Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLII NEW YORK, SATURDAY, NOVEMBER 29, 1913 No. 22

PUBLISHED WEEKLY BY

McGraw Publishing Company, Inc.

James H. McGraw, President. C. E. Whittlesey, Secretary and Treas.
239 West 39th Street, New York.

Chicago Office.....1570 Old Colony Building
Philadelphia Office.....Real Estate Trust Building
European Office.....Hastings House, Norfolk St., Strand, London, Eng.

Terms of Subscription

For 52 weekly issues, and daily convention issues published from time to time in New York City or elsewhere: United States, Cuba and Mexico, $3.00 per year; Canada, $4.50 per year; all other countries, $6.00 per year. Single copies, 10 cents. Foreign subscriptions may be sent to our European office.

Requests for changes of address should be made one week in advance, giving *old* as well as new address. Date on wrapper indicates the month at the end of which subscription expires.

Entered as second-class matter at the post office at New York, N. Y.

Of this issue of the Electric Railway Journal, *8000 copies are printed.*

NEW PROGRAM OF ENGINEERING ASSOCIATION

The proceedings of the executive committee of the American Electric Railway Engineering Association, as noted in these columns last week, show a wise desire to limit the number of subjects assigned to the several standing committees. A forceful industry like the electric railway business always has a most tempting number of problems for study, but discretion must be exercised in view of the limitations of convention week. Great progress was made when the advance printing and distribution of convention reports was instituted, yet even when such contributions are read by title only the number of subjects may be too many for an adequate discussion of all. To mention one instance: The subjects assigned to the 1912 committee on equipment covered high-grade rubber insulation, end wear on journals, self-propelled cars, squealing of steel wheels, heat-treated gears and pinions, couplers for interurban cars and end connections on same, specifications for steel wheels, wrought iron, cold-rolled axles and ordinary carbon steel axles. This report, aside from several supplements, embraces more than 110 pages of the printed proceedings of the Engineering Association. The enormous amount of research that is involved may be appreciated from the fact that the section on self-propelled cars had the best bibliography ever gathered on the subject, while the study on steel wheel specifications embodied the invention of original tapes, gages and templets. When committeemen do such work *con amore*, they may be pardoned for feeling some discouragement if time is not found for discussing their efforts. Happily, the executive committee of the Engineering Association has tried to avoid this embarrassment of riches by concentrating, during the coming year, on subjects of immediate interest, feeling that other more general topics which have been treated exhaustively before could be postponed for another year at least. Thus the equipment committee will take up the new tendencies in car lighting but will drop such subjects as self-propelled cars and specifications for axles and wrought iron.

THE NEW CHICAGO RAILWAY CONTRACTS

Under the new contracts recently executed between the electric railway systems of Chicago and the Commonwealth Edison Company the latter is able to carry out extended plans for increasing economy of distribution. The surface lines of the city divide the territory fairly well, the Chicago City Railway occupying the southern and the Chicago Railways Company the northern section. The five elevated railways, however, are superimposed upon the surface roads and the lighting system is, of course, all-pervasive. There are thus three separate electrical distributions in the same territory, each with its conduits, cables and substations. To obtain an approximately unified electrical system, the power company has entered into contracts with the railway companies by which it controls not only all generating and transmission equipment but a considerable part of the apparatus for converting a.c. to d.c. power as well. Provision has also been made for the occupation of otherwise unused space in the railway companies' substations with the lighting company's apparatus. This is a perfectly logical step in the rapid development in the power situation in Chicago, and it is economically a correct one. Entirely aside from the question as to whether the railway companies can generate electrical energy as cheaply as the Edison company or not, no one can dispute the undesirability of having three complete transmission systems supplying the same territory. A single system cannot fail to be cheaper and better if it receives equal attention. In fact, all the signs of the times indicate that wholesale energy generation is bound to increase.

CONSERVATION OF WATER POWER

The one definite valuable result of the Fifth Conservation Congress, which met in Washington last week, was the adoption of a statement of principles looking to water-power development. Neither a majority nor a minority report of the water-power committee was adopted, but the congress fortunately approved the declaration of general principles upon which the members of the committee were able to act unanimously. The effect of the action taken on these principles is to commit the conservation congress to a course which should further legislation to promote the development needed so greatly. As large users of power, electric railways have a distinct concern in this matter. Water-power development will help to reduce power costs and thus to offset in slight degree the effect of the steady upward trend of nearly all other costs, both labor

and material, which enter into electric railway operation. It will also conserve coal which would otherwise be consumed by steam power stations. Thus conservation of water-power, as the committee wisely emphasizes, is a double conservation; the value of the coal not used for specific purposes is measurable, but no one can truly measure the commercial worth of all of the energy lost by the non-utilization of natural water-power. Lost energy of the latter type is economic loss, but that fact is not so much a cause for regret at the past as it is a cause for stirring action in the future in order that non-utilization may be minimized. The declaration of principles adopted by the congress recognizes the right of the government to regulate, to receive compensation, to re-determine compensation, to prescribe accounts, to make privileges unassignable except on governmental approval and to revoke permits after a certain definite period, in which event compensation equal to a fair valuation, exclusive of franchise and consequential damages, is to be paid. It is fully recognized in the report, however, that development, with proper public safeguards, should be earnestly encouraged and hastened. In other words, the committee recognizes the public need of utilization of now wasting resources. In so doing, it names principles which, in its judgment and the judgment of the congress that accepted them, should govern franchises. The tests of the practicability of the principles will come if they are adopted as a government program and are applied generally in the effort to produce the developments which ought to be made. If they are applied reasonably under governmental auspices and are so interpreted as to attract capital and assure efficient development of now wasting resources, real conservation will result. If they are adopted or applied so rigorously as to frighten capital and prevent utilization, there will be no conservation, but continued waste.

LIGHTING STREET CARS

As our columns will bear witness, there has been greater activity in the matter of improving the lighting of street cars within the past year than in the previous decade. We have published within a few weeks a group of interesting and important studies on the technique of car lighting, and it may not be inappropriate here to consider the subject in general. Those who complain of the methods commonly used must realize that a street car is for several reasons one of the most difficult interiors to light properly. In the first place, aside from all difficulties which reside in the proper supporting of the lamps, the physical conditions present about the maximum of difficulty from an illuminating standpoint. That is to say, a street car is long and narrow with insufficient head room for the easy placing of fixtures, with seats generally running lengthwise and with sides mostly composed of windows through which the light may stream unobstructed unless they are covered by dark curtains, which makes the matter no better. Besides this, it has been customary to give the interior woodwork of street cars a rather dark finish. We have, therefore, to deal with what is practically a long and narrow room with little or no diffusion from the wall surface, and we are expected to give good light at least along the two sides without placing lights where they will shine in the eyes of the passengers. The obstacles in the way of meeting the requirements are very great, and it is small wonder that results have been often unsatisfactory. The amount of light required, too, in a car, say at least 2½ or 3 foot-candles, demands a considerable expenditure of energy unless the lights are highly efficient and very carefully placed.

The present increasing use of the drawn-wire tungsten lamp has given greater promise of successful car lighting than has ever been in sight before, and recent experiments show that excellent results are thus obtained. There seems to be little doubt that the best place for the lamps, both theoretically and practically, is found in center-deck lighting where the lights are in a single row at the roof of the car. In this position the lights are above the heads even of standing passengers and in good position to throw the light downward along the two lines of seats at a very effective angle. Furthermore, lights in this position mean greater simplicity and lower cost in the wiring, to say nothing of lessened general maintenance and the easy possibility of using larger tungsten lamps and hence lamps with stouter filaments and more resistant to shock. The amount of energy required, from recent experiments with the present standard railway tungsten lamps and in ordinary cars using lights installed under good reflectors, is about 1.25 watts per square foot of area. Ordinary glass reflectors of the kinds which have proved highly efficient in general illuminating work are well suited to car work, but they must be provided with special appliances to prevent their jarring loose and falling on the heads of the passengers. Suitable holders have been devised to meet this requirement. The reflectors themselves, whatever the material, must be such as give a medium angle of distribution, and this type is fortunately the one most easily made in a variety of shapes and textures. Whatever the reflectors, they ought to be deep enough to prevent the lamp filament from being too much in evidence.

In regard to further improvement it must be remembered that a light finish is important in securing sufficient illumination. The difference in the actual illumination secured in a given car finished in dark mahogany and the same car finished in light maple is sufficient to render possible an economy in energy in the latter case which would show up handsomely at the end of the year. Pale yellowish tints, either in natural wood or in paint, are by far the best, aside from downright white, from the standpoint of illumination. Given a light interior surface, particularly in the center deck, one can utilize semi-indirect or wholly indirect lighting with a fair degree of efficiency. The former would probably have to be on a basis of about 1½ watts per square foot and the latter somewhere about 2 watts. Either is pleasanter in its effect than direct illumination as used in cars, where the lights have at best to be set rather low and are particularly difficult to screen properly. Most illuminating engineers consider semi-indirect lighting as rather preferable to wholly indirect, but either can be made to give admirable results in cars, and these methods are altogether worthy of encouragement, especially in the case of interurban traffic, where passengers have to ride considerable distances and generally settle down to read. We are rather inclined to think, too, that, given a proper interior finish, the total light flux required in semi-indirect and indirect lighting may be reduced to a figure that will not

render these methods at all unduly expensive, while the fixtures for them are easily maintained and simply wired.

We are glad to see the keen interest in the better illumination of cars and particularly the tendency toward getting rid of the bare lamps which have so long brought unnecessary discomfort to the traveling public. The problem of good illumination has now fortunately been sufficiently worked out to insure rapid progress in the near future.

THE PROPOSED ASSOCIATION OF ELECTRIC RAILWAY PURCHASING AGENTS

The letters which we published last week from five purchasing agents on the desirability of an organization of purchasing agents, somewhat along the lines of the other affiliated associations of the American Electric Railway Association, are in answer to the original suggestion, made in our issue of Nov. 8 by E. E. Stigall, purchasing agent Metropolitan Street Railway, Kansas City. These letters and the other expressions of opinion which we have received are, on the whole, favorable to the plan. The only objection which has been raised is that there may be a lack of topics to consider. We have no fear on this score. Practically the same thought was suggested at the time of the formation of the other affiliated associations, but the union of many minds soon proved that the difficulty in each case was not the lack of subjects which it was profitable to discuss but the embarrassment of making a selection among a great many important topics.

These questions, in the cases of an association of purchasing agents, would include not only methods of procedure, where the discussion should help to develop the best methods for roads of different sizes, but would also include the question of stores, so far as the purchasing agent had charge of the storeroom. Moreover, we do not see any reason why such an association could not also discuss prices. Indeed, such a plan would be in line with the principle of open prices recently adopted by the manufacturers of manganese steel, and, in commenting on the manganese steel open-price society in a recent issue of this paper, Mr. Eddy, who took a large part in the organization of the society, suggested that the plan was as well adapted for the purchaser as for the manufacturer and that there need be no reason why the purchasing agents of the different railroads should not interchange the prices which they pay for all purchases.

Finally, the purchasing agent comes into touch with each of the other associations in a more intimate way, perhaps, than any other branch of service. This should give an opportunity for instructive joint meetings of the purchasing association with the Engineering Association, for instance, at which the relations of price to quality of engineering apparatus could be considered, and with the Accountants' Association, at which the question of accounts could be discussed from the standpoint of the purchasing agent. We also see very close lines of connection between the purchasing agents and the Transportation & Traffic Association and also, although perhaps not to the same extent, between the purchasing agents and the Claims Association. Altogether, the opportunities for useful work on the part of such an organization seem inexhaustible.

THE COPYING OF CORPORATE RECORDS

A decision just handed down by Associate Justice Haley of the Supreme Court of Maine in a case against the Commonwealth Power, Railway & Light Company is of vital interest to the immense number of corporations that have taken out their charters in that State. The ruling, in its general interpretation, is to the effect that any stockholder in a Maine corporation, although he hold but one share of stock, is entitled to have access to the corporate stock ledger, stock transfer book and other corporate books for the purpose not only of inspecting them but even of making a copy of the list of stockholders. The Maine law recognizes, as does the penal or corporation law of most states, the right of stockholders to inspect the corporate books at the principal office or place of business during the usual business hours, but never before, so far as we know, has such an unrestricted recognition been made by the court of the stockholders' right to take off copies therefrom. Some state jurisdictions, it is true, allow stockholders to copy any section of the minute book that they may desire to obtain. In the matter of copying the list of corporate stockholders, however, the right of each shareholder to do so, if recognized at all, is usually restricted to securing a printed alphabetical list of stockholders without addresses. The present decision apparently sweeps away this restriction and gives any stockholder access to the complete mailing list.

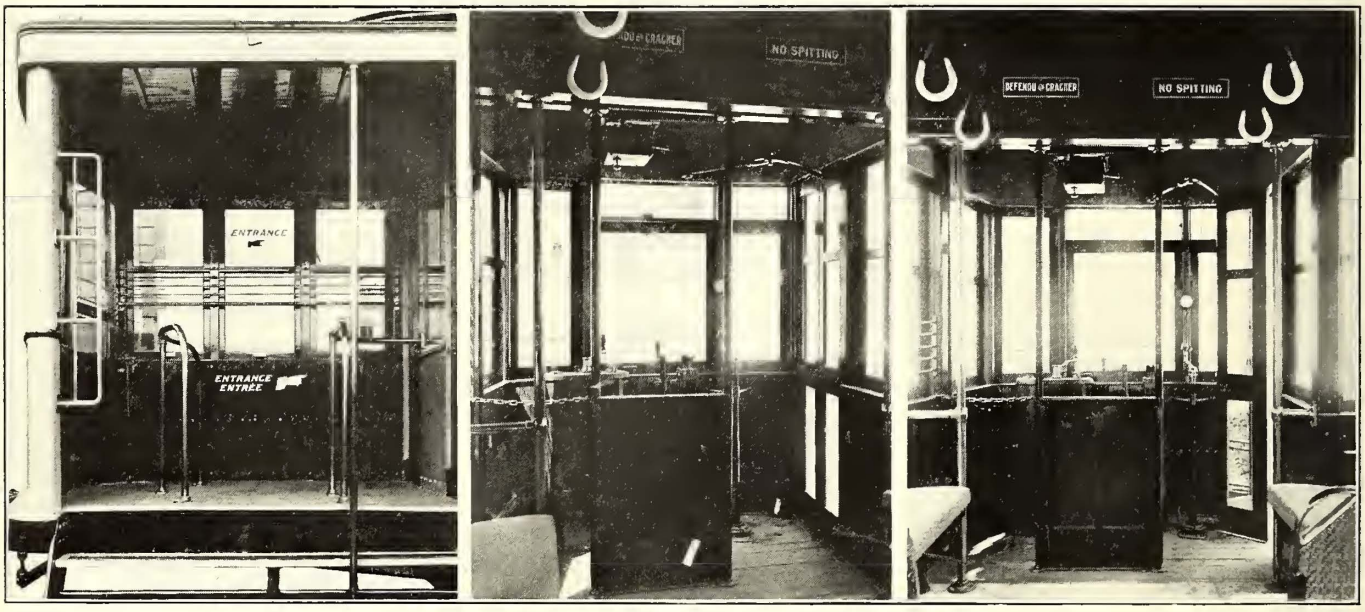
One of the evils against which corporation officials and agents have always tried to guard has been the activities of the corporation parasites who frequently endeavor by stealth or force to obtain the names of stockholders for the sake of profiting by their sale. In the light of the decision in question it seems that a mere temporary purchase of one share of stock is sufficient to enable a person to copy the corporate records. In fact, in the case in point the plaintiff became suddenly interested in the personnel of the stock-holding body only two weeks after he had purchased his single share, a fact which tends to refute the claim of any legitimate interest in the list. If the claimant had been an old stockholder, who because of dissatisfaction with the existing management desired to organize an opposition party, his demand to be allowed to copy the list of stockholders would, we believe, have been justified.

Of course, the line of demarcation between the commercializing of the list and its legitimate use within the stockholding body is not always clear, which brings the queston down to a proper one of the specific facts in each case. Under New York, New Jersey and Pennsylvania law, the right even to inspect the corporate books is not absolute but must have reference to an election of directors or otherwise be germane to a person's status as stockholder. This right exists also only in common law and is enforced by mandamus only when the exercise is sought in good faith and for a specific purpose that the court will recognize. These are restrictions which ought doubly to obtain in connection with the right to copy the corporate records. We hope that when the full Maine Supreme Court renders its decision in the case mentioned it will act more in accordance with the decisions and practices which obtain in other states in this country.

Latest Features of Montreal Cars

The Article Describes a Number of Improvements Such as Arch Roofs, Wooden Cushions for Bumpers of Steel Cars, Method of Getting Clean Air for Ventilation, Door Mechanism, Sign Practice, Etc.

In addition to the twenty-five motor and twenty-five trail cars for train service, as described in the Electric Railway Journal for Oct. 25, 1913, the Montreal Tramways Company had placed an order in December, 1912, for 225 standard motor cars with Westinghouse 533-T-4 equipments. This order was divided equally between the Canadian Car & Foundry Company and the Ottawa Car Company. The new cars embody several improvements which have lately been applied to reconstructed cars under the direction of D. E. Blair, superintendent of rolling stock, and they also have several other features which have been standard Montreal practice for a number of years past. Particulars of these betterments follow.



Montreal Cars—Rear Platform and Two Views at Front of Car, Showing All-Glass Door, Absence of Bulkhead and Door Levers

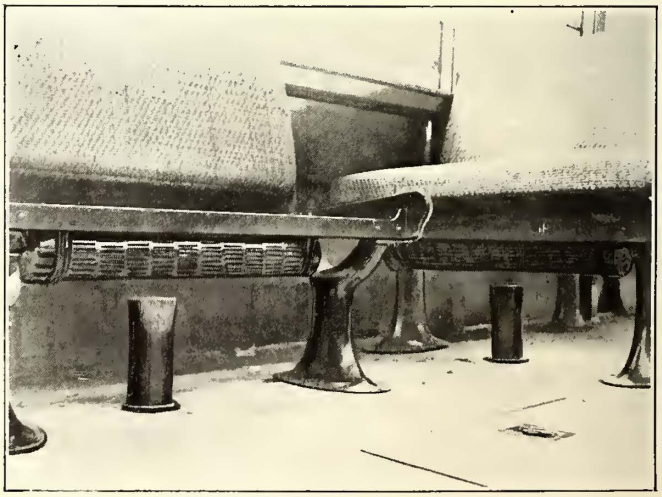
Dimensions and Constructional Features

The new cars are 45 ft. 8½ in. over the platform end sills, 32 ft. 3 in. between the bulkheads and 20 ft. 8 in. between truck centers. The front platform is 5 ft. 7¾ in. outside width and the rear platform 7 ft. 9¾ in. outside width. All-steel underframes are used, the largest sections being 4-in. channel side sills. The corners are strengthened with reinforced and flanged gusset plates. The body bolster is of diamond shape, including channel sections as follows: 10-in. lower member, 12-in. upper member, 6-in. center braces, 18-in. separators. The sides of the car as shown in the accompanying cross-sections are of ¼-in. steel to a height of 18 in. with 1/16-in. plate for the next 15 in. to the bottom of the window sill. The posts are 1⅞ in. wide and only 2¾ in. thick, but to compensate for this an outer strap of 3/16-in. steel is installed from the top of the ¼-in. side plate over the window sill to the letterboard, thus affording an extremely strong reinforcement to the car side. The panels are covered with ¼-in. Agasote for heat insulation. The vestibule and roof of the car are of wood.

The only wood used at the floor level is that for filling the motor trap doors, but the doors themselves are framed with angle iron. The floor foundation is of the Keystone steel type. It is covered with a one-piece vulcanized inlaid rubber carpet which has been standard by the Montreal system since it was first tried in 1904. Not one installation has yet worn out on the 325 cars on which this flooring is used. The combination is very durable and highly sanitary because it is non-absorbent and easily cleaned. The carpet costs 65 cents per square foot, or $140 per car, consisting of the top dressing of 1/16-in. highest grade rubber and ⅛-in. lower grade rubber, vulcanized in turn to 1/16-in. jute. This combination is cemented to the steel foundation. The cement dressing is also applied along the sides of the car so that all water will be discharged toward the center.

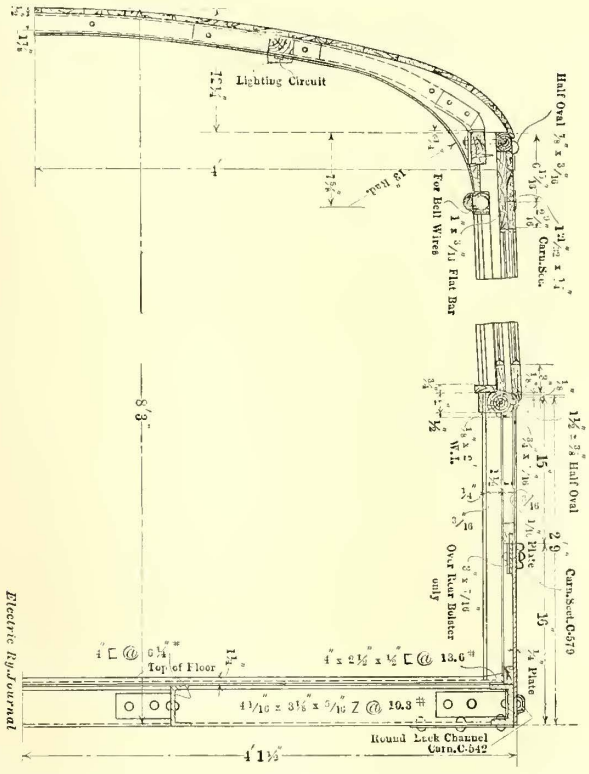
Roof Changes, Ventilation and Heating

Like so many other companies, the Montreal Street Railway has adopted the single-arch roof, the first cars of this type having been ordered during December, 1912. Each roof is fitted with eight Perry or Garland ventilators, which are placed in pairs. The difficulty of supplying clean air from openings near the street level has been solved by means of the dust deflector box shown in an accompanying



Montreal Cars—Air Inlets Under Electric Heaters

drawing. This consists merely of an open galvanized iron box containing a pair of deflectors. For the single-end cars standard in Montreal these deflectors are so placed that the dust particles of the entering air are forced downward and out at the rear as they impinge against the larger deflector. The cleansed air passes through the floor of

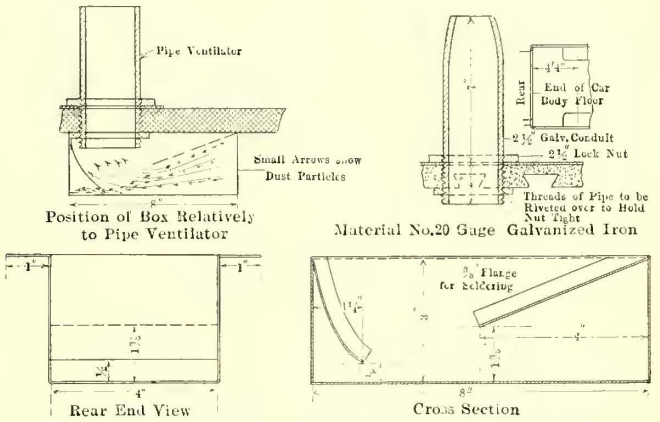


Montreal Cars—Half Cross-Section of Single-Arch Car

the car via a 2½-in. pipe up to the electric heaters, as shown in an accompanying halftone illustration. The deflector box avoids the troubles due to clogged screens, while the effectiveness of the ventilation scheme as a whole is clear from the fact that the car windows will not collect frost even in the most severe weather.

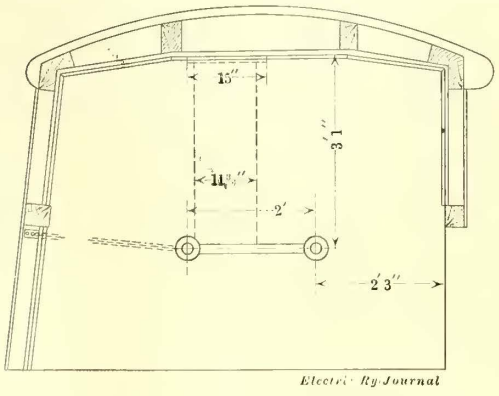
PLATFORMS

As the pioneer prepayment system, the Montreal Street Railway has done quite a little experimenting in platform length. The front platform, which is used only for exit, has been maintained at 5 ft. 3 in., but the rear platform at one time attained the great length of 9 ft. Both platforms are bolted to the car-body members to facilitate repairs. The new cars have rear platforms with 7 ft. clear space, a size which has been found satisfactory in giving ample room for exit and entrance aisles as well as a place for smokers. The 9-ft. platforms of the older cars have been reduced to 7 ft. also. The oxy-acetylene process was used to cut down the sill members. Montreal rear platforms are open on the operating end and are reached by two fixed steps with 9-in. risers. The distance from the ground to the first tread is 16 in. with the 33-in. diameter wheels new. The rear bulkhead is furnished with a swinging entrance and a sliding exit door. The rather ornate grab-handles illustrated have been common to Montreal from ante-prepayment days.

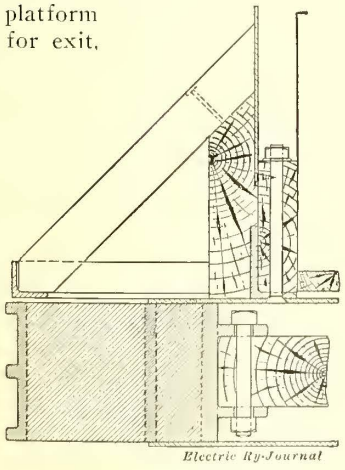


Montreal Cars—Deflector Box for Obtaining Purified Air

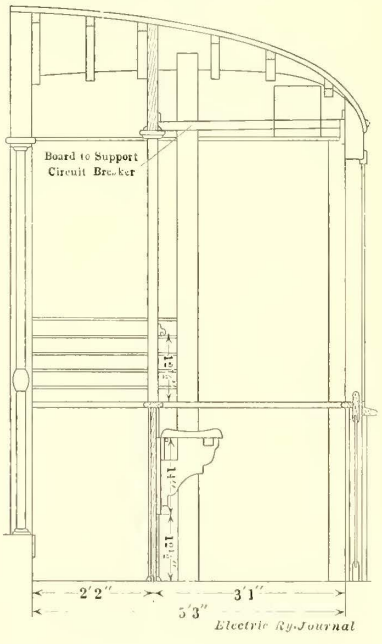
An important change has been made at the front by the practical elimination of the bulkhead. Formerly a bulkhead was carried across the car except for a 24-in. doorless opening at the exit side. However, as the front platform is fully vestibuled, this construction has been superseded except for a panel 2 ft. wide x 3 ft. high from which the motorman's seat is carried. This panel is placed 3 ft. 1 in. behind the middle section of the vestibule sash. The passage to the exit door has also been increased from 24 in. to 27 in. while a chain serves to prevent passengers from using the opening at the left of the motorman. A very important result of this change is to give ample room for a motorman-instructor without his being in the way of the passengers. The views of the folding exit door show the application of clear glass for all panels.



Plan of Front Platform



Wooden Buffer Block



Elevation of Cab

CUSHIONED BUMPERS

The Montreal Company found that a disadvantageous feature of steel cars, as ordinarily constructed, is the tendency toward the loosening of rivets and buckling of members under impacts which, within certain limits, would be

readily absorbed by a wooden car. The shock of steel against steel at only 2 m.p.h. was enough to produce serious damage. To avoid trouble from this source in the future, the continuous bumper channel has been superseded by the construction illustrated in which a central box girder with a cushion block of ash is used. This construction has

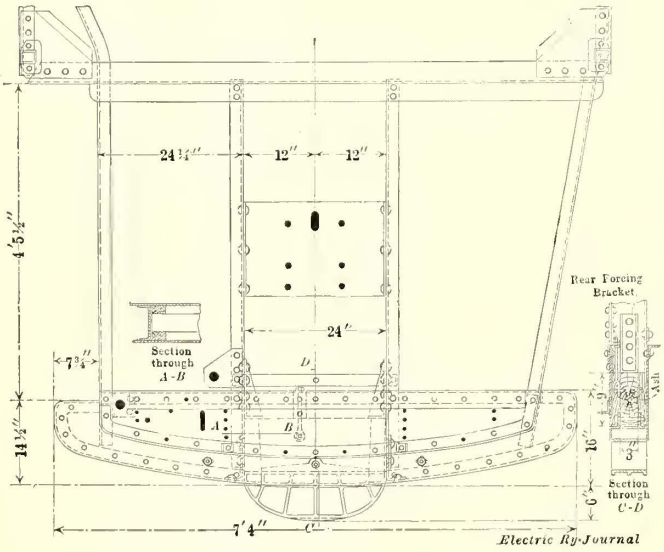
Montreal Cars—Under-Platform Levers, Door Closed and Locked

Montreal Cars—Under-Platform Levers with Door Open; Motorman's Handle Shaft at Left and Door-Hinge Shaft at Lower Right-Hand Corner

been found capable of absorbing impacts of 5 m.p.h. without starting a rivet.

DOOR MECHANISM

Until very recently the exit door on the front platform was of the swinging type. In the latest car a two-leaf folding door is used instead. The simplified mechanism devised for operating these doors eliminates all guides and thus avoids the possibility of jamming. The leverage which is obtained with this mechanism is ample to operate the doors readily. The device is manipulated just like an ordinary hand brake, the spindle and rod for this purpose being

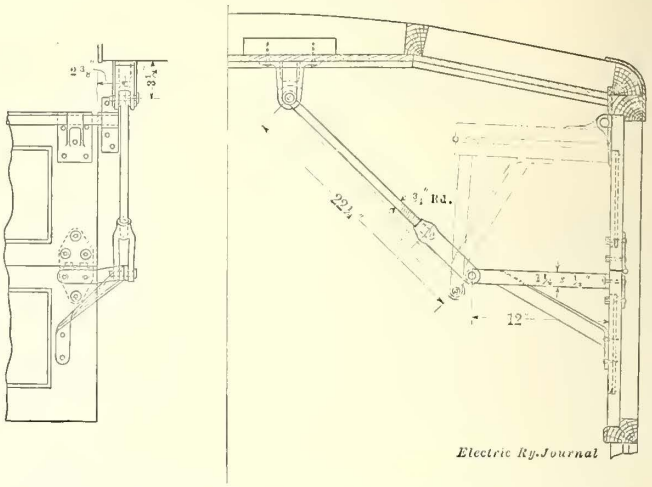


Montreal Cars—Wood-Backed Buffer for Steel-Frame Street Car

conveniently placed between the controller and air brake. To close the doors, for example, the motorman moves this spindle one-half turn, thereby shifting the levers under the platform from their open to their closed positions, as shown in one pair of the accompanying halftones. This movement is transmitted by means of a shaft which is attached to one leaf of the door at the floor line. Near the top of the other leaf is screwed a V-shaped pattern of 1¼-in. x ¼-in. strap which swivels in the prong of a ¾-in. rod which is anchored in the vestibule framing. This rod is threaded at the forked end to permit adjustments. Two accompanying halftones show the position of the vestibule apparatus with the doors closed and open while the same positions are indicated in the drawing by means of full and dotted lines.

SEATING PLAN

The seating is still a combination of transverse and longi-

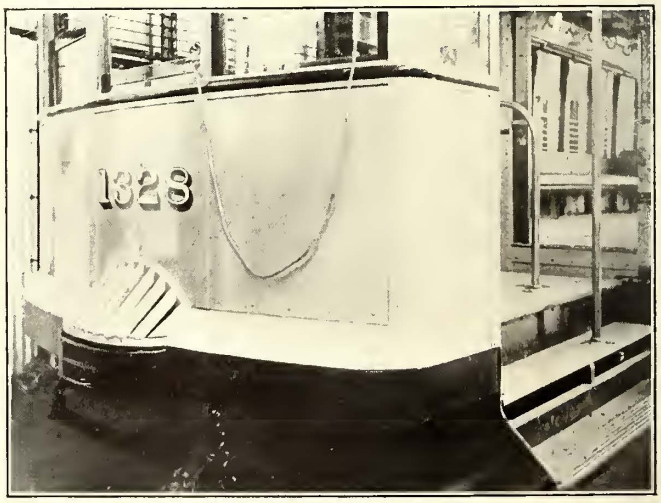


Montreal Cars—Door Lever Arrangement in Vestibule

tudinal types, but the arrangement of the standard 32-ft. 3-in. body has been modified as follows: longitudinal seating at rear lengthened from 7 ft. 10¾ in. to double that dimension; longitudinal seating at the front shortened from 7 ft. 10¼ in. to 34½ in., and the intermediate pairs of transverse seats reduced from five to four. This new plan is clearly more logical than the old one because balance in seating is not desirable in single-end cars.

INSIDE SIGNS

Instead of painting or frosting signs or rules on glass, the company uses a process similar to that of the colored transfer pictures so popular with children. These signs cost only 3 cents to 5 cents each and remain on the glass



Montreal Cars—New Bumper with Wood-Block Backing to Absorb Shocks

despite any number of washings. The materials are furnished by a French firm.

According to a report from the British consul at St. Michaels, the Junta Geral of Ponta Delgrada is prepared to receive tenders for a concession to construct a narrow-gage electric railway, with power station, in the Azores, from Ponta Delgrada to Furnas, with a branch to Riberia Grande. So far as possible the line will run on public roads. The concession is for eighty years, at the end of which the railway will revert to the government. The total cost is estimated at about $1,000,000.

Errors in the Interpretation of Tests for Electrolysis

The Author Shows that These Errors Will Often Lead to the Drawing of Entirely Wrong Conclusions from the Tests—The "Indirect" Method of Measuring the Currents Is Among Those Criticised

BY CARL HERING

Electrical engineering is justly termed the most exact of all branches of engineering, because the measurements, calculations and predeterminations may be made with a greater accuracy, positiveness and reliability than in other kinds of engineering. Nevertheless, there are still three fields in this branch of science which are open to the charlatan for duping the public with sheer nonsense clothed in apparently serious terms, namely, those pertaining to the electric belt, the lightning rod and "electrolysis," in the sense in which that term is used in connection with corrosion by currents from electric railways.

While much could be written upon electrolysis, the purpose of the present note is merely to point out a few of the errors which are not infrequently made in connection with it by those who profess to know, and in some cases by those who ought to know better. In the latter case a more charitable term to use is "carelessness." The fact that the things under consideration are buried underground where they are inaccessible for disproving the assertions leads to carelessness and liberty in making assertions. If physicians could not so easily bury their faults, mistakes and results of ignorance 6 ft. underground, they would no doubt do a little more studying and be more careful in what they say and do, with an assumed but often unwarranted positiveness.

It has been repeatedly stated that if the voltage measured between two buried conductors is high the mysterious iron-eating current becomes ravenous. As a matter of fact it may be, and doubtless often is, just the reverse. Suppose two pipes which are not in contact with each other to be buried in a box of perfectly dry sand and suppose a high voltage to be applied to them; absolutely no current would flow from one to the other, notwithstanding the cry of danger, based on the high voltage. Now suppose a low voltage was applied to them and a bucket of lye was poured over the sand. A very destructive current would then flow between them, although they would be considered "safe" because the voltage was low.

A voltage reading alone is therefore no criterion at all; the actual results may be the reverse of those supposed. A high voltage merely indicates a stronger tendency for a great current to flow, but a low voltage by no means indicates that a very large current is not flowing.

Moreover, an existing voltage may be merely what might be called "static"; that is to say, without any energy behind it actually to produce a current. It is then quite harmless from the standpoint of electrolysis and practically disappears when the two points are connected with an ammeter. For purposes of distinction the other kind of voltage might appropriately be called "dynamic." Therefore the internal resistance of the voltmeter may often be a very important factor in the measurement, for if too low, it may give quite false results.

The supposed voltage of the "ground" is sometimes measured by driving a "stake" into the earth, old iron pipes being often used for this purpose. Sometimes one stake happens to be a galvanized pipe while the other is a rusted one. In such a case a voltage which was not present before could be found to exist because the zinc and the rust form a depolarized battery. Consequently, not the ground but the one who is making the tests is responsible for the voltage.

To be sure of what is actually going on, it is necessary to find out also whether or not a current is flowing, and if so, how much. This determination is not always simple and easy, as will be shown below, and this is especially the case for one who is not well versed in such measurements. Even if a current is found to be flowing in a pipe, it does not necessarily follow that this current is doing damage. It may be flowing out of the pipe quite harmlessly through a metallic connection instead of through an electrolyte like the liquids in the ground.

It has been asserted that, as the surface of pipes is large, quite a large current could be permitted to leave a pipe without doing much more damage than the usual and expected rusting. It is thereby assumed that the current leaves the pipe evenly distributed over its large surface. But the probabilities are generally quite strong that the contrary is the fact and that the outflow will concentrate itself in one relatively small part where the conditions for its leaving the pipe and finding its way "home" are the most favorable. Thus, such a supposedly harmless current may then do serious damage.

It has also been asserted that at least a certain voltage is required to make the current flow out; that is to say, that a certain counter electromotive force must first be overcome before a current can flow at all; hence below this voltage there can be no current. This is also an error. The so-called counter electromotive force of iron when the current leaves it may actually be negative and probably generally is so. Hence it tends actually to produce a current itself without external help, and if a good depolarizer happens to be present at the corresponding cathode such a self-generated current would very likely flow and corrode the iron. In other words, this would be a case of damage for which the railway currents would in many cases be held responsible even though they were not at all to blame.

Pitting, which is often believed to establish the fact that the corrosion was electrolytic, may also be caused by such self-generated currents if the stream of current happens to be localized at points by the surrounding soil or by holes in the paint on the pipe. On the other hand, the resistance, or, better, the virtual resistance, from a metal surface to the ground may be very high, so high, in fact, that at times it probably acts as a moderate insulator. The difficulties of making a good low-resistance connection with the ground for a large current are well known to those who have tried it. The ground itself seems to have a rather low resistance after the current penetrates some distance and gets well distributed in it.

Measurements have been made in all seriousness with a volt and ammeter to obtain the ohmic resistance of "the ground" between the tracks and a line of pipe, or between two lines of pipe, while currents are flowing in both and while a voltage exists between them; yet can anyone say what such a measured resistance signifies? It must necessarily embrace the whole globe and include the earth as far as our antipodes in Australia. The voltage between them is then divided by this resistance to get the current flowing between them, on the plea that this is Ohm's law and that that law is correct! A part of that calculated current must then necessarily flow through Australia also; hence the claims for damages might involve international complications! Practically all of the real effective resistance is probably only in the immediate surrounding of the pipe. The resistance between two plates in the ocean is

said to be nearly the same whether they are a few feet or many miles apart.

Sometimes a very large current is made to flow when a pipe is connected to a track through a low resistance. It looks startling, spectacular and serious, and it worries the uninitiated; yet it may not signify any real danger. A pipe may be positive to a nearby track and hence be in the so-called danger zone yet be quite free from danger, because the ground between them, including perhaps some other conductor, may be positive to the pipe.

Much has been said on paper about pipes being eaten away at a poor joint, hence the assertion about the danger of currents flowing lengthwise through a line of pipe. But have these cases been found as often as they have been talked and written about? If this is so serious, why are not the actual cases of such "sawed-off" pipes more numerous? The probabilities in such cases are that owing to the high surface resistance the current generally gets into the ground over a larger area and is not confined chiefly to a ring around the pipe right at the bad joint, which would be the cause of the "sawed-off" effect.

Another not infrequent error may arise when one measures and expresses a true voltage in terms of a resistance in ohms. This practice may lead to seriously false conclusions. A counter electromotive force is physically a very different thing from a resistance, even though both act jointly to oppose the flow of a current. While at times the measurement of volts in terms of ohms may be justified and correct for certain purposes, it should be done only by those who understand clearly what they are doing.

In many cases one of the most difficult measurements to make properly and reliably in tests for electrolysis is that of the currents flowing in inaccessible, buried conductors or through the ground. At the same time this is often one of the most important measurements to make, for as shown hereinbefore a mere voltage alone is not conclusive. The usual way of measuring such currents in pipes is to "assume" the resistance of a piece of the pipe and then divide this into the drop of voltage. This, at times, is a very useful and convenient expedient for a very crude approximate measurement, but the error in the result is just as great as the error in the assumption. The actual resistance of a buried pipe may be quite different from that of samples of new pipe on which the tabulated figures are based. The writer has found discrepancies of as much as 100 per cent between the actual and the tabulated assumed resistance of pipes. Moreover, in crossing valleys a line of water pipe probably has much thicker walls than over hills, and it would not be possible to determine this thickness from the outside appearance.

A practical method for really measuring such resistances of buried pipes in place was described in this journal by the writer in the issue for Oct. 11, 1913. Another method, and one which is often used, is called "the indirect" method, as though there was only one! To dignify a method by a name is thought to give it a cloak of respectability. But let us examine this well-known and much-used method and see to what serious absurdities it may lead.

The method consists in measuring the voltage E between two points, say on a pipe, rail, column, bridge, reinforcement, etc., through which current is supposed to be flowing and which current is to be measured. Then the investigator connects an ammeter between those points and measures the current I through it and at the same time the new and lower voltage e at these points. Then the current which was flowing normally through this conductor is calculated from the formula $EI/(E-e)$.

To test this method, assume that the voltage which produces this current is impressed on the pipe at some distant places, which will almost always be the case and is therefore quite normal. Hence the current goes through some resistances before it gets to the piece under test.

For the sake of convenience in figures, let this unknown resistance be 1 ohm, and let the piece under test have 10 ohms, while the original voltage which causes the current is 11 volts. The normal current flowing through the piece under test is therefore just 1 amp, and the voltage E at the two points under test will be 10. Now connect an ammeter between these points having a resistance, including its leads, of 0.5 ohm. It will then read about 7.1 amp and e will be found to be about 3.55 volts, from which the calculated current obtained by the foregoing formula will be about 11 amp while before it was shown that it really is 1 amp. The error is therefore enormous, more than 1000 per cent. In practice the real current is not known, hence one does not know the error he is making and accepts the result.

One who is careful enough to analyze the theory of this method will find that it is based on the assumption that the total current which actually is flowing between these two points is the same before and while the ammeter is applied. But how is the one who makes the test to know that this unknown current is or is not the same? It depends entirely upon where the voltage is applied, and this is generally unknown. It may be thought safe to assume that the current is constant when the piece under test is known to have only a small part of that total resistance which determines the current, that is to say, when it is only a short piece of a long line of track or pipe. Even this assumes that one knows where the voltage is really applied, which may be a dangerous assumption.

The "indirect" method may lead to still worse absurdities, as shown, for instance, in the following practical case.

The drop of voltage between two fire plugs connected to a long line of 16-in. cast-iron water pipe, at two points 100 ft. apart, is found to be 500 millivolts, which would seem to be serious. The normal resistivity of such a pipe may be of the order of about 0.01 milliohm per foot, so that the resistance of 100 ft. should be about 1 milliohm. Hence the calculated current which is flowing would be 500 amp, a quantity quite important and possibly quite serious.

To find out whether this is true and to confirm it, the "indirect" method is applied. The ammeter is connected and reads 250 amp, and the reduced voltage e is found to be 250 millivolts, or just half of the former E. The current calculated from these observations will then be 500 amp, confirming the first estimated value so nicely that it would generally be accepted as a proof. Two entirely different methods have given the same result; the tester is satisfied, and the pipe owner is worried. As a matter of fact, and in spite of these readings and tests, a perfectly insulating joint existed in this 100 ft. of pipe under test, and normally absolutely no current was flowing through this pipe under these conditions, showing how seriously wrong the results of these measurements may be. Since the method gives the same results whether the current is really flowing or not, it is totally unreliable in this form.

Any one wishing to confirm this statement by analysis can readily do so. Assume the circuit under test to be broken; assume the original voltage to be 500 millivolts, applied at two points beyond the piece under test, and the resistance of the rest of the pipe between these points and not under test to be 1 milliohm. By applying the "indirect" method, the values of E, e and I given above will then be found to be obtained.

This is not at all a tricky case but is one which may easily arise. For example, an instance occurred in which it was thought that the circuit was continuous while as a matter of fact it was not. Moreover, if the joint does not insulate absolutely but only poorly, serious errors will also result, though they may not be quite so large.

The foregoing illustrations will show what wrong and deceptive results can be obtained by the interpretations of the careless or the unskilled, and they emphasize the importance of making such measurements and interpretations with intelligence and care.

PLANS OF INTERSTATE COMMERCE COMMISSION FOR RAILWAY VALUATION

The Interstate Commerce Commission will have an extensive organization in order to comply with the act of Congress directing the valuation of railways and other interstate agencies of commerce over which it has jurisdiction. The organization is still far from complete, but the commission has made much progress with the plan and has perfected the general outlines of the methods which will be followed.

The work of valuation will be directly in charge of Charles A. Prouty, of Vermont, who has presented his resignation as a member of the commission to President Wilson in order that he may take up his new duties. He will be known as the director of valuations and, subject to the Interstate Commerce Commission, will have complete authority over all features of the work. The organization in this branch of the commission's activities will report to him.

The general lines of this organization were considered carefully by the commission in conference with a temporary advisory committee which has now completed its labors and will not have active connection with the work itself. This advisory committee was composed of Charles F. Staples, member of the Minnesota Railroad and Warehouse Commission; Prof. Edward W. Bemis, of Chicago; Prof. Henry C. Adams, of Ann Arbor, Mich., formerly statistician of the Interstate Commerce Commission; John Lancaster Williams, Assistant Secretary of the Treasury, and Oscar T. Crosby, of Wilmington, Del. It is the intention to create another advisory or advising committee to discuss questions with the commission as they arise in the future, but the personnel of this committee has not been entirely decided.

The commission will make every effort to surround itself with men who have given attention to the matters of railroad regulation and valuation. It is expected that Mr. Staples, who has had long experience as a member of the Minnesota commission, will be a member of the new advisory board. In view of the appointment by the steam railroads of leading attorneys to represent them in the legal aspects of the subject, the commission felt that it would be desirable to have an attorney to represent it in all phases of the valuation from the beginning. With that object in mind, the commission has asked John H. Roemer, chairman of the Railroad Commission of Wisconsin, to take this office, and Mr. Roemer now has the matter under consideration.

The work of valuation will be handled by the commission through a regularly constituted division of valuation corresponding to other divisions in the organization of the commission, such as the division of statistics, the division of accounts, etc. The direction of the engineering organization will be in charge of a board of engineers of which there will be five members, as follows: E. F. Wendt, Prof. W. D. Pence, R. A. Thompson, J. S. Worley and Howard M. Jones. These engineers were appointed directly by the commission. Each will be in direct charge of one of the districts into which the commission has divided the country for the purpose of facilitating the work. Mr. Wendt will be stationed at Washington and will have the direction of the Eastern territory, comprising Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia. Professor Pence will make his headquarters at Chicago and will have charge of the central district, comprising Arkansas, Illinois, Iowa, Louisiana, Michigan, Minnesota and Wisconsin. Mr. Worley will make his headquarters at Kansas City and will have charge of the territory comprising Colorado, Indian Territory, Kansas, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota and Texas. Mr. Thompson, with headquarters at San Francisco, will have charge of the Pacific territory, including Alaska, Arizona, California, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming. Mr. Jones will have headquarters at Chattanooga, Tenn., and will direct the work in the Southern territory, comprising Alabama, Florida, Georgia, Indiana, Kentucky, Mississippi, Ohio, Panama, Porto Rico, South Carolina and Tennessee. Each of these districts includes approximately 50,000 miles of railroad track.

As it is expected that the supervisory and consulting duties of members of the board of engineers will require their presence at Washington frequently for conference with the commission, it was decided to have a district engineer in each division, who will report directly to the members of the board of engineers responsible for the respective divisions. With this method of organization no delay will result from the necessary absence of members of the board of engineers from their respective territories. The district engineers have been appointed directly by the Inter-State Commerce Commission. The district engineers are as follows: Eastern district, Frank Rhea; central district, D. V. Moore; Kansas City district, Carl C. Witt; Pacific district, F. L. Pitman; Southern district, John Y. Bayliss. In accordance with the policy laid down by President Wilson, it is understood that all appointments to offices below the rank of those named are to be made through the Civil Service Commission. It is stated that about 40,000 applications for appointments in connection with this work were received by the Civil Service Commission. The Civil Service Commission has practically finished the analysis of the applications and the certification of names for the Interstate Commerce Commssion.

The headquarters of the division of valuation will be located in a building one block from the headquarters of the Interstate Commerce Commission, which was formerly occupied by the division of statistics and accounts.

Pending the completion of the organization the commission has been giving consideration to a general plan of work and to such initial steps as should be taken to prepare for the greater task of the future. Under date of Aug. 1, the commission issued a tentative draft of regulations for maps and profiles, asking carriers for suggestions for modifications. The second tentative draft was issued under date of Oct. 2 and this requested carriers to offer such criticism and suggestions regarding the regulations as might be helpful to the commission in the preparation of the final specifications for authoritative issue. It is expected therefore that the final authoritative specifications will be issued within a short time.

There is no expectation on the part of the commission that the figures showing the results of the valuation will be available within two years at any rate.

ELECTRIC LINE BETWEEN TOKYO AND YOKOHAMA

In preparation for the increased traffic which is expected between Yokohama and Tokyo (a distance of 18 miles) when the electrification of the present railway line is completed in the spring of 1914, the Japanese imperial government's railway bureau has been improving the roadbed and increasing the number of tracks on this line from two to four. The central power station, which is to supply the current, is shortly to be completed at Kabata, midway between the capital city and Yokohama. On completion of this power house the Tokyo elevated railway line will receive its current from the central plant. This road is the Yamanote line, which runs through the suburbs of Tokyo from Uyeno station on the north of Tokyo and Gofukubashi through the heart of the city opposite the new central railway depot now under construction. The new plant will lessen the strain on the Tokyo city plant, which for some time has been unable to supply all the current needed in the city.

New Railway Power Contracts in Chicago

The Power Contracts Between the Surface Railways of Chicago and the Commonwealth Edison Company Have Been Revised in Several Important Particulars, and the New Arrangement Is Expected to Apply During the Remaining Life of the Railways' Franchises—The Changes Are Published in Outline

Revised contracts covering power supply during the remaining life of the railway companies' franchises have recently been executed between the Commonwealth Edison Company of Chicago on the one hand and the companies operating elevated and surface railways on the other. Under these contracts, as a result of the more efficient use of generating and distributing equipment provided for, energy will be furnished to net a lower price than before and at the same time more reliable service will be given.

The Commonwealth Edison Company has consistently maintained that it is uneconomical to supply the same territory by means of more than one system of electrical transmission. For several years past the company has supplied all of the power requirements of the Chicago City Railways and part of those of the elevated railways and the Chicago Railways. The railway portion of the output of its power plants has rapidly increased until it is 70 per cent of the total. These plants have been enlarged to care for the increased demand while the few existing railway power stations are being gradually put out of commission.

The Edison company has been supplying twenty-five-cycle, three-phase power at 9000 volts pressure to substations owned and operated by the railway companies. In addition it has operated substations in the same territory for the purpose of transforming the high-voltage three-phase current into the 4000-volt, three-phase form for distribution by the four-wire system at 2300 volts, single-phase, to the lighting and industrial power circuits. The later substations have been connected with the power plants by underground cables entirely distinct from the railway cables. The surface railway lines have also required transmission lines and substations separate from those of the elevated lines. The results of this duplication have been several. In the first place, an excessive number of expensive substations have been required. Second, and possibly more important, the load factor of the cables has been low and the cost of cables and conduit correspondingly large. Third, the unnecessarily large number of cables has increased the tendency to electrolysis.

The new contracts, as their terms given in some detail in the following paragraphs will show, remove the necessity for this duplication. They are modifications of the contracts under which the railways have been operating for some years and have been framed not only with a view to greater efficiency under existing conditions but to provide for the eventual consolidation of the railway systems of the city with possible management by the city or its lessee. It is assumed farther that at any time the steam railways having terminals in Chicago may electrify them and may desire to purchase energy from the lighting company. Hence the articles of the contracts are carefully worded to permit the company to use its generating and distributing equipment for all of these purposes if able to offer satisfactory prices for energy.

CHICAGO RAILWAYS CONTRACT

The first part of the amended contract with the Chicago Railways Company is taken up with a definition of the maximum demand which the Commonwealth Edison Company may be called upon to supply. As in the old contract, this maximum demand for any month is calculated from the heaviest hourly morning and evening loads on three consecutive days so selected as to yield a total energy consumption for the six hours greater than would be obtained as the total of the corresponding six hours on any other three consecutive days. The Edison company must be ready to supply a maximum demand of 20,000 kw or one equal to that established by the loads of previous months if they exceed 20,000 kw. To provide for the extra power required for heating cars in extremely cold weather the "emergency energy" consumed when the temperature of the air is at or below 15 deg. Fahr. is excluded in determining the maximum demand.

The second part of the contract covers the scale of prices for energy. This, as before, is made up of two parts, but a sliding scale is provided for both primary and secondary charges. These are shown in the following table:

Primary or Power Charge

Maximum Demand in Kw.	Primary Charge per Kw
To and including 30,000	$1.25
Excess over 30,000 to and including 60,000	1.00
Excess over 60,000 to and including 90,000	0.91⅔
Excess over 90,000 to and including 120,000	0.87½
Excess over 120,000	0.83⅓

Secondary or Energy Charges

Monthly Energy Consumption in Kw-hr.	Charge per Kw-hr. in Fractions of a Cent
To and including 5,000,000	0.400
Excess over 5,000,000 to and including 10,000,000	0.395
Excess over 10,000,000 to and including 15,000,000	0.390
Excess over 15,000,000 to and including 20,000,000	0.385
Excess over 20,000,000 to and including 25,000,000	0.380
Excess over 25,000,000 to and including 30,000,000	0.375
Excess over 30,000,000 to and including 35,000,000	0.370
Excess over 35,000,000 to and including 40,000,000	0.365
Excess over 40,000,000	0.360

These charges are subject to a correction for the price of coal. If during any two-year period the price of coal, having a heating value equivalent to that of coal from mines in central Illinois, delivered at the storage yards of the Edison company exceeds on the average $1.90 per ton, the railway company shall pay an extra charge to cover this excess. The correction in dollars is obtained by dividing by 1000 the number of kilowatt-hours delivered during the two-year period and multitplying this by the excess price of the coal. This calculation is obviously made on the basis of a payment by the railway company of 2 lb. of coal per kilowatt-hour. That is,

$$\text{Excess cost of coal} = \frac{2 \times \text{kw-hr.}}{2000} \times \text{cost} - \$1.90.$$

On the other hand, if the cost of the coal is less than $1.40 the lighting company is to pay to the railway company a sum calculated as described.

As so far described the new contract differs only in detail from its predecessor. The next feature is designed to effect transmission and distribution economies and involves the joint use of substations by the two companies or the erection of substations by the lighting company alone. As at present, the railway company will own and operate at least a part of the required substations, but if there is in these ample space for the equipment required by the lighting company for its lighting or other business, such equipment may be installed under terms mutually agreed upon. This equipment may include rotary converters for 600-volt service and the Edison company agrees that, if it has available capacity in the transforming equipment, it will sell d.c. energy to the railway company for use in the vicinity of the substations. The Edison company farther agrees to install substations where needed or required and to sell d.c. energy under the same general terms as a.c. energy with an additional charge for conversion and for a share of the cost of maintaining the substation based upon the proportion of its output used by the railway company.

The advantages gained by the new arrangement are partly these: From one substation power can be supplied for all purposes, including railway power for different companies occupying the same territory; for example, the elevated and the surface roads which now have separate systems of substations can be supplied from one system, thus greatly reducing the number of substations required. A reduction in number of substations renders the transmission systems simpler and thus more reliable and at the same time cuts down the transmission cost.

The railway company has agreed to generate no electrical energy during the period from Nov. 1, 1914, to Jan. 31, 1924, but reserves the right to do so after that date. In doing so, however, it is provided that Edison power shall be used in such amount as shall insure an average monthly load equal to 35 per cent of the amount which the lighting company must, under the contract, stand ready to supply.

The new contract differs from the old one in that the energy will be metered in a.c. form at the high-tension terminals of the transformers in cases where the railway company operates the rotary converters, otherwise at the points where power is delivered to the d.c. feeders on the price basis outlined in the last paragraph.

Looking forward to a possible consolidation of the railway systems of the city, the contract provides a new maximum scale of charges for use in such a contingency. These are similar to the ones already tabulated except that the rates apply to different ranges of consumption as follows: primary charge, $1.25 up to 75,000 kw; $1, excess to 150,000 kw; $0.91⅔, excess to 225,000 kw; $0.87½, excess to 300,000 kw; $0.83⅓, excess above 300,000 kw. The accompanying secondary charges are: 0.400 cent up to 12,500,000 kw-hr. per month; 0.395 cent for excess to 25,000,000 kw-hr.; 0.390 cent for excess to 37,500,000 kw-hr.; 0.385 cent for excess to 50,000,000 kw-hr.; 0.380 cent for excess to 62,500,000 kw-hr.; 0.375 cent for excess to 62,500,000 kw-hr.; 0.375 cent for excess to 75,000,000 kw-hr.; 0.370 cent for excess to 87,500,000 kw-hr.; 0.365 cent for excess to 100,000,000 kw-hr.; 0.360 cent for excess above 100,000,000 kw-hr.

The remaining features of the contract involve provisions for arbitration in case of dispute as to service and charges, methods of measuring and checking all physical quantities upon which charges are based, notification of proposed changes in demand for power on the one part and of ability to supply power in excess of contract stipulations on the other, and other details necessary to the satisfactory operation of the agreement.

The new contract has been in force for several months but has just been announced. The operation is very satisfactory and is already resulting in marked economies in construction and operation of substations. Some of the new substations constructed to take advantage of the agreement will be described in an early number of the ELECTRIC RAILWAY JOURNAL.

CHICAGO CITY RAILWAY CONTRACT

The Chicago City Railway Company has used Edison power exclusively for nearly five years. Its original contract covered a five-year period. The new contract is, therefore, in the nature of a renewal. The company, however, obtains a better rate for energy and, by agreeing to the joint use of substations, co-operates in securing the economics already described. The terms of the contract are virtually the same as those of the Chicago Railways contract.

THE ELEVATED RAILWAYS CONTRACTS

The Commonwealth Edison Company has supplied an increasing proportion of the power required by the five elevated railways, but the railway companies, having several power plants of varying degrees of excellence, have continued to operate the most economical of them in order to keep down the service charges and to insure an extra source of power supply. They have now, however, agreed to take their entire supply from the lighting company for a term of twenty-five years. The principal feature in which the contracts differ from the others is the provision made for the leasing by the Edison company of all power plants and substations at rentals so graduated as to cover the natural depreciation of buildings and equipment. By thus controlling all electrical equipment the electric company can operate the steam plants or not as may prove more economical and can utilize the substations in the general distribution scheme already outlined.

In the operation of the power plants and substations the lighting company agrees to maintain the equipment in good running order and to pay the taxes assessed against the property. The railway companies are to supply coal-and-ash-handling service for the power plants, for which service a reasonable charge is to be made, and the railway companies guarantee that the cost of such service and of maintaining a satisfactory supply of water for condensing purposes shall not exceed these costs at the beginning of the contracts. The lighting company has the option of purchasing the power plants, substations and equipment on a scale of prices graduated according to years and allowing for depreciation, but at the same time either party may release the generating stations from the lease.

The electric company also gains the right to install wires and cables upon the elevated structures, with the necessary poles and cross-arms, provided that these do not interfere with the use of the structures for railway purposes.

The Edison company is to furnish d.c. energy at 600 volts and, as the original contract was drawn in terms of a.c. energy, the a.c. equivalent of the d.c. energy is calculated on the basis of transformation efficiency taken to be 93 per cent. The following additional charges are made for transformation: primary charges, 30 cents per kw-hr. to and including 10,000 kw, 26 cents for the excess over 10,000 kw to 20,000 kw, 23 cents for the excess over 20,000 kw. The railway companies also pay a proportional share of the cost of operating the substation and an energy charge of 0.025 cent per kw-hr. for all energy delivered. They agree to take a limited amount of power in d.c. form at the generating stations; for example, the Metropolitan West Side Railway takes not to exceed 10,000 kw.

PLEA FOR LOWER PAVEMENT CHARGES IN ENGLAND

At the meeting of the Municipal Tramways Association in Sheffield, England, on Sept. 24, 1913, a strong plea was made by W. C. Fenton for a reduction of the pavement charges required under the tramways act of 1870. During the last six years, however, according to Mr. Fenton, opposition to this arrangement has been gaining ground, owing partly to the obsolescence of the factors upon which this part of the act was founded and partly to the great increase in both heavy and light motor traffic. The act was based upon the use of horse traction only, involving wear and tear of the paving because of this method of haulage. The tramways are taxed also upon their track, depots and offices. The bus companies contribute toward the cost of street improvements only a small amount through a petrol tax and a small tax on their buildings, which often represents a very low capital expenditure and is not allocated to the particular district affected. The enormous increase of motor vehicles has laid heavier burdens upon tramways for the maintenance of paving within the statutory area of their tracks. Thus in Sheffield a twenty-four hours' observation showed 3327 vehicles using the whole street and only 137 tramcars. Similar statistics in London are 4140 vehicles, including 973 buses, to 336 tramcars. Moreover, says Mr. Fenton, "the wear and tear from this vehicle traffic does not all come at the side of the track, for easier traction on the tracks and in some cases the camber of the roadway causes the use of the tracks themselves."

FIRE PROTECTION FOR CAR STORAGE YARDS

BY A. L. KEMPSTER, MANAGER PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

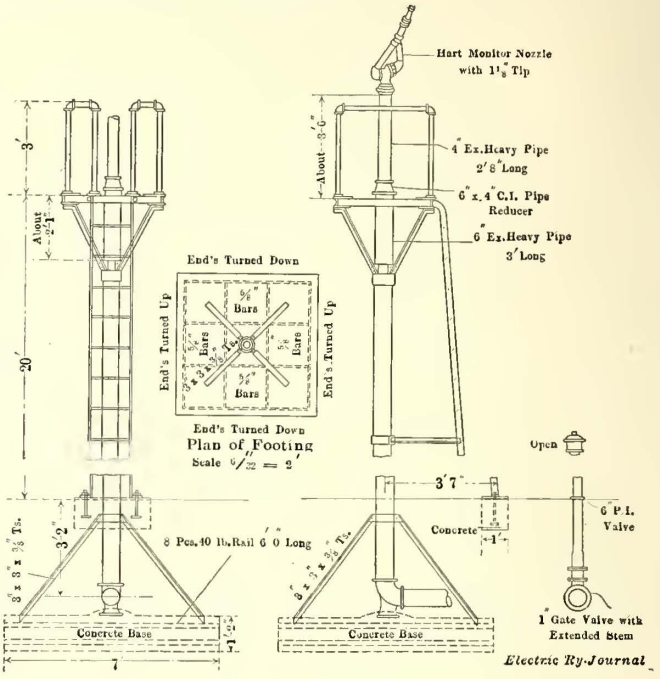
Public service corporations have come to realize that the insurance received in case of fire is but a fractional part of the loss sustained and that the real loss to the company is that caused by the crippled service and the inconvenience incurred by patrons. They have also learned that better protection and good care will decrease the insurance rate.

During the last few years the Puget Sound Traction, Light & Power Company has spent considerable time and money for fire prevention and fire protection. The resulting decrease in the insurance rate has proved that this expenditure has been worth while from a financial standpoint, even without relation to the improved fire protection and the cleaner conditions produced in the company's buildings.

Foremost among the recent installations is a system of fire protection for the North Seattle, Fremont and Jefferson Street car storage yards. The installation, known as the monitor tower system, consists of a number of towers placed about the car yards, each tower carrying a nozzle and an operator's platform. The 6-in. pipe used for the tower also serves as the supply pipe to the nozzle. This nozzle, which is mounted about 23 ft. above the ground, throws a 1⅛-in. stream of water. A universal joint permits the nozzle to be pointed in any direction and at any vertical angle.

The towers are connected to the city water main by a 6-in. supply line, and each system is equipped with a steamer connection for the use of the city fire department. In order to cover the yards thoroughly, the towers were spaced so that any car could be reached by at least two streams. This required the installation of four towers at North Seattle, of three at Jefferson and of two at Fremont.

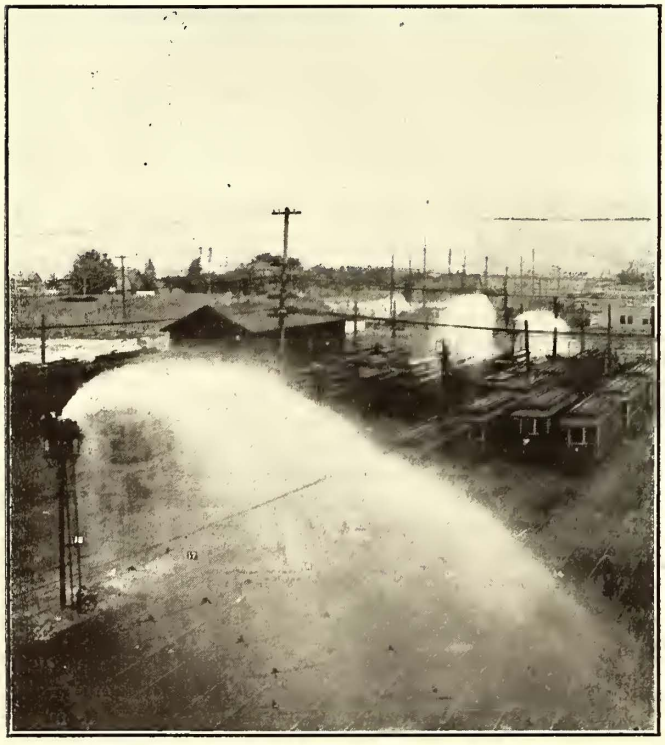
Upon the completion of the work tests were made by members of the Washington Survey and Rating Bureau. At Jefferson car yard, where the static pressure is only 65 lb., the nozzle pressure is 47 lb. and the discharge 255 gal. per minute. At Fremont the static pressure is 125 lb., the nozzle pressure 88 lb. and the discharge 350 gal. per minute. No gage test was made at North Seattle. The static pressure there is 110 lb., so the results would be practically the same at the Fremont yard. From these data it will be observed that in case a car is on fire it can be flooded with water at the rate of 400 gal. or 500 gal. per minute, making it almost impossible for fire to spread to neighboring cars.



Details of Water Tower

This system was installed in preference to hose protection or yard sprinklers for several reasons, some of which are: low cost of installation, practically no maintenance charges and the small space required in the car yards for the towers.

One can quickly and easily turn a stream upon a fire in any part of the yard, while under the ordinary plan of hose



Monitor Fire Protection System in North Seattle Yard

Monitor Water Tower in North Seattle Yard

and hydrants it is difficult to carry the hose underneath the cars and over the platforms to reach a car that may be burning in some distant part of the yard. The monitor system also permits the cars to be moved, which is impossible where hose and hydrants are used. The operator is above the cars and is able to see every part of the yard and can thus locate and extinguish fire to the best possible advantage. There is no danger from electrical shock to the man operating the nozzle and directing the fire streams, because each tower is thoroughly grounded.

The installation, which was made by the Automatic Sprinkler Company of America, was the first system of this kind installed on the west coast. The work was done in a thorough and substantial manner, so that practically no maintenance should be required for a number of years. Views of the monitor water towers under test and details of design are shown in the illustrations.

INDUCTIVE INTERFERENCE WITH TELEGRAPH AND TELEPHONE LINES

At the joint meeting of the British and French electrical engineers in Paris, of which an account was given on page 1067 of the ELECTRIC RAILWAY JOURNAL for June 14, 1913, a part of the discussion centered upon the subject of inductive interference with telegraph and telephone lines along the right-of-way of single-phase electric railways. The full report of this discussion has now become available through the Proceedings of the British Institution. It is given herewith in abstract.

G. Girousse, engineer of the telegraphs, French State Railways, stated that the trouble due to single-phase traction was different in character with regard to messages along a single wire and along two wires. In the former case, which comprised telegraph and signal lines, current which absolutely prevented the operation of the apparatus existed when trains were passing. In the latter case, or in the telephone lines, annoying and sometimes dangerous voltages were set up even when no trains were running. When the insulation resistance of the circuit was defective, owing to rain, for example, the dangerous pressures disappeared, but conversation was rendered impossible by a crackling noise caused by the harmonics, the effects of which were, however, negligible in the case of the telegraph. The trouble could undoubtedly be reduced by moving the telegraph and telephone lines further from the track, but this of course involved considerable additional expense. It was also possible to protect the telegraph by eliminating the use of ground returns, but this method also introduced various disadvantages. The speaker had obtained good results in reducing the trouble on the telegraph lines by employing a receiver with two equal windings connected so that their magnetic actions counteracted one another when they were connected in parallel and were carrying equal currents. One of these windings was in series with a circuit which was in resonance for the fundamental frequency of the disturbing current. The other had a resistance equal to that of the induction coil. Thus the disturbing alternating current divided into two equal parts and had no external effect, the working current only going through the winding in series with the resistance. This arrangement had been adopted on several of the state lines.

As regards the telephone, the speaker said that these could be protected by transposing the wires of the circuit one-quarter of a turn per pole, also by taking care that the insulation was good and by grounding the wires through discharge coils. The latter could be made in the form of induction coils with two similar circuits, the common point being connected to earth and the two ends to the conductors. The distributing current in going through the two windings in parallel therefore encountered zero self-induction and flowed without difficulty to the earth, but the telephone current had to flow through these two windings in series and was stopped by the large self-induction of the coils, so that the shunt had no appreciable effect from the telephonic point of view.

The speaker considered it desirable to erect telegraph and telephone lines with the telegraph wires on the side nearest the traction line and to run the telephone lines on the top cross-arms and at the farther side of the pole. The telegraph conductors were maintained at a low potential, and since they were grounded at both ends they prevented the pressure from rising to dangerous values on the telephone lines. The use of a low frequency for traction purposes was of considerable importance since the disturbing current was proportional to the frequency, therefore a frequency of sixteen and two-thirds was better than a frequency of twenty-five. There would also be considerably less trouble if in place of an overhead wire a third-rail was employed, especially when it was divided into short sections. Underground cables, even those which were used for telegraphs working over single wire, appeared to be altogether free from these disturbances. On the other hand, underground wires sustained very serious damage from direct-current traction owing to electrolysis.

Some of the experiences of the British Post Office were then described by W. Slingo, who stated that trouble from continuous current railways had been overcome by artificially raising the resistance of the telegraph circuit and considerably augmenting the voltage used for signaling purposes. The interferences produced by high-tension alternating-current railways had been much more difficult to eliminate, but a grounded wire located between the power line and the telegraph line had been found to be successful as a screen, reducing the electrostatic pressure from 350 to 50 volts. However, the interference with telephone loops was not so much due to the fundamental frequency of twenty-five cycles per second in the single-phase systems as to the fact that harmonics were present in the current wave. If the traction current was of approximately true sine-wave form, at such a low periodicity the inductive effects, although present, would not be heard, as the frequency would be below the normal limit of audition. If machines could be produced to generate current at low frequency with approximately a true sine-wave form—that is, without the presence of harmonics—the trouble experienced on account of interference would not appear to a great extent. The only effective methods yet tried—namely, the erection of grounded screen wires and the application of impedance leaks to the ground—were not entirely satisfactory. This was true of the former because it increased the electrostatic capacity of the power line and caused a greater expenditure of energy in charging the power network at all times, and of the latter because it reduced the transmission efficiency of the telephone loops and interfered with the signaling arrangements between the terminal telephone station.

As a part of a paper on the Midi electrification, E. J. Jullian spoke on the difficulties which had been encountered in reducing inductive interference along that line, stating that no universal means had been discovered for satisfactorily overcoming these disturbances. For protecting telegraph instruments, however, the apparatus suggested by Mr. Girousse was to be installed and, for protecting the telephones, transposition of the lines at intervals of about 1000 ft., introduction of transformers between the lines and the receiving apparatus and the replacement of the insulators with others of very high dielectric strength were to be carried out.

Following his usual custom W. Kesley Schoepf, president of the Cincinnati Traction Company, gave the orphans of Cincinnati a picnic at the Zoological Garden on Aug. 7. The inmates of all the institutions for orphans in the city who were able to go were taken, in thirty-one cars.

MAIN-LINE ELECTRIFICATION OF THE CHICAGO, MILWAUKEE & ST. PAUL IN MONTANA

Probably by Jan. 1, 1914, the Chicago, Milwaukee & St. Paul Railway will have reached a decision as to the type of equipment to be employed for its main-line electrification over the mountains in Montana. It is practically certain that either a 14,000-volt, twenty-five-cycle a.c. system or a 2400-volt d.c. system will be used. The plans of the General Electric Company and the Westinghouse Electric & Manufacturing Company are now under consideration. For the railroad company the entire matter of electrification has been placed in the hands of C. A. Goodnow, vice-president in charge of operation and construction. Previous articles on this proposed electrification have been published in this paper.*

The company first expects to electrify a division of the railroad 113 miles long, extending over the Rocky Mountains between Three Forks and Deer Lodge, Mont. This work will be begun early in 1914. Ultimately the electrification will be extended to that portion of the main line between Harlowton, Mont., and Avery, Idaho, a main-line distance of 440 miles and, including sidings, a total of 450 miles of track. This plan will mean an outlay on the part of the railroad company of perhaps $6,000,000 or $8,000,000, with an annual expenditure of say $1,500,000 or $2,000,000. This work foreshadows the probable electrification of the entire line from Harlowton to the Pacific Coast, a main-line distance of 865 miles, including the line to Tacoma.

Electrical energy will be obtained from the Montana Power Company of Butte, Mont., and the Thompson Falls Power Company, with which the railroad company has entered into long-term contracts, as previously noted in these columns. The length of transmission will vary from about 15 miles to about 140 miles.

In the zone of the proposed electrification the railroad crosses three separate mountain ranges, namely, the Bitter Root Mountains, the Rocky Mountains and the Belt Mountains. The elevations attained by the railroad are respectively 4170 ft., 6322 ft. and 5788 ft. above sea level. The grades range from 1 per cent to 2 per cent in the mountains with many miles of from 0.3 to 0.6 per cent grades between the ranges. Across this profile it is proposed to haul all passenger and freight trains by electric locomotives at speeds of from 25 m.p.h. to 30 m.p.h. in the case of the former, and from 15 m.p.h. to 18 m.p.h. for the freight trains. All switching service will also be performed by electric locomotives. One electric freight locomotive will be capable of hauling a train as heavy as 2500 tons on 1 per cent grades and two will handle the same tonnage on 2 per cent grades. The electric locomotive units will consist of coupled halves.

One interesting feature of the electrification in connection with train dispatching is pointed out by Mr. Goodnow. At the outset but 20,000 kw-hr. will be available for railroad operation under the contract. The dispatcher will have this amount of energy to move his traffic, and he must not use electricity in excess of that amount. To this end he not only must have the entire situation clearly before him so that trains will not be started from terminals at hours when they will be unreasonably delayed on the line waiting for energy, but he must supervise the speed of the trains on ascending gradients. In order to push an important train across a mountain range at maximum speed it may be necessary for the dispatcher to slow down other trains, or he may order one or more trains to move at maximum speed to provide for the prompt movement of subsequent trains. These considerations would seem to add to the complexities of the duties of the train dispatcher, but there are compensations, as Mr. Goodnow points out, in the knowledge that under electric propulsion a train when ordered forward may be made to move at the precise speed calculated, that the meeting and passing points may be figured to the minute, that there will be no delays for coal and water and for cleaning fires, and that the electric locomotive will be ready for service at terminals as soon as a new crew can be provided. The working conditions of the engineman and assistants under electric locomotive operation should also be greatly improved.

*See Electric Railway Journal, Jan. 11, Feb. 1, Feb. 15, May 24, and June 7, 1913.

MEETING OF NEW ENGLAND STREET RAILWAY CLUB

At the regular monthly meeting of the New England Street Railway Club at Boston on Nov. 20 Carl F. Woods, secretary Arthur D. Little, Inc., Boston, presented a paper upon the "Relation of the Chemist to the Electric Railway." The author pointed out the increasing importance of scientific investigation in relation to the economical operation of railways and cited a considerable number of ways in which the industrial chemist can be of assistance to transportation companies, including fuel analyses, the study of flue gases, feed water, lubricants, cables, wire for trolley service, steel, equipment and supplies in general. An abstract of the paper is given below.

COAL

A glance at the log sheets of any station shows that the item of coal represents about 50 per cent of the total cost of producing power. Many a purchaser buys coal by the ton with no accurate knowledge of its heating value or suitability for his particular conditions. Purchase on the basis of an analysis including the heat units, coupled with intelligent selection under existing conditions, would prevent the need of explaining log sheets showing the consumption of 4 lb. or 5 lb. of coal per kw-hr. or the attempt to burn coal having a fusing temperature of its ash of 2300 deg. Fahr. in a furnace whose temperature over the grates was close to 2800 deg Fahr.

An analysis should show the percentage of moisture, fixed carbon, volatile matter and ash. High moisture means the purchase of so much water at the price of coal, and a proportional amount of heat must be wasted in evaporating it. The volatile matter is of importance as indicating the probable difficulty with which the coal may be burned completely without smoke. All coals having the same amount of volatile matter do not behave alike in the furnace, and it is, therefore, necessary to know both the chemical composition and the actual heating value. The ash is not only valueless but offers greater resistance to free and even distribution of air through the coal on the grates. Excessive quantities of ash increase the labor and cost of firing and of handling ashes.

FLUE GASES

An analysis of the flue gases at once affords a direct measure of efficiency. Under proper conditions of combustion flue gases should contain not less than 12 per cent of carbon dioxide, but they frequently contain as low as 3 per cent. This means that more than 50 tons of excess air are heated to a high temperature for every ton of coal burned. Similarly, fuel losses occur by incomplete combustion. For each pound of coal which is burned to carbon monoxide instead of to carbon dioxide about two-thirds of the available heat is lost. The object of flue gas analysis is therefore to prevent excess of air and at the same time to insure the complete combustion of the coal. The determination of the combustible matter in the ashes at once shows the percentage of unburned coal which is lost through the grates into the ash pits and which represents a direct waste of fuel.

FEED WATER

The formation of scale and the softening of water are due to the simplest of chemical reactions, and by an analysis of proposed feed water a competent chemist can

readily predict the proper amounts of suitable chemicals necessary to prevent scale or corrosion. Hence he can not only save the company the cost of frequent boring and replacing of tubes but can obviate the necessity of attempting to force heat through the same substance with which many steam pipe lines are insulated. The services of a chemist would prevent the purchase of a special compound at $1,000 a year which consisted of 97 per cent water and 3 per cent molasses, or obviate the need of purchasing a mixture of soda ash, tannin and water under a brand name at 8 cents per pound, when the principal ingredients can be obtained at 1 cent per pound.

LUBRICANTS

The study of lubricants, belt dressings, babbitt metal, packings, transformer oil and many other supplies is a fertile field for the chemist's efforts.

CABLES

It is important to take every precaution to obtain the maximum life from cables. A chemical analysis will show whether the insulation used is composed of shoddy, rubber substitutes or pitch. As even a poor cable will last five years and a fairly good one twice as long, little basis of initial selection is afforded. It is known, however, that certain definite qualities are very satisfactory and that if steps are taken through the chemist to obtain such compounds, the engineer can feel reasonably safe.

TROLLEY WIRE

At least 100 trolley wire breaks occur close to the ear, owing to the stoppage at that point of wave action, as compared with one break in the middle of the span. The frequency of such breaks can be greatly reduced if the wire is purchased to specifications calling for proper strength and ductility. In this case it is worthy of note that several manufacturers are experimenting with different alloys with a view toward producing a stronger and tougher wire which shall at the same time possess the conductivity of copper.

CARS

Recently a master painter was troubled by the crawling of varnish on his cars. The matter was called to the attention of the company's chemist, and an investigation of the soap used in car washing brought out the fact that it contained a material quantity of free fat due to careless manufacture, which remained on the car bodies in small spots and caused the difficulty. The public demand for clean, well-kept cars can be met only by durable paint colors and long-wearing varnish. The chemist cannot perform miracles, but he can determine whether the body color is brightened up with an aniline dye which will rapidly fade in service; whether chrome yellow, supposedly a high-grade imported product, is really lead chromate or a mixture of this with clay and barytes; whether the company's turpentine is produced by steam distillation of gum or is refined kerosene, or whether the varnish used is composed of pure linseed oil, high-priced gums and turpentine or is a solution of rosin in cottonseed oil, thinned with naphtha. He can see to it that varnish is not rapidly dulled by washing with cleaning powders containing free alkali or by putting signs on the dasher with paste cut with free borax. The author referred to the experience of the Detroit United Railway in car washing and the value of chemical analyses of soap in that connection as described in a recent issue of the ELECTRIC RAILWAY JOURNAL.

BABBITT METAL, SOLDER, ETC.

An armature getting down upon a pole piece may easily cost many times the price of a chemical analysis of the babbitt metal. The chemist can determine whether the trolley wheels are of the composition proved by experience to give the best service or whether they contain large percentages of zinc and lead, which are readily volatilized by arcing and rapidly increase the wear. He can ascertain the nature of insulating varnish and impregnating compounds used in field coils and can state whether it will retain its elasticity and impermeability or is composed of substances which rapidly distil under working temperatures and leave a brittle, porous mass.

ELECTROLYSIS

There are few problems of electric railway management concerning which there is so much current misinformation and lack of knowledge as electrolysis. Other interests have not been slow to grasp this and to charge the neighboring railway with responsibility sometimes not its due. A thorough understanding of the chemical phenomena of electrolysis is essential to just action in such cases. In a recent instance an iron service pipe passing below a railway developed a leak. Surrounding the pipe was found a heavy incrustation, and it appeared that the company had made a practice of salting a switch immediately above the pipe. The railway was called upon to settle the damages. An analysis of the incrustation showed that it was composed mainly of sodium carbonate, the presence of which could only be explained by electrolysis of the salt solution soaking down from the track. When an electric current is passed through a salt solution the chlorine migrates to the positive and the sodium to the negative pole. The liberated chlorine corrodes the steel, which results in a deposit of rust. The sodium, when liberated at the negative pole, unites with water to form sodium hydrate, which is in turn finally converted to sodium carbonate. In this case the sodium carbonate was found at the pipe or negative pole, a fact which at once proved that current was passing, but obviously from the rail to the pipe and not vice versa, so that through the work of the chemist the situation was cleared sufficiently to make it necessary to attribute the leak in the pipe to some other cause than the escape of stray railway currents.

The speaker also touched upon the importance of the chemist in the study of steel products of all kinds, in the standardization of miscellaneous construction materials, preservation of metals and timber. In conclusion, he emphasized the opportunities for scientific research existing in connection with electric railway problems and stated that a thorough study of what the chemist has actually accomplished and a broad conception of his duties and possibilities will enable operating costs to be reduced and plant and equipment to be greatly improved.

DISCUSSION

In a brief discussion which followed the presentation of the paper, J. W. Dozier, Nahant & Lynn Street Railway, called attention to the difficulties attending the preservation of varnish on cars subjected to frequent exposures to salt water. On the Nahant-Lynn line it is necessary to varnish all box cars yearly, and all are washed nightly to overcome so far as possible the effects of salt spray which is thrown upon the rolling stock from the ocean probably three times a week. Mr. Woods suggested that experimentation with some of the newer varnishes made of China wood oil and fish oil might be helpful, in view of the resistant qualities of such varnishes as regards water. He also suggested the possibilities of rubbing over the varnish with oil to keep the former glossy and prevent it from becoming dull.

C. H. Hile, chief of maintenance Boston Elevated Railway, spoke briefly of the electrolytic corrosion sometimes observed in iron and steel pipes placed underground, as a result of local differences in composition. Such action, he averred, should not be charged to some street railway unless it could be proved that the damage was positively caused by its stray currents.

Six new members were elected at the meeting.

The outing of the employees of the Columbus Railway & Light Company, Columbus, Ohio, and their friends, was held on Aug. 22. More than 10,000 badges were distributed entitling the wearers to trips to all parts of the city. All amusements at Olentangy Park were opened to them. George W. Whisner, superintendent of transportation, delivered an address of welcome at the park.

PROTECTION OF WORKMEN AT SOUTHERN PACIFIC ELECTRIC SHOPS

In an article on the rolling stock and repair shops of the Southern Pacific Railway's electrification at Oakland, Cal., published in the Electric Railway Journal for June 17, 1911, brief reference was made to the method there used for protecting men at work on the steel car roofs and pantographs. Further particulars from *The Travelers' Standard* of the Travelers' Insurance Company follow:

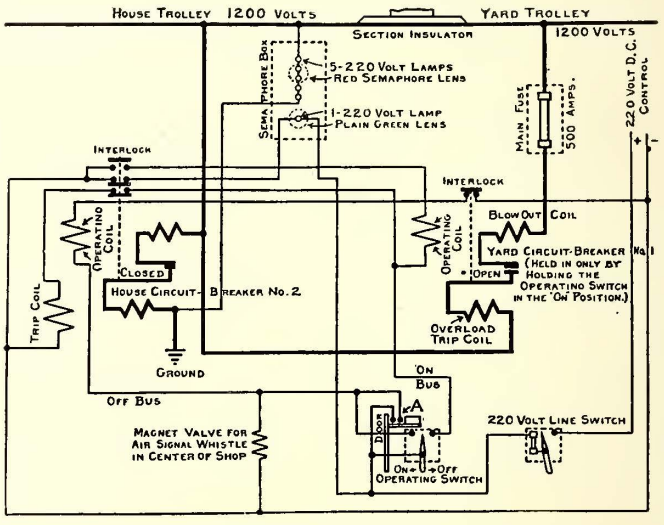
When moving cars into or out of the shop it is necessary to energize the overhead line with 1200 volts. A green light installed over each track at one end of the building indicates that the line below it is grounded, and not energized, while a corresponding red light indicates that the line is energized, with 1200 volts potential. If the line is not energized but is not grounded neither light shows. Furthermore, an alarm whistle is located near the center of the building, and one blast is given upon it when the line is about to be energized. By repeatedly throwing the operating switch to the "off" position the whistle is then made to sound the number of the track on which cars are to be moved. Upon hearing the whistle all employees who may be working on or about the cars are supposed to stand clear of the cars and the overhead line and to wait for the appearance of the red light. If it should appear over the track on which a man is employed he must not return to work until the line is again cleared and grounded, as indicated by the return of the green signal. The switches governing the energizing of the overhead shop trolley wires are under lock and key, and their care rests with the shop foreman.

The yard trolley wire, which is charged continuously to 1200 volts, is insulated from the trolley wire in the shop by means of a section insulator, located at the top of the door frame. The two wires are connected through a circuit-breaker designated in the accompanying wiring diagram as "yard circuit-breaker No. 1," which is protected by a 500-amp copper-ribbon fuse. Another circuit-breaker, designated as "house circuit-breaker No. 2," serves to ground the trolley wire inside the shop. Both circuit-breakers are located on the wall above the doors, and controlled through a secondary or auxiliary circuit, by means of an operating switch fixed upon the end wall of the building at a point convenient for manipulation from the floor. The operating switch is supplied with current from the 220-volt shop circuit and is protected by a 3-amp fuse inclosed in the line switch. The operating circuit is so interlocked that the two circuit-breakers operate alternately. Circuit-breaker No. 1 is held in the closed position by the operating circuit, but only as long as the operator holds the switch handle in the "on" position; and circuit-breaker No. 2, when closed by the operating circuit, is held in this position by means of an integral mechanical lock. The operating coil on circuit-breaker No. 2 is connected in parallel with a valve which operates the air whistle. The operating switch is located in a special box, the door of which has a metal contact, indicated diagrammatically at *A*, which energizes the magnet-valve circuit as soon as the door is disturbed and thus sounds the alarm whistle and gives warning that one of the shop trolleys is about to be energized. A mechanical trigger is also installed in the operating switch box and interlocked with the handle of the switch in such a way that this handle must be moved to the position which energizes the valve magnet and the operating coil on circuit-breaker No. 2, thus insuring that the whistle is sounded before any other operation of the switches can be made. The breaker is closed at the same time, connecting the shop trolley to ground.

To close circuit-breaker No. 1 it is first necessary to open circuit-breaker No. 2, because the operating coil on circuit-breaker No. 1 and the trip coil on circuit-breaker No. 2 are connected in series with contacts on circuit-breaker No. 2 and interlocked. When the handle of the operating switch is placed in the "on" position the trip coil on circuit-breaker No. 2 is energized, opening the circuit-breaker, and through its interlocks the control circuit for the operating coil on circuit-breaker No. 1 is energized, thus closing circuit-breaker No. 1. Circuit-breaker No. 1 is equipped with an interlock which open-circuits the operating switch to the operating coil of the No. 2 breaker, thereby making it impossible to manipulate No. 2 breaker at an improper time.

When the shop trolley is energized current is supplied to the semaphore lens lamps that show through the red lens. This indicates that the trolley is energized. When circuit-breaker No. 2 is closed and No. 1 is open the green semaphore lens lamps are lighted, and the green light indicates that the shop trolley wire is grounded.

A car is moved as follows in or out of the shop: The shop foreman, as the only one with a key to the switch box, must first be notified. He cannot move the operating switch or the line switch without first opening the door of the box.



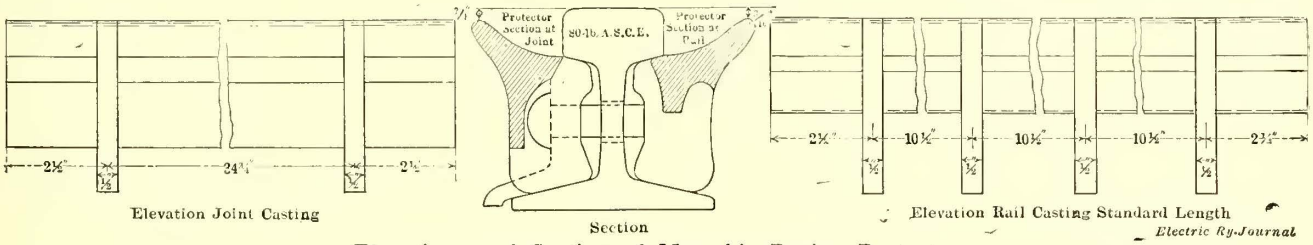
Wiring Diagram of Safety Circuit-Breakers

The act of opening the door automatically blows the alarm whistle in the center of the shop. After the door is opened the foreman must unlock the handle of the operating switch. This act blows the alarm whistle a second time and simultaneously throws current into the operating coils of the circuit-breaker through which the house trolley is grounded—the object being to test the condition of the circuits by insuring that the house trolley wire is grounded at the time the alarm whistle is blown. In the meantime house circuit-breaker No. 2 is held in, mechanically, by a toggle. Hence it is remotely possible that a mechanical shock may have released it and placed the trolley wire in a dangerous condition before the sounding of the whistle. The handle of the operating switch is now in a position where its operation will trip the ground circuit-breaker, relieve the house trolley wire from its ground connection, energize the operating coil of the breaker through which the yard potential is conveyed to the house trolley wire, and change the semaphore lamps from green to red on the trolley wire energized.

When the car movement is complete and it is desired to clear the house trolley wire, the operations take place in the reverse order, with this important difference—that in case the foreman neglects to throw the handle of the operating switch into its locked position and thereby to energize the operating coil of the house circuit-breaker through which the house trolley wire is grounded, his omission is rectified automatically by a mechanical connection on the switch door, by means of which the handle of the operating switch is placed in its normal closed position. It thus energizes the operating coil of the ground circuit-breaker and sounds the alarm whistle to indicate to the men that the potential has been cut off from the house trolley wires.

PAVING PROTECTOR USED WITH T-RAIL IN MEMPHIS, TENN.

A paving protector used in connection with T-rail construction in paved streets has been adopted by the Memphis Street Railway Company, Memphis, Tenn. This device was designed in Memphis and is manufactured by local foundries. Its form varies slightly with the rail sections with which it is used. Its purpose is not only to protect the paving alongside of T-rails but also to eliminate the use of the special paving blocks which usually form the flangeways. It is cast in sections 3 ft. in length, which weigh approximately 7 lb. per linear foot. The material used is cast steel which costs between 1½ cents and 2¼ cents per pound, the difference in cost depending on the market as well as the quantity purchased.

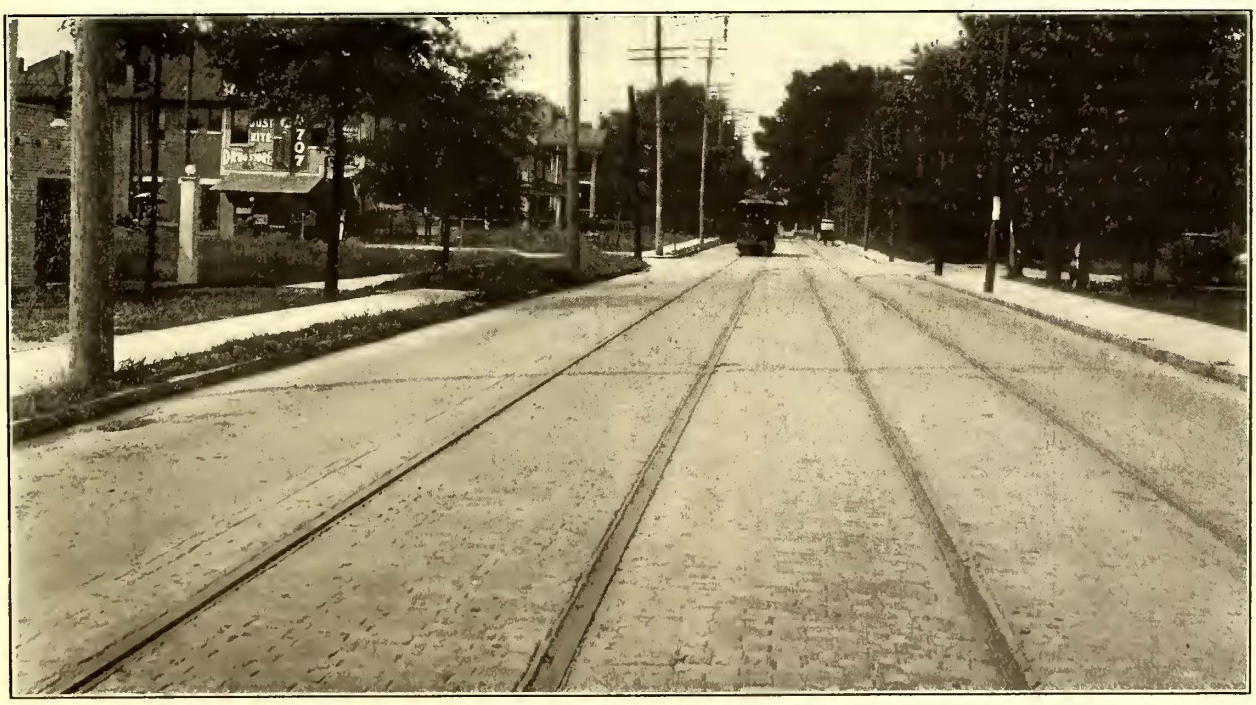


Elevations and Section of Memphis Paving Protector

This paving protector has been used by the Memphis Street Railway Company for more than five years. The circumstances connected with its original installation were that the city government secured from the State Legislature the passage of a front-foot assessment law permitting the city to pave any street by assessing two-thirds of the cost against the abutting property holders and by assuming one-third of the cost itself. The street railway company, under contract with the city, pays for the paving within its tracks and 2 ft. outside. Under this arrangement the city was able to do a great deal of paving at a small cost to itself, especially on streets occupied by the street railway company.

Just prior to the passing of this particular law, the street railway company had reconstructed many miles of its tracks by using 70-lb. and 75-lb. A. S. C. E. rail in what were then and what were expected to be for some time to come macadam streets. The expense that would have been incurred by relaying all this track with girder-groove or tram-rail sections was too great even to be considered, and it became necessary to devise some means other than the use of special paving block to provide a flangeway and protect properly the paving alongside of T-rails. After the company had conducted a number of experiments with various kinds of nose blocks and brick fillers, it decided that the paving protector would serve its purpose best. Consequently it was adopted as standard when paving is required along tracks where T-rail has been laid. The Memphis Street Railway Company uses this protector casting in conjunction with 80-lb. A. S. C. E. rail at the present time wherever the installation results in a saving when compared with the cost of girder-grooved rail.

As shown in the illustration, each section of this paving protector consists of a solid cast-steel groove which forms the steel flangeway. This is held firmly against the ball and base of the rail by ½-in. webs spaced at 10½-in. centers which fit the rail contour like an angle bar. The protector is held securely in position under the ball of the rail by the paving surface and filler. It is made continuous across joints by a slight change in the design to give clearance around the bolt heads and angle bar. The spacing of the supporting web also is increased so it will clear the length of the angle bar. The accompanying half-tone illustration shows track in streets paved with brick where the paving protector has been in service five years under moderately heavy vehicular traffic.



80-lb. A. S. C. E. T-Rail in Brick Paving with Paving Protector in Flangeway

FRIDAY SESSION OF CENTRAL ELECTRIC RAILWAY ASSOCIATION

The session on Friday, Nov. 21, of the Central Electric Railway Association was held in the Hotel Severin, Indianapolis, Ind., with President Brady presiding. Owing to the unavoidable absence from the city of the Hon. Thomas Duncan, chairman of the Public Service Commission of Indiana, Charles Murphy, one of the commissioners, presented a paper on "Industrial Arbitration." At the conclusion of Mr. Murphy's paper President Brady stated that after the serious trouble recently experienced in Indianapolis there could be no question that there was a demand for legislation to prevent violence and damage to property during industrial strike periods. He urged that all should consider the problem carefully, so that when the question of industrial arbitration came up before the Legislature all could assist in the proper solution of the subject. After brief discussion on the subject of remedial legislation Mr. Murphy received a vote of thanks for the paper on "Industrial Arbitration."

Continuing the program, J. F. Starkey, general passenger agent Lake Shore Electric Railway, Sandusky, Ohio, read his paper entitled "The Relation of the Traffic Department to the Company." This paper was published in abstract in the issue of this paper for last week. J. F. Keys, general passenger agent Detroit (Mich.) United Railway, opened the discussion. He indorsed Mr. Starkey's recommendations and emphasized the point regarding the difference between getting business and billing business. He stated that the most important factor in the successful operation of an electric railway was a satisfied public. The only way to attain this end is through the operating department handling promptly all the business the traffic department can get.

Charles L. Henry stated that no subject was of more importance to the electric railways than traffic, but the great difficulty was in the newness of the problem. Steam railroad methods provide no guide for its successful solution. In Indianapolis, for example, an ordinance provides that the freight rates over electric lines shall not exceed those in effect on steam roads. At the time the ordinance was passed this requirement was considered fair, but since that time the operators of electric railways have been considering the problem carefully and have found that they had failed to consider the kind of service required of them. The dispatch with which freight traffic is handled on electric lines added value to the shipper. At the existing rates the shipper was obtaining this value gratis when the interurban railways should have it, but the city ordinance of Indianapolis prohibited an increase of rates.

In many instances the ordinances governing the operation of interurban railways prohibited transporting certain commodities. A little education along this line, particularly in so far as the shippers were concerned, should be productive of good results. It certainly was no more of a detriment to a community for an inclosed electric freight car to haul certain commodities than for an open wagon to do so. Certainly the advantage of an unlimited dispatch freight service offered to the shippers and consumers should not be prohibited. In closing, Mr. Henry stated that the traffic department could be very useful in carrying on this educational campaign, as the people were entitled to all the advantages offered by electric railways and electric railways were entitled to a fair return for the service which they rendered.

F. D. Norviel, general passenger and freight agent Union Traction Company of Indiana, emphasized the advisability of increasing freight rates. He stated that an exhaustive investigation made by the American Electric Railway Traffic Association showed that freight business as it is handled by electric roads at the present time is unprofitable. The quality of service rendered by electric interurban roads at the present time cannot be offered by other classes of carriers. In view of the marked difference in the character of service rendered by electric and steam roads, it appeared that no serious difficulty should be experienced in devising some means of raising rates.

At the conclusion of this discussion President Brady announced that the next meeting of the Central Electric Railway Association would be held in Cleveland, Feb. 26 and 27, 1914, provided satisfactory hotel arrangements could be made. He also appointed a committee composed of F. D. Carpenter, general manager Western Ohio Railroad; W. S. Whitney, general freight and passenger agent Ohio Electric Railway; E. B. Peck, vice-president Terre Haute, Indianapolis & Eastern Traction; H. C. Mason, general manager Benton Harbor, St. Joe Railway & Light Company, and L. J. Drake, Galena Signal Oil Company, a nominating committee to report at the February meeting of the association.

INEXPENSIVE TIMETABLE FOR INTERURBAN SERVICE

The Berkshire Street Railway, Pittsfield, Mass., employs schedule boards of the type shown in the accompanying illustration at all important stations on its system. The nominal cost of maintaining these timetables, their convenience from the passenger's standpoint and their simplicity of arrangement have received much favorable comment. Each board, located beside the track at a point where the local street lighting provides ample illumination, shows the leaving times of the passing car service from that particular point only. The board is 3 ft. wide and 6 ft. high, with a neat ornamental iron scroll at the top. All

Schedule Board of the Berkshire Street Railway

schedules on the system are semi-annually withdrawn and corrected at the paint shop to meet summer and winter traffic conditions. Any mid-season changes are also promptly made. The company handles a large summer business in pleasure traffic, and in addition to the fixed schedules, distributes illustrated folders containing an excellent map and "step-by-step" description of the route from Canaan, Conn., to Hoosac Falls, N. Y., a distance of 97 miles. All historic spots on the road are marked by bulletin boards numbered to correspond to the data in the folder.

COMMUNICATION

FLAT CONTACT WIRE FOR PANTOGRAPH COLLECTORS

NEW YORK, WESTCHESTER & BOSTON RAILWAY
NEW YORK, NOV. 22, 1913.

To the Editors:

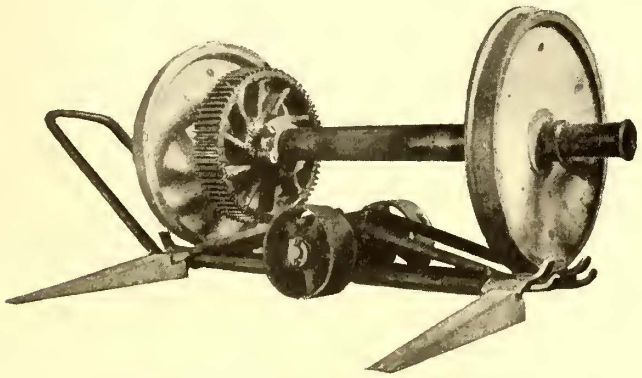
On account of the increasing tendency toward the use of high-voltage systems with rolling or sliding contact shoes, I believe a timely suggestion would be that the contact wire should be manufactured or rolled so that a flat surface comes in contact with the collector. When a round contact surface is used, for some considerable time the collectors are sliding or rolling on a surface of practically no width. As it is necessary to have considerable pressure of the collectors against the trolley wire, the wear on the collectors is very rapid and the wire does not reach a condition for good service until a very long period has elapsed. While the pressure of a pantograph shoe on the wire is generally nearly as much as the pressure of a third-rail shoe on its contact rail, the area of contact is many times less and the wear is proportionately greater.

We have experienced an increase in the life of our standard pantograph shoes from 600 miles to 2500 miles during the operation of our cars for about one and one-half years. This I attribute mostly to the fact that the steel contact wire now has a contact surface worn about ⅛ in. wide, the wire having been of the standard round grooved form at the start. I see no diffculty in the manufacture of a wire with a flat contact surface, or in its installation, as the clips or hangers of the catenary construction would hold it in proper position even on curves. Such a wire would give satisfactory service at once, while from a round wire this can be obtained only after a long period of operation which covers a considerable part of the total life of the wire.

R. R. POTTER, Superintendent of Equipment.

REPAIR SHOP CAR WHEEL TRUCK

The mechanical department of the Duluth Street Railway Company, Duluth, Minn., uses a wheel truck or original design to move a pair of wheels from a storage yard adjoining the shop building to the wheel lathe and press. While it would be just as easy to roll the wheels by hand between these points as to truck them, the new plan obviates the danger that the shop floors will be damaged by sharp or broken wheel flanges when the wheels are removed from one point to the other.



Car Wheel Truck Loaded

Essentially, the truck consists of a pipe carriage balanced on a pair of 12-in. wheels with 6-in. flanges. The carriage is built of three sections of 1¼-in. extra heavy wrought-iron pipe, which taken together form two simple trusses, or the truck side frames. The bottom members of both side frames and the handle used in moving the truck about the shop are formed of a single section of pipe, containing four bends. The upper members of the side frames are bent at the center and flattened at the ends. Both members of each side frame pass through a special cast bearing provided for the axle of the truck wheels. The length of the axle of the truck is sufficient to allow approximately 18 in. of clearance between the wheel flanges. The flattened ends of the pipe which forms the upper members of the side frames are turned up so as to prevent longitudinal movement of a pair of wheels. Plates riveted between the upper and lower members of the two side frames at the car wheel gage lines connect the two side frames, and the car wheels rest on them when in position to be moved. These plates project about 4 in. beyond the side frame on each side of the truck and, together with two 24-in. wedge-shaped wooden blocks which are inserted beneath them, serve as inclines over which the wheels are loaded onto the truck. The upper members of the side frames are riveted to the tops of these end connecting plates and serve as stop blocks to prevent the car wheels from rolling off the truck when it is in motion.

Two men are required to load a pair of wheels, and one man readily wheels the loaded truck about the shop. The complete truck cost approximately $12, including material and labor.

DIESEL ENGINES TO BE MANUFACTURED BY WELL-KNOWN ENGINE BUILDERS

An announcement has just been made of unusual interest and importance in industrial and engineering affairs. A corporation has been formed with a New York State charter to engage in the manufacture on an extensive scale of a full line of Diesel engines, both stationary and marine. The company is planning to extend its line of manufacture up to the large sizes. In this work it will be backed not only by strong American interests but also to a large extent by Swedish capitalists, who now control the Swedish Diesel Motor Company (Aktiebolaget Diesels Motorer). This company is known all over the world as one of the largest and most successful concerns devoted entirely to the manufacture of Diesel engines. These engines are built on the "Hesselman" system.

The new corporation will take over the plant and organization of the McIntosh & Seymour Company, of Auburn, N. Y., well known as a builder of steam engines of the highest grade. The present steam-engine business will also be continued as heretofore. The name of the new corporation is "McIntosh & Seymour Corporation." The board of directors is as follows: Marcus Wallenberg, president Stockholms Enskilda Bank, Stockholm; Frank A. Vanderlip, president National City Bank, New York; Thatcher M. Brown, Brown Brothers & Company, New York; Edwin S. Church, Auburn, N. Y.; J. A. Seymour, Auburn, N. Y.; Oscar Lamm, Stockholm, Sweden, and F. B. Kirkbride and P. W. Henry, New York City. Edwin S. Church, formerly superintendent Akron plant, International Harvester Company, will be executive head of the new corporation. J. A. Seymour, president McIntosh & Seymour Company, will be vice-president, in charge of engineering. The initial capitalization will be $2,200,000, half common and half 6 per cent cumulative and participating preferred stock.

The Swedish Diesel Motor Company started building these engines in 1898. Many of its designs of the most important features peculiar to the Diesel engine, such as the fuel pump, the atomizer, details of pistons, etc., have been purchased and adopted by other leading builders of Diesel engines in Europe. The McIntosh & Seymour Company has long been a manufacturer of steam engines, many of which have been used in electric railway power stations, and its product has always represented the very best in workmanship and design.

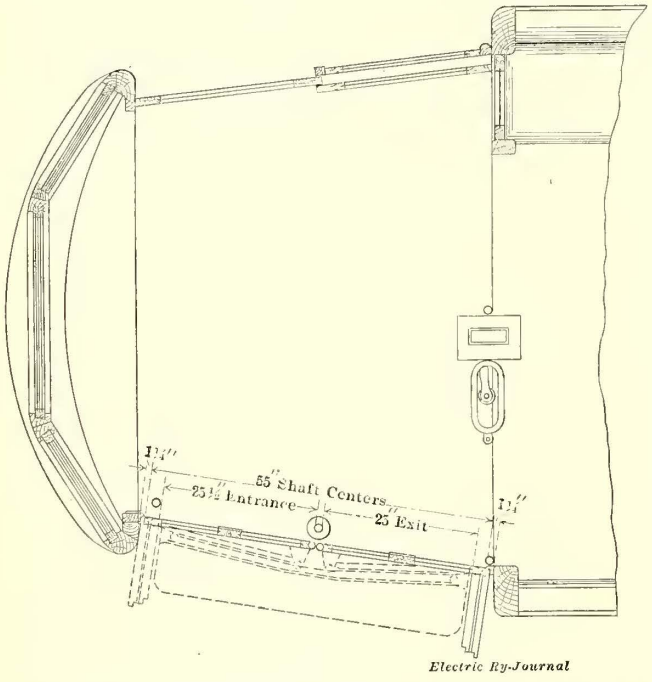
It has for some time been a subject of much comment, in view of the highly successful business being done in the

Diesel engines by many European concerns, that no further attempt has been made to use them in this country. It should be remembered that, notwithstanding the increase in the price of fuel oil, the actual cost of fuel oil and its relative cost, as compared with coal, are generally much lower in the United States than in Europe; also that oil suitable for Diesel engines is a by-product which will always be available in ample quantities as long as the present large consumption of gasoline and kerosene exists. Many large new oil fields are also being developed in this country and Mexico.

In view of these facts, there seems to be no reason why there should not be a broad field in this country for this type of engine, especially when constructed by an organization which understands American conditions of manufacture and the needs of the market here as well as does the McIntosh & Seymour Company.

THIRD AVENUE RAILWAY CONVERTING PREPAYMENT CARS TO NON-BULKHEAD TYPE

The Third Avenue Railway, New York, and its allied company, the Union Railway, are changing from body end door prepayment to non-bulkhead prepayment style a total of 477 cross-seat convertible and 100 longitudinal-seat closed cars. The object of this change is to eliminate rear platform boarding and alighting accidents by inclosing the vestibule on both sides so that, as this platform will be fitted with folding doors and steps, it will be as safe as the front exit, which is already furnished with a sliding door and folding step. In addition, the doors on the conductor's platform are furnished with a contact device which keeps the motor circuit open until the doors are closed. The motorman, therefore, does not have to wait for a signal from the conductor. At present only six cars have been equipped, but it is planned to change the rest of the cars within a year on a piece-work basis at the rate of two cars a day.



Remdeled Platform of Third Avenue Car, Showing Removal of Bulkhead and Addition of Folding Platform Door

CARPENTRY CHANGES

The cars changed or to be changed have bulkheads and end body doors of three different types, namely, double sliding doors with end bulkheads, swinging exit door and sliding entrance door with center pocket, swinging exit door and double sliding door with both center and end pockets. All of these types will be changed to the same pattern by omitting all doors and bulkheads except the far-side bulkhead along the entrance into the car body. As shown in the accompanying plan, the remaining bulkhead is equal to the width of a short longitudinal seat and does not interfere with travel. The platform side of this bulkhead will carry the heater switch and possibly other control equipment, while the area in front of it (in the case of the closed cars) serves for a sandbox and seat.

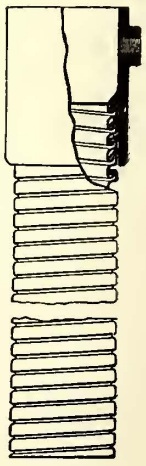
The inclosure of the vestibule consists of the present sliding door, which is used for exit from the front platform, and of a four-leaf folding door, which is manually controlled by the conductor from his station. These doors are of wired glass throughout, so that the conductor can have a full view of the outside of the rear portion of the car. The elimination of bulkheads has also been accompanied by the use of a folding bench on the front platform and a removable seat for the motorman.

ELECTRIC DOOR CONTROL

One important feature of the door control is the contact and relay circuit invented in connection therewith by J. S. McWhirter, superintendent of equipment Third Avenue Railway. The wiring of this circuit is arranged not only to prevent the car from being started until the doors are closed but also to prevent it from being started from any but the first notch of the controller. It is evident that this feature will prevent burnouts in case an impatient motorman has the controller on a more advanced notch in anticipation of the starting signal. Mr. McWhirter has assigned his rights to this device to the Prepayment Car Sales Company, which is supplying the door and step mechanisms on the present order.

SPIRAL-RIBBON SAND SPOUT

A new non-breakable metallic sand spout, to which brief reference was made in the Electric Railway Journal of Oct. 14, is shown in the accompanying illustration. It has been recently put on the market by the H. W. Johns-Manville Company, New York, N. Y. This spout is a strong metal ribbon wound spirally, the edges being crimped or turned in during the winding to form a continuous interlocking spout that can be bent to the desired curve without fear of fracture. The spout withstands a crushing strain of 300 lb. to each four turns of its spirals and cannot break square, flatten or bend beyond the give of its interlocking metal spirals. This sand conveyor, therefore, is free from the leakage trouble of ordinary coiled wire spouts which kink and leave an opening. As the spout is tested to withstand a pulling strain of 1000 lb. to 3000 lb., it will not unwind if it strikes an obstruction. This spout is made either in stiff or flexible form so that it can be set for curves as well as tangents. It is finished with plain couplings or with couplings for either DeWitt or Ridlon sand boxes. Its standard diameter is 1⅝ in. and its lengths are 30 in and 36 in. It is believed that such a spout will not only be much more durable than the ordinary design but can be kept much more easily from clogging.



Spiral-Ribbon Sand Spout

The Public Service Railway, Newark, N. J., is completing the building of nine cars at its Plank Road shops, Newark, N. J. These cars are of the company's 2400 type except that a 2-in. ramp is being installed between the kingbolt and bulkhead line. This change will cut down the height of the first platform step from 17 in. to 15 in. with new springs and to 13 in. with springs set and wheels worn.

News of Electric Railways

Franchise Developments in Kansas City

Whether street cars shall be allowed to run across the plaza in front of Kansas City's new railway station or whether they shall be confined to Main Street was the question which occupied most of the time of the Council committee in charge of the Metropolitan Street Railway's franchise negotiations during the past week. The Main Street people are asking that the franchise be amended to prohibit the Metropolitan from using the plaza. Should the cars not be allowed on the plaza, however, travelers will be forced to walk several hundred feet to the Main Street line. The distance from the street car line to the entrance to the new station is 258 ft.; that to the exit 398 ft.

Another feature of the negotiations of the week was provided by representatives of organized labor, who contended that employees of the Metropolitan Street Railway should be allowed to act on union committees or otherwise be active along that line without danger of losing their positions. The labor representatives were told to submit a draft of amendments covering the subjects in question, and the Council committee will take them under consideration.

At a recent speech on the subject of the proposed franchise for the Kansas City Railway Mayor Jost said that he was opposed to the municipal operation of street railways but favored city control of such utilities. Mayor Jost stated that he believed in municipal ownership and operation of gas, electric light and water utilities, "but when it came to street railroads it was too big a proposition." He added: "It takes ten times more men to run a street railroad than the city has to employ, and it keeps me busy checking up the men I now have to keep track of."

The interurban interests have suggested that the section of Mayor Jost's ordinance dealing with interurban lines be stricken out and one more satisfactory substituted. The original section, abstracted in the ELECTRIC RAILWAY JOURNAL of Sept. 27, 1913, would not be changed in its broad details, but several separate points would be altered. The fact that the Kansas City Railway must take interurban cars as its own cars at the city line and the resulting liability therefor are made clearer. Under the proposed substitute, while such cars are in possession of the company, on its own tracks, it shall be responsible to the passengers, the public and the city for any negligent act or omission of the company, its servants, agents or employees, to the same extent as though it were the owner of such cars; and it shall indemnify and hold harmless such suburban lines against all claims for damages arising from any defect in the company's tracks or ways and from any negligence of the company, its agents, servants and employees in operating such suburban cars while in its possession and under its control. Any suburban line, however, shall indemnify and hold harmless the company against all claims for damages arising out of or connected with any defect in any such car not due to the negligence of the company. Cars of interurban lines must be so constructed as to be suitable for convenient and safe use on the tracks of the company.

The second revised draft of the proposed franchise provided that the Kansas City Railway should, in the absence of any written contract to the contrary with the interurban line approved by the board of control, be entitled to all the passenger fares and freight charges paid for interurban traffic within city limits, and that a commission consisting of two members of the board of control and one interurban representative should determine what portion, if any, of this amount should be paid to each interurban company. The commission, in deciding this question, was to consider the value of the property of the respective interurban lines, the character of the service rendered and the cost and expense to the company of handling such interurban cars. Under the proposed plan the commission is abolished, and the company is to pay to each interurban line for the use of the suburban cars while on the company's tracks the sum of 1 cent for each passenger on such suburban cars when delivered to the company at the point of connection and 1 cent for each passenger on the cars when redelivered to the suburban lines at the point of connection, unless the company and such suburban line shall agree in writing upon some other amount, which agreement shall be subject to the approval of the board of control and also of the city.

Another important provision is that interurban cars shall not be required to stop within the city limits to take on passengers on incoming trips or to discharge passengers on outgoing trips, and that the board of control may determine and by written order designate when and where the interurban cars may be stopped by the company to receive and discharge suburban passengers, and such orders shall be posted and kept at places where the public may be constantly advised thereof.

In the matter of suburban market and produce cars, the original section provided that all such should be run to or near the public markets between 12 o'clock at midnight and 6 o'clock in the morning. The interurban lines desire that the hours of operation of these cars be left to the regulation of the board of control and the city. Moreover, the compensation for the transportation of such cars carrying market products and freight, including the use of the tracks of the company and the power necessary for such transportation, is set at 25 cents per car mile, the interurban company paying the wages of the train crew while the cars are operated over or upon the tracks of the company.

With a view to hastening the work of securing the proposed franchise as many suits as possible outstanding against the Metropolitan Street Railway are being settled out of court by the receivers. Fifty-five suits were dismissed during the past week, agreements being reached between representatives of the electric railway and the plaintiffs. The other cases, in which amicable settlements have not been effected, will be tried in the immediate future.

Indianapolis Differences Placed Before Commission

The differences between the representatives of the Indianapolis Traction & Terminal Company, Indianapolis, Ind., and the committee of employees were placed before the Public Service Commission on Nov. 21 under the terms of the settlement agreement of Nov. 7. The commission will sit as a whole and render decision within thirty days from the date of first meeting. The decision will then be binding for a period of three years upon all parties concerned. All original documents were filed with the answer of the company before the commission, including the original demands in the form of an agreement between the company and the union, the second paper as revised by the committee of employees and the company's answers to the various contentions and grievances. A summary of the demands of the men and the answers of the company follows:

The first section of the grievances asks for recognition of a committee from the "employees' association" to treat with the proper officials of the company regarding all grievances, present and future. The company objects to this on the ground that it is not within the scope of the agreement of Nov. 7, that the same is not within the jurisdiction of the Public Service Commission, and that the three-year clause of the agreement would be violated by recognition of this demand.

The second demand is that 75 per cent of the runs should be "earlies and lates," completed within eleven consecutive hours, swing runs to be completed within fourteen hours; that runs working less than nine hours shall pay nine hours' time, and that time and one-half shall be paid for overtime. The company's answer to this is that operation of the company's lines under such provisions is not practicable if good service is to be furnished in Indianapolis, and the company declines to accede to the demand for time and one-half for overtime and to pay full time for runs of less than nine hours.

The third grievance is in regard to night or "owl" cars.

The company states that present operating conditions are substantially as demanded by the men.

The fourth contention, one of the most important, relates to wages. It contains demands for a flat rate of 32 cents an hour for motormen and conductors, and in addition names all carpenters, air-brake men, helpers in air department, paint shop men, surfacers, coaters and finishers, pitmen, armature winders, shop wiremen, coil wiremen, controller men, power house men, track men, etc., as parties to an increased scale of wages, the increases varying with the demands of the men. The company objects to this section on the ground that no suburban or interurban men are in its employ, as intimated in the demands, and that the shop employees, power house and track men were not included in the agreement of Nov. 7, which covered only men in train service. The company further contends that its present wage scale of 20 cents to 25 cents an hour is a fair wage and equal to that paid by other employers in Indianapolis to men whose business calls for no more skill than that needed by street railway employees. The company further states that it has always been able to obtain men to operate its cars at the rates now paid, and that during the last four years the wages have been increased between 11 per cent and 20 per cent, according to length of service of the men. The company then sets forth in detail the work of outside agitators leading to the strike called on Oct. 31. The company claims that dissatisfaction did not exist among the employees until these agitators, pretending to represent the employees, trumped up grievances. The company further sets out in detail the rate of wages of all carhouse employees, shopmen, trackmen and power station employees, showing that increases were granted to many of these employees on June 1, 1913, and to others on Nov. 1, 1913.

The fifth grievance is in regard to working conditions on Sundays and holidays, meal relief, etc. The company says that the present working conditions are substantially as demanded.

The sixth grievance is in regard to minor changes in working conditions. The company contends that some of these changes are impracticable, but that it will experiment with other demands made. The seventh and eighth grievances are also in regard to changes in local working conditions.

The ninth contention is in regard to reinstatement of men who have served as officers of the employees' association upon the expiration of such term of office. The company states that this demand is not in accordance with the terms of the contract of Nov. 7. The tenth grievance is concerning minor matters only.

The eleventh demand is that men shall receive $1.50 a day when they are called to the carhouse, whether they work or not. The company says that this is impracticable and that the average wages of extra men exceed the daily minimum demanded.

The twelfth demand is for books of free transportation over all lines. The company states that transportation is given to and from work, and that even this has been abused.

The thirteenth demand is that motormen shall not work as conductors, or vice versa. The company states that this has never been the case except in emergencies.

The fourteenth demand of the employees is for a closed shop not only on the lines of the city company but also on "all lines into and within Indianapolis." The company shows that this demand is not in accordance with the agreement of Nov. 7, that it would limit the scope to which the company might impose discipline and take away the freedom of action to which it is entitled under the law.

The fifteenth to twentieth demands are for minor changes in working conditions which the company refuses to accede to on account of their impracticability.

The twenty-first demand is in regard to the right to choose runs practically on demand. The company states that seniority rights have always been observed, and that if it is the desire of the majority of the men the runs will be thrown open twice a year for choosing, and defines the method of procedure.

The twenty-second grievance is for a board of arbitration to settle disputes. The company answers that such a demand does not come within the scope of the settlement agreement of Nov. 7, which provides that the decision of the Public Service Commission shall be binding for the next three years.

The twenty-third "grievance" contains a straight demand for recognition of the employees' association. The company asserts that it cannot consider this demand because it is not within the scope of the contract of Nov. 7, and that it is not within the jurisdiction of the arbitrators under the said contract, and it further declines to consider the demand for the reason that the award of the board of arbitration (the Public Service Commission) will, under the terms of the contract of Nov. 7, settle all disputes and grievances for a period of three years.

No time has been set by the commission for the first hearing on the above demands.

The petition and answer of the grievances of the men of the Indianapolis & Cincinnati Traction Company, filed several days ago before the Public Service Commission for final decision, was withdrawn on Nov. 22. Charles L. Henry, president of the company, and a committee of the men called at the office of the commission and revoked the petition, stating that a new list will be filed with the commission covering only the matters of the rate of wages and the question of dividing the schedules of the two divisions of the road. Four of the original twenty-one demands have been withdrawn and eliminated by the employees, and the other fifteen have been amended and will probably be satisfactorily adjusted between the company and the men.

Final Offer of Tacoma Railway to City

What is believed to be the final offer of the Tacoma Railway & Power Company, Tacoma, Wash., on the question of the construction of the tideflats car line across the Eleventh Street bridge was recently submitted by John A. Shackleford, president of the company, to the city commission. The Council adjourned without taking any definite action.

Mr. Shackleford's proposition was that if the city of Tacoma would remit the tax against the gross earnings of the company, which amounts to about $20,000 a year, and relieve the company of the obligation of furnishing free tickets to the employees of the city, it would construct the line on a ten-year or twenty-year permit from the city to operate over the bridge, giving the city the right to cancel the contract at the end of five or ten years, provided that the city take over the line and pay the company the full cost of its construction.

Lorenzo Dow, prosecuting attorney for the city, suggested a bond issue of $80,000 to build a municipally owned line. Mayor Seymour said the people of Tacoma had turned down the proposition once, and he added furthermore that they would doubtless realize that the operation of the line by the city would require the payment of a double fare to reach any point in the city from the tideflats. Another suggestion made was that the city maintain the present light rates and use the profits of the light department to construct the line. This proposition also met with opposition.

In his talk to the Council President Shackleford said:

"The cost of the proposed line would be determined by engineers, one selected by the company, one by the city, the engineers so selected to select a third engineer to act with them. On the line so constructed the company would give 5-cent fares, with transfers to other city lines, and would accept on this line transfers which would be issued by the other city lines. The construction and operation of such a line, however, would be at a loss. The company will not enter into an arrangement that will not in some way protect it from this loss. If the city commission has some other plan that will accomplish this purpose of taking care of the loss that the construction and operation of the line would entail, the company will be glad to consider it.

"The company desires to put squarely up to the commissioners the question whether the construction and operation of the tideflats line for a 5-cent fare with transfers is of more benefit to the city of Tacoma than the gross earnings, taxes and free transportation now received by the city.

"It is all very well to say that if the Tacoma Railway & Power Company receives a fair return on its system as a whole it should build the tideflats line, but the company does not receive a fair return. By reason of unnecessary

extensions of the city limits, the present transfer system and other conditions, the average distance a passenger is hauled is too great in Tacoma for a 5-cent fare.

"In the last few years the company has been under a very heavy burden in furnishing funds for street paving between its rails. Some of this street paving was not needed. The city imposes a 2 per cent tax on the gross passenger earnings of the company and a 5 per cent tax on the gross freight earnings. The company furnishes to the city 16,000 free city tickets per month, in addition to transporting policemen and firemen in uniform without charge.

"The tideflats line would be a good thing for everybody except the concern which builds and operates it. The company is not in a position to build it unless the city or public will make up to the company the loss that will be incurred not only by the construction of the line but by its operation. If the street car problem is to be worked out to the best advantage for the city and with fairness to the company, the people who ride long distances will have to pay more than 5 cents or the company will have to be relieved from gross earnings taxes and the portion of the paving expenses that is not caused by the company's structures and operation. The company cannot forever furnish more than it gets paid for."

At a special meeting between the Council and the Tideflats Car Line Club on Nov. 15 it was decided unanimously to call a special election on Jan. 3 to submit to the people a proposal to issue $100,000 of bonds to build the tideflats car line. The estimate of City Engineer Raleigh on the cost of the tideflats line is $87,000, but the Council voted to issue $100,000 in bonds to cover any emergency expense that could not be foreseen. The registration books will be closed on Dec. 23, ten days before the special election. As yet only 14,025 voters have registered, less by 1000 than half of the voting strength of the city.

The question of transfers between the proposed city line and the cars of the Tacoma Railway & Power Company was discussed at the special meeting. Mr. Dow expressed the opinion that a transfer agreement might be made, but said that the Supreme Court had ruled that no such agreement could be forced by the city.

C. G. Jacobs, a tideflats worker, took a stand opposing the municipal line, saying that the extra fare, in case no transfer agreement could be made, would be a big drain on the workingmen. It would be better for the Council to accept the offer of the Tacoma Railway & Power Company and relinquish the right to the percentage of the company's earnings, amounting to $20,000 a year.

Rapid Transit Construction Progress in New York

A number of important steps in the carrying out of the dual system subway contracts have been taken by the Public Service Commission for the First District of New York recently.

A contract has been awarded for Section No. 3 of the Seventh Avenue subway in Manhattan, which went to the lowest bidder, the Degnon Contracting Company, for $2,185,063. It is the first contract awarded for the Seventh Avenue subway line, which will be operated by the Interborough Rapid Transit Company in connection with the existing subway. Bids were rejected recently by the commission for Section No. 2, immediately south of Section No. 3. The lowest bidder on this contract was the Thomas J. Buckley Engineering Company, New York, but the chief engineer of the commission refused to recommend the award of the contract to that company on the ground that it did not have the experience and equipment necessary for the successful handling of a very difficult piece of work. Accordingly all bids were rejected and the commission has readvertised for bids, to be opened on Dec. 2. On Nov. 12 the commission opened bids for the construction of Section No. 5 of the Seventh Avenue subway, lying in Seventh Avenue between Sixteenth Street on the south and Thirtieth Street on the north. The lowest bidder was the Canavan Brothers Company, whose total was $2,401,306.75, and the contract has been awarded to the company.

Plans have been announced by the commission for the temporary operation of the Steinway tunnel between Forty-second Street and Lexington Avenue, Manhattan, and Jackson and Van Alst Avenues, Long Island City. The cost of fitting up the tunnel temporarily will be about $500,000, and the bids for its execution will be invited shortly. When the Steinway tunnel line is completed it will stretch on the Manhattan side as far west as Times Square, but the plans for this are not yet drawn. On the Queens side it will connect with the Queensboro Plaza by way of Ely Avenue.

The contract for the construction of the Queens extension of the Steinway Tunnel from its present terminus in Long Island City to the Queensboro Bridge and a connection with the Corona and Astoria rapid transit lines has been awarded to the Degnon Contracting Company, New York, the lowest bidder, for $557,856. The commission has also opened bids for the construction of the proposed elevated railroad in New Utrecht Avenue, Brooklyn, from Thirty-ninth Street and Tenth Avenue to Stillwell Avenue and Avenue Y, near Coney Island. According to unofficial figures the lowest bidders for this work were Post & McCord, Inc., New York, at $1,672,000, to whom the contract has been let.

Losses on Southern Pacific Suburban Lines

The ELECTRIC RAILWAY JOURNAL of Sept. 6, 1913, contained a short reference to facts brought out in a fare hearing before the California State Railroad Commission in regard to losses on the suburban electric service of the Southern Pacific Company. According to the complete report of the commission just received this case dealt with the commutation rate of $3.50 from Fremont Way and Fairfax Avenue to San Francisco and $4.50 from Seminary Avenue to San Francisco. The complainant, the East Oakland Protective League, introduced testimony to the effect that these fares were discriminatory, but the railroad contended that the fares were not unreasonable as compared with other fares for a similar service, that its present fares between San Francisco and Alameda County suburban points did not yield a return sufficient to cover operating expenses and taxes, not considering interest on bonded debt and the return on the investment, and that it was forced by the competition of the San Francisco-Oakland Terminal Railways to establish the present fares to the districts around Thousand Oaks but had not by similar causes been forced to establish lower fares to the points in question.

In answer to various fare comparisons submitted by the defendant, the commission held that most of them concerned cases where conditions and circumstances surrounding the fares are not sufficiently similar to constitute a true standard. The commission also criticised the method by which the company apportioned its expenses between through traffic and local traffic, as given on page 394 of the issue of the ELECTRIC RAILWAY JOURNAL previously mentioned. The company had held that 90 per cent of the expense items were exclusively applicable to the suburban service, as well as a portion of the remaining 10 per cent.

In the opinion of the commission, the basis of apportionment for the expenses of maintaining and operating ferry boats across San Francisco Bay was particularly erroneous and burdened the suburban lines with much expense that should be borne by the main line. The apportionment was made on the basis of the number of passengers carried, the defendant having found that 90 per cent of the passengers using its ferries across San Francisco Bay originate at or are destined for suburban points, while but 10 per cent originate at or are destined for points beyond Alameda County suburban points. The entire expense of maintaining and operating the ferry boats was segregated on these percentages regardless of the fact that many are necessarily operated to carry out their primary purpose of meeting main line trains and would have to be so operated if there were no suburban service. Such suburban passengers as used the boats making connections with main line trains are therefore merely incidental to the trip. The item of maintenance and operation of these vessels being one of the largest items of expense charged against the suburban lines, it followed that any material change in this amount would seriously affect the final results, and for this reason the commission concluded that the exhibit did not present with sufficient accuracy the expenses properly attributable to the suburban lines and the main line.

In its final order, the commission found that the fares

in question were discriminatory and ordered a monthly commutation fare of $3 to be charged between San Francisco and Fremont Way, Fairfax Avenue and Seminary Avenue, and a one-way fare of 10 cents. There is nothing in the decision, however, to indicate that the commission would not reopen the case for even a horizontal fare raise upon further detailed testimony based upon a different apportionment of the operating expenses between suburban and through traffic.

Financial Aspect of Toronto Purchases

According to John Mackay, the auditor retained by Mayor Hocken of Toronto to advise the city regarding the financial and general merits of the proposed municipal ownership of the Toronto Railway and the Toronto Electric Light properties, there need be no hesitation in the completion of the purchase, provided certain conditions are carried out.

Mr. Mackay's opinion is that the purchase of the Toronto Electric Light Company will justify itself financially and will result in lower rates to the citizens than could ever be afforded on the present competitive basis. The purchase of the railway company, its consolidation with the civic car lines and extension into an ideal system is compared by Mr. Mackay with the non-purchase of the company until the expiration of the franchise in 1921 and the extension of the civic car lines into the best possible system. His opinion is that the former alternative will result in a saving of $3,000,000.

Mr. Mackay figures that, if the Toronto Railway property is bought and the proposed extensions are made there will be by 1921 an accumulated surplus of $11,500,000. This can be used as a sinking fund to retire all but $500,000 of the bonds devoted to the buying of the company's so-called intangible assets, which are valued, as noted in the Electric Railway Journal of Nov. 15, 1913, page 1054, at $10,713,553. In giving these figures Mr. Mackay says he has provided for a system which in 1921 will cover 283 miles of single track. He also has provided for turning into the civic treasury the same percentage of the railway's gross receipts as now prevails under the existing franchise. This item, he says, would amount to $13,000,000 during the period.

If the railway property be not bought, Mr. Mackay asserts, an adequate extension of the present system of civic car lines will involve an accumulated deficit of $3,750,000 in the year 1921. Since, therefore, by buying the railway and amalgamating the systems, the city will by 1921 have got back all but $500,000 of its outlay on the intangible assets, Mr. Mackay claims that the purchase has a financial advantage of $3,250,000, figured as of July 31 last. As of Dec. 31 next, this would be reduced to $3,000,000.

The chief assumptions on which Mr. Mackay bases his calculations are: the continuation of normal industrial conditions; a monopoly of traction in the city; competent management, freed from all municipal or political influence or interference; a satisfactory interpretation of the prevailing Niagara power contracts to be bought; a satisfactory new contract when the present contracts expire; the issue of the purchase payment bonds at par, subject to recall at par; the issue of all further bonds at a price not costing more than 5 per cent and subject to recall at par. Mr. Mackay says in comment:

"I am unable to measure or allow for bad or mediocre management. The city must choose between high-class commercial management, with the results indicated herein, and inferior management, with losses I am not competent to measure. But unless it chooses the former it should abandon the proposal."

Mr. Mackay's report to Mayor Hocken covers eight printed octavo pages, but he says, in conclusion:

"A fuller statement will be presented with all necessary supporting data in my formal report now in course of preparation.'

Mayor Hocken has announced that the report of H. H. Couzens respecting the merits of the Toronto Electric Light purchase from the viewpoint of the Hydro-Electric system would favor the proposition. Mr. Couzens has so assured the Mayor, though his report is not yet complete. The Mayor has therefore decided to recommend that the City Council proceed with the submission of a by-law to the ratepayers on Jan. 1.

Transfer Charge Probable in Cleveland

Peter Witt, street railway commissioner in Cleveland, is quoted as saying that the 1-cent charge for transfers on the lines of the Cleveland Railway may have to be put in force after Jan. 1, 1914, because of the loss incurred by the snowstorm two weeks ago, described in the Electric Railway Journal of Nov. 22, 1913. This was heavy, he says, and inability to tell just what it will be makes it impossible to give a clear statement of conditions now. It will be necessary to await the November report, which will be out in December. By some it is estimated that the total losses due to the storm will aggregate $80,000.

Mayor Baker also stated on Nov. 20 that the transfer charge would probably have to be restored. It is believed, however, that this is due not only to the recent storm but also to the fact that the interest fund will soon be depleted by making good the deficit in the maintenance fund and charging off the value of the plants that are to be scrapped in January, 1914.

Charles W. Stage, who has been appointed director of public utilities by Mayor Baker, of Cleveland, says that he favors the early purchase by the city of the property of the Cleveland Railway. Mr. Stage argues that the property can be purchased with the proceeds of bonds bearing 4½ per cent interest and that the city will be able to operate the property at less expense that the company is now doing. The stock now outstanding totals $21,644,200 and in addition the city would have to pay a premium of $10 a share. While adhering to his idea of municipal ownership, Mayor Baker says that there has been some criticism of the cost of the city portion of the management and as yet there is little talk among the people about putting the whole property under this management.

The Cleveland Automobile Club is preparing to protest against the street railway commissioner's plan for a four-track road on Superior Avenue between East Ninth and East Fifty-fifth Streets, and a meeting will be called soon to discuss the matter.

Southern Pacific Agreement Regarding Seniority and Rates of Pay

The first important decision under the provisions of the federal act of July 15, 1913, commonly called the "Newlands act," which provides mediation, conciliation and arbitration in controversies between certain employers and their employees, has recently been handed down by the board of arbitration appointed by the Commission of Mediation and Conciliation to consider various matters that in their unsettled state threatened to bring about an open strike between the Southern Pacific Company and certain of the organizations of enginemen and trainmen employed in its system. While the only point decided by the board of arbitration was in reference to the difference between street car service and interurban service, as shown by the findings published in the Electric Railway Journal of Nov. 22, 1913, page 1113, complete reports now on hand show that several important points were settled by agreement between the company and the employees before the board of arbitration began its work.

The points in dispute arose in connection with the rates of pay on the company's steam suburban and street car lines. For some time prior to 1910 the Southern Pacific Company was operating a number of suburban steam trains in Alameda County, on which the crews had seniority rights, determined by certain printed schedules, and received rates of pay under these steam schedules, which rates were known as "suburban rates," as distinguished from the main line rates. In 1911 the entire suburban system in Alameda County was converted into electric operation. A large type of cars, known as the "300 class," equipped for either single or multiple unit operation, was installed in place of the former steam suburban service, and the company adhered to the steam suburban rates for engineers who had been transferred to and made motormen on the electric service. While this was going on the company was having built a street car of a type not adapted for suburban or interurban service, but solely a street car of the center entrance type, to be operated under a street car franchise over the same tracks and mingle with the same suburban

service above referred to. This cross-town street car service has substantial and practical competition in the form of parallel lines of the Oakland Traction Company, manned by platform men who are paid on their schedule of street car wages. In the meantime extensive electric development was going on by the Southern Pacific Company in the Northwest, around Portland. The whole situation caused such apprehension on the part of the organizations that an agitation started which culminated in a strike ballot to call a general strike of the entire Pacific system, from Portland on the north to El Paso on the south and Ogden on the east, unless the Southern Pacific Company should make a formal obligation to extend the main line rights to the street car service.

The Southern Pacific Company appealed to the newly created board of mediation and conciliation, as a result of which Judge Hanger, assistant commissioner, came to San Francisco and obtained mutual concessions.

The agreement made between the company and the organizations settled the following points before the arbitration board met:

1. The company concedes to the organizations the right to negotiate schedules covering rates of pay, rules of seniority and working conditions governing enginemen, trainmen and yardmen, in both steam and electric service.

2. Portions of the Southern Pacific system that have been electrified, any portion that may hereafter be electrified and any new lines constructed for operation in connection therewith will not be segregated in so far as it affects the rights of enginemen, trainmen and yardmen, in either steam or electric service, or of the system general committees to legislate for and represent such employees, and the rates of pay and working conditions provided for in steam service shall apply, subject to agreement provisions.

3. Before an employee in the exercise of his seniority rights can be transferred either to or from the electric or steam service, the company reserves certain rights in the establishment of the qualifications of the man to exercise his seniority rights with safety in the operation of its trains.

It was further agreed that Section 2 should have no reference to street car service. The only question to be determined by the board of arbitration, therefore, was what constitutes street car service as distinguished from suburban electric service. The men who composed the board of arbitrators were: M. E. Montgomery, for the organization; W. R. Scott, general manager, for the Southern Pacific Company, and John F. Davis, appointed at large by the Assistant Commissioner of Mediation and Conciliation, as provided.

Report on Chicago Railroad Terminals

The complete report just received of B. J. Arnold on Chicago terminals, mentioned in the ELECTRIC RAILWAY JOURNAL of Nov. 22, 1913, contains four fundamental principles, as follows: (1) The straightening of the Chicago River and opening up in the congested district of many closed streets. (2) The depression of tracks in the congested district and placing them in covered subways. (3) The development and more efficient use of present railroad property in the business district. (4) Provision for intercommunicating the main railway stations with additional suburban station facilities, in a manner to inaugurate through routing between the different railroad systems.

Mr. Arnold's report recommends that the Pennsylvania Railroad passenger station and freight station layout as recommended by J. F. Wallace and the Pennsylvania Railroad be rearranged so as better to conserve the city's interests. Mr. Arnold concludes that any plan contemplating less than three stations would be impracticable, and he recommends the Illinois Central station on the lake front, the present Northwestern station and a new union station to be built south of Harrison Street instead of on Adams Street.

Mr. Arnold disagrees with Mr. Wallace in regard to the use of depressed tracks to the proposed freight station on the ground that these would be as great a barrier as overhead structures and he recommends the use of covered subways. While Mr. Arnold leaves the question of motive power open, still for these freight subways and the subways recommended for the tracks of all steam railroads, with a few exceptions, in the district bounded by Twelfth Street, Halsted Street, Lake Street and the lake front, no power except electricity is yet sufficiently developed.

In connection with the proposed straightening of the Chicago River, Mr. Arnold makes the following specific statement regarding electrification:

"While this class of improvement practically necessitates the electrification of the tracks, the suggestion is not made with the intention of attempting to force such electrification, as almost all progressive steam railroad men now recognize that electrification of terminals must come within a reasonable time, and for the further reason that this subject is now being analyzed, at the expense of the railroads, by the committee on smoke abatement and electrification of the Chicago Association of Commerce, whose report is promised for the near future."

Strike at Schenectady Works of the General Electric Company

On the morning of Nov. 25, after negotiations between the company and representatives of the men, from one-third to one-half of the employees at the Schenectady works of the General Electric Company went on strike. A number of the men have since returned to work. It is estimated that the number who were still out when this issue went to press was about 13,000. The ostensible cause for the strike was the laying off of two workers. Other definite causes which had a potent influence in the matter were the existence of unions among the employees between which there has always been strong feeling. These unions were branches of the Industrial Workers of the World and the American Federation of Labor, between which there is strong opposition. According to reports from Indianapolis, executive officials of the American Federation of Labor sent telegrams from that city to representatives of local unions at Schenectady urging strongly that no strike be called at this time.

Chicago's Terminal and Subway Committees' Inspection Trip

The members of the local transportation committee of the Chicago City Council, accompanied by George Weston, of the Board of Supervising Engineers, have returned from a trip of inspection of the subway systems of New York, Boston and Philadelphia. The purpose of this trip was to obtain further enlightenment before recommending to the Chicago City Council either the comprehensive subway system, as recommended by Mayor Harrison, or the Arnold plan for a downtown system of subways for surface lines. Several of the members of the committee have expressed themselves as favoring the Arnold plan as outlined in the ELECTRIC RAILWAY JOURNAL of Nov. 8, 1913, page 1031.

At the same time the local transportation committee inspected subways, the members of the committee on railway terminals of the Chicago City Council made a trip to New York to inspect the New York Central & Hudson River Railroad and the Pennsylvania Railroad terminal layouts. Bion J. Arnold accompanied the committee on this inspection trip and John F. Wallace met them in New York. The purpose of the trip was to make a careful study of the New York terminal situation with a view of solving the Chicago terminal problem, which is now being considered by this committee. Both Mr. Wallace and Mr. Arnold have submitted reports on the solution of the terminal problem to this committee with recommendations.

Delos F. Wilcox on Cleveland Situation

Delos F. Wilcox, formerly chief of the bureau of franchises of the New York Public Service Commission, First District, has made a supplemental statement in reference to the interview with him on the Cleveland situation published in a Cleveland paper and mentioned in last week's issue of the ELECTRIC RAILWAY JOURNAL. Mr. Wilcox said he did not say that the Tayler franchise should have permitted the company to pay dividends in excess of 6 per cent. He pointed out the recognized fact that the Tayler ordinance fixes the profit on the capital invested, leaving no

possibility of additional profit to furnish the incentive to economy usually relied on under private ownership. He said, however, that the ordinance attempts to supply a substitute for this motive by means of the arbitrary limit on operating expenses and the powers of supervision given to the city street railroad commissioner. He said that this is a unique experiment which is being watched by the country at large, and it is not for outsiders to go to Cleveland to criticise but rather to learn from the people who are getting the practical experience.

In regard to municipal ownership, Mr. Wilcox called attention to the possibilities of beginning to acquire the property, even under private operation, by means of an amortization fund, without waiting for the time when the city buys the plant for a lump sum representing the full amount of the investment. He said it would be a pity if 3-cent fares came to be a political necessity, as in his opinion the scheme should be worked out along sound economic lines, and the question of the rate of fare, within reasonable limits, should be subordinated to the necessities of service and the policy of making the property pay for itself out of earnings. Mr. Wilcox added that if fares were put so low as to enable the street railway system just to skim along without any surplus for a sinking fund, then in case the city takes the property over and begins to retire the bonds out of earnings, fares will have to be increased, unless the city is able to effect economies in the way of fixed charges or otherwise sufficient to take care of the sinking fund.

Electrification of Charles City Western Railway Proposed.—The Charles City (Ia.) Western Railway contemplates electrifying its line within the coming year, but is not yet ready to award any contracts.

New Oklahoma Road Opened.—The Norman Interurban Railway, controlled by the Oklahoma Railway, Oklahoma City, Okla., has been placed in operation between Norman, Oklahoma City and Edmond. The road is 33 miles long.

Application for Elevated Railway Franchise in Havana.—Joseph E. Barlow, Havana, Cuba, has asked the City Council to grant him a concession for erecting an elevated railway from Havana to Buena Vista, Camp Columbia and other nearby places.

Roanoke Strike Declared Off.—The strike of the employees of the Roanoke Railway & Electric Company, Roanoke, Va., which was begun last May, has been declared off officially. As stated previously in the Electric Railway Journal, the strike failed shortly after its inception.

Subways Promised for Montreal.—The Montreal (Que.) Tramways recently applied for an extension of its charter, promising underground railways. On Nov. 17 the Canadian Autobus Company also stated that it was prepared to construct tubes serving both the downtown and uptown districts.

Bill to Repeal Massachusetts Trolley Merger.—Representative Thomas A. Niland, of East Boston, has filed with the clerk of the House a bill to repeal the western Massachusetts trolley merger bill, which was enacted at the last session of the Legislature, as mentioned in the Electric Railway Journal of June 21, 1913, page 1119.

Demand for Two Doors on Near-Side Cars.—Mayor Brock's veto of a resolution ordering the International Railway to place two doors on its near-side cars in Lockport, N. Y., was sustained on Nov. 18 at a meeting of the aldermen by a vote of 5 to 5. Seven votes were necessary to pass over the veto. Later a similar resolution was offered giving the International Railway ninety days in which to place a rear as well as front door on its near-side cars. It was submitted to the committee on ordinances.

Safety Zones Needed at Street Corners for Buses.—At a meeting of the Fifth Avenue Association in New York on Nov. 19 to discuss traffic conditions it was recommended that the police keep clear 25 ft. on Fifth Avenue at the northeast and southwest corners of streets, so that buses may take on or discharge their passengers in safety. It was stated by inspectors that by reason of the curb line being blocked at congested points, the buses were frequently compelled to stop in the moving line of vehicles, thus endangering the lives of those who had to board them.

Tidewater Southern Railroad Opened.—The regular schedule on the Tidewater Southern Railroad between Modesto, Cal., and Stockton, Cal., was started on Nov. 15 Three trains each way will be maintained until Dec. 1, when six trains will be operated. The cars make the trip of 30 miles in one hour and twenty-five minutes with thirty-three stops. About Dec. 12 eight trains will run daily over the line and the regular running time when finally arranged will be one hour and twenty-five minutes between Stockton and Modesto.

Prize for Sales or Advertising Essay.—*Advertising and Selling* has authorized the Associated Advertising Clubs of America to offer a prize of $1,000 in cash, which it will pay at the Toronto convention and every year thereafter until further notice to the person who writes the most vital and helpful essay on a sales or advertising subject. The jury will be the official awards committee of the Associated Clubs and the editorial advisory board of *Advertising and Selling*, consisting of prominent advertising managers. All contributions should be sent to John K. Allen, chairman of the program committee of the Associated Advertising Clubs of America, in care of the *Christian Science Monitor*, Boston, Mass.

Power of Commission to Fix Rates and Remove Officials.—As a result of the decision of the Missouri Public Service Commission that it has power to fix utility rates, regardless of franchise conditions, and also to remove officials of utility companies, an application will be made to the Missouri Supreme Court testing the authority of the commission. The commission, in rendering its decision in the case of citizens of Nevada, Mo., against the Fort Scott & Nevada Heat, Water & Lighting Company, held that it had to go behind franchise rates and establish its own rates, and that it had authority to remove officers of a utility, as noted in the Electric Railway Journal of Nov. 22, 1913.

New Hydro-Electric Plant in Georgia.—The Georgia Railway & Power Company, Atlanta, Ga., on Oct. 27 began using electricity from its new 80,000-hp hydroelectric plant at Tallulah Falls, the electricity being transmitted 90 miles to Atlanta. The development includes a dam 380 ft. long by 120 ft. high, forming a lake 2 miles long and nearly half a mile wide, with a depth of from 100 ft. to 200 ft. By next March the company expects to complete its dam at Mathis, 5 miles above Tallulah Falls, forming a lake 8 miles long and 2 miles wide. This will be a storage basin for use at low stages of the river. At present the developments at Tallulah Falls, Morgan Falls and near Gainesville will furnish 98,000 hp for transmission to Atlanta and sixteen neighboring towns.

Court of Appeals Upholds Washington Transfer Law.—The Court of Appeals at Washington, D. C., has decided that the law requiring the giving of reciprocal transfers between the Metropolitan Coach Company, operating the line of herdics, and the Capital Traction Company is constitutional and enforceable. The court holds that there is no violation of contract in the amendment of any act of Congress affecting a public utility which uses public spaces, and that in this particular instance there is no ground to view the exaction of free reciprocal transfers as confiscatory and therefore unconstitutional. According to the view of the Court of Appeals Congress can annul the charter of a street railway or any other public utility that uses public spaces for the supposed benefit of the people as well as for profit. The court holds that the granting of the transfers reciprocally between the lines affected is an advantage rather than a disadvantage, inasmuch as each company will presumably benefit through the inducement of traffic.

Toronto Deviation Appeal Decided in City's Favor.—Lord Moulton, of the British Privy Council, recently rendered a decision with costs in favor of the city of Toronto as against the appeal of the Toronto & York Radial Railway in respect to the Yonge Street deviation of the Metropolitan line. The court held that the radial railway was a company which, as far as was material to the present case, might be taken to be the successor in law to the Metropolitan Street Railway, and that it was subject to the jurisdiction of Toronto and other municipalities that had at times been authorized to pass on any agreements

concerning it. The company was held to be bound by the whole of the obligations of these agreements so far as they related to such portion of the track, there having been no statutory release from those obligations. The court was of the opinion that the proposed line was a new line which the appellants desired to construct and operate without having obtained any franchise or statutory authority to do so.

PROGRAMS OF ASSOCIATION MEETINGS

Southwestern Electrical & Gas Association

The next annual convention of the Southwestern Electrical & Gas Association will be held in Galveston, Tex., May 22, 23, 24 and 25, 1914. Further details as to headquarters, exhibits, etc., will be announced as soon as decided by the executive committee.

Keystone Railway Club

At a joint meeting on Nov. 18 of the executive committee of the Keystone Railway Club and the committee on consolidation which was appointed at the September meeting of the club, it was decided that the members of both these committees should attend the regular annual meeting of the Pennsylvania Street Railway Association in Harrisburg, on Dec. 2, 1913, at which time the members of the Pennsylvania Street Railway Association will decide whether or not they will consolidate with the Keystone Railway Club. The date of the next regular meeting of the Keystone Railway Club has been postponed indefinitely pending the outcome of the consolidation question.

Midyear Meeting American Electric Railway Association

Some details of the banquet to be held on Jan. 29 at the time of the midyear meeting of the American Electric Railway Association were decided at a meeting of the banquet committee in New York on Nov. 25. The committee in charge of the banquet consists of five representatives of the American Electric Railway Association and five of the Manufacturers' Association. The former are: C. Loomis Allen, joint chairman; G. J. Roberts, Frank Hedley, T. S. Williams and L. S. Storrs. The five members of the Manufacturers' Association are: W. L. Conwell, joint chairman; C. R. Ellicott, B. A. Hegeman, Jr., E. H. Baker and H. G. McConnaughy. The meeting was held at the Engineers' Club. Mr. Allen entertained the committee, and, in addition to the members of the committee, H. C. Donecker, H. J. Clark and E. B. Burritt were in attendance. A committee consisting of the secretaries of the two associations, Messrs. Burritt and McConnaughy, was appointed to send out announcements in regard to the banquet and to take charge of registration and subscriptions. These notices will be issued soon. The following committee was then appointed to select the speakers: Frank Hedley, chairman, and Messrs. Allen and Ellicott. It was decided that C. N. Black, president of the American Association, should preside at the banquet, and he will deliver an address. In addition two and perhaps three other speakers will be selected, each address to be about twenty minutes in length. One of these speakers will be selected to represent the interests of the manufacturers in the purposes of the association, and one will probably be of national prominence and not directly connected with the operating or manufacturing field. The following committee was also appointed to have charge of other details of the banquet, such as the selection of menu, seating arrangements, decorations, etc.: W. L. Conwell, chairman, and Messrs. McConnaughy, Baker, Storrs and Roberts, with Secretary Burritt to act as secretary for the committee.

According to a resolution adopted by the executive committee of the association at Atlantic City, this banquet will not be a complimentary one extended to the railway men by the Manufacturers' Association as in the past, but a charge of $10 will be made for each attendant, and those who expect to be present will be asked to notify the committee at as early a date as possible. Another meeting of the full committee will be held at the Engineers' Club Dec. 9 at 6 p. m.

Financial and Corporate

Stock and Money Markets

Nov. 25, 1913.

There was a striking contrast between the volume of trading on the New York Stock Exchange to-day and that of Monday. Almost four times as much business was done to-day as on Monday. There was a brisk demand for the important issues all through the early dealings, and the prices of the principal railroads and industrials made gains ranging from substantial fractions to around one point. Rates in the money market to-day were: Call, 2¾ @ 4 per cent; sixty days, 5 @ 5¼ per cent; ninety days, 4¾ per cent; four to six months, 4½ @ 5 per cent.

The Philadelphia market was strong to-day, with the trading broad. The bond transactions totaled $36,600, par value.

Advances were recorded in the Boston stock market to-day, and at the close prices were at or near the highest of the session.

Trading in Chicago to-day was active and the tone of the market was stronger.

In Baltimore the trading in stocks was dull. The demand for bonds was fair.

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

	Nov. 19	Nov. 22
American Brake Shoe & Foundry (common)	87	87
American Brake Shoe & Foundry (preferred)	127	128
American Cities Company (common)	36	36
American Cities Company (preferred)	63½	64½
American Light & Traction Company (common)	339	334
American Light & Traction Company (preferred)	106	106
American Railways Company	38¾	38¾
Aurora, Elgin & Chicago Railroad (common)	41	a41
Aurora, Elgin & Chicago Railroad (preferred)	84	82
Boston Elevated Railway	85	85
Boston Suburban Electric Companies (common)	7	7
Boston Suburban Electric Companies (preferred)	60	60
Boston & Worcester Electric Companies (common)	*6½	*6½
Boston & Worcester Electric Companies (preferred)	38	39
Brooklyn Rapid Transit Company	86¾	87⅛
Capital Traction Company, Washington	112	111½
Chicago City Railway	160	160
Chicago Elevated Railways (common)	25	25
Chicago Elevated Railways (preferred)	75	75
Chicago Railways, ptcptg., ctf. 1	90	90
Chicago Railways, ptcptg., ctf. 2	27	26½
Chicago Railways, ptcptg., ctf. 3	7	5½
Chicago Railways, ptcptg., ctf. 4	2	2
Cincinnati Street Railway	105	105
Cleveland Railway	103¾	104
Cleveland, Southwestern & Columbus Ry. (common)	*5½	*5½
Cleveland, Southwestern & Columbus Ry. (preferred)	*30	*30
Columbus Railway & Light Company	18	18
Columbus Railway (common)	59½	59½
Columbus Railway (preferred)	88	88
Denver & Northwestern Railway	111	*111
Detroit & United Railway	a80	68
General Electric Company	140¼	139
Georgia Railway & Electric Company (common)	119	119
Georgia Railway & Electric Company (preferred)	85	85⅞
Interborough Metropolitan Company (common)	14	14⅛
Interborough Metropolitan Company (preferred)	58⅝	58½
International Traction Company (common)	*40	*40
International Traction Company (preferred)	*95	*95
Kansas City Railway & Light Company (common)	*22	*22
Kansas City Railway & Light Company (preferred)	*30	*30
Lake Shore Electric Railway (common)	*7	*7
Lake Shore Electric Railway (1st preferred)	*92	*92
Lake Shore Electric Railway (2d preferred)	*25	*25
Manhattan Railway	130	130
Massachusetts Electric Companies (common)	11	10½
Massachusetts Electric Companies (preferred)	65	64
Milwaukee Electric Railway & Light Co. (preferred)	100	*100
Norfolk Railway & Light Company	*25¼	*25¼
North American Company	70	70½
Northern Ohio Light & Traction Company (common)	66¼	66¼
Northern Ohio Light & Traction Company (preferred)	97	97
Philadelphia Company, Pittsburgh (common)	39½	39½
Philadelphia Company, Pittsburgh (preferred)	39	39
Philadelphia Rapid Transit Company	19⅛	18⅜
Portland Railway, Light & Power Company	56	56
Public Service Corporation	106	107
Third Avenue Railway, New York	39⅝	39⅝
Toledo Traction, Light & Power Company (common)	a30	30
Toledo Traction, Light & Power Company (preferred)	a80	80
Twin City Rapid Transit Co., Minneapolis (common)	104¾	104
Union Traction Company of Indiana (common)	*13	*13
Union Traction Company of Indiana (1st preferred)	*83	*83
Union Traction Company of Indiana (2d preferred)	*25	*25
United Rys. & Electric Company (Baltimore)	25½	25⅛
United Rys. Inv. Company (common)	18	17
United Rys. Inv. Company (preferred)	34	34
Virginia Railway & Power Company (common)	56	56
Virginia Railway & Power Company (preferred)	96	93½
Washington Ry. & Electric Company (common)	88	86½
Washington Ry. & Electric Company (preferred)	87	86
West End Street Railway, Boston (common)	68	67⅞
West End Street Railway, Boston (preferred)	90	90
Westinghouse Elec. & Mfg. Company	64	65
Westinghouse Elec. & Mfg. Company (1st preferred)	112½	112

*Last sale. a Asked.

ANNUAL REPORT

Virginia Railway & Power Company

The gross earnings, income and expenses of the combined properties owned, leased and operated by the Virginia Railway & Power Company, Richmond, Va., for the fiscal years ended June 30, 1912 and 1913, after excluding offsetting transactions between companies and departments, are given below:

	1913	1912
Gross earnings:		
Railway department	$2,926,364	$2,746,293
Electric light and power and gas departments	1,937,743	1,758,089
Ferry department	.....	*53,811
Total gross earnings	$4,864,107	$4,558,193
Operating expenses (including depreciation):		
Railways department	$1,670,238	$1,676,310
Electric light and power and gas department	746,750	703,779
Ferry department	.....	*42,814
Total operating expenses (including depreciation)	$2,416,988	$2,422,903
Net from operation	$2,447,119	$2,135,290
Other income:		
Rentals from lands and buildings	$5,396	$7,355
Rentals from pole lines	125	127
Rent of water power	9,394	9,563
Interest on notes receivable and open accounts	20,935	19,333
Interest on investments	9,333	7,444
Interest on deposits	24,131	19,705
Cash discount	3,548	2,615
Revenue from Chesapeake Ferry Company under lease	13,622	2,039
Salvage account Steamer "Maryland"	.....	1,866
Operation of garage	.....	†889
Rental of equipment	220	.....
Total other income	$86,704	$69,158
Gross income	$2,533,823	$2,204,448
Taxes and licenses:		
Railway department	$202,940	$188,474
Electric light and power department	60,419	67,071
Gas department	11,000	10,260
Ferry department	229	983
Total taxes and licenses	$274,589	$266,789
Gross income over operating expenses, depreciation, taxes and licenses	$2,259,234	$1,937,659
Fixed charges and rentals:		
Interest on bonds	$1,086,638	$1,032,923
Sinking fund payments	40,273	39,463
Other interest	.....	151
Rental paid Norfolk Railway & Light Company	99,000	83,875
Total fixed charges and rentals	$1,225,911	$1,156,412
Surplus over fixed charges	$1,033,321	$781,247
Less direct charges:		
Amortization of discount, premium, and expense on bonds sold	$23,681	$18,909
Miscellaneous net charges, not operation, charged direct to surplus by order of board of directors and executive committee	26,463	32,568
Total	$50,145	$51,478
Net surplus before deducting dividends	$983,178	$729,769
Dividends:		
Preferred stock:		
2½ per cent paid Jan. 10, 1913	$192,480	.....
2½ per cent paid July 10, 1913	192,480	.....
Common stock:		
1 per cent paid Oct. 21, 1912	$119,499	.....
1½ per cent paid April 10, 1913	179,250	.....
Total dividends	$683,709	.....
Surplus for the year after payment of dividends	$299,468	.....

*Operated only to May 1, 1912.
†Loss.

Thomas S. Wheelwright, president of the company, says in part: "The operating expenses include a charge of $8,333.33 per month against the Richmond, Petersburg and Interurban divisions to provide for depreciation. This depreciation fund is set aside in cash and is carried in a separate account in the bank. The amount to the credit of this fund for the Richmond, Petersburg and Interurban divisions on June 30, 1913. was $142,782.

"At the time of the merger of the properties of the Norfolk & Portsmouth Traction Company with this company the sum of $415,099 was set aside to provide for the depreciation and the rehabilitation of the properties formerly owned and operated by the Norfolk & Portsmouth Traction Company. The work of rehabilitation of these properties has been steadily progressing and there has been charged against this fund for the fiscal year $197,444.

"There were 913.4 ft. of new single track constructed on the Richmond division; on the Interurban division a siding 433 ft. long was constructed between Stops 14½ and 15—this track is constructed with 60-lb. T-rail, laid on white oak ties, embedded in gravel—and on the Petersburg division the Sycamore Street line was extended 5496 ft. and 343 ft. of siding constructed and the Halifax Street line was extended 1468 ft.

"The track mileage in Richmond and vicinity has been materially decreased by the sale of the Seven Pines line, a small portion of this decrease being offset by the construction of the Franklin Street loop and several sidings. In Petersburg the track mileage has been increased by the construction of extensions of the Sycamore Street and Halifax Street lines. The track mileage in Norfolk and vicinity has been materially decreased by the elimination of the ferries mileage (approximately 16½ miles), the changing of the larger part of the Masons Creek line from double track to single track, the taking up of dead track on Maryland Circle and to the Marine Barracks Reservation and the remeasurement of all the lines in Norfolk and vicinity.

"During the year the new carhouses at Norfolk, contracts for which had been let at the close of the past fiscal year, were completed and the consolidation of the carhouses and shops of the company in that territory together with the construction of suitable operating offices at the carhouses has resulted in great convenience and economy.

"During the year the new twelve-story fireproof office building of the company, at Seventh and Franklin Streets in the city of Richmond, was completed and was occupied by the offices of the company about June 1, 1913. At the close of the fiscal year the greater portion of the offices in this building not occupied by the company had been rented on satisfactory terms. By the construction of this building the company has secured suitable and convenient offices for its business and fireproof vaults for its records.

"During the fiscal year the new power station, as an addition to the central power station of the company at the foot of Twelfth Street in the city of Richmond, was completed. In this plant has been installed one 9000-kw horizontal turbine equipped with surface condensers and auxiliaries, including the necessary switchboards and switching apparatus. There were also installed eight Babcock & Willcox water-tube boilers of 600 hp each, equipped with superheaters for 125 deg. superheat, with automatic stokers of the Westinghouse type. This building has been so constructed that an additional large unit may be installed at a very low cost whenever the business of the company shall demand additional service. The new unit began operation March 20, 1913, and has proved satisfactory.

"During the year the high-voltage transmission line connecting the water-power station at the Locks power house at Petersburg to the central station of the company at the foot of Twelfth Street, Richmond, a distance of about 24 miles, has been completed and put into operation. The use of this line has already resulted in considerable economy in the production of power in this territory as it renders available the surplus water power of the Petersburg plant for distribution in Richmond and contiguous territory whenever the water-power conditions will permit and, by reversal of current, power generated at the central station in Richmond may be distributed in Petersburg and contiguous territory. In this way the reliability of the service in the entire territory is increased and the old steam plant at Petersburg which has been maintained as an auxiliary is no longer required and has been abandoned.

"Each month the company set aside the following percentages of gross transportation earnings, as a reserve against injuries and damages: Richmond, Petersburg and Ocean View divisions, 3.5 per cent of gross transportation earnings; Norfolk and Portsmouth divisions, 6 per cent of gross transportation earnings, making the total amount reserved for the system for the year ended June 30, 1913, the sum of $131,022. The charges against the injuries and damages reserve for the year ended June 30, 1913, were $146,755, or $15,733 in excess of the amount reserved for the fiscal year. These charges equaled 5.01 per cent of the gross transportation earnings of the system. This increase in expenditures on account of injuries and damages and expenses of the claim department for the fiscal year was largely in the city of Norfolk, where there were a series of

expensive accidents during the year, the charge on that division being 7.06 per cent of the gross transportation earnings as compared to 3.59 per cent in Richmond and vicinity.

"For several years past there has been considerable agitation in the city of Norfolk looking to the sale of tickets at the rate of six for 25 cents on the cars of the company. The franchises in that city do not require the sale of tickets at all, but provide for a straight fare of 5 cents. During later years, in the adjustment of certain controversies with the city, the company agreed to sell tickets at six for 25 cents at certain fixed points in the city, but not on the cars, but this arrangement has not apparently proved satisfactory to the public. A comprehensive plan for the readjustment of the franchises in Norfolk and the re-routing of the car lines in that city was presented to the Council on March 10, 1913. As a part of this plan, it was proposed to sell tickets at the rate of six for 25 cents on the cars. At the close of the fiscal year this plan was under consideration by a special committee of the Council, and it is hoped that some definite report will be made thereon in the near future."

Comparative traffic statistics contained in the report are as follows:

	1913	1912
Revenue passengers carried	64,532,079	60,500,584
Transfers and free passengers carried	16,117,776	16,833,441
Total passengers carried	80,649,855	77,334,025
Percentage of passengers using transfers	18.90	20.57
Average fare per passenger including transfers	$.036	$.035
Car mileage	12,207,419	12,098,522
Car hours	1,473,940	1,463,349
Passengers per day	220,959	211,295
Passenger receipts per car mile	$.235	$.222
Passenger receipts per car hour	$1.95	$1.84
Total receipts per car mile excluding advertising	$.239	$.225
Total receipts per car hour excluding advertising	$1.98	$1.86
Operating expenses per car mile, including depreciation	$.137	$.139
Operating expenses per car hour, including depreciation	$1.13	$1.15

Alton, Jacksonville & Peoria Railway, Alton, Ill.—F. L. Butler, receiver for the Alton, Jacksonville & Peoria Railway, has announced that he intends to advise the Madison County Circuit Court to order the sale of the railroad.

Boston (Mass.) Elevated Railway.—The stockholders of the West End Street Railway at the annual meeting on Nov. 25 voted to increase the capital stock of the company by issuing 7000 additional common shares, the proceeds to be used to pay Boston Elevated Railway for permanent additions and improvements made to the property of the West End Street Railway. The retiring directors were re-elected. There were 169,820 shares represented at the meeting.

Bowling Green (Ky.) Railway.—Following a judgment for $19,000 in favor of the Fidelity & Columbia Trust Company, of Louisville, trustee for the bondholders of the Bowling Green (Ky.) Street Railway, an order of sale has been entered by the Court of Appeals of Kentucky. Master Commissioner Speck will offer the property, including the franchise and plant, for sale on Dec. 22. The company has been in the hands of a receiver since last March, the final authorization of the receivership being recently secured from the Court of Appeals, as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 15, 1913.

Bristol County Street Railway, Taunton, Mass.—In the case of the Federal Trust Company, trustee, against the Bristol County Street Railway and the Taunton & Pawtucket Street Railway, Judge Pierce of the Superior Court on Nov. 18 rendered a decision denying the motion of the Taunton & Pawtucket Street Railway Company to recommit the master's report and confirming the report. The case involved the rights of bondholders in street railway companies. On May 3, 1904, receivers were appointed for the Bristol County Street Railway, and subsequently its property was sold at receivers' sale, subject to a mortgage and bond issue, and was acquired by the Taunton & Pawtucket Street Railway, which was organized for that purpose. After the sale the Taunton & Pawtucket Street Railway continued to pay the interest on the bonds up to Jan. 1, 1909, when default was first made. The defendant Taunton & Pawtucket Street Railway asserted that certain alleged informalities in connection with the organization of the Bristol County Street Railway and the issue of its stock rendered invalid the mortgage as well as the bonds secured thereby. The master found against this contention and found that the mortgage and bonds constituted a valid lien.

Central Illinois Public Service Company, Mattoon, Ill.—A certificate of increase of capital stock of the Central Illinois Public Service Company from $6,000,000 to $10,000,000 was filed on Nov. 15 in the office of the Secretary of State. The company owns more than thirty public utilities in cities of Central Illinois, including several operating electric railway systems.

Chicago & Milwaukee Electric Railroad, Highwood, Ill.—Attorneys for the reorganization committee of the Chicago & Milwaukee Electric Railroad appeared before Judge Landis of the Federal Court at Chicago on Nov. 24, presenting a motion for direction of the court with reference to the resale of the property of the road. The court replied that pending the decision of the question before Judge Geiger of Milwaukee as to whether the reorganization committee would be allowed to bid at the sale, no directions would be given the master, as it is the intention of the court that both the Wisconsin and the Illinois divisions of the road be sold at the same time.

Detroit (Mich.) United Railway.—Notice is given that the People's State Bank of Detroit will on Dec. 1 redeem and pay for first mortgage 5 per cent gold bonds of the Detroit Railway numbered 51 to 100, inclusive. The total authorized issue under the mortgage securing these bonds is $1,800,000. Of this amount $1,750,000 is outstanding. The bonds are dated June 1, 1895, and are in the denomination of $1,000. Bonds numbered 1 to 600 mature in the order of the numbers at the rate of $50,000 a year, commencing on Dec. 12, 1912. The remaining bonds mature on Dec. 1, 1924.

Dominion Power & Transmission Company, Hamilton, Ont.—The directors of the Dominion Power & Transmission Company have declared a dividend of 2 per cent on the limited preferred stock payable on Dec. 15 to shareholders of record Nov. 30. This stock is entitled to receive total dividends of 10 per cent, after which it becomes common stock. Already dividends of 1½ per cent have been paid and it is expected that the remaining 8½ per cent will be paid in the course of the coming year.

Federal Utilities Company, Inc., New York, N. Y.—The directors of the Federal Utilities Company, Inc., have passed up the quarterly dividend of 1½ per cent due next month on the preferred stock. In explanation of this action De Forest Candee, president of the company, notified shareholders that the income in the ten months ended with Oct. 31 was sufficient to meet dividend requirements, but depreciation in the market value of securities owned and a consequent shrinkage of surplus had caused the directors to conserve resources. The directors of the company considered the matter of the dividend at a meeting on Nov. 25.

Illinois Traction Company, Peoria, Ill.—The shareholders of the Illinois Traction Company have voted to issue one one-hundred-dollar share of new common stock (present authorized issue $15,000,000, outstanding $9,984,000) for each two one-hundred-dollar shares of the $4,521,800 common stock of the Western Railways & Light Company. The preferred stock of the latter company to the amount of $3,169,000 will remain outstanding, the amalgamation involving simply the acquisition of the common shares. As stated in the ELECTRIC RAILWAY JOURNAL of Nov. 8, the management of the two corporations is practically identical. The merger will require an issue of $260,000 additional common stock of the Illinois Traction Company. It is the intention to ask an increase of $5,000,000 in the authorized amount, although no present issue is contemplated beyond the amount required for the purchase of the Western Railways & Light Company's stock.

International Railway, Buffalo, N. Y.—The Public Service Commission for the Second District of New York on Nov. 20 authorized the International Railway to issue $1,111,000 of its 5 per cent fifty-year gold mortgage bonds under an indenture given to the Bankers' Trust Company as trustee, to be sold at not less than 88 per cent of their par value and accrued interest, the proceeds to be used for additions and betterments and to retire certain car trust certificates maturing Dec. 15, 1913. This order super-

sedes all previous orders of the year. The company was also permitted to issue $620,000 of 5 per cent refunding and improvement fifty-year gold mortgage bonds, the proceeds to be used solely and exclusively for the purpose of paying and discharging certain underlying and prior lien bonds. Permission was also granted to issue $635,000 of 5 per cent fifty-year gold mortgage bonds for proposed expenditures from Jan. 1 to Dec. 31, 1914, and for expenditures to retire certain car trust certificates maturing in March, June, September and December, 1914.

New Midland Power & Traction Company, Cambridge, Ohio.—The New Midland Power & Traction Company has filed a request with the Ohio Public Utilities Commission for authority to sell its electric railway properties in Cambridge and Guernsey County to the Ohio Service Company, recently organized. The sales price is to be $900,000, of which $650,000 is to be in convertible notes bearing 6 per cent interest.

Northern Illinois Electric Railway, Chicago, Ill.—The Northern Illinois Electric Railway has been placed in the hands of Andrew Asehenbrenner as receiver with instructions to continue the operation of the road.

Public Service Corporation of New Jersey, Newark, N. J.—The Public Service Corporation of New Jersey has applied to the Board of Public Utility Commissioners of New Jersey for permission to issue $620,000 of 5 per cent bonds to refund $620,000 of outstanding first mortgage 6 per cent bonds of the North Hudson County Railway dated 1884 and due Jan. 1, 1914. The bonds which it is proposed to issue to refund the bonds about to mature are to run to Jan. 1, 1928.

Stockton Terminal & Eastern Railroad, Stockton, Cal.—New directors have been elected for the Stockton Terminal & Eastern Railroad as follows: George F. Hudson, G. McM. Ross, E. H. McGowan, Amos Jones, John R. Humphreys, J. B. Lundy, John Strohm, Warren V. Clark and Theodore C. Bee.

Toledo & Chicago Interurban Railway, Kendallville, Ind.—In the Superior Court on Nov. 11, in the suit of Josephine B. Hanson, administratrix of the estate of James B. Hanson, deceased, against the Toledo & Chicago Interurban Railway, the final report of the receiver, James D. Mortimer, was filed and approved and the receiver was discharged. The final report and the court's discharge showed that the orders of the court had been complied with; that all the receivers' certificates, preferred claims for injuries and damage claims had been paid, and that all the first mortgage bonds of $1,250,000, except three bonds of $1,000 each and three bonds of $500 each, had been surrendered and were in the hands of the receiver, and that $1,702.20 was on hand to pay the pro rata share of these six outstanding bonds. The new organization, known as the Fort Wayne & Northwestern Interurban Railway, which was mentioned in the Electric Railway Journal of April 19 as the probable successor of the Toledo & Chicago Interurban Railway, is now free to go ahead with its improvements as soon as its financial arrangements can be completed.

Union Street Railway, New Bedford, Mass.—The Union Street Railway recently petitioned the Public Service Commission to approve the issue of 250 bonds with a par value of $250,000 to meet an outstanding debt of $250.000 maturing Jan. 1, 1914. These bonds are part of an issue of $2,000,000 of twenty-year 4½ per cent mortgage bonds voted by the stockholders of the company at the annual meeting on Oct. 17, as noted in the Electric Railway Journal of Nov. 1, 1913.

Washington Railway & Electric Company, Washington, D. C.—Officials of the Washington Railway & Electric Company conferred on Nov. 17 with representatives of the Public Utilities Commission regarding the recent action of the company in declaring an extra dividend of 1 per cent on its common stock. The examination thus far has been conducted principally with reference to the facts upon which the decision to declare an extra dividend was based. It is proposed to examine the company's depreciation reserve and other funds and the sources from which they are obtained, and it is thought the inquiry will last a month.

Watsonville Railway & Navigation Company, Watsonville, Cal.—John E. Gardner, Watsonville, Cal., has been appointed receiver of the Watsonville Railway & Navigation Company on the application of the Union Trust Company, San Francisco, Cal., which as mortgage trustee has brought suit in the Superior Court of Monterey County to foreclose the mortgage securing $100,000 of bonds.

Dividends Declared

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

Chicago (Ill.) Elevated Railways, quarterly, $1.50, preferred participating certificates.

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., quarterly, 1¾ per cent, preferred; quarterly, 2 per cent, common.

Louisville (Ky.) Traction Company, quarterly, 1 per cent, common.

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1¼ per cent, common.

Portland Railway, Light & Power Company, Portland, Ore., quarterly, 1 per cent.

Washington Railway & Electric Company, Washington, D. C., quarterly, 1¼ per cent, preferred; quarterly, 1½ 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.,	Oct.,	'13	$68,454	*$27,938	$40,516	$17,354	$23,162
1 "	"	'12	62,964	*26,773	36,191	17,033	19,158
12 "	"	'13	755,084	*343,270	411,814	207,455	204,359
12 "	"	'12	692,630	*310,379	382,251	193,244	189,007

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m.,	Oct.,	'13	$99,358	*$62,447	$36,911	$25,856	$11,055
1 "	"	'12	95,580	*56,606	38,974	22,600	16,374
12 "	"	'13	1,194,265	*709,875	484,390	292,536	191,854
12 "	"	'12	1,040,465	*619,914	420,551	260,971	159,580

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO

1m.,	Sept.,	'13	$114,659	$66,363	$48,296	$32,329	$15,967
1 "	"	'12	109,713	59,299	50,414	31,886	18,528
9 "	"	'13	939,427	561,884	377,542	284,443	93,099
9 "	"	'12	878,244	512,809	365,435	277,409	88,026

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO

1m.,	Sept.,	'13	$43,186	*$21,467	$21,719	$10,396	$11,323
1 "	"	'12	40,240	*19,815	20,425	10,032	10,393
9 "	"	'13	326,712	*175,185	151,527	93,752	57,775
9 "	"	'12	305,603	*172,147	133,456	89,265	44,191

DETROIT (MICH.) UNITED RAILWAY

1m.,	Sept.,	'13	$1,087,267	$729,324	$357,943	$181,322	$176,621
1 "	"	'12	1,076,097	721,612	354,485	175,756	178,729
9 "	"	'13	9,921,795	6,546,019	3,375,776	1,618,714	1,757,062
9 "	"	'12	8,812,968	5,683,248	3,129,720	1,594,583	1,538,137

FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.

1m.,	Aug.,	'13	$181,273	$103,564	$77,709	.....	.....
1 "	"	'12	175,008	106,026	68,982	.....	.....
8 "	"	'13	1,546,889	889,973	656,916	.....	.....
8 "	"	'12	1,383,236	812,253	570,983	.....	.....

JOPLIN & PITTSBURG RAILWAY, PITTSBURG, KAN.

1m.,	Oct.,	'13	$49,917	*$31,133	$18,784	$12,542	$6,242
1 "	"	'12	47,358	*27,576	19,782	12,542	7,240
12 "	"	'13	572,315	*344,318	227,997	150,500	77,497
12 "	"	'12	519,697	*306,614	213,083	153,504	59,579

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m.,	Oct.,	'13	$574,524	*$278,639	$295,885	$174,259	$121,626
1 "	"	'12	565,839	*283,029	282,810	149,291	133,519
12 "	"	'13	6,697,741	*3,317,804	3,379,937	1,959,860	1,420,077
12 "	"	'12	6,582,920	*3,268,162	3,314,758	1,721,380	1,593,378

ST. JOSEPH RAILWAY, LIGHT, HEAT & POWER COMPANY, ST. JOSEPH, MO.

1m.,	Oct.,	'13	$103,814	$61,869	$41,945	$19,818	$22,127
1 "	"	'12	103,953	56,565	47,388	19,631	27,757
12 "	"	'13	1,236,644	703,867	532,777	240,360	292,417
12 "	"	'12	1,164,156	673,444	490,712	235,728	254,984

SAVANNAH (GA.) ELECTRIC COMPANY

1m.,	Sept.,	'13	$67,292	*$44,370	$22,922	$22,666	$249
1 "	"	'12	62,783	*46,599	16,183	16,141	42
12 "	"	'13	808,169	*556,458	251,712	244,170	7,542
12 "	"	'12	736,539	*544,401	192,138	190,767	1,351

TAMPA (FLA.) ELECTRIC COMPANY

1m.,	Sept.,	'13	$73,362	*$39,162	$34,200	$4,431	$29,769
1 "	"	'12	62,989	*33,166	29,823	4,452	25,371
12 "	"	'13	806,676	*433,870	372,806	55,105	317,701
12 "	"	'12	745,289	*392,383	352,906	53,540	299,366

*Includes taxes.

Traffic and Transportation

Opinion of California Commission on Drinking-Cup Order

Brief reference was made in the ELECTRIC RAILWAY JOURNAL of Oct. 25, page 950, to the order of the Railroad Commission of California directing all steam and electric railways of that State whose schedule between terminals exceeds one hour and thirty minutes to provide sanitary individual drinking cups for passengers at a cost not to exceed 1 cent a cup. The opinion on which the order is based was given in part by Commissioner Gordon, as follows:

"At the hearing the representatives of the different railroad companies testified as to the manner in which they were supplying cups. In most cases where cups are supplied, with the exception of the Pullman Company, they are to be had from the news agents. The Southern Pacific Company has placed a sign on each water tank notifying the traveling public that it is unlawful to provide drinking cups in cars or waiting rooms and that individual drinking cups may be secured from the news agent on the train. This sign lists the different classes of cups that are for sale, together with the prices for the same. The Brown News Company has an exclusive contract with the Southern Pacific Company to barter drinking cups, magazines and the usual merchandise sold by news agents on trains. This company has a package containing four paper cups, which is sold for 5 cents, and prices for cups range from this style, as the lowest, up to 75 cents for a collapsible nickel cup in a leather case. The Brown News Company operates only on the Southern Pacific Company's lines in this State, but there are news agents on the trains of the other large railroad companies in the State who operate in practically the same manner. These news agents sell their produce on a commission basis and naturally endeavor to sell the highest priced article they have, and it is very often the case that the news agent does not display or inform the purchaser that cups may be had at less than 25 cents, and as a great many of the traveling public take only an occasional ride and do not know that cups can be purchased at a lower price, and further, owing to the fact that only an occasional trip is taken and a cup which is permanent in its character and design is not desired, the intended purchaser very often, through ignorance or the high price of the cup, will forego the drink of water.

"At the hearing testimony given by representatives of a great many of the carriers showed that the carriers that had news agents on their trains had for sale sanitary individual drinking cups at a nominal price. In a great many public places automatic cup-dispensing machines are installed, but only one or two of the railroads have tested these machines. One objection to the machine which dispenses the most desirable cup is that the company manufacturing it is having litigation with other cup-vending machine companies for patent infringement, etc.

"Testimony was also introduced as to the prices of cups, and although this evidence was insufficient to determine the cost to the railroad companies of all classes of cups, at the same time the testimony which was given showed that cups could be purchased for from $5.50 to $6 per 1000 cups, depending on the size of the order. This was for a paraffine, pressed-paper cup, probably as inexpensive as any other make of paper cup. Undoubtedly other cup manufacturers would have to sel their cups at as low a figure in order to compete with this cup. No testimony was introduced at the hearing to show how much it would cost the railroad companies to barter these cups. I am of the opinion that the railroad companies should be compelled to place these cups in the hands of the traveling public, and I am also of the opinion that they should not barter said cups for the purpose of making a profit from their sale, but I do believe that the railroad companies should have available for all passengers who so desire a cup at such a price as will not be unreasonable.

"At the present time there are objections to the different types of vending machines, and as these have not been thoroughly tested by the railroad companies in this section of the country, I do not believe that an order should be entered by this commission at this time compelling the railroads in the State to install automatic cup-vending devices. I am also of the opinion that cups should not be required on trains whose schedule run is short. A great many of the companies whose scheduled movement is less than one hour or thereabouts have not provided water tanks in their cars.

"I believe and I find as a fact that the merits of this matter justify the commission in issuing a general order to this effect."

Vandalism of Detroit Patrons.—The Detroit (Mich.) United Railway offers a reward of $25 for information that will lead to the arrest and conviction of any person or persons cutting or otherwise destroying car seats.

Commission Orders Reduced Rates on Atlanta Interurban Line.—Reductions in fares were recently ordered by the Railroad Commission of Georgia along the new Stone Mountain line of the Georgia Railway & Power Company. It was decided, however, that no transfers should be allowed to places along the line.

Warning to Rochester Wagon Drivers on Car Streets.—The Rochester Railway & Light *Bulletin* has appealed to wagon drivers to drive, when possible, on streets where there are no cars. The *Bulletin* says: "Drive between track and gutter whenever possible. When you must drive on tracks, do so for shortest distance possible and pull out at once for cars."

Denver Citizens Favor Skip-Stop.—In response to post cards sent out by John A. Beeler, vice-president and general manager of the Denver (Col.) City Tramway, the patrons of the East Colfax Avenue and Montclair lines have signified their preference for skip-stop operation. Out of a total of 2150 families, representing approximately 10,000 patrons, 60 per cent replied within two weeks as follows: Non-committal, 35, or 3 per cent; against, 512, or 34 per cent; for, 947, or 63 per cent.

Warning to Drivers.—James Gunn, superintendent of the Toronto (Ont.) Railway, issued a special notice recently in the form of a newspaper advertisement addressed to drivers of motor cars and other vehicles. Attention was called to the new Queen and Bay and Queen and Teraubay Street intersections. As the cars rounding curves at these intersections are scheduled not to stop after completing the turn, drivers of vehicles were warned to exercise caution in not driving too near the curves.

New Interurban Magazine Issued.—"The Texas Interurban" for November, a new magazine published by the Interurban Advertising Company, has recently been issued. It is devoted to the interests of patrons and employees and the development of the territory traversed by the Waco-Dallas-Corsicana Interurban Railway and the Denison-Sherman-Dallas Interurban Railway. Bushrod W. Fontaine, Dallas, the president of the new company, was in charge of the adjusting work of the Santa Fé gulf lines for several years.

Illinois System Starts New Service.—The Illinois Traction System, Peoria, Ill., inaugurated on Nov. 20 its new through Peoria-St. Louis service. Six through cars are run daily from each terminal. According to the new schedule the first car leaves Peoria for St. Louis at 6 a.m. and a car leaves every two hours thereafter until 4 p.m. The first car leaves St. Louis for Peoria at 5 a.m. and a car leaves every odd hour thereafter until 5 p.m. The 175 miles between the cities is made in six hours and twenty-five minutes.

Ohio Southeastern System Advertising Campaign.—An advertising campaign has been conducted by the Ohio Southeastern System, Cincinnati, Ohio, by means of a series of little pamphlets. One folder contained a number of brief "safety first" hints to the employees of the company. Another appealed to the public to purchase tickets before entering cars. A third described the scenic beauties of the line. A fourth called attention to the advantages of "Lake Allyn" in Clermont County as a picnic ground. The fifth folder announced special service and excursion rates to a recent fair held at Ripley, Ohio.

Kansas City Automobile Ordinance Interpreted.—A police judge of Kansas City, Mo., has ruled that motorists need not stop 10 ft. in the rear of street cars which are discharging or taking on passengers, and that they are

complying with the spirit of the ordinance passed recently by the City Council governing the point by running 10 ft. to the right of the car. Eight persons arrested on a charge of violating the ordinance were discharged. The police department has been instructed to observe the ordinance as it stands and some confusion has resulted over the various rulings. Most of the streets, however, are wide enough to allow motorists to pass 10 ft. to the side of cars in the roadway.

Interborough Makes Gift to Wives of Employees.—T. P. Shonts, president of the Interborough Rapid Transit Company, New York, announces that, commencing Dec. 1, 1913, a pass card will be presented to the wife of every married employee who then shall have been in the service one month or more. This ticket will be good for free transportation over the system on which the husband is employed. This privilege is extended as a further step in the work for the welfare of employees. No restriction is made upon the use of the pass, but it is suggested that its use may be of advantage in connection with the stores which the company maintains at various points for the benefit of employees.

Evansville Railways Extend Service.—The Evansville (Ind.) Railways has extended its passenger service by installing a fast motorboat line between Grandview, the eastern terminus of this company's line, and Cannelton, Ind., and Hawesville, Ky., 20 miles up the Ohio River. This fast boat service includes two trips each day with direct connections at Grandview with the interurban cars which operate between that point and Evansville. The motorboat line is operated in the name of the Crescent Navigation Company, which was incorporated by officials of the Evansville Railways. The officers of the navigation company include W. A. Carson, general manager of the Evansville Railways, president; D. C. Powell, general freight and passenger agent of the Evansville Railways, vice-president; G. L. Ford, auditor of the Evansville Railways, secretary, and A. W. Epmeier, treasurer. To advertise thoroughly the new combination service between Evansville, Ind., and Hawesville, Ky., a prize of $10 in gold has been offered to the person suggesting the most suitable name for the boat. The passenger traffic which has been developed by the company up to the present time indicates that the new service will be very popular.

Brooklyn Committee of Public Safety.—The Brooklyn committee of public safety at a meeting held at the Hamilton Club on Nov. 20 completed its organization and elected officers for the ensuing year. The Brooklyn safety committee was originally called together by T. S. Williams, president of the Brooklyn Rapid Transit Company, who requested leading citizens of the borough to co-operate in the campaign which the company was financing throughout the territory in which it operates. Officers were elected for the committee as follows: General George W. Wingate, chairman; Howard S. Hadden, vice-chairman; Walter S. Benedict, treasurer, and Mrs. Jessie P. McCall, secretary. An executive committee composed of chairmen of the various standing committees was chosen, its members being the following: Miss Jessie H. Bancroft, Arnon L. Squiers, D. V. B. Hegeman, Herbert N. Warbasse, J. W. Tumbridge, Frederick B. Pratt, John N. Harman, Judge Norman S. Dike and H. A. Bullock. The sub-committees through which the active work of the committee will be done are those on schools and playgrounds, boy scouts, church and civic organizations, public institutions other than schools, vehicular and pedestrian traffic, structures, pavements and excavations, street railroads, explosives, fireworks and firearms, hazardous occupations, law and legislation, and publicity. The general committee will hold three stated meetings during the year, on the first Mondays of October, February and June, the October meeting being the annual meeting for the election of officers. Between these meetings the affairs of the organization will be in the hands of the executive committee, which will meet once a month at luncheon to hold a clearing house for the business of the various sub-committees. About twenty-five representative men and women responded to the original invitation of the Brooklyn Rapid Transit Company to organize a Brooklyn committee of public safety. At the last meeting forty-two additional members were elected.

Personal Mention

Mr. Charles W. Stage has been appointed director of public utilities under the new city charter of Cleveland, Ohio.

Mr. Henry W. Hays, state engineer in the Attorney-General's office, has been appointed engineer of the Massachusetts Public Service Commission, effective on Jan. 1, 1914.

Mr. W. R. W. Griffin, who resigned as general manager of the Tri-State Railway & Electric Company, East Liverpool, Ohio, last March at the time that he was appointed one of the receivers for the property, continued actively operating the Tri-State property as one of the receivers from that date until Nov. 1, at which time Mr. Horatio G. Lloyd took the active operation of the East Liverpool Traction & Light Company and the Steubenville & East Liverpool Railway & Light Company, which are leased properties of the Tri-State Railway & Electric Company. Mr. Lloyd in turn employed Mr. B. J. Jones to act as his manager. Both Mr. Lloyd and Mr. Griffin continue as receivers for the property. Mr. Griffin is general manager of the Beaver County Light Company, the Steubenville, Wellsburg & Weirton Railway, the Wellsburg Electric Light, Heat & Power Company, the Midland Electric Light & Power Company and the Hancock County Electric Company, none of which properties is in any way concerned in the receivership of the Tri-State Railway & Electric Company.

Mr. Edgar J. Dickson, general manager of the Springfield (Mass.) Street Railway, has been elected vice-president of the International Railway, Buffalo, N. Y., in immediate charge of operation, and will assume the duties of his new position on Dec. 1. Mr. Dickson's railway experience began in 1887, when he became connected with the Chicago, Burlington & Quincy Railroad. He served for fourteen years in various capacities in the mechanical, transportation and freight departments and resigned in 1901 to enter the motive power department of the Northern Pacific Railroad. Between 1904 and 1907 he was in the mechanical and accounting departments of the Lehigh Valley Railroad and in 1907 joined the organization of the New England Investment & Security Company as purchasing agent, with headquarters at Boston. In September, 1907, he was appointed vice-president and general manager of the Milford, Attleboro & Woonsocket Street Railway and the Uxbridge & Blackstone Valley Street Railway. His authority was extended a year later to include the Attleboro lines of the New England company. In the fall of 1909 he was appointed general manager of the Springfield system, and he has served with marked success as the chief operating officer of the lines in central Massachusetts embraced in this organization.

E. J. Dickson

Mr. John G. Baukat has been appointed electrical engineer of the National Steel Car Company, Ltd., Hamilton, Ont., in charge of the company's coach department and the design and building of cars. The present capacity of the plant is thirty-five cars a day. Mr. Baukat has long been connected with railroad and electric railway work. He was born in 1870, and from 1887 to 1895 worked as a machinist and studied engineering. From 1895 to 1898 he was engaged in drafting, and mechanical engineering on marine work, automatic machinery and general machine work. From 1898 to 1899 he was connected with the Port Chester (N. Y.) Railway as assistant engineer in charge of power and equipment. He next became connected with the railway department of the General Electric Company, Schenectady, N. Y., as designing engineer, including test work. He served this company from 1899 to 1902. He then became

chief engineer of the Schenectady Railway in charge of rolling stock, repair shops, track work, trolley lines and construction work, and during his connection with the company supervised the construction of 30 miles of high-speed interurban railway, and the building of new carhouses and a power house. From 1905 to 1909 he was connected with the New York Central & Hudson River Railroad as assistant superintendent of electrical equipment in charge of the electric rolling stock, repair shops and inspection sheds. After serving for a short time as chief engineer in the development work of the Miami Valley Construction Company, New York, Mr. Baukat in 1910 accepted the position of mechanical engineer of the Wilmington-Philadelphia Traction Company, Wilmington, Del., in charge of the rehabilitation of rolling stock and equipment. He next became superintendent of equipment of the Lehigh Valey Transit Company, Allentown, Pa., which he served from 1911 to 1913, during the period of its important extensions to Norristown and Philadelphia. He has recently been connected with Day & Zimmerman, engineers, Philadelphia, Pa., on general electric railroad engineering work.

OBITUARY

John Donovan, formerly president of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., is dead. Mr. Donovan was fifty-nine years old. He was interested in a number of other enterprises besides the railway, light and power company. Mr. Donovan is survived by a widow and a daughter.

W. E. Dunbar, assistant electrical engineer in charge of substations on overhead lines of the Aurora, Elgin & Chicago Railroad, Wheaton, Ill., died at his home in Elgin, Ill., on Nov. 15. Mr. Dunbar and his assistant were making an inspection trip on a gasoline speeder on Nov. 6, when the car jumped the track at Ingalton, Ill., fatally injuring Mr. Dunbar and instantly killing his assistant.

Mr. J. C. Calisch, special agent of the railway department of the General Electric Company, died in New York on Nov. 28. Mr. Calisch was graduated from Stevens Institute in 1887, and served his apprenticeship with the Electric Storage Battery Company in Philadelphia. In 1890 he entered the New York office of Edison General Electric Company and remained with this company when it was merged with the General Electric Company in 1892. In 1895 Mr. Calisch was appointed manager of the Pittsburgh office, and in 1899 manager of the Buffalo office. In 1906 he resigned to become vice-president and general manager of the Buffalo & Lake Erie Traction Company. In 1912 he resigned from this company to return to the General Electric Company in the capacity of special agent in its railway department. Mr. Calisch was forty-six years old.

E. A. Ziffer, the dean of the European electric railway fraternity and Edler von Teschenbruck, died at Vienna, Oct. 27. Despite his eighty-one years, Mr. Ziffer had remained in harness not only as the operating head of several electric and steam railways but as a most active publicist and railway association worker. Age could not wither his youthful enthusiasm for all progress in his craft, and one of his last papers was an elaborate study for the members of the International Street & Interurban Railway Association on self-propelled cars. An abstract of this report and abstracts of earlier reports were published in this paper. Mr. Ziffer has also contributed a number of original articles to the columns of this paper on electric railway practice in Austria-Hungary. At the time of his death he was president of the Royal Lemberg-Czernowitz-Jassy Railway, the Bukowina Local Railways, the Lemberg-Belzer Railway, the Kolomaer Local Railways and the Lemberg-Jaworow Local Railway. As an association man, he was president of the Austrian City & Interurban Railway Association, a member of the executive committee of the International Street & Interurban Railway Association and was also a member of several local technical bodies. As a publicist, he edited the monthly journal of the Austrian Association, often being the chief contributor of original articles and translations as well. The Austrian government recognized his valuable services by conferring upon him the Order of Francis Joseph and the Order of the Iron Crown. An account of Mr. Ziffer's earlier career was published in the STREET RAILWAY JOURNAL for June 18, 1904.

Construction News

RECENT INCORPORATIONS

***Mount Vernon Traction & Car Company, Mount Vernon, Ill.**—Incorporated in Illinois to operate an electric railway and other public utilities in Mount Vernon. Capital stock, $40,000. Officers: Louis G. Pavey, Mount Vernon, president; Earl Green, Mount Vernon, vice-president and treasurer; Charles C. Baldwin, Mount Vernon, secretary and chief engineer; John Emerson, St. Louis, purchasing agent.

***Cherry River & Southern Railroad, Ronceverte, W. Va.**—Chartered in West Virginia to build a 40-mile steam or electric railway from the junction of Cranberry and Gauley Rivers to Ronceverte. Capital stock, $5,000. Headquarters, Charleston. Incorporators: H. L. Kirtley, George W. McClintic and W. G. Mathews, Charleston; A. Bringardner, Columbus, Ohio; Samuel W. Richey, Cincinnati, Ohio.

FRANCHISES

Glendale, Cal.—The Pacific Electric Railway has received a fifty-year franchise from the Council to double-track Broadway from Glendale Avenue to Brand Boulevard in Glendale.

East St. Louis, Ill.—The East St. Louis & Suburban Railway will ask the Council for a franchise on Twenty-fifth Street south from Lincoln Avenue to Caseyville Road in East St. Louis.

Galesburg, Ill.—The Rock Island Southern Railroad, Monmouth, has received a franchise from the Council to cross seven streets in entering Galesburg. The line will enter Galesburg on its own right-of-way.

Jacksonville, Ill.—The Jacksonville Railway & Light Company has asked the Council for a twenty-five-year franchise in Jacksonville.

Quincy, Ill.—The Quincy Street Railway has received a franchise from the Council to extend its line from the Gardner governor works to the Weiss paper mills in Quincy.

St. Joseph, Mo.—The St. Joseph Railway, Light, Heat & Power Company will ask the Council for a franchise to extend its Frederick Avenue line to the state hospital for the insane in St. Joseph.

Gowanda, N. Y.—The Hamburg-Falconer Electric Railway has asked the Council for a franchise in Gowanda. This is part of a plan to build an electric railway between Falconer, Buffalo, Ellington, Leon, Wesley, Dayton and Gowanda. L. R. Simons, Gowanda, is interested. [E. R. J., June 21, '13.]

Dallas, Tex.—An order was passed by the County Commissioners Court permitting the Dallas Southwestern Traction Company to amend its franchise to the extent of laying rails along the new cut-off just opened up by the county from the West Dallas pike as an extension of Fisher Avenue to Cement City. [E. R. J., Oct. 18, '13.]

Port Arthur, Tex.—The Port Arthur Traction Company has received an extension of its franchise to extend its line on Procter Street from De Queen Boulevard to Van Der Voort Boulevard in Port Arthur.

Tacoma, Wash.—The Seattle-Tacoma-Olympia Railway, Seattle, has received a franchise from the Council in Tacoma for an electric elevated line from Eleventh Street across the middle waterway to the tideflats in Tacoma. W. D. Hall, Seattle, president. [E. R. J., Nov. 1, '13.]

***Casper, Wyo.**—E. Richard Shipp, Casper, has asked the Council for a franchise in Casper. This is part of a plan to build a street railway from the Burlington depot to the southern boundary of Casper, via the Butler addition and McKinley Avenue, to connect with a cross town line which extends from Capitol Hill to the Midwest refinery. Application for a charter will soon be made. It is planned to use storage-battery cars.

TRACK AND ROADWAY

Rome & Gadsden Railroad, Gadsden, Ala.—No definite plans have yet been made as to when construction will be begun on this 60-mile line to connect Rome, Cave Springs,

Center, Forney Key, Rock Run and Gadsden. Louis S. Daniel, Rome, secretary. [E. R. J., July 5, '13.]

Decatur, Moulton & Russellville Railway, New Decatur, Ala.—This company states that the project to build this 60-mile line to connect Decatur, New Decatur, Newburg, Mount Hope, Landersville, Danville, Jesseton and Russellville is still in a preliminary stage. W. J. Cottingham, New Decatur, is interested. [E. R. J., April 30, '10.]

Calgary (Alta.) Municipal Railway.—During 1914 this company will award contracts to build about 10 miles of new track.

Nelson (B. C.) Street Railway.—Plans are being made by this company for certain improvements and extensions of its lines in Nelson.

British Columbia Electric Railway, Vancouver, B. C.—This company is negotiating with the Great Northern Railway for the purchase of the abandoned right-of-way of the Cloverdale-Blaine line from Hazelmore to the Canadian boundary at Blaine, Wash. Bids are being asked by this company for the construction of an interlocking tower at the Esquimalt & Nanaimo Railway crossing on the Esquimalt road.

Northern Electric Railway, Chico, Cal.—Plans are being made by this company to enter Napa Valley and give the city of Napa its third direct connection with San Francisco, via Vallejo.

San Rafael & San Anselmo Valley Railway, San Rafael, Cal.—In a decision rendered by the State Railroad Commission, authority was granted this company to issue $55,000 of stock and $45,000 of bonds for the purpose of constructing an electric line from the Union depot in San Rafael through the business section of that town to San Anselmo and Fairfax. E. S. Rake, San Rafael, president. [E. R. J., Oct. 18, '13.]

Sacramento Valley West Side Electric Railway, Willows, Cal.—Plans are being made by this company to begin work in January on the first section of its line from Woodland to Rio Vista. This 160-mile railway will extend through the west side of the Sacramento Valley. C. L. Donohoe, Willows, president. [E. R. J., Oct. 25, '13.]

Waterbury & Milldale Tramway Company, Waterbury, Conn.—This company has placed in operation its new line in Waterbury.

Deep Lake Company, Fort Myers, Fla.—About 2 miles of track has been laid by this company on its 13-mile line from Deep Lake to the Everglades. Gasoline motor cars will be used. H. McCormack, Everglade, president. [E. R. J., May 3, '13.]

Savannah (Ga.) Electric Company.—Extensive improvements will be made by this company early next year on its lines in Savannah.

Nezperce & Idaho Railroad, Lewiston, Idaho.—This company states that its 75-mile line between Nezperce, Vollmer, Waha and Forest will be operated by steam. [E. R. J., May 10, '13.]

Southern Illinois Railway & Power Company, Chicago, Ill.—This company has made a proposition to the city of Herrin looking toward the extension of its line from Eldorado through Harrisburg, Carrier Mills and Johnston City to Herrin. The company asks $50,000 stock subscription, 2½ miles of right-of-way and a franchise into Herrin in consideration of the building of the line to Herrin.

Union Railway & Power Company, Chicago, Ill.—This company, which plans to build a 6-mile line between South Chicago and Hammond, Ind., and a 7-mile line from Hervey, Ill., to Hammond, Ind., has completed surveys from South Chicago to Hammond and surveys are now being made between Harvey and Hammond. Construction will be begun as soon as a franchise can be obtained in West Hammond. F. Arthur Jost, 715 Royal Insurance Building, Chicago, president. [E. R. J., May 24, '13.]

Decatur, Sullivan & Mattoon Transit Company, Mattoon, Ill.—At a recent meeting of the directors of this company at Mattoon the following officers were elected: J. McFall, Mattoon, president; George B. Spittler, Mount Zion, vice-president; J. G. Thode, Mattoon, treasurer and secretary. [E. R. J., June 28, '13.]

Chicago, Peoria & Quincy Traction Company, Quincy, Ill.—At a special meeting of the stockholders of this company to be held on Dec. 6 a bond issue for $8,000,000 will be asked for by the company. Surveys have been nearly completed and construction will soon be begun by this company on its line between Quincy and Peoria. C. A. Van Ness, Quincy, secretary. [E. R. J., Nov. 8, '13.]

Tri-City Railway, Davenport, Ia.—It is reported that negotiations are under way by this company for a right-of-way for extensions next spring to Hampton, Rapids City, and Port Byron.

Union Electric Company, Dubuque, Ia.—During the next few months this company will award contracts to build 1 mile of new track.

Detroit, Almont & Northern Railway, Detroit, Mich.—Contracts for grading have been awarded by this company to W. E. French & Company, Detroit, and construction will be begun in the spring on this 9-mile line between Romeo and Almont. This line will be built entirely on private right-of-way adjacent to the main highway between Romeo and Almont. The following officers have been elected: F. W. Brooks, 12 Woodward Avenue, Detroit, president; J. C. Hutchins, vice-president; A. E. Peters, secretary, and Irwin Fullerton, treasurer. All are associated with the Detroit United Railway. [E. R. J., Nov. 1, '13.]

Minneapolis, Minn.—Plans are being made by the City to build a 1½-mile electric line in Minneapolis from the terminus of the city lines to the filtration plant. This line will be used for passenger as well as freight service. W. R. Young, Minneapolis, registrar. [E. R. J., Oct. 11, '13.]

Jefferson City Bridge & Transit Company, Jefferson City, Mo.—This company, which plans to build a line between Jefferson City and Columbia, has filed with the Circuit Court at Jefferson City a certificate of power granted by the Public Utility Commission, authorizing it to operate an electric line in Callaway, Cole, Boone and other counties.

***Kingston, Mo.**—H. L. Gilbert and David Miller, Kansas City, are back of a project to build an electric line from Hamilton to Kingston, Mo., a distance of 9 miles. The question will be submitted to the voters at a special election on Dec. 1. The Councils of the two towns already have approved plans.

Brazil, Devil's Lake & Minneapolis Electric Railway, Brazil, N. D.—This company has placed in operation its 5-mile gasoline and steam line in Devil's Lake. The line will be extended to North Chautauqua, Fort Totten, Brazil and Bismarck, N. D., and to Minneapolis, Minn. Capital stock authorized, $100,000; issued, $30,000. Bonds authorized, $100,000. The company operates eleven cars and its repair shops are located at Devil's Lake. A. B. Fox, Brazil, president and general manager. [E. R. J., May 31, '13.]

Devil's Lake & Chautauqua Electric Railway, Devil's Lake, N. D.—This company has under construction its line between Chautauqua, Devil's Lake and Fort Totten. It will furnish power for lighting purposes. Officers: Joseph M. Kelly, president; H. E. Kenner, secretary; J. M. Thompson, treasurer; E. M. Lewis, general manager, and P. S. Dunn, superintendent and purchasing agent, all of Devil's Lake. [E. R. J., May 31, '13.]

Gallipolis & Northern Traction Company, Gallipolis, Ohio.—This company, a subsidiary of the Kanauga Traction Company, has placed in operation its 5-mile line between Gallipolis, Ohio and Point Pleasant, W. Va. Its power station and repair shops are located at East Gallipolis. It operates eight cars and furnishes power for lighting purposes. Capital stock authorized, $50,000; issued, $50,000. Bonds authorized, $50,000; issued, $50,000. Officers: T. W. Jackson, Belpre, president of the Kanauga Traction Company, president; H. L. Lambert, Pennsboro, W. Va., vice-president; C. R. Cunningham, secretary and treasurer; H. Marsh, Parkersburg, general manager and purchasing agent, and A. E. Gorby, chief engineer. [E. R. J., Oct. 18, '13.]

Cleveland-Sharon Railway, Cleveland, Ohio.—Plans are being made up to finance this company, which was organized several years ago to build an electric line between Cleveland and Sharon, Pa. The company finished the.

grading of 26 miles of its line and then suspended work, going into the hands of a receiver. Plans of the company contemplate the construction of a line between Sharon and Middletown and using the Cleveland & Eastern Traction Company between Middletown and Cleveland. [E. R. J., Aug. 31, '12.]

*Lima, Ohio.—A company with a capitalization of $100,000 has been organized by Lima citizens to build an electric line in Lima to compete with the city railway as a result of differences between the latter and citizens over the fare charges. No names are yet given of those interested in the project.

Ohio River Electric Railway & Power Company, Pomeroy, Ohio.—This company is building a ¾-mile extension from its present terminus in Middleport to Hobson to connect with the Kanawha & Michigan Railway and extending to its repair shops and yards. Material has been purchased.

Kingston, Portsmouth & Cataraqui Electric Railway, Kingston, Ont.—During the next few months this company plans to award contracts to build ½ mile of new track, using 90-lb. A. S. C. E. section.

International Transit Company, Sault Ste. Marie, Ont.—Plans are being made by this company to build a line in Steelton. All work will be done by the owners. Rails will be supplied by the Lake Superior Corporation, Sault Ste. Marie.

St. Thomas (Ont.) Street Railway.—Estimates have been prepared on the cost of extending this company's line in St. Thomas from the end of the Ross Street line to Pinafore Park.

Toronto (Ont.) Railway.—The City Council has referred to the Board of Control a resolution that negotiations be opened with the Toronto Railway for the extension of the Harbord Street line from its present terminus at Bloor Street north on Ossington Avenue to Hallam Street, thence west to Dufferin Street, and along Lappin Avenue to connect with the Lansdowne Avenue line in Toronto.

Lehigh Valley Transit Company, Allentown, Pa.—The new concrete arch bridge, ½ mile long and 138 ft. high, between Allentown and South Allentown, which will be used by this company, was opened to traffic on Nov. 18.

Harrisburg (Pa.) Railways.—Work has been begun by this company on the extension of its Reservoir Falls line from Prospect Street to Twenty-first Street, Bellevue Park. The company plans to begin work at an early date on its extension from Rockville to Dauphin.

Mahoning & Shenango Railway & Light Company, New Castle, Pa.—Plans are being considered by this company for extensions and improvements of several of its lines in New Castle.

Montreal (Que.) Tramways.—The tramway engineer of the Montreal Council has prepared a report outlining additional lines required in the outer wards in Montreal, but the Montreal Tramways has declined to consider any building of new tracks until the company obtains more facilities for handling traffic in the center of the city. Notwithstanding this, the Board of Control has been authorized to continue negotiations with the company.

Cross Anchor, S. C.—Plans are being considered to build an electric line from Spartanburg to Clinton, via Walnut Grove, Nesbitts, Hobbysville, Cross Anchor and Musgrove Mill. The line will be built if right-of-way and $100,000 can be secured. W. B. Patton, Cross Anchor, and J. W. Copeland, Clinton, are interested.

Jackson Railway & Light Company, Jackson, Tenn.—This company has been asked by the Board of Trade of Jackson to build a suburban line to Bemis, Tenn., but has decided that the project is not feasible. Plans are being made by the company to begin work on an extension of 1¾ miles to West Jackson.

Southwestern Traction Company, Temple, Tex.—The board of directors of the Chamber of Commerce in Temple has indorsed the proposed extensions of this company's lines to Waco and Austin and will assist in raising $75,000 in stock subscriptions for the line in Temple.

Lynchburg Traction & Light Company, Lynchburg, Va.—This company is arranging to extend its Fort Hill line from the Fair Grounds to the Lynchburg Fort in Lynchburg.

Yakima Valley Transportation Company, North Yakima, Wash.—Plans are being considered by this company for a 3-mile extension into Wide Hollow to the Tieton district. It is planned to connect the Summitview line, which extends 3 miles west, with the Harwood branch of the Wide Hollow-Ahtanum line.

Seattle-Tacoma-Olympia Railway, Seattle, Wash.—An agreement has been signed by this company with the Tacoma City Council to build a railway on the tideflats between Lincoln and Puyallup bridges within six months. If the line is completed within that time, long-term franchises will be given to the company. J. S. Wheeler, 507 New York Building, Seattle, general manager. [E. R. J., Nov. 1, '13.]

Northwestern Electric Company, Vancouver, Wash.—This company has filed for record mortgages to secure an issue of $10,000,000 of bonds. It is reported that the company will build a line from Portland to the North Fork of the Lewis River, Clarke County, Wash., via Vancouver. [E. R. J., June 28, '13.]

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—This company's carhouse at Seventh Street and Central Avenue in Los Angeles was damaged by fire on Nov. 12. The loss is estimated to be about $24,000.

Southern Pacific Company, San Francisco, Cal.—This company has opened new offices at the corner of Thirteenth Street and Franklin Street in Oakland.

Detroit, Almont & Northern Railway, Detroit, Mich.—This company plans to build a new passenger and freight station at Romeo in the spring.

Hattiesburg (Miss.) Traction Company.—This company's carhouse at Hattiesburg was damaged by fire on Nov. 11.

Omaha & Lincoln Railway & Light Company, Lincoln, Neb.—This company has completed its new 32-ft. x 180-ft. carhouse in Lincoln.

Brooklyn (N. Y.) Rapid Transit Company.—It is reported that this company has purchased 50 acres of land at Coney Island on which it plans to build a terminal.

North Carolina Public Service Company, Salisbury, N. C.—This company has awarded a contract to build a new carhouse in Greensboro.

Bartlesville (Okla.) Interurban Railway.—This company has completed its new carhouse in Bartlesville. The structure is 150 ft. x 50 ft. in size.

Citizens' Traction Company, Oil City, Pa.—During the next few months this company plans to build a natural-gas-heating plant for its carhouse in Oil City.

POWER HOUSES AND SUBSTATIONS

Little Rock Railway & Electric Company, Little Rock, Ark.—The American Cities Company, New York, N. Y., has authorized the Little Rock Railway & Electric Company to expend $3,500,000 for development of the Ouchita River water-power near Little Rock. It is proposed to furnish power to operate the street-railway lines in Little Rock, together with the proposed interurban lines, and also to supply power for Memphis.

London (Ont.) Street Railway.—This company has practically arranged with the city's hydoelectric department to use its power, the terms being that the company shall take a minimum of 1000 hp. This, however, is for direct current, and in order to convert the hydro-power alternating current a rotary generator will have to be installed at a cost of about $20,000. The agreement is to run for twelve years, to the end of the present franchise of the company in London.

Citizens' Traction Company, Oil City, Pa.—This company is installing a 1500-kw turbine in its power house in Oil City.

Charleston-Isle of Palms Traction Company, Charleston, S. C.—During the next eight weeks this company will award contracts to build a new substation at Mount Pleasant. The structure will be 20 ft. x 30 ft. and of brick construction.

Tazewell (Va.) Street Railway.—This company expects to purchase one 150-hp horizontal tubular boiler for its power house in Tazewell.

Manufactures and Supplies

ROLLING STOCK

Portland (Maine) Railroad has ordered ten cars from the Wason Car Company.

Albany (Ga.) Transit Company is reported as being in the market for new cars.

Omaha & Lincoln Railway & Light Company, Omaha, Neb., expects to purchase one double-truck passenger car.

Oakwood Street Railway, Dayton, Ohio, has practically completed plans for four new cars which will be built in its own shops.

Bartlesville (Okla.) Interurban Railway has purchased one single-truck car from the St. Louis Car Company to be used for city service.

Ogden (Utah) Rapid Transit Company expects to purchase six or eight city cars between Nov. 15, 1913, and Jan. 1, 1914, and twelve motor and six trailer interurban cars between Nov. 15, 1913, and March 1, 1914, for the new interurban extension to its present line.

Minneapolis (Minn.) Water Works are in the market for car equipment to be used on its new line running from the terminus of the city lines to the filtration plant, which will be operated for passenger service as well as shipping of carloads of material from the railway to the filtration plant.

TRADE NOTES

Canadian General Electric Company, Ltd., Toronto, Ont., has elected J. K. L. Ross, Montreal, a director, to succeed his father, the late James Ross.

Northey-Simmen Signal Company, Ltd., Indianapolis, Ind., will open an additional office and warerooms during the latter part of December at Buffalo, N. Y.

Railway Supply & Curtain Company, Chicago, Ill., has received an order from the Chicago City Railway Company for complete curtain equipment for 180 cars.

Railway & Traction Supply Company, Chicago, Ill., has received an order from the Brooklyn Rapid Transit System for 904 additional Wyoming vacuum sanders. This makes a total of 2032 sanders of this type now installed on the Brooklyn system.

Sterling Varnish Company, Pittsburgh, Pa., has appointed J. H. Shugg as its engineer of insulation. Mr. Shugg was formerly superintendent and engineer of winding at the Schenectady works of the General Electric Company and has been twenty-four years in charge of insulation of that company.

Universal Safety Tread Company, Boston, Mass., has recently received orders for its "Anti-slip" metal tread and for its standard universal tread to be installed in 500 to 600 cars of electric railways. The company also reports orders from public service corporations in Boston, New York, Philadelphia and Chicago.

National Steel Car Company, Ltd., Hamilton, Ont., has appointed John G. Baukat to take charge of its coach department, looking after the designs, the building of cars and also helping out on the sales end of the business. This company, which has a plant costing approximately $2,000,000, manufactures trolley cars and wood and all-steel passenger coaches for steam railroads.

H. W. Johns-Manville Company, New York, N. Y., has recently been obliged to provide larger quarters for several of its subsidiary offices in Ohio. The Columbus office and contract department are now on the ground floor of the new Peters Power Building, 45 West Long Street, with large warehouse facilities half a block distant. The Toledo office and warehouse have been moved to 213 Water Street. The Cleveland branch has just leased another larger warehouse on Front Street, which, when remodeled, will give the branch larger and better storage and shipping facilities.

Laconia Car Company, Boston, Mass., reports net earnings of $103,109 for the fiscal year ended Sept. 30 last, or a balance of $33,109 after payment of 7 per cent in dividends on the 10,000 outstanding preferred shares. Owing to the few large orders for cars placed in the New England States during the past two years, it has been compelled to manufacture many classes of cars, having delivered seventeen types during the year. Constantly increasing demand for all-steel cars has necessitated many additions to the company's equipment and forces, the company having in former years been engaged chiefly in manufacture of wooden cars. On the company's board, William C. Endicott, Donald M. Hill and Spencer R. Hill have succeeded Parker W. Whittemore, Robert Treat Paine, Jr., and the late W. H. Hill.

Union Switch & Signal Company, Swissvale, Pa., has awarded, through R. W. Day, general manager of the Scranton & Binghamton Railroad, a contract for automatic block signals on that line between Rock Switch and Factoryville Junction. This signaling will protect 10½ miles of track divided into nine siding-to-siding blocks, employ absolute signals and provide two blocks for following cars and one block for opposing cars between sidings. The signals will be of the Union Style "B," two-position, 0 to 60 deg., upper left-hand quadrant, semaphore type at the sidings and Union Model 13 light type intermediate to the sidings. The signal control will be secured by continuous a.c. track circuits. Including this contract, the Union Switch & Signal Company has installed or under construction 104 miles and fifty-one siding-to-siding blocks employing this particular scheme of single-track signaling. Signal locations have been staked out and the first shipment of material is now on the ground.

Railway Supply Exhibit Association, Chicago, Ill., has been organized by approximately eighty manufacturers and jobbers of railway supplies with offices on the twelfth floor of the Karpen Building, Chicago. The purpose of this association is to promote the interests of its members in the steam and electric railway fields and serve as a local aid to the national associations of the same character in bringing conventions and exhibits to Chicago and then furnishing all the assistance possible to make them a success. The following officers and board of directors were elected at the first meeting of this association: president, A. F. Young, International Harvester Company; vice-president, J. W. Johnson, Pyle-National Electric Headlight Company; secretary and treasurer, W. F. Hebard, of the W. F. Hebard Company. The board of directors include the officers of the association and H. E. Peare, Calumet Supply & Manufacturing Company; F. E. Wade, Fairmont Machine Company; F. C. Fenn, Crane & Company; J. W. Mack, Specialty Device Company; F. C. Dinsmore, National Refining Company; W. B. Wood, Forest City Paint & Varnish Company; H. A. Smith, *Railway Review;* Henry Fischer, Verona Tool Company, and A. B. Cross, Cross Paint & Manufacturing Company.

ADVERTISING LITERATURE

Ingersoll-Rand Company, New York, N. Y., has issued a catalog describing its "Little David" pneumatic drill.

Morrison Boiler Company, Sharon, Pa., has issued a catalog describing and illustrating its water-tube boilers.

Delta-Star Electric Company, Chicago, Ill., has issued Bulletin No. 8, describing its unit-type high-tension wet process busbar supports.

MacGovern & Company, New York, N. Y., have issued a catalog listing their electrical and steam machinery, electric cars and car equipments.

Chicago Pneumatic Tool Company, Chicago, Ill., has issued a catalog describing its "Chicago Pneumatic" Corliss steam-driven compressors.

Hess-Bright Manufacturing Company, Philadelphia, Pa., has issued a catalog describing its ball bearings and their application to axle generators.

Sprague Electric Works of General Electric Company, New York, N. Y., has issued a catalog describing and illustrating the application of its round type direct current motors to a wide variety of uses.

John A. Roebling's Sons Company, Trenton, N. J., has issued a catalog entitled "The Wire Rope at Panama," which is an article that will appear in the "History of the Panama Canal, Its Construction and Builders." The catalog contains photographs illustrating various applications of heavy twisted wire rope to the work of constructing the Panama Canal.