreck the car. Bickle was covered with dust and he showed other traces of rough treatment. Mr. Moyer's examination, however, made him skeptical of the story. He discovered several matches of peculiar type partly burned at the side of the track near the scene of the alleged attempt at train wrecking. The tools with which the track had been torn up were marked with the name of the Big Four Railway. After going back to Delaware Mr. Moyer discovered that the toolhouse of the Big Four had been broken open, and his investigation there also disclosed several matches like those which had attracted his attention at the place where the alleged attempt at wrecking was made. As a result of a conference between J. H. Lahrmer, superintendent of the Columbus, Delaware & Marion Railway, William Baker, roadmaster, and Night Chief of Police Vinney, it was decided to detain Bickle as a witness. He was taken back to the scene of the fake attempt to wreck the car, and the ground was gone over a second time. The investigating party went back to Delaware at midnight, and Bickle was told that he was under suspicion. At first he became abusive, but finally confessed that he had been a fireman on the Erie Railroad, was out of work and thought that by doing what he did it would appear to the officials of the company that he had done them a great service and he would be taken into their employ.

Through Service Between Buffalo and Queenstown.—The International Railway, Buffalo, N. Y., is operating through service from Buffalo to Queenstown, Ont., where the cars connect with boats on Lake Ontario for Toronto and other Canadian points. The cars are operated via Niagara Falls.

Southern Pacific Company Asks Permission to Increase Fares.—The Southern Pacific Company has filed an application with the Railroad Commission of California in which it asks the commission for authority to increase its fares between San Francisco and suburban points in Alameda County. This includes the commutation and one-ride rates on the Melrose Branch of the Berkeley system and on the Seventh Street line, Oakland, which comprise the electric system of the company.

More Letters to Automobile Owners.—J. R. Blackhall, general manager of the Chicago & Joliet Electric Railway, Joliet, Ill., has commenced a campaign to reduce the number of accidents in which automobiles and street cars are involved. In this connection he has addressed a letter to the owners of automobiles impressing them with the necessity of exercising the utmost care in managing their machines, and telling what the company is doing on its part toward lessening the number of such accidents by careful instruction of its men.

Illinois Traction System Wage Agreement.—Trainmen of the Illinois Traction System have agreed to accept the company's offer of a wage increase from 30 cents to 33 cents an hour. The agreement will take the place of one which expired Nov. 30, 1913. At that time an increase to 40 cents an hour was asked. The demand later was reduced to 35 cents. All other demands of the trainmen have been adjusted by the company. Brakemen will receive an increase of 10 per cent. The new agreement will hold for three years from Dec. 1, 1913.

Accident Fakir Arrested in Pittsburgh.—The Pittsburgh (Pa.) Railways recently caused the arrest of James Warner, aged thirty-five, who is charged with perjury. Warner was arrested as he was leaving the court house after losing a suit for damages against the company. Thomas A. McQuaide, former police superintendent, who was employed by the company, alleges Warner has filed thirteen suits against various corporations in several cities. Each time it is said he has sought damages because of dislocation of the right hip. Mr. McQuaide says that Warner's real name is James Burgerstock, alias James Warner, alias Charles Warner, alias James Webb, etc.

Ontario Safety League Work.—The Ontario Safety League is placing an order for 100,000 "safety first" buttons, to be distributed among the school children, the police, street railway employees and other members of the league before the end of May. The league is also distributing 75,000 blotters to the children of the public and private schools. These blotters are printed with ten "Don'ts," and call to the attention of children and their parents the dangers that constantly beset small citizens in their every-day lives. A small folder issued by the league is being distributed among the employees of the Toronto Railway. The folder is accompanied by a letter from R. J. Fleming, the general manager of the company, urging the hearty cooperation of the men in the movement.

Addresses to Kansas City Employees on Responsibility.—The Metropolitan Street Railway, Kansas City, Mo., has concluded its spring meeting with trainmen, held for the purpose of calling the attention of crews to the new conditions with which they are confronted by summer traffic. The meetings are held semi-annually. The trainmen, as a rule, fail to take into consideration the changes demanded by the seasons and the company therefore sends an officer from the transportation department to make short addresses at each division. Two meetings were held at each division point recently, one for the benefit of day crews and the other for tripper trainmen. The division superintendents, who also spoke briefly, emphasized the need for more care with open cars and heavier traffic, as well as the necessity for courtesy in the face of even the most provoking conditions.

St. Louis Company Replies to Complaint.—Henry S. Priest and Morton Jourdan, attorneys for the United Railways, St. Louis, Mo., have filed a return with the State Public Service Commission, following the complaint made by the West End Business Men's Association. The company's answer follows: "The complainant does not fully, clearly and with reasonable certainty state the act or thing done of which complaint is made, and does not state any

facts which can either be denied or admitted; all of the statements in said complaint are mere matters of opinion of the complainants, and with said opinions this defendant begs leave to differ and offer the contrary opinion. This defendant respectfully represents that the said complaint should be so amended as to state specifically the facts in such manner and form that said defendant may then admit or deny them, or satisfy them, or make a submission of the relief it is willing to give."

Safety First on the Insull Lines in Southern Indiana.—All the employees of the North Side Utilities, as the lines of the Insull properties in southern Indiana, across the Ohio River from Louisville, Ky., are known locally, are much interested in the "safety first" slogan contest. Charles B. Scott, head of the Insull bureau of safety, announced recently that \$30 would be awarded for the best, \$15 for the second and \$10 for the third selections among the names submitted. The contest will close on June 15, and the names of the winners will be announced as soon as possible thereafter. The quarterly meeting of the employees of the North Side Utilities will be held in June, also, and the officers of the company are preparing an interesting program in the way of "safety first" addresses. The May issue of *The Booster*, a publication issued in the interest of the employees and the cities the lines serve, leads with an article on "The Conservation of Man" by C. A. Gilkerson, who is the secretary of the central committee on safety of the Public Service Company of Northern Illinois.

The World's Busiest Spot.—An editorial, "The World's Busiest Spot," which appeared recently in the *New York Times*, has provoked considerable discussion among transportation authorities. P. Compton Miller, of the Hudson & Manhattan Railroad, claimed for the Hudson Terminal the distinction of being the "world's busiest spot," with a record of 30,535,500 people yearly. Other figures quoted in substantiation of claims which have been made show for the South Station in Boston 28,347,399; Grand Central Station, New York, 22,405,295 and the Charing Cross Station in London 15,000,000. The report of the Public Service Commission for the First District of New York on station traffic for the year ended June 30, 1913, gives the Atlantic Avenue, Brooklyn Subway, station a yearly total of 21,262,140 tickets purchased. This total is for passengers going into the station. It is argued that to arrive at the total number of people using this subway station yearly this figure should be doubled, thus giving the station the distinction of 42,254,280 passengers yearly. By the same method the Brooklyn Bridge Subway station has 36,177,898; the Grand Central Subway station 33,878,476; the Fourteenth Street Subway station 28,173,376, and the Times Square Subway station 26,423,914.

Petition for Revision of Fares on Indiana Line.—The Union Traction Company of Indiana has petitioned the Public Service Commission of Indiana for authority to revise its schedule of interurban fares on its lines. The company proposes that the rules for computing fares established by the 2-cent fare law be disregarded and that fares be computed at the rate of 2 cents a mile for the distance actually traveled, one-half mile at 1 cent to be taken as the unit. Under the present method, fares are computed in multiples of 5 cents. The company represents that the public is complaining of "short-ride fares" because of the 5 cent unit. The company also asks for authority to eliminate the reduction in round-trip fares where the single trip fare is 30 cents or more. The company does not propose to make any change in fares now existing on its interurban lines, as follows: The fare of 5 cents between Indianapolis and Broad Ripple on the city service cars; special round-trip fare of 25 cents and other special fares between Indianapolis and Fort Benjamin Harrison on army post special service cars; the fare of 5 cents between Marion and Jonesboro; the fare of 5 cents between Jonesboro and Fairmount; the fare of 5 cents between Fairmount and Summitville on local cars operated between Marion and Summitville, and the fare of 5 cents for a ride wholly within the corporate limits of one municipality. While the company proposes that the 1-cent unit for one-half mile be adopted, the minimum fare would remain at 5 cents.

Personal Mention

Mr. Charles D. Bell has been elected secretary of the Arkansas Valley Interurban Railway, Wichita, Kan., to succeed Mr. A. Stone.

Mr. J. H. Purdy, Pittsburgh, has been appointed assistant to Mr. H. H. Porter, president of the American Water Works & Electric Company.

Mr. George M. S. Schulz, surrogate of the Borough of the Bronx, has finally declined appointment as a member of the Public Service Commission of the First District of New York.

Mr. T. R. Cummins has resigned as engineer of the Niagara, Welland & Lake Erie Railway, Welland, Ont., to become connected with a timber property with headquarters at Revelstoke, B. C.

Mr. Arthur Cushing has been appointed operating engineer of the Clinton (Ill.) Gas & Electric Company. He was formerly with the Decatur Railway & Light Company and other Illinois Traction properties.

Mr. S. C. Stivers, whose resignation as auditor of the American Cities Company was noted in the *ELECTRIC RAILWAY JOURNAL* of May 2, 1914, has become connected with Ford, Bacon & Davis, New York, N. Y.

Mr. J. K. Punderford, who for nine years has been general manager of the Connecticut Company, New Haven, Conn., has been appointed vice-president, and his title hereafter will be vice-president and general manager.

Mr. Homer Bunnell, for thirty years employed in various capacities in the office of the Louisville (Ky.) Railway, has been promoted to the post of cashier of the company, made vacant by the recent death of John R. Neat.

Mr. A. H. R. Jackson, formerly general superintendent of the properties of the Illinois Traction System in Jefferson City, Mo., has been made general superintendent of the Oskaloosa Light & Traction Company, Oskaloosa, Iowa, which is also an Illinois Traction property.

Mr. H. M. Wall, assistant chief engineer of power stations for the Memphis (Tenn.) Street Railway, has associated himself with the firm of Ruebel & Wells, consulting mechanical and electrical engineers, Chemical Building, St. Louis, Mo.

Mr. Foster Hannaford has been appointed acting general superintendent of the Galesburg Railway, Lighting & Power Company, Galesburg, Ill., vice Mr. Dickerson McAfee, now on a leave of absence. Mr. Hannaford has been operating engineer of the company, which is one of the subsidiaries of the Illinois Traction System.

Mr. D. W. Snyder, formerly superintendent of the Clinton Gas & Electric Company, Clinton, Ill., has been appointed general superintendent of the Jefferson City, Bridge & Transit Company and the Jefferson City Light, Heat & Power Company, all of which properties are subsidiaries of the Illinois Traction System. Mr. Snyder has been succeeded at Clinton, Ill., by Mr. Charles Cline.

Mr. James Blaine Walker, assistant secretary of the Public Service Commission of the First District of New York, contributed to the *Annalist* of May 11, an article on "Commission Efficiency in Public Service," in which he reviewed briefly the important economies that have been effected by regulation in the operation and administration of steam and electric roads under the jurisdiction of the commission with which he is connected.

Mr. E. T. Stotesbury, chief resident partner of Drexel & Company in Philadelphia and chairman of the board of the Philadelphia (Pa.) Rapid Transit Company, has been elected president of the Reading Company to fill the vacancy caused by the death of George F. Baer. Mr. Stotesbury has also been elected chairman of the board of the Reading Company, the Philadelphia & Reading Railway and the Philadelphia & Reading Coal & Iron Company.

Mr. W. E. Moore, who has been general manager of the West Penn Traction Company, Pittsburgh, Pa., will in the future have the title of vice-president and general man-

ager of the company. His jurisdiction with the West Penn Traction Company in general will cover engineering, construction and maintenance of way, transportation matters, operation of power plants, purchasing, sale of power and the securing of new franchises and rights.

Mr. E. C. Sherwood, who has been general foreman of equipment of the Manhattan & Queens Traction Corporation, Long Island City, N. Y., has been appointed superintendent of equipment of the company. Before becoming connected with the Manhattan & Queens Traction Corporation Mr. Sherwood was general foreman of shops of the Coney Island & Brooklyn Railroad, Brooklyn, N. Y. Previous to that time he was with the New York (N. Y.) Railways as general foreman of the mechanical department.

Prof. R. E. Heilman, of the State University of Iowa, delivered a series of five lectures at the University of Illinois recently on the control of public utilities. The subjects of the lectures were "The Development of Commission Control of Public Utilities," "Principles of Public Utility Capitalization," "Principles of Public Utility Valuation," "Principles of Public Utility Rate Making" and "Principles of Public Utility Service." The lectures were attended by students of the courses in electrical engineering and in economics and business management and also by the general public.

Mr. E. J. Skehan has been appointed general manager of the Muncie & Portland Traction Company, with general offices at Portland, Ind., to succeed the late E. B. Lincoln. Mr. Skehan entered the electric railway field in 1902 as chief clerk to the superintendent of motive power of the Union Traction Company of Indiana. Later he was promoted to storekeeper of that company, resigning to assume the position of storekeeper of the Chicago & Milwaukee Electric Railway. He has held the positions of auditor, purchasing agent, general passenger and freight agent and trainmaster of the Muncie & Portland Traction Company, at different times during the last eight years.

Mr. George Kidd has been appointed general manager of the British Columbia Electric Railway, Ltd., Vancouver, B. C., to succeed Mr. R. H. Sperling, whose promotion to the position of assistant to the chairman of the board is referred to elsewhere in this column. Mr. Kidd has been connected with the company's offices both in London and British Columbia. He was appointed secretary of the company in connection with its London work in January, 1908, when he was transferred to British Columbia. He has since been located at the head office of the company in Vancouver, filling the position of comptroller. He takes up his new duties of general manager well qualified for the post on account of his long experience with the company.

Mr. C. N. Duffy, vice-president and general manager Manila Electric Railroad & Light Company, Manila, P. I., has been elected president of the Manila City Club. This is an organization of business men recently formed to boom the Philippines and to co-operate in the popular movement in Manila now of "Hands Around the Pacific." Its members join at luncheon once a week to hear addresses from visitors or local speakers. At the first meeting of the club Mr. Joseph Leiter, Chicago, who was making a trip around the world, made the principal address. Recent Philippine papers also disclose the fact that the most successful speech at the St. Patrick's Day banquet in Manila this year was made by Mr. Duffy.

Mr. A. H. Jones, the newly elected president of the Mississippi Electric Association, is general manager of the McComb City Electric Light & Power Company, McComb, Miss. He was formerly vice-president of the State association and for several years has been active in its affairs as secretary-treasurer. Mr. Jones was born at Boston, Mass., in 1881, and after the usual preliminary training entered the course in marine and electrical engineering of the Massachusetts Nautical School, Boston, from which he was graduated in 1899. He next took up the testing course offered by the General Electric Company at its Schenectady and Lynn shops, and in 1902 was transferred to that company's sales organization with headquarters at Atlanta, Ga., and later New Orleans, La. In 1904 Mr. Jones was appointed superintendent of the McComb company's system, but he has served as general manager since 1906.

Mr. H. J. Jumonville, whose appointment as auditor of the American Cities Company was noted briefly in the ELECTRIC RAILWAY JOURNAL of May 2, 1914, was born on



H. J. Jumonville

July 29, 1879. He entered business with the Edison Electric Company, New Orleans, on July 29, 1896. From the time of his becoming connected with the company to Jan. 1, 1902, Mr. Jumonville was promoted through all desks of the auditing department to the position of general bookkeeper. In August, 1902, a general consolidation of the Edison Electric Company with all of the local street railways and gas companies at New Orleans took place and at that time Mr. Jumonville was appointed assistant auditor

of the consolidated company, known as the New Orleans Railways Company. In February, 1911, he was appointed auditor of the New Orleans Railway & Light Company, the successor to the original New Orleans Railways Company. His appointment as auditor of the American Cities Company dated from May 1, 1914. This company controls the New Orleans Railway & Light Company; Birmingham Railway Light & Power Company, Birmingham, Ala.; Memphis (Tenn.) Street Railway; Little Rock Railway & Light Company, Little Rock, Ark.; Houston Light & Power Company, Houston, Tex., and the Knoxville Railway & Light Company, Knoxville, Tenn. All of Mr. Jumonville's business career has been with public service corporations, he having started to work with the Edison Electric Company of New Orleans immediately after completing his high school course.

Mr. R. H. Sperling, who has been general manager of the British Columbia Electric Railway, Ltd., the field of operation of which covers the southwestern portion of British

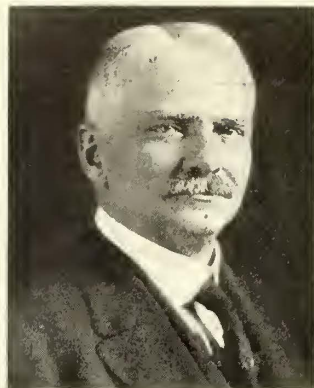


R. H. Sperling

Columbia and the southern portion of Vancouver Island, has been promoted by the London Board of the company to the position of assistant to Mr. R. M. Horne-Payne, chairman of the board, and has also been elected a director of the company. Mr. Sperling has been connected with the work of the British Columbia Electric Railway in British Columbia for eighteen years. He obtained both theoretical and practical training as an electrical engineer in the old country. He entered the company's employ with the light and

power system at Victoria in 1896 and was promoted successively until he was made electrical engineer of the company. In 1901 he was transferred from Victoria to the company's head office at Vancouver and assumed the duties of general superintendent and chief engineer. In this capacity he gave special attention to the development of the company in the electrical field, showing extraordinary ability in this work. In 1905 Mr. Sperling was promoted to the position of general manager of the company to succeed Mr. J. Buntzen, who was appointed a director of the company. Mr. Sperling will leave British Columbia during July and take up his residence in London in connection with his new duties at the company's London offices. The position of assistant to the chairman of the board in London to which Mr. Sperling has been appointed, is a new one with the company and has been created on account of the rapid development of the company's work and the advisability of having an executive at the London offices who is fully in touch with the company's operations in its actual field of work.

Mr. Williston Fish, vice-president of the Chicago (Ill.) Surface Lines, and also recently elected vice-president of the West Penn Traction & Water Power Company, Pittsburgh, Pa., was born at Berlin Heights, Ohio, in 1858. He entered Oberlin College in 1876 and was appointed to West Point in 1877. Mr. Fish was graduated from the military academy in 1881 with high standing in mathematics, engineering, law and language, and was appointed second lieutenant of the Fourth U. S. Artillery in 1881. He served with that regiment at San Francisco, New London, Conn., and Fort Snelling, Minn., during part of which time he continued the study of law in the office of Governor



Williston Fish

Thomas Waller, of Connecticut. In 1887 he resigned from the army to enter the employ of the Crane Elevator Company, Chicago, as a salesman. Mr. Fish continued the study of law in Chicago in the school of Judge Thomas Moran and was admitted to the bar in 1897. From 1890 to 1899 he served as right-of-way and claim agent, and assistant counsel for the Chicago City Railway. At the latter date he was made assistant to President Jesse Spaulding of the Chicago Union Traction and to his successor, Mr. John M. Roach. During this time Mr. Fish took an important part in the valuation of the property of the Chicago Union Traction Company, and in the negotiations for the settlement ordinances of 1907. He continued as assistant to Mr. Roach, president of the new Chicago Railways, until February, 1912, when he became general manager of that system. When the Chicago Railways and the Chicago City Railway were combined as to operation, under the title of the Chicago Surface Lines on Feb. 1, 1914, he was made vice-president. Mr. Fish's jurisdiction as vice-president and comptroller of the West Penn Traction Company in general covers treasury matters, auditing department, real estate, taxes and insurance, responsibility of following rights and obligations under ordinances, custody of contracts, etc.

Mr. Frederick W. Doolittle has been appointed director of the bureau of fare research of the American Electric Railway Association by which a careful, detailed study of the factors affecting rates of fare has been begun for the association. Mr. Doolittle has many qualifications for the work. He is a native of Hopkington, Ia., and received his primary education in that city. He holds a B. A. degree from Lenox College, a B. A. degree from Princeton, a B. S. C. E. degree from the University of Colorado and a C. E. degree from the same university. From July to November, 1907, Mr. Doolittle was engineer and cost keeper for the surplus working of the Boston Consolidated Mining Company, Bingham, Utah. From November, 1907, to September, 1908, he was engineer and paymaster of the Consolidated Coal & Coke Company, Dacoma, Col. From September, 1908, to June, 1909, he was instructor in mechanics and hydraulics in the University of Illinois, and from September, 1909, to June, 1910, he was in charge of structural engineering work at the University of Colorado during the absence of Prof. Milo S. Ketchum. From September, 1910, to February, 1913, he was assistant professor of mechanics at the University of Wisconsin. Mr. Doolittle has been very closely associated with railroad work, serving in the engineering department of the Union Pacific Railroad dur-



F. W. Doolittle

ing the summers of 1903, 1905 and 1906, and of the Chicago, Milwaukee & St. Paul Railroad during 1909 and 1910. From October, 1910, to May, 1914, Mr. Doolittle was with the Railroad Commission of Wisconsin as special investigator, being engaged in research work in the apportionment of expenses between services and the consideration of rate schedules, as well as making compiled surveys of operating conditions and traffic studies. In this study as to cost of railroad surveys he collaborated with the special investigations now being conducted by the Interstate Commerce Commission. From January, 1914, to May, 1914, he was in charge of the organization of the new Illinois State Public Utilities Commission. Mr. Doolittle is an associate member of the American Society of Civil Engineers and a member of the honorary engineering and scientific fraternities Tau Beta Pi and Sigma Xi. The establishment of the bureau of fare research is the continuation of the work of committees of the association in previous years along the same lines. In 1910 the committee on determining the proper basis for rates of fares was appointed with Mr. Frank R. Ford of Ford, Bacon & Davis, as chairman. This committee reported at the 1911 and 1912 conventions and its reports were discussed in detail and supplemented by discussions at the mid-year meetings of 1912 and 1913. In 1912 the title of the committee was changed to the committee on the cost of passenger transportation service and Mr. James D. Mortimer, then president of The Milwaukee Electric Railway & Light Company and now president of the North American Company, was named as chairman. At the 1913 convention the committee reported in favor of the establishment as one of the activities of the association of a bureau of fare research, which should engage in a study of the entire question of rates of fare, assembling data and facts for the use of member companies and making available all possible information upon this subject, as well as establishing standards for the consideration of this important subject. The report of the committee was unanimously adopted and Mr. Doolittle's appointment is the beginning of the actual work of the bureau. The objects of the bureau were outlined in the report of the committee on the cost of transportation service presented to the 1913 convention.

OBITUARY

Earle Smithers, manager of the Salina Street & Interurban Railway, Salina, Kan., died at St. Barnabas Hospital, Salina, on May 5, of injuries sustained on the previous day while repairing a guy wire. Mr. Smithers was belted to an 18-foot pole, making some minor repairs, when the post broke near the top, throwing him to the ground.

Interstate Trade Commission Bill

The subcommittee of the Senate interstate commerce committee has completed the draft of a bill providing for the creation of an interstate trade commission of five members to supervise the activities of all corporations. The bill will soon be presented to the full committee for consideration. The subcommittee disregarded the suggestion to permit manufacturers to fix retail prices and did not exempt trade unions and farmers' organizations from operations of the Sherman law. According to the members of the subcommittee, the trade commission will have many of the authorities of a court, without the power to punish but with wide power of investigation, examination and recommendation. Prosecutions for violations of the terms of the bill would be instituted by the Department of Justice in the proper courts. Other supplementary legislation in the proposed bill includes a provision for the supervision of stock and bond issues of corporations. The bill prohibits the issuance of watered stock under penalty of exclusion from interstate trade. Common carriers are specifically prohibited from making purchases from corporations, directors of which are also directors of the carriers. Similar restrictions are also placed upon the activity of banking institutions. Price cutting is forbidden by the terms of the bill.

The property of the Southern Indiana Power Company has been transferred to a group of capitalists, headed by Chester P. Wilson, president of the Interstate Public Service Company.

Construction News

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

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

RECENT INCORPORATIONS

San Francisco-San Mateo Right-of-Way Company, San Mateo, Cal.—This company has been chartered in California to secure a right-of-way for an electric railway down the peninsula from San Francisco to Palo Alto, which will either be sold to a railroad company to build a competing system or retained for the San Mateo electric line. Capital stock, \$50,000. Directors: M. B. Johnson, Montara, president of the San Mateo County Development Association; H. C. Tuchsens, Redwood City; Torence Masterson, San Mateo; D. G. Doubleday, Millbrae; F. A. Cunningham, South San Francisco; E. M. Moores, Burlingame, and Rev. W. A. Brewer, Hillsborough. [E. R. J., May 9, '14.]

***Oil Belt Traction Company, Oklahoma City, Okla.**—Application for a charter has been made by this company in Arizona to build a 575-mile electric railway with Fort Smith, Ark., as an eastern terminus and Shawnee, Okla., as a western terminus. The road will connect Blackwell, Newkirk, Ponca City, Pawhuska, Tulsa, Bartlesville, Nowata, Vinita, Miami, Grove, Jay, Westville, Stilwell, Tahlequah, Muskogee and Okmulgee, and extend thence to Oklahoma City via Shawnee and from Okmulgee to Tulsa. Capital stock, \$50,000,000.

***Beaver, Meade & Englewood Railway, Beaver, Okla.**—Incorporated in Oklahoma to build an electric railway from Beaver to Forgan, the western terminus of the Wichita Falls Railway & Light Company.

***London, Grand Bend & Stratford Railway, London, Ont.**—The Ontario Legislature has incorporated this company with power to build a railway to be operated by electricity or any other motive power, from London to Lake Huron at the boundary between Lambton and Huron Counties, thence to Stratford and London, Ont., with branches as may be deemed necessary. The company is given authority to generate electrical power and to distribute the surplus in the municipalities along its route. The authorized capital stock is \$2,000,000, with a bonding power of \$35,000 a mile of line. Directors: W. R. Wullard, G. H. Gray and J. J. Gray.

FRANCHISES

***Fort Smith, Ark.**—The Oil Belt Traction Company, the incorporation of which is noted elsewhere in this issue, has asked the Council for a franchise in Fort Smith. This line will connect Fort Smith, Ark., and Shawnee, Okla.

Los Angeles, Cal.—The Board of Public Utilities has adopted a resolution directing the Los Angeles Railway to complete its line on Vernon Avenue and to install an interlocking apparatus at Long Beach Avenue crossing the Pacific Electric Railway tracks in Los Angeles.

San Diego, Cal.—The San Diego Electric Railway has asked the Council for a franchise to extend its F Street line to Arctic Street and for an extension on Laurel Street to Fifth Street in San Diego.

Boston, Mass.—The committee on street railways has filed in the House of the Massachusetts General Court in Boston a bill extending time within which the Boston & Eastern Electric Railroad shall file penal bond of \$400,000 with the State treasurer, before commencing work of construction, to April 1, 1915. The extension granted last year by the General Court to the company expired on Jan. 1, 1914. [E. R. J., Dec. 20, '13.]

Clifftondale, Mass.—The Bay State Street Railway has asked the Council for a franchise to double-track its line from Clifftondale Square to Central Street and along a part of Central Street in Clifftondale.

Rennselaer, N. Y.—The United Traction Company has asked the Council for a franchise to extend its lines on Washington Avenue to connect with the Third Street line in Rennselaer.

Elizabeth City, N. C.—T. J. Markham and associates have received a franchise from the Council to build an electric

railway in Elizabeth City. This is part of a plan to build a 100-mile railway from Wade's Point to Norfolk through Pasquotank and Camden Counties via Elizabeth City and South Mills. [E. R. J., Dec. 20, '13.]

Columbus, Ohio.—The Cincinnati Traction Company has asked the Council for a franchise to extend its Price Hill line in Columbus.

Findlay, Ohio.—The Toledo, Bowling Green & Southern Traction Company has offered to give up its present franchise, which expires in 1915, for a new twenty-five-year franchise in Findlay. The company offers to pave the street between and 18 in. on each side of the tracks, lay 100-lb. rails and reduce the cost of current to commercial consumers.

Warren, Ohio.—The Mahoning Valley Street Railway has asked the Council for a twenty-five-year franchise to extend its tracks to Packard Park.

Cushing, Okla.—B. B. Jones, representing the Cushing Traction Company, has received a franchise from the Council to build an electric line in Cushing. This line will be extended to the oil fields 13 miles east of Cushing. [E. R. J., May 2, '14.]

Dunnville, Ont.—The Dunnville, Wellandport & Beamsville Electric Railway has received a six months' extension of time on its franchise from the Council in which to complete its line in Dunnville.

Windsor, Ont.—The Detroit United Railway has received a franchise from the Windsor Council to build the Ferry Avenue loop line on the Canadian end of the railway in Windsor.

***Milwaukee, Ore.**—Louis H. Campbell, Milwaukee, has asked the Council for a twenty-five-year franchise to build an electric railway over practically every improved street in Milwaukee between the downtown district and the eastern town limits.

Frackville, Pa.—The Schuylkill County Railway has received from the Council an extension of time of three months on its franchise in which to complete its line between Frackville and Shenandoah. [E. R. J., June 14, '13.]

Handley, Tex.—The Northern Texas Traction Company, Fort Worth, has received a fifty-year franchise from the Council in Handley.

***Port Angeles, Wash.**—The Seattle, Port Angeles & Lake Crescent Railway has received a franchise from the Council to build an electric railway over certain streets in Port Angeles.

Seattle, Wash.—The Puget Sound Traction, Light & Power Company has received a franchise to double track its California Avenue line in West Seattle, extending from the ferry landing to the junction, from College and Handford Streets, a distance of 1 mile.

Seattle, Wash.—The Vashon Electric Company has received a franchise from the County Commissioners to build an electric line on Vashon and Maury Islands. [E. R. J., April 18, '14.]

***South Bend, Wash.**—Frank Mackean, Seattle, president of the Willapa Power Company, has asked the County Commissioners for a franchise to build an electric railway in Pacific County.

TRACK AND ROADWAY

Northwest Arkansas Railway, Bentonville, Ark.—Grading has been begun by this company on its line between Bentonville and Rogers. H. L. Cross, Bentonville, secretary. [E. R. J., April 18, '14.]

Salt River Valley Electric Railway, Phoenix, Ariz.—This company advises that it has no definite plans when work will be begun on its 20-mile electric railway from Phoenix to Mesa. C. C. Lewis, Phoenix, president. [E. R. J., Nov. 1, '13.]

Glendale & Verdugo Mountain Railway, Glendale, Cal.—On account of being unable to obtain financial backing work has never been begun on this railway in Glendale. Lewis T. Ginger, Glendale, president. [E. R. J., June 8, '12.]

Clear Lake Railroad, Lakeport, Cal.—Plans are being made by this company to begin building its 23½-mile extension between Hopland and Lakeport.

Petaluma & Coast Railway, Petaluma, Cal.—This project to build an electric railway to connect Liberty, Bloomfield and Petaluma has been abandoned. [E. R. J., June 29, '12.]

Redwood City, Cal.—Plans are being made to begin work within the next few months to build a 6-mile electric railway from Redwood City to Woodside. Edward F. Fitzpatrick, Redwood City, is interested. [E. R. J., April 20, '12.]

San Francisco (Cal.) Municipal Railway.—Bids for the construction of the Potero Avenue line of the Municipal Railway which will connect with the Van Ness Avenue line at Market Street and will extend along Eleventh Street and Potero Avenue to Twenty-fifth Street in San Francisco, were opened by the Board of Public Works and the contract awarded to Eaton & Smith, San Francisco.

West Side Railroad, San Francisco, Cal.—This company has constructed a roadbed from the west side of the M Street bridge, crossing the Sacramento River, to the southerly end of the West Sacramento Company properties, a distance of 6 miles. Rights-of-way have been tentatively secured to Rio Vista, a distance of 35 miles from Sacramento. This line is operated by the Northern Electric Railway Company. William Herlitz, 310 Sansome Street, San Francisco, president. [E. R. J., Oct. 26, '12.]

Sacramento Valley West Side Electric Railway, Willows, Cal.—This company has begun laying rails from the Oakland and Antioch Junction, southeast toward Dixon. Only ½ mile of rails can be laid before a bridge 345 ft. long is to be constructed. Melville Dozier, Dixon, general manager. [E. R. J., May 9, '14.]

New Britain, Kensington & Meriden Tramway Company, New Britain, Conn.—No definite arrangements have yet been decided upon by this company when construction will be begun on its electric line to connect New Britain, Kensington and Meriden. E. A. Moore, New Britain, president. [E. R. J., Sept. 20, '13.]

Georgia Railway & Power Company, Atlanta, Ga.—This company is asked to consider plans to extend its Virginia Avenue line into and through Woodland Hills.

Peoria (Ill.) Railway.—This company is obtaining frontage consents in Peoria preparatory to double tracking its West Bluff line.

Rockford & Interurban Railway, Rockford, Ill.—Plans are being made by this company to begin work at once double-tracking several of its line in Rockford.

Union Electric Company, Dubuque, Ia.—A 1-mile extension to the West Locust Street line in Dubuque is being built by this company.

Columbus, Kan.—The Century Engineering & Construction Company, Joplin, Mo., has secured much of the right-of-way for the proposed electric line between Columbus, Kan., and Miami, Okla. George D. Thayer is secretary-treasurer of the company. The railway will probably be constructed through Hattenville, Okla., though another route through Galena and Baxter Springs is under consideration. [E. R. J., May 2, '14.]

Arkansas Valley Interurban Railway, Wichita, Kan.—Plans are being considered by this company to extend its lines from Newton to Salina, a distance of 60 miles.

Louisville (Ky.) Railway.—This company has completed the relaying of a section of its tracks on Main Street in Louisville. Large forces of men are being employed in other sections of the city, where improvement work will follow. Some 7 miles of new double track is to be laid.

Middlesboro, Ky.—Construction of an electric railway in Middlesboro, Ky., in the center of the Eastern Kentucky mining region, is promised in the purchase by Cincinnati capitalists of a city franchise. This provides for a line of 5 miles in length, to communicate with the principal mines near the city and to supply a city service. The Cincinnati men were represented by Fred Moomau, of the Tri-State Realty & Insurance Company, who paid \$410 for the privilege. Mr. Moomau is quoted as saying that the work would begin on the construction of the line within the next six months, the time stipulated in the franchise. [E. R. J., May 9, '14.]

Winnipeg (Man.) Electric Railway.—It is reported that this company plans to build an extension to Transcona during the summer.

Sandy Springs Railway, Kensington, Md.—During the next three weeks this company will award contracts to build in Kensington one through plate girder bridge of three spans, one 44 ft. and two 25 ft.

Granite City Railway, St. Cloud, Minn.—Within the next few weeks this company plans to lower its tracks on the bridge over the Mississippi River and also relay ¼ mile of track on East Main Street in St. Cloud. The material for this work has been purchased.

***St. Paul, Minn.**—The firm of A. Guthrie & Company, St. Paul, will be awarded the grading contract for the electric line to connect the main campus of the University of Minnesota with that of the College of Agriculture. The bids were opened recently by Comptroller George H. Hayes of the university.

Lincoln (Neb.) Traction Company.—During the next four weeks this company will award contracts to build 4 miles of new track in paved streets in Lincoln.

United Traction Company, Albany, N. Y.—Plans are being made by this company for an extension from the end of the present Broadway line to Washington Avenue, and on Washington Avenue to connect with the Third Street line in Rennselaer.

Elizabeth City, N. C.—Preliminary arrangements are being made to build a 100-mile electric railway from Wade's Point to Norfolk through Camden County and Pasquotank County via Weeksville, Elizabeth City and South Mills. Right-of-way has been secured from Elizabeth City to Weeksville in the lower part of the county and from Elizabeth City to the upper part of the country through Camden County to Norfolk in Virginia. The Wade's Point terminus is to be connected by boat with points in Tyrell County. Among those interested are T. J. Markham, J. C. Commander and D. E. Williams. [E. R. J., Dec. 20, '13.]

Bartlesville (Okla.) Interurban Railway.—During the next four weeks this company will award contracts to build 2 miles of new track for city loop extensions.

Choctaw Railway & Light Company, McAlester, Okla.—During the next few weeks this company plans to build a 1-mile extension in McAlester. All material is on hand.

Tulsa (Okla.) Railway.—During the next few weeks this company plans to build 2 miles of new track in Tulsa.

Ontario West Shore Railway, Goodrich, Ont.—F. H. McGuigan, Toronto, formerly of the Grand Trunk Railway, inspected the completed work of the Ontario West Shore Railway financed by the municipalities under the guidance of John W. Moyes. Mr. McGuigan was accompanied by Vaughan Roberts, formerly chief engineer of construction for the Ontario West Shore Railway. Neither Mr. McGuigan nor Mr. Roberts would discuss the situation for publication, though Mr. Roberts intimated that some plan affecting the future of the railway was under consideration. [E. R. J., March 14, '14.]

Ottawa, Rideau Lakes & Kingston Railway, Ottawa, Ont.—An extension of time has been granted by the Ontario Legislature to build this projected railway between Ottawa and Kingston. The company is also authorized to build a branch line from near Lombardy, on the projected main line to Perth, and to increase its bonding power from \$30,000 to \$40,000. N. M. Clougher, Ottawa, president. [E. R. J., April 18, '14.]

Ottawa, Ont.—The plan for an electric railway from Toronto to London and Windsor, with branches to Woodstock and Stratford, has fallen through with the withdrawal in the Railway Committee of the Dominion of Canada Government on April 30 of the Western Central Railway bill asking a time extension.

***Portland, Ore.**—Negotiations are on foot for the construction of an electric line from Bull Run to Welch's, a distance of 20 miles. If this line is constructed, it will not be by the Portland Railway, Light & Power Company, though it may be operated by that corporation under specific traffic arrangements with the builders. When this line is to be constructed and by whom has not been made known.

Moose Jaw (Sask.) Electric Railway.—During the next few weeks this company plans to build 4 miles of new track in Moose Jaw.

Middle Tennessee Traction Company, Franklin, Tenn.—The appropriation of \$100,000 asked for Lincoln County by this company has been subscribed in full. P. E. Cox, Franklin, general manager. [E. R. J., Jan. 31, '14.]

***Bonham, Tex.**—The McKinney, Bonham & Paris Interurban Railway Association has been formed to push plans for a 74-mile electric line between McKinney, Bonham and Paris. The line will connect Blue Ridge, Leonard and Bonham and then will parallel the Texas & Pacific Railroad to Paris. The following directors have been elected: R. L. Waddill, J. L. Lovejoy, L. A. Scott, J. W. Russell, Mark McMahan, J. F. McReynolds and M. H. Ragland.

Salt Lake & Ogden Railway, Salt Lake City, Utah.—During the next few weeks this company will award contracts to build 2 miles of paved double track with 80-lb. high T rails, steel ties and concrete foundation. It will also let contracts for a large amount of special work, steel poles, trolley wire, etc.

SHOPS AND BUILDINGS

Public Utilities Company, Evansville, Ind.—This company is rebuilding the present carhouses at Water and Goodsell Streets in Evansville. The special work has been purchased from the Cleveland Frog & Crossing Company, Cleveland, Ohio.

Union Electric Company, Dubuque, Ia.—This company has completed the addition to its carhouse in Dubuque.

Oregon Electric Railway, Portland, Ore.—This company has opened its new passenger station at Eugene. [E. R. J., Jan. 10, '13.]

Southern Traction Company, Dallas, Tex.—This company plans to build soon a new passenger station at Hillsboro.

Utah Light & Railway Company, Salt Lake City, Utah.—This company has recently purchased the property adjoining the general office building on West Temple Street in Salt Lake City. It is probable that the general office building will be provided with new quarters.

POWER HOUSES AND SUBSTATIONS

San Francisco-Oakland Terminal Railway, Oakland, Cal.—Extensive improvements have been begun by this company at the Yerba Buena power plant in Emeryville, with the building of a new boiler shop, machine shop, mixing house and material sheds, at a cost of several thousand dollars. The company has recently undertaken to do its own street work, which has heretofore been let out to private concerns under contract. Increased facilities for handling this work became necessary and the company is adding to its equipment.

Illinois Traction System, Peoria, Ill.—Two horizontal Corliss turbines of 4000-kva capacity have just been purchased for installation in this company's generating station at Danville, Ill. These turbines will be novel in that they will operate at 3600 r.p.m. The additional new work at the Danville station, which is now in progress or being planned, includes a complete new pumping plant and condenser water system to be supplied to obtain water from the Vermillion River. A 10-ft. dam will be built across this stream. Also a new steel stack, 14 ft. x 225 ft. above the grates, will be erected and superheaters will be installed in the fourteen 400-hp boilers now in this plant.

Lincoln (Neb.) Traction Company.—During the next four weeks this company expects to install a large boiler feed-water pump in its power house in Lincoln.

Dominion Power & Transmission Company, Hamilton, Ont.—The contract with the Canadian Westinghouse Company for equipment for the new steam power plant at Hamilton covers the following: Two 10,000-kw, 6600-volt, three-phase, 66 2/3-cycle steam turbine generators operating at 200 lb. steam pressure, 200 deg. superheat, with surface condensers, condensation pumps and boiler feed pumps. All pumps will be centrifugal type, turbine driven. The excitors will be one turbine driven and two motor driven. The step-up transformers will rise from 6600 volts to 40,000 volts. There will be the usual switchboard, lightning arresters and other accessories.

Salt Lake & Ogden Railway, Salt Lake City, Utah.—During the next few weeks this company expects to purchase one 250-hp boiler for heating.

Manufactures and Supplies

ROLLING STOCK

Moose Jaw (Sask.) Electric Railway expects to build one electric sweeper.

San Francisco-Oakland Terminal Railways, Oakland, Cal., is reported to be in the market for thirty city cars.

Montreal (Que.) Tramways has received ten steel under-frame city cars, from the Canadian Car & Foundry Company.

Rockford & Interurban Railway, Rockford, Ill., has ordered four single truck city cars from the Niles Car & Manufacturing Company.

Pittsburgh (Pa.) Railways is considering the purchase of several interurban cars. Fifteen new cars, it is reported, will be required.

Toronto & York Radial Railway, Toronto, Ont., is in the market for three cars for its Mimico division to replace those which were burned recently.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan., has ordered four arched roof cars from the Cincinnati Car Company. Automatic ventilators, ARIE type, are specified.

St. Louis (Mo.) Water Works Railway has ordered from the St. Louis Car Company two T-post steel cars with 38-ft. bodies. The cars will be 50 ft. over all and mounted on St. Louis 23-E trucks.

Wilkes-Barre (Pa.) Railway, noted in the ELECTRIC RAILWAY JOURNAL of March 21, 1914, as expecting to purchase ten center-entrance cars, has ordered these cars from The J. G. Brill Company.

Rhode Island Company, Providence, R. I., has issued specifications for about 100 new double-truck cars, 42 ft. over all and 29 ft. over body, to be equipped with four-motor equipments.

Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., has ordered four all-steel passenger cars, five electric locomotives and five cabooses from the McGuire, Cummings Manufacturing Company.

Southern Traction Company of Illinois, East St. Louis, Ill., has ordered from the St. Louis Car Company six cars of similar design and dimensions as the six passenger cars which were ordered last year.

Pacific Coast Motor Coach Company, Los Angeles, Cal., is having built by the St. Louis Car Company 104 double-deck motor buses, each seating 54 passengers and being mounted on a Kelly Springfield five-ton truck chassis.

Homestead & Mifflin Street Railway, Homestead, Pa., noted in the ELECTRIC RAILWAY JOURNAL of May 9, 1914, as having purchased one city car, has placed this order with the St. Louis Car Company.

Edmonton (Alta.) Radial Railway has received two single-end double-truck city cars, mounted on standard trucks, with Westinghouse 101-B2 quadruple equipment, from the Preston Car & Coach Company.

Regina (Sask.) Municipal Railway is in the market for four double-truck cars, similar to the sixteen supplied during last year by the Preston Car & Coach Company, except that they will be 6½ ft. longer, with seating accommodation for six additional passengers.

British Columbia Electric Railway, Vancouver, B. C., has received ten double-end double-truck city cars, mounted on 27-G1 trucks with Westinghouse 101-B2 quadruple equipment, for its Victoria service, and five single-end double-truck city cars for its Vancouver service, from the Preston Car & Coach Company.

Electric Short Line Railway, Minneapolis, Minn., has recently ordered an additional GE gas-electric car, making a total equipment of five of these cars. The car measures 70 ft. 1¾ in. over bumpers by 10 ft. 6¾ in. wide over all, weighs approximately 50 tons, seat ninety-one passengers and is equipped with two motors having a total of 200 hp capacity.

Missouri & North Arkansas Railroad, St. Louis, Mo., has arranged to place on operation another GE gas-electric car, making a total of three of these cars the company is using,

The new car measures 70 ft. 7 $\frac{3}{4}$ in. long over the bumpers and 10 ft. 4 $\frac{3}{4}$ in. wide over all, weighs approximately 51.4 tons, seats eighty-five passengers and is equipped with two motors having a total of 200 hp capacity.

Michigan Railway Company, formerly known as the Michigan & Chicago Railway, has placed an order with the St. Louis Car Company for five limited interurban cars 66 ft. 10 in. long by 9 ft. 6 in. wide. The design of these cars includes four compartments, namely, baggage, passenger, smoker and parlor. They are built of all steel, mounted on Baldwin trucks equipped with GE motors designed for 2400-volt, d.c. train operation, with full speed on 1200-volt trolley and third rail.

Michigan United Traction Company, Jackson, Mich., has purchased from the St. Louis Car Company for its Grand Rapids, Holland & Chicago Railway six local interurban cars, 61 ft. long by 9 ft. 6 in. wide, arranged with three compartments and constructed entirely of steel except doors and sashes, and four freight locomotive express cars, 61 ft. long by 8 ft. 11 in. wide, of all-steel construction and designed to provide a carrying capacity of forty tons. These cars are equipped with Baldwin trucks, General Electric motors designed for 2400-volt and 1200-volt trolley and third-rail train operation.

Guelph (Ont.) Radial Railway has received two double-ended pay-as-you-enter city cars, mounted on standard trucks with rolled steel wheels, Westinghouse 101-B2 quadruple equipment and S.M.1 air brakes, and with all-steel underframes and semi-steel sides and ends, from the Preston Car & Coach Company. The exit and entrance doors are under the conductor's control, and the front door exit under the motorman's control.

TRADE NOTES

Railway & Industrial Engineering Company, Greensburg, Pa., has removed its works and offices from Pittsburgh to Greensburg.

American Creosoting Company, New York, N. Y., has removed from 95 Liberty Street to rooms 1211-1212, 17 Battery Place.

Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has acquired the plant of the Bullock Electric Manufacturing Company at Norwood, Ohio.

Morden Frog & Crossing Works, Chicago, Ill., has moved its Chicago sales office to the new Continental & Commercial Bank Building, 208 South La Salle Street, Rooms 1873-75-77-79.

Buffalo Foundry & Machine Company, Buffalo, N. Y., announces that it is now handling direct all inquiries covering vacuum apparatus, castings, patterns and machine work.

American General Engineering Company, New York, N. Y., has received an order from the Brooklyn Rapid Transit Company for 10,000 type D Eureka reinforced trolley wheels with special composition.

Price Electric & Manufacturing Company, Basic City, Va., has been incorporated with a capital stock of \$500,000. The officers are Paul Steinman, Waynesboro, Va., president, and T. A. Sammis, Basic City, secretary.

W. N. Matthews & Brother, Inc., St. Louis, Mo., have issued a folder describing their teleheight, a little pocket instrument for the accurate determination of correct pole lengths for the safe clearance of any obstruction to pole lines.

Tool Steel Gear & Pinion Company, Cincinnati, Ohio, has recently moved into its new plant at Elmwood Place, Ohio, a suburb of Cincinnati, and is now situated in quarters about four times as large as those previously occupied. The company has also installed new machinery to take care of its increasing volume of business.

Sprague Electric Works of the General Electric Company, New York, N. Y., has issued a catalog describing and illustrating its electric hoists, including monorail cranes with operator's cages, grab bucket monorail cranes of $\frac{1}{2}$ to 3 cu. yd. capacity and vertical and horizontal electric winches, for foundries and other industrial purposes.

Esterline Company, Indianapolis, Ind., has appointed R. R. Holden, New York Life Building, Chicago, Ill., as

factory representative for the sale of Golden Glow headlights for the States of Illinois, southern Wisconsin and northern Indiana. Mr. Holden will also have charge of the sale of these headlights for industrial purposes.

McMeen & Miller, Chicago, Ill., engineers, have opened a branch office at 407 Electric Building, Cleveland, Ohio. Allen C. Morse, who has been engaged in engineering work for several years, has been chosen as resident engineer and manager of the new office. McMeen & Miller do general engineering work, devoting particular attention to the rehabilitation of plants, the making of appraisals and the establishment of proper systems of records.

General Electric Company, Schenectady, N. Y., has received an order for motors for the four storage-battery sweepers which were recently ordered by the Third Avenue Railway from the Russell Car & Snow Plow Company. The motors selected for the eighty-five new cars ordered by the United Railways & Electric Company, Baltimore, Md., are the GE-200, split-frame, commutating-pole, positive-ventilated type, and have a nominal rating of 33 hp on 500 volts and 40 hp on 600 volts. The motors will have a gear ratio of 69 : 14. This additional traction equipment has been purchased primarily to provide adequate service during the centennial celebration of the writing of "The Star-Spangled Banner," which occurs in Baltimore during the week of Sept. 7.

ADVERTISING LITERATURE

Stow Manufacturing Company, Binghamton, N. Y., has issued a folder describing some of its portable tools, including portable emery grinders, tool post grinders, two-spindle drills and electric breast drills.

Railway & Industrial Engineering Company, Pittsburgh, Pa., has issued a folder describing its switches for sectionalizing, and in connection with outdoor transformer substations and for mounting outside stations and buildings to disconnect in case of fire or accident.

National Lamp Works of the General Electric Company, Cleveland, Ohio, engineering department, has issued Bulletin 11B describing its mazda high-efficiency lamps for series street lighting service and Bulletin 13D, containing technical data concerning 750 and 1000 watt multiple mazda lamps.

Buckeye Engine Company, Salem, Ohio, has issued Bulletin 114-B for April, 1914, which contains interesting data on its Buckeye-mobile engines. This engine, in its elements consists of an internally fired tubular boiler of the non-return or "gunboat" type on which is mounted a compound engine of simple construction. A well-insulated sheet-metal smokebox encloses a tubular superheater, both engine cylinders, all steam piping and valves and a secondary superheater which imparts heat to the steam as it passes from the high to the low pressure cylinder. The engine exhausts through a closed feed-water heater into a jet condenser which is provided with a rotary air pump. This air pump and the boiler feed pump are so located as to be readily driven in an economical manner from the engine shaft. The catalog includes tables showing the general performance of this engine as to coal and steam consumption, steam pressures, superheat, etc., and diagrams showing the small space required for installation.

C. J. Franklin, Portland, Ore., who resigned recently as general superintendent of the Portland Railway, Light & Power Company to open an office in the Wilcox Building, Portland, as a consulting expert, has issued an exceedingly attractive folder, "Expert Service—Public Utilities." Mr. Franklin is prepared to act as a consultant in all matters embracing operating problems, construction, valuations, rate situations, etc., in connection with public utility properties, and the folder deals with the service of his organization in this connection. The subjects covered briefly in the publication follow: "Operating Problems," "Rate Investigation," "Projected Railroads," "Electrifications," "Valuations and Appraisals," "Public Service Commissions," "Audits," "Examinations and Reports." Aside from the several subjects named, the service which Mr. Franklin is prepared to perform embraces the preparation of cases and service upon boards of arbitration, mediation and conciliation, expert assistance in preparation of cases before railroad and public service commissions and expert testimony in connection with damage suits.