

# Electric Railway Journal

A CONSOLIDATION OF

Street Railway Journal and Electric Railway Review

VOL. XXXIV.

NEW YORK, SATURDAY, AUGUST 28, 1909

No. 9

PUBLISHED EVERY SATURDAY BY THE

## McGraw Publishing Company

James H. McGraw, President. J. M. Wakeman, 1st Vice-president.  
A. E. Clifford, 2d Vice-president. C. E. Whittlesey, Sec. and Treas.

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NEW YORK, 239 WEST THIRTY-NINTH STREET.

CHICAGO: Old Colony Building.

PHILADELPHIA: Real Estate Trust Building.

CLEVELAND: Schofield Building.

LONDON: Hastings House, Norfolk St., Strand.

Cable Address, Stryjourn, New York; Stryjourn, London—Lieber's Code.  
Entered at the New York Post Office as Second Class Mail Matter.  
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Single copies.....10 cents

Combination Rate, in connection with American Street Railway Investments (The "Red Book"—Published annually in May; regular price, \$5.00 per copy).....\$6.50 per annum

CANADA: extra postage.....\$1.50 per annum

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ELECTRIC RAILWAY JOURNAL (52 weekly issues and also daily editions as above), postage prepaid.....\$6.00 per annum  
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### Interurban Express Service

The paper of John H. Crall, Terre Haute, Indianapolis & Eastern Traction Company, read this week before the meeting of the Central Electric Railway Association at Detroit, contains some interesting figures in relation to the express business handled directly by this company. Although this railway, like many of the other interurban properties in the Central West and other parts of the country, has made a contract with an old-line express company, it continues to conduct its own express business on exactly the same plan that was followed by the contract was

made. That is, it carries shipments in the vestibules of passenger cars on certain trains, without giving a wagon pick-up or delivery service. Mr. Crall has calculated that in the month of May, 1909, the space used in the cars for the express transported in this way was 6.36 per cent of the total space in the cars. In the same month the revenue from the interurban express business amounted to 6.14 per cent of the gross passenger earnings. Mr. Crall says later in his paper, in speaking of the increase in the revenue derived from the interurban express, that this revenue has amounted to 4.01 per cent of the gross earnings from all sources in 1909. Whether this statement refers to the fiscal year ended June 30, 1909, or to the record indicated so far for the calendar year, it is evident that average results, although not equal to the favorable earnings from this part of the traffic in May, are sufficiently impressive to justify careful attention to the business in the territory served by the line with which Mr. Crall is identified. If interline business of this character is developed, as Mr. Crall recommends, it should have the effect of stimulating traffic of a character that can be handled with some of the existing cars and without great additional expense.

### Question of Legal Advice in the Promotion of Railways

Experience among those who have gone through repeated promotions of electric railways is a guide to those who contemplate the formation of an organization with the object of building a railroad. It is a grave error to utilize the services of a lawyer who is not personally acquainted by virtue of continuous practice with the State railroad and railway acts and with the judicial interpretations of these acts. In every community there are attorneys at law who are highly regarded, locally, both as men and as successful legal practitioners. To employ one of such as counselor in a proposed enterprise having as its object the construction of a railroad, unless he is also an "electric railway lawyer," will invariably delay the promoters and likely lead them into grave error. Loss of time at the early promotion stage is often of vital importance, and while the attorney unversed in this particular department of the law is trying to set the promoters right on the various questions that develop from time to time, important advantage may be lost in not only securing the financial interest of local people, but may result in the loss of a strategic position relative to the moves of a possible rival corporation. The practice of railroad and railway law is as much of a specialty among lawyers as any one of the many departments of engineering is a specialty of the broad-termed engineer. Therefore, the members of a newly formed railway syndicate should carefully consider the question and obtain specialized legal advice. Where it is impossible to secure experienced rail-



road attorneys in the home community it is not merely convenient but actually necessary to retain a railroad attorney at the State capital. His experience will save a syndicate many times the cost. Such a one can be an associate counsel of the local lawyer, who would appreciate the necessity, but seldom suggest it.

### Accounting in the Repair Shop

A department which produces no direct revenue is always at a disadvantage in the operation of a public service corporation. A non-technical board of directors will appropriate money much more quickly for a department immediately concerned with the company's income than for a branch of the organization which is simply a spender of revenue. Hence the importance of doing all that is possible to set a money value upon such work as the shop performs; to know closely the cost of repairs from month to month, and to be able to show, at least by conservative estimates, how the shops are saving money as well as expending it. To obtain a fairly accurate idea of these savings, the company must keep simple but complete records of the cost of performing standard operations; it must know where its material goes; where material can be saved from old apparatus with economy, and what the expenditure of money for labor has brought the road in specific instances. The time required for routine work should be standardized. Then when improvements are made—and few shops are not progressing in the way they handle work—when the amount of labor, time and material needed for regular operation is reduced, a reasonable value can be set upon the benefit gained. Such facts set forth in a request for appropriation or covered in a routine report are certain to be impressive and generally effective in securing the equipment or labor desired. Show the director where money has been saved in the shop administration, and he will be more disposed to grant funds for betterments than in cases where he never sees anything but the expense accounts.

### Electrical Insulation of Steel Street Cars

The protection of passengers from stray currents and short-circuits is an important consideration in the design and construction of all-steel street cars. In the new cars of the Chicago Railways Company, which are described elsewhere in this issue, this feature of electrical insulation of all parts with which a passenger or trainman might come in contact has been given special attention. Except in case of very heavy discharges of current which might seek isolated paths there is comparatively small danger of serious shocks to passengers within the car coming in contact with the inside lining, seat frames or door posts, as these parts are all commonly connected and grounded through the body framing and the truck center plates. The platform grab handles and steps are sources of particular danger, however, as even a slight shock received from contact with these parts while in the act of boarding or alighting with one or both feet on the ground might cause a serious accident by its suddenness rather than its severity. It will be noted in the article describing these cars that these two points of greatest danger to passengers have been thoroughly insulated from the remainder of the car body. Pre-

sumably, it was not believed to be entirely safe to rely on the efficiency of the ground connection formed between the body and the trucks by the center plates and side bearings. A coating of oil or grease on the center plates might introduce sufficient resistance to create a small, nevertheless dangerous, difference of potential between the car body and the earth if any heavy leakage of current was taking place from the trolley or other wiring circuits. The corner grab handles are insulated at the attachment of the brackets, and the platform partition pipe running up from floor to roof, which is also commonly used as a grab handle, is protected in a similar manner. The steps, although of wood, are insulated with fiber sheets at the point of attachment of the step brackets to the platform sills.

In wooden cars, the roof is sufficiently insulated from the ground by the intervening wood, and on a dry day a trainman standing on the upper deck may handle the trolley pole with impunity in his bare hands. With steel cars, however, the roof is part of a direct path to ground and special precaution must be taken to insulate the trolley completely, and also to protect the roof against accidental dropping of any part of the overhead line. The use of a specially prepared roofing canvas on the Chicago cars seems to have done away with this latter danger and at the same time made it reasonably safe for a trainman to handle the trolley pole from the roof.

### Extension of Kansas City Franchise

One of the letters to the public issued by Bernard Corrigan, president of the Metropolitan Street Railway of Kansas City, in relation to the proposed extension of franchise of the company, states that the most common objection advanced regarding the ordinance is that it extends a measure having still 16 years of life. The corollary argument of the critics of the ordinance is that action should be deferred until two years or so before expiration of the existing rights of the company. To many people who have not been familiar by practical experience with the long and unwholesome contests resulting from expiring franchises in other cities, the common criticism of the ordinance, which Mr. Corrigan recognizes and answers, appears to be a plausible one. The railway system is giving reasonable satisfaction to the majority of its riders and so long as they have a service which fairly meets their convenience, the critics ask what advantage can be found in a consideration thus early of the question of renewal of franchises that hold good for some years to come. This is a short-sighted and specious argument. The answer of Mr. Corrigan is that the policy of delay until just before expiration of the franchises was followed in other cities and proved disastrous both "to the city and the company, for the reason that no person will loan money on a short-time franchise, consequently the company could not keep up with the growth of the city in extensions and rolling stock."

Of those that are interested in the successful operation of a street railway, the class that is most seriously affected comprises persons who are entirely dependent upon the service for daily transportation between their homes and places of work. What these people want is a service that will be safe, prompt and regular, enabling them to ride in reasonable comfort twice a day. They are not concerned



very much about the security of the investment in the railway or about the salaries and wages of the employees of the system.

The limited franchise is iniquitous if it permits a street railway earning not more than a reasonable return to reach a point where, its rights being in danger of annulment and its property threatened with confiscation, receivership and the protection of the courts become inevitable. If the theory of a limited franchise should be applied properly, it would mean the establishment of rates of fare sufficiently large to meet all rightful expenses and taxes and a fair return on the investment plus enough to meet periodically the requirements of an amortization fund so drawn as to assure the reservation of sufficient funds to make possible, with the addition of the scrap value of the property, the return to all the security holders of the paid-in value of their stocks and bonds. Such rates of fare do not appear to be practicable; they would necessarily be so much greater than the existing fares to which the public has become accustomed that riding would be affected. The revenues would decline, service would be curtailed, the investment would be larger than traffic under the new conditions would justify, the values of outlying property would diminish and every large city would face in more serious degree than ever before the problem of increasing congestion in the crowded quarters.

The laws in most States provide for contracts, limited as to time and other features, between the municipality and the public service corporations, instead of the surrender of control to State authority and commission rule. In every developing large city in the country additional lines or equipment must be provided annually. As new capital is raised to meet the expense of these improvements the bankers who advance it, taking securities in lieu thereof, ascertain the financial and operating conditions of the property, and the length of its contract right to continue to operate. If its franchise grant is such as to jeopardize the safety of the securities there is abundant evidence that the company will be unable to borrow satisfactorily. Security of the investment encourages the construction of improvements, whereas insecurity causes investment funds to be withheld, leads to a dispirited organization and may cause eventually a street railway service that will be a reproach to a municipality.

### Operating Power Plants Efficiently at Night

In electric railway systems where the traffic imposes a load curve upon the generating equipment, with two pronounced peaks at the morning rush and in the late afternoon, the efficient all-day operation of the power-plant machinery is often a difficult end to attain. If the trolley lines are kept alive throughout the night efficient operation at the station is still harder to secure during those hours when the load is but a small percentage of the average. To obtain the best results during these light hours every condition must be understood, and the system as a whole handled with special reference to the most economical service.

Fortunately, the range of schedules and routes of cars possible at night is, in general, much more flexible than during the day; and if these are adjusted to some degree

with the effect upon the power plant in mind, if the feeder circuits are handled so as to throw the loads upon the generating units to the best advantage, and if the apparatus in the station service is kept as fully loaded as the total outside conditions will permit, much will be gained over the old haphazard way of running the system with each part independent of every other.

The opportunities for economical service at the station end of the system occur more often upon roads where several plants are required to handle the service than in cases where only one station is needed to supply the necessary current for the car movements. It is most desirable on systems of considerable size that so far as possible the number of stations in operation during the small hours of the night shall be cut down to the fewest consistent with reliability. In many instances one plant will meet the conditions, or one substation, on a system where the power supply is secured from a central alternating plant with the orthodox methods of transmission, conversion and local distribution. Usually the reduction of the number of stations in this way means a large cut in the cost of labor and fuel.

When all the night service load is thrown upon one of a group of plants it will pay to make sure that the feeder connections are such as to insure the best possible voltage conditions on the outlying parts of the system, even if certain changes in the switches at different section boxes have to be made during the next day. It is surprising how far a single power station can feed a few cars with good economy over a system of overhead lines having a large excess of capacity, so far as the demands of the night service are considered.

If the voltage and load conditions can be made better, and one or more plants or substations cut out of service by introducing certain feeder ties during the night that would not be satisfactory during the day, the trouble required to manipulate the switches will be well expended. It should not be forgotten that the possibilities of widely extended trouble resulting from a ground or short circuit on one feeder section are not formidable during the night, when only a relatively small number of cars are on the lines. A large system can be tied together at night without fear of interrupting hundreds of cars by a defect on a localized portion of the overhead network.

While the schedules in force at night must be determined by the traffic rather than by the power-station requirements, something can be done on large systems to arrange the starting times of the cars from common points so that the most violent peaks can be avoided. If all the night cars of a city, for instance, start at the same time from a central square for runs to the outlying districts, neglecting the inbound service, and if this is repeated each hour, more station capacity will need to be turning over under steam than where a little spacing is practised in the starting out of the night service. Back at the power station the requirement of operating the fewest number of machines possible and loading those in service as fully as can be done is the desideratum no less by night than during the daylight hours. Special care to keep down the number of units in service will be worth all that it costs in watchfulness.



**STEEL CARS FOR CHICAGO RAILWAYS COMPANY**

The Chicago Railways Company is just putting into service 50 all-steel surface cars of the pay-as-you-enter type. These cars were built by the Pressed Steel Car Company, Pittsburg, and include in their design many new and interesting features.

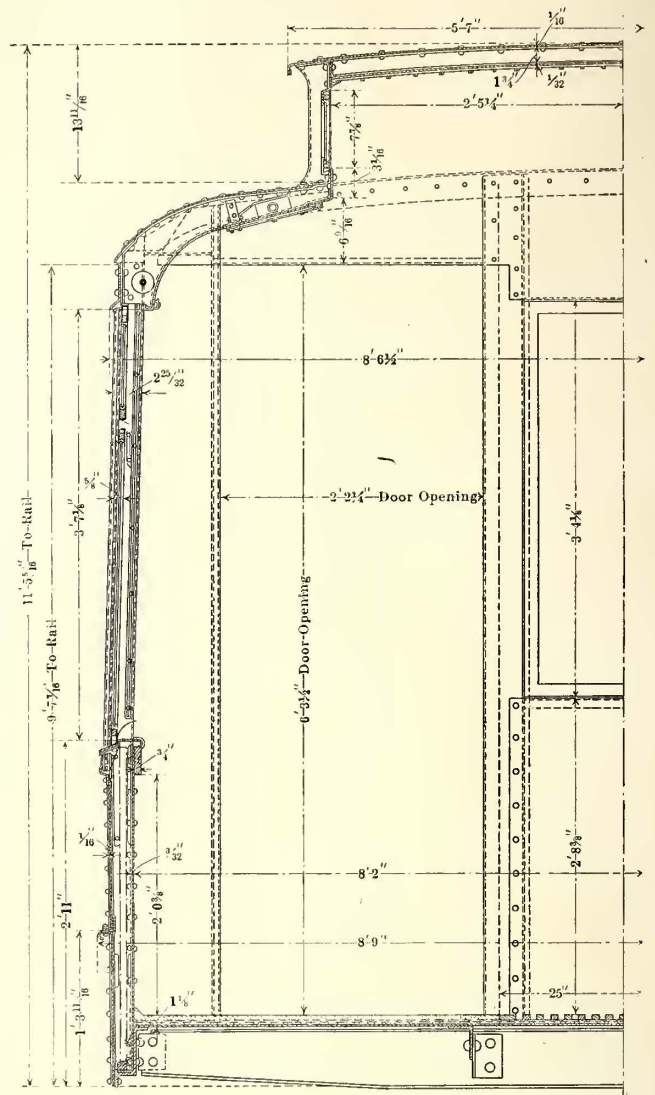
The following are the principal dimensions of this type of car:

Length over bumpers.....	49 ft. 2 in.
Length over end panels.....	32 ft. 5 in.
Truck center distance.....	20 ft. 1 in.
Length truck center to platform ends.....	14 ft. 6½ in.
Width over drip rails.....	8 ft. 6½ in.
Width over belt rail.....	8 ft. 8 in.
Width over guard rail.....	8 ft. 9 in.
Height, top of rail to top of trolley board.....	11 ft. 8 in.
Window post spacing.....	2 ft. 8 in.
Height, bottom of sill to rail.....	2 ft. 9⅝ in.
Diameter of wheels, cast iron.....	33 in.
Diameter of wheels, steel.....	34 in.
Seating capacity.....	40 persons

The accompanying engravings illustrate the general appearance of these cars and some of the many unique details of construction. In general the design of the steel cars differs little from that of the 600 wooden cars built for the same company by the Pullman Company and described in the *ELECTRIC RAILWAY JOURNAL* for Nov. 7, 1908. The principal difference in the car bodies, other than in the material used in their construction, is that the steel cars have drop sash. This arrangement of windows was used so that the weight of the framing might be kept low. This window arrangement is not so objectionable in steel cars as it would be in wooden cars. By the use of steel sash and steel window posts any water leaking into a drop window pocket will not cause the sash to warp or bind, as would be the case with wooden sash arranged to drop in pockets.

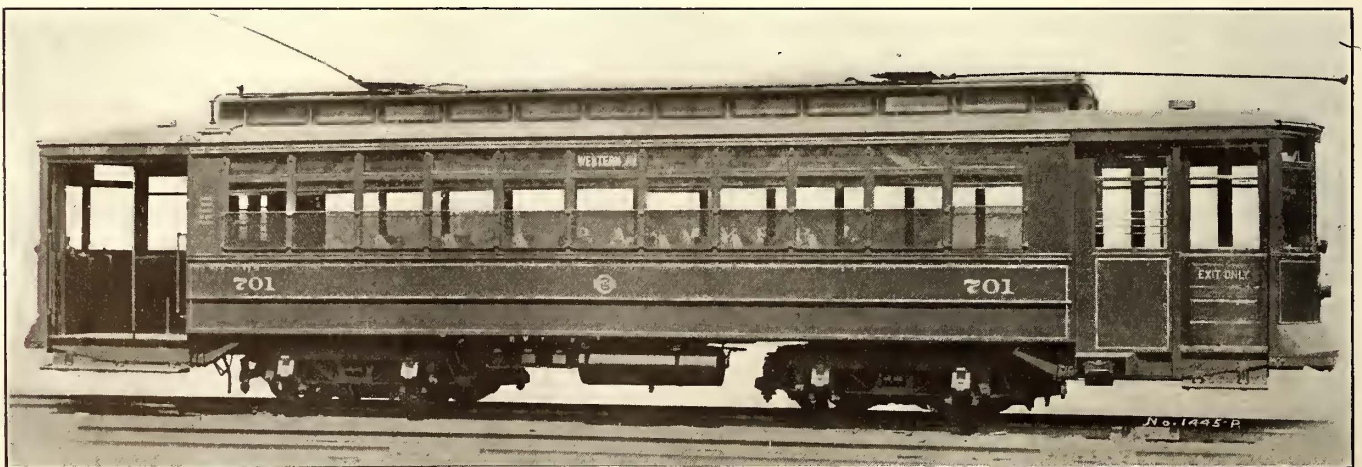
The principal reasons favoring the choice of steel cars were the following: With the possibility of subways for surface traffic in the downtown district of Chicago, it was thought desirable to design a type of car suited for underground service; also the steel car was thought to be more sanitary, to have an increased life over wooden cars, and to eliminate the fire risk and possibly lower the mainte-

company previously mentioned. The estimated weights of the new cars are 52,700 lb. summer and 53,000 lb. winter. The approximate weights of the parts are: Body, complete



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**Chicago Steel Cars—Half Cross Section**



**Chicago Steel Cars—Exterior View**

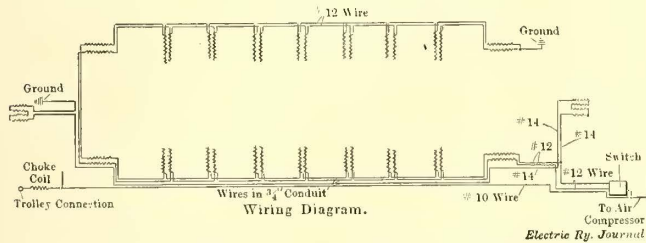
nance cost. The prospect that all-steel cars may eventually become standard on city railway systems was also considered. The design for the body of this car has been so carefully studied that the new cars weigh practically the same as the wooden pay-as-you-enter cars of the same

with equipment for summer, 26,420 lb.; body alone, 19,800 lb.; trucks, with 575-lb. cast-iron wheels, 14,800 lb.

The entire car structure, with the exception of trolley boards, doors, steps and floor mats, is of metal, comprising largely structural and pressed-steel shapes. The specifica-



tions for these cars stated that "structural steel shall have an ultimate strength between 60,000 lb. and 70,000 lb. per square inch, elastic limit not less than one-half of the ultimate strength, elongation 22 per cent, bending test 180 deg. to a diameter equal to the thickness of piece tested, without cracks or fracture on outside of bent portion." The steel plates were made of open-hearth mild steel. The body framing, consisting of rolled and pressed shapes, was so designed that the stress in any section would not exceed 12,500 lb. per square inch with the maximum loading of the car. The outside panels are flat steel plates 1/16 in. thick, sloping in in a straight line from just below the window rail to the bottom of the side sill. This slope is approximately 1 in 44. The posts are arranged so that the lower side sashes drop into pockets provided between the outside panels and the inside lining of the car. These pockets are provided with hinged caps, and rubber stops are placed at each corner of each sash pocket.

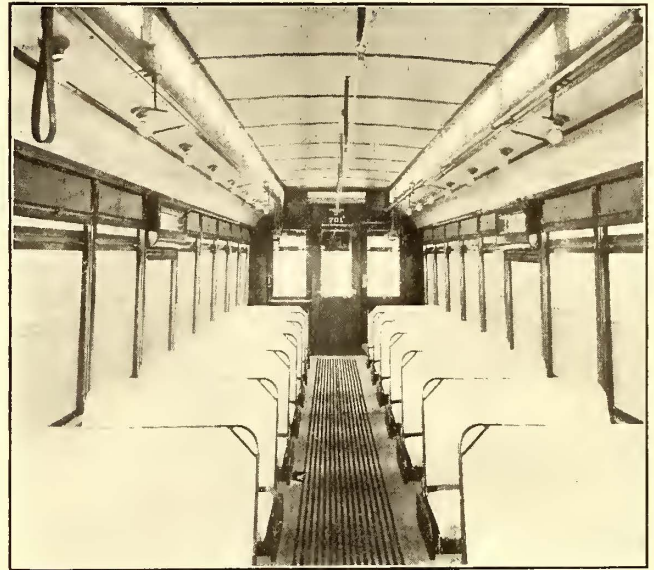


Chicago Steel Cars—Wiring Diagram of Heater Circuits

The underframing consists of two 5-in. Z-section side sills weighing 11.6 lb. per foot, cross-connected with pressed-steel sections having the shape of the letter U laid on its side. Intermediate sills are so disposed as to best

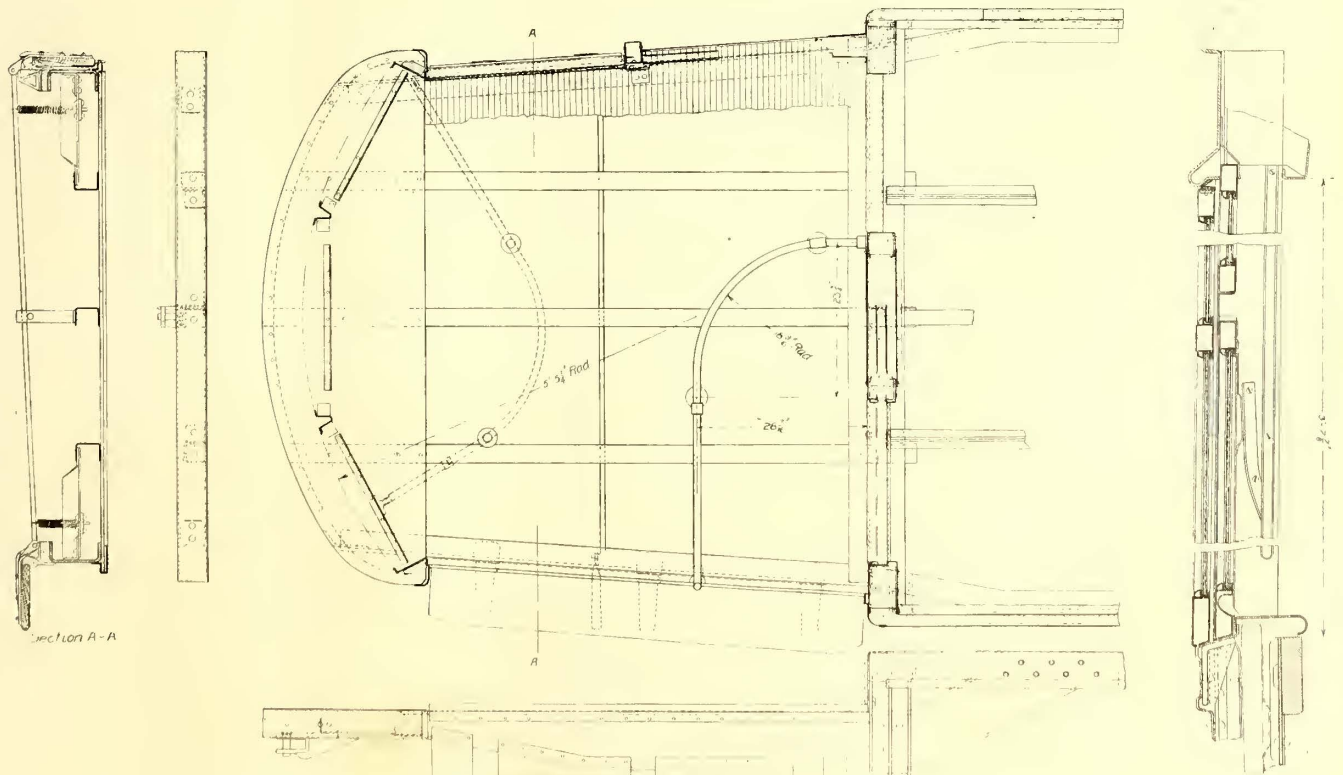
drop of 10 in. between the top of the knees and the top of the body framing.

The monitor deck extends from end to end of the car body and is supported by steel carlines at each post. The upper deck is covered with 1/16-in. steel plates and the



Chicago Steel Cars—Interior View

lower deck with 3/64-in. steel plates riveted to the roof framing with 3/16-in. tinned steel rivets. All seams and rivets are soldered to make the steel roof watertight. Trolley boards of yellow pine rest on ash saddles fastened to



Chicago Steel Cars—Details of Platform Framing and Partition Railings

Section Through Side Window

support the heavy parts of the electrical equipment. The body bolsters are made of two pressed-steel channels, placed back to back and tied together with top and bottom cover plates. The two side platform knees are U-sections 10 in. deep, tapered at the ends and supported so that there is a

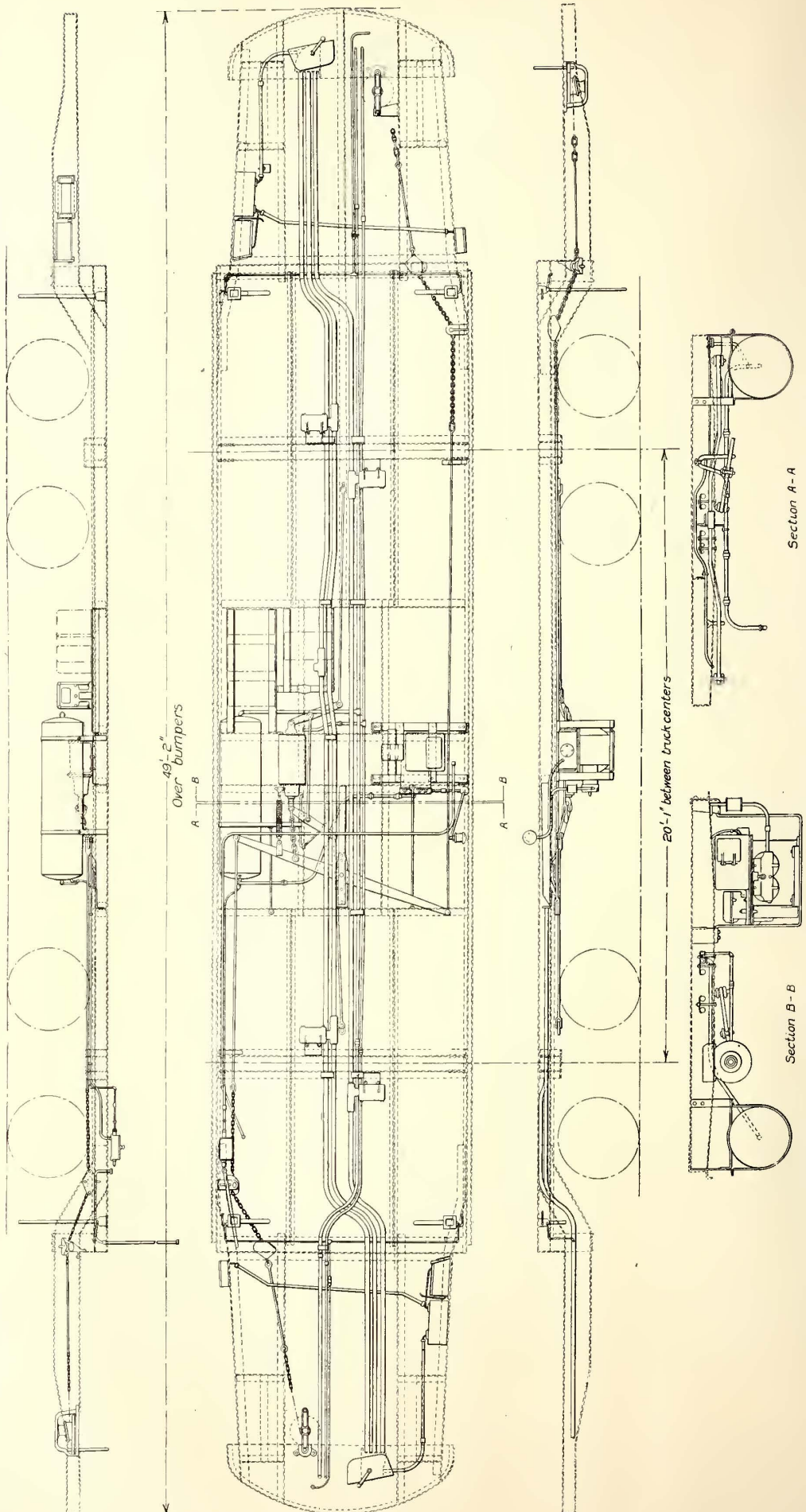
the roof with rubber cushions under each bracket. The insulation of the trolley boards from the steel roof was the subject of special attention by the division of car design of the Board of Supervising Engineers and by the mechanical department of the Chicago Railways Company.



With a view to preventing short-circuits between the trolley fittings and the steel roof the trolley board saddles of ash were boiled for two hours in paraffin before being placed over the roofing canvas. Between these saddles and the roofing canvas is a length of 1/8-in. rubber belting, covered on both sides with insulating paint. The trolley board, 1 1/4 in. thick, which rests on the saddles, also is protected with insulating paint, and all bolt heads are countersunk and covered with compound to further protect the car from short-circuits.

In order to protect the steel roof against short-circuits from broken trolley or span wires it is entirely covered with National prepared roofing canvas. Preliminary experiments were made with ordinary canvas, but this did not fulfill the requirements, because it lacked insulating quality. The experimental conditions were arranged to be nearly similar to those of actual service. A grounded steel plate used in the different tests was covered with the various kinds of canvas and the canvas-covered side was struck with a copper rod connected to the trolley circuit through a 2000-amp circuit breaker. It was found that while the ordinary canvas as applied to the steel plates possessed very little insulating quality, the prepared roofing canvas could be subjected to severe pounding with the copper rod without causing short-circuits.

To fully protect the car against short-circuits there will be placed on the car roof, in addition to the MA13 fuse boxes on the platform sills, two enclosed Noark fuses, one near each trolley base. In the event of a heavy short-circuit these fuses, which are rated at 450 amp, will protect the entire conduit system which encloses the electrical wir-

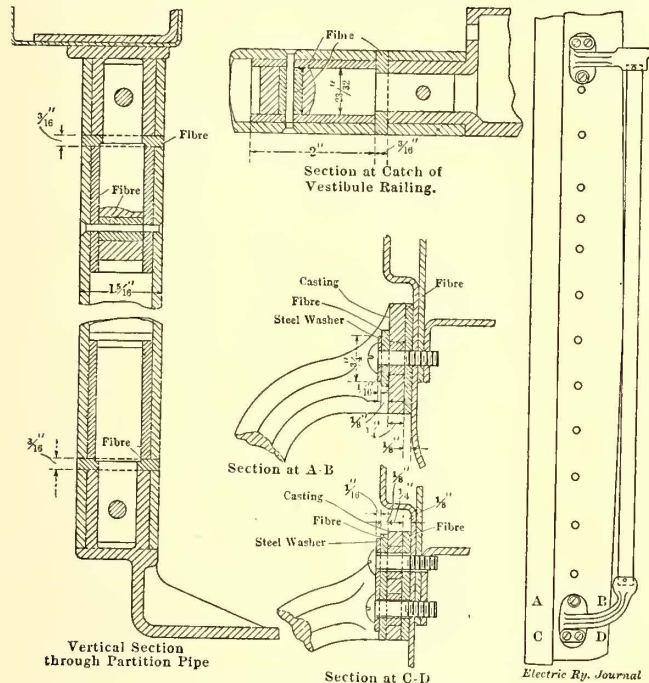


Chicago Steel Cars—Plan of Underframing, Showing Location of Electrical and Brake Equipment



ing. The platform circuit breakers are arranged normally to open on ordinary surges.

These cars have a "carbolith" composition flooring in the body and platforms, supported on Ferrolinclave steel sheets riveted to the underframing. The monolithic floor is  $\frac{5}{8}$  in. deep above the metal, except at the sides of the car, where it is brought up an inch above the floor level to provide drainage away from the steel car lining. Maple floor-

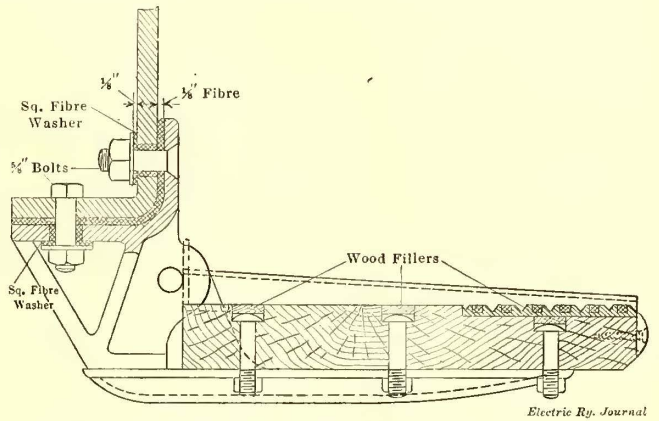


Chicago Steel Cars—Insulation of Grab Handles and Partition Pipe

mat strips  $\frac{5}{8}$  in. deep and spaced  $\frac{1}{2}$  in. apart are secured in the aisle so that they can be renewed readily. Wooden doors are used in these cars, because they are lighter and cheaper than steel doors and because the possibility of using the cars in subway service is rather remote at present. The vestibule folding and sliding doors are solid cherry.

As earlier stated, the car bodies are arranged for collecting fares according to the system of the Pay-as-You-Enter Car Corporation. The arrangement of platform railings is the same as that described for the wooden cars of the Chicago Railways Company, and the doors in the bulkheads also are arranged one to swing and the other to

The car body has five sets of windows on each side, with two upper sash and two lower sash in each set; the lower sash is arranged to drop into pockets, as earlier described. The window openings are 30 in. high. Storm sash are provided for all side windows, and these sash conform in material and finish to the permanent sash. All window sash are made of steel and were supplied by the Hale & Kilburn Manufacturing Company.



Chicago Steel Cars—Insulation of Platform Steps

The seating plan for the new steel cars is the same as that for the 600 wooden cars earlier mentioned. It includes longitudinal seats at the ends of the cars and cross seats in the center. The seat and cushion frames are of pressed steel. The metal trimmings inside the cars are cast bronze held in place by oval-headed screws.

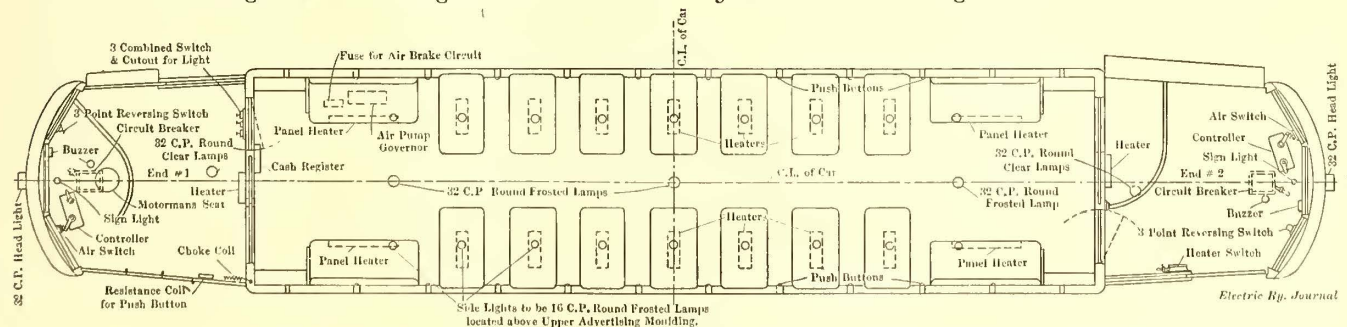
These new all-steel car bodies will be mounted on Pullman No. 150 trucks, and will carry the same electrical and braking equipment as that described in an earlier issue for the 600 wooden cars.

The following is an abstract of the specifications for painting these steel cars:

Material: All color used in the painting of these cars shall be of the Moser-Valentine, Sherwin-Williams make, or equal. Varnish shall be of Beckwith-Chandler, or equally good and approved guaranteed paint or varnish.

All exposed, rough, unfinished steel requiring a smooth surface, such as side sills, etc., to be painted as follows:

1. To be thoroughly cleaned.
2. Primed with special steel primer.
3. Puttied and plastered where necessary.
4. One coat of lead color.
5. Three coats of rough stuff.



Chicago Steel Cars—Floor Plan, Showing Location of Lights, Heaters and Other Equipment

slide, as in the standard design. The pay-as-you-enter division rail and stanchion are insulated from the steel framework of the car. The folding steps are to be covered with wood treads, and all grabhandles and metallic parts will be insulated with fiber washers and bushings for the protection of passengers whenever the car becomes insulated from the rail. An abrasive top dressing will be inserted in the carbolith floor at the top of the steps.

6. Rub smooth with pumice.
7. Three coats of color.
8. Ornamented, lettered and striped.
9. One coat of rubbing varnish to be rubbed.
10. Two coats of heavy body wearing varnish.

All exposed smooth steel, such as side panels and end panels, letter boards, etc., to be painted as follows:

1. Thoroughly cleaned with emery and washed with benzine.



2. One coat of steel primer.
3. All defects to be puttied.
4. Two coats of surfacer.
5. Rubbed down.
6. Three coats of color.
7. Ornamented, lettered, numbered, striped, etc.
8. One coat of rubbing varnish, to be rubbed.
9. Two coats of heavy body wearing varnish.

Interior painting and varnish: Doors and sash to be painted and varnished on outside same as steam railway practice.

All inside finish, including inside of doors and sash, to be finished imitation cherry, dull finish.

1. Primed with special steel primer.
2. All defects to be puttied.
3. Two coats of color, grained or tinted.
4. Two coats inside finishing varnish.
5. Rubbed dead, or what is known as oil finish. No shellac to be used.

Ceiling:

1. To be painted with one coat of light primer.
2. All defects to be puttied.
3. Two coats of ceiling color, flat.
4. One coat of color and varnish.
5. Ornamented and striped.
6. One coat of varnish rubbed dead.

Underframe:

1. One coat of red lead.
2. Finished with one coat of varnish and mineral mixed.

Miscellaneous: All joints to be red leaded before assembled. All framework and furring to be well painted with red lead. Back of steel headlinings to be well painted before same is put up. Outside color and style of lettering, numbering and striping to be as selected by the railway company. Roof to have three coats of paint mixed with linseed oil and varnished. Not less than 24 hours between each coat of paint, and not less than 48 hours between each coat of varnish.

## SPECIAL TRIPS TO DENVER

A brief account was published in the *ELECTRIC RAILWAY JOURNAL* for July 17 of the special train organized by Charles S. Clark, secretary of the Massachusetts Street Railway Association, to go to the Denver convention and afterward visit the Pacific Coast and return to Boston. The complete itinerary of this special train has just been made public and indicates that it will be even more extensive and attractive than outlined in the preliminary plan. As now arranged, the party will leave Boston by the Boston & Maine Railroad at 1 p. m. Thursday, Sept. 30, and will pass on to the New York Central lines at Rotterdam Junction. Passengers from New York intending to take the train will join it at Utica by leaving New York at 2:50 p. m., Sept. 30. The train will go to Chicago on the New York Central and the Lake Shore & Michigan Southern railroads, and from Chicago to Denver over the Northwestern Railroad, reaching Denver at either 9:40 p. m. Saturday, Oct. 2, or about 8 a. m. Sunday, Oct. 3, as desired. It will be parked in Denver, so that the passengers can use the sleeping cars instead of going to a hotel, if they wish.

On Saturday, Oct. 9, at the close of the convention, the train will leave Denver over the Denver & Rio Grande Railroad at 2 a. m., passing through the Royal Gorge by daylight; will reach Salt Lake City Oct. 10, at 10 a. m., and will spend a day there. The party will then travel by the Oregon Short Line, the Great Northern Railway, the Alberta Railway & Irrigation line and the Canadian Pacific Railway to Calgary and Banff, where a stop will be made from 5 p. m., Oct. 12 to 12 noon, Oct. 13. On Thursday, Oct. 14, the train will arrive at Seattle by the Northern Pacific Railway. Oct. 15, 16 and 17 will be spent

in Seattle, where the train will again be parked, so that passengers may use the sleeping cars if desired. On Sunday evening, Oct. 17, the train will leave Seattle by the Southern Pacific Railway for Portland, where Monday morning will be spent, and will arrive in San Francisco at 6 p. m. Tuesday evening. Wednesday and Thursday, Oct. 20 and 21, will be spent in San Francisco. Leaving there Thursday evening and traveling by the Southern Pacific Railway, the train will go to Santa Barbara, where a stay of five hours is scheduled, and thence to Los Angeles, where Friday and Saturday, Oct. 22 and 23, will be spent. The train will leave Los Angeles by the Southern Pacific Railway 10 a. m. Sunday, Oct. 24, and will arrive at El Paso Monday, Oct. 25, where a stay of eight hours has been arranged. Three hours will be spent at San Antonio on Oct. 26; then the train will run through Houston to New Orleans, where a stay of 16 hours will be made. The return trip will be by way of Memphis, Louisville, Cincinnati, Cleveland and Buffalo.

The cost for the New England party, as announced by Mr. Clark, will be: tickets, \$136.75; berth in sleeping car, \$69.75; cost of meals in dining car, \$45.25, making a total of \$251.75. In addition, a charge of 5 per cent, or \$12.60, will be made for incidental expenses to constitute a fund to care for parking of train and other items which cannot be foreseen. If there is any residue from this fund after the bills are paid it will be refunded pro rata. This will make the charge of one person, with berth, \$264.35. If a stateroom accommodating two persons is taken instead of a berth, the charge will be \$150, instead of \$69.75 each. A drawing-room, accommodating three persons, will cost \$225. Henry L. Wilson, treasurer of the Boston Elevated Railway, has consented to act as treasurer for the party. Persons desiring accommodations should make application to Charles S. Clark, 70 Kilby Street, Boston, accompanied by check of \$50, payable to Mr. Wilson's order.

It is important to add that the Southern Pacific Company, which owns the New York-New Orleans Steamship lines, has announced that those of the party who desire to go to New York via water instead of by rail will have the privilege of doing so without extra charge. The Southern Pacific Company has also made the announcement that any persons who are not in the party, but who desire to visit Seattle, San Francisco, Los Angeles and New Orleans, can have the benefit of the special round trip rates quoted above until Nov. 4. Those who wish to take advantage of this offer should ask the lines from whom they secure their Denver tickets to extend these tickets to Seattle, and see that their coupons read by way of the Union Pacific, Oregon Short Line, Oregon Railroad & Navigation Company and Southern Pacific. The fare for the round trip from New York going via the New York Central lines and returning via steamer from New Orleans is \$105; returning by all rail from New Orleans is \$107.25. The fare going by the Pennsylvania Railroad and returning via all rail is \$107.25. Tickets reading via Southern Pacific steamer, New Orleans to New York, include meals and staterooms on the steamer.

### CHANGE IN SCHEDULE OF PENNSYLVANIA SPECIAL

A change has been made in the schedule announced for the special train over the Pennsylvania Railroad. This was formerly to leave New York at 3:55 p. m. on Friday, Oct. 1. Instead, the train will leave New York at 9:55 a. m. on Friday, Oct. 1, and will reach Denver six hours earlier than originally planned. The routing of the train after leaving Chicago will be over the Northwestern Railroad and Union Pacific Railroad.



### RECENT REPORT ON RAIL CORRUGATION IN EUROPE

The theory that rail corrugation develops from defects which exist in the rails before they are put into service and is caused by rolling the rails when they are too cool has recently been made the subject of an exhaustive study by Mr. Peterson, manager of the municipal tramways of Dortmund, Germany. Mr. Peterson suggested this explanation at the last meeting of the Street Railway Association of the Rhine Provinces, held at Munster, Westphalia, and his report on the subject has just been issued in pamphlet form by the International Street & Interurban Railway Association.

Mr. Peterson states that this theory has been advanced in the past, especially in the report on rail corrugation presented at the eleventh annual meeting of the German Street & Interurban Railway Association, at Mannheim, in 1907,\* and in a report on the same subject at the Munich convention of the International Street & Interurban Railway Association in September, 1908.† In the latter, the speaker, Mr. Busse, said that he had been able to locate by means of light filing the existence of corrugations 500 mm to 700 mm apart in new rails, and believed that these corrugations were produced in the final passes of rolling the rails. Mr. Busse also stated that one of the principal inherent causes of corrugation was the structure of the metal in the rail, and called attention to the necessity of using the greatest amount of care in rail manufacture, especially in finishing the rail. Mr. Peterson also referred to the studies on the subject conducted by Messrs. Fell, of London, and Perroud, of Paris, both of whom were quoted as saying that rails in general have a rough or slightly corrugated surface immediately after leaving the mill.

Fig. 1 shows an apparatus designed by Mr. Peterson to measure the smoothness of the surface of the head of a rail. With it the corrugations of two adjoining rails in a track, welded at the joints, were measured, and it was found that while each rail was corrugated, the corrugations were of different lengths and depths, showing that the direction of movement of the cars did not influence the formation of the waves. Mr. Peterson then took several rails at random from an electric railway track in process of construction and had their heads slightly planed. They were then measured by the apparatus and found to contain a series of slight but very characteristic corrugations, although

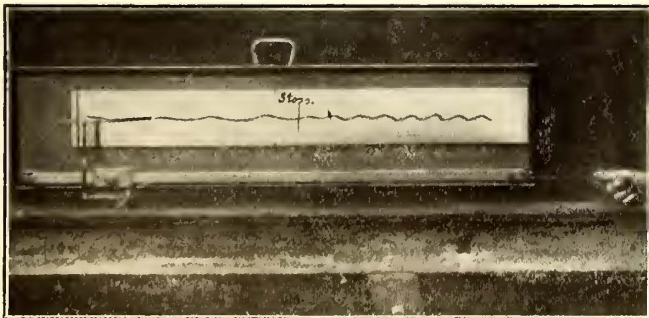
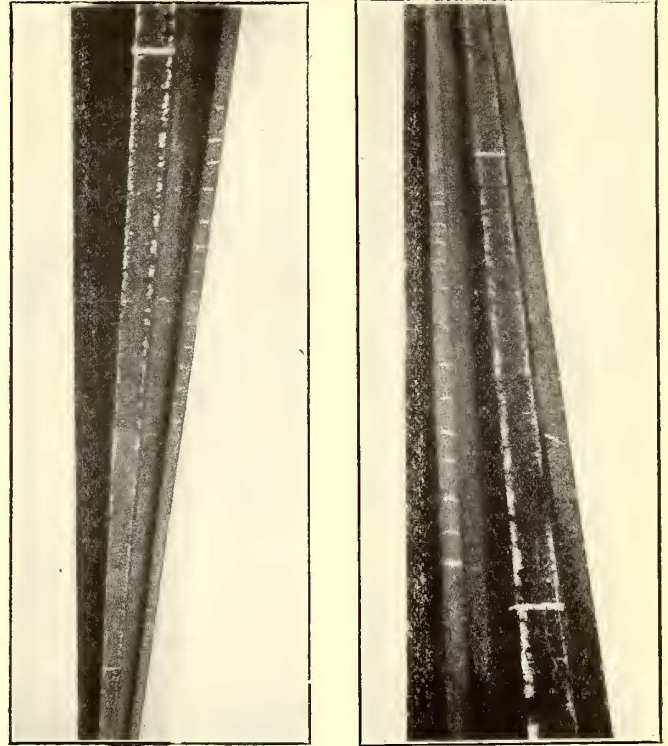


Fig. 1—Rail Corrugation—Apparatus for Measuring Waves

none of the rails had been in contact with a car wheel. These rails had a tensile strength of 75 kg per square millimeter, with an elongation of 10 per cent. It was found, moreover, that at the rail ends which had last left the rolls in the mills the corrugations were much shorter and more marked than at the other end of the rails. These

rails are shown in Figs. 2 and 3, and the white spots indicate the crests of the corrugations. A nick was made on the lips of the rails directly opposite each crest, and they were put in service. The period which has since elapsed was too short to permit Mr. Peterson to draw conclusions which were absolutely definite, but it was apparent that corrugations were in process of being formed at the points which he had previously marked.

Mr. Peterson then discussed the process of rolling



Figs. 2 and 3—Rail Corrugation—New Rails with Corrugations Marked

grooved rails, which he said was so complicated that only a few mills had been able to do it successfully. He explained that the relation between the energy consumed by the rolls in a mill and the temperature of the ingot rolled has recently been made the subject of a careful investigation by Mr. Puppe. (See *Stahl und Eisen*, Vol. 1909, Nos. 1 and 5.) According to this authority, a bloom in passing through the rolls does not advance at a speed uniform with the speed of the periphery of the rolls, but its movement is a series of irregular advances and halts, each of which produces a characteristic mark on the surface. The higher the temperature, and hence the greater the plasticity of the metal, the more nearly constant is the rate of advance of the bloom. As the temperature falls, the resistance to passage through the rolls increases, while the frictional force tending to pull the bloom forward remains nearly constant. Hence the advance of the bloom lags materially behind the periphery of the rolls, and the characteristic marks which later develop into corrugations are close together.

The diagram, Fig. 4, taken from *Stahl und Eisen*, 1909, No. 1, shows the relation between energy and temperature, mentioned above. The ordinates indicate the number of cubic millimeters of metal in the bar displaced by the expenditure of 1 kg meter of energy in the rolling. That is  $S_1$  is the original section in square millimeters,  $S_2$  is the reduced section in square millimeters, and  $L$  is the original length in millimeters. The three lines on the diagram

\*See *Street Railway Journal* for November 9, 1907, page 948.

†See *Electric Railway Journal* for November 7, 1908, page 1323.



refer to three ingots of soft basic steel of about 40 kg per square millimeter tensile strength, which were rolled into flat plates. The diagram shows that the energy required to roll these ingots at 1220 deg. C. was about double that at 1320 deg. C., and that the malleability of the metal decreased rapidly with its temperature. Although the diagram, Fig. 4, was obtained in rolling a rolled plate, the same conditions apply very closely in rolling grooved girder rails.

Owing to the usual requirements of electric railway companies regarding tensile strength and elongation in the

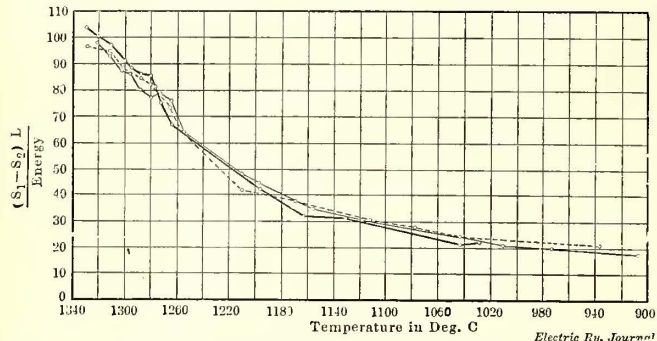


Fig. 4—Rail Corrugation—Diagram Showing Relation Between Temperature and Energy Required in Rolling

rails purchased by them, the average temperature at which these rails are rolled rarely exceeds 1140 deg. C., and in European mills they are generally given 12 passes through the rolls. At each pass the section, of course, approaches more closely that finally required, and during the last two passes the groove is rolled in the head, which, up to that time, has been flat (see Fig. 5). By this time the rail has lost a considerable amount of its initial heat, and when the groove is rolled the molecules in the ingot offer great resistance to the forces required to displace them. To balance the pressure which has to be exerted on one side of the head during these two final passes, it is customary in European mills to enlarge the base of the rail directly below the tread, as shown in Fig. 5, on the eleventh pass, and at the twelfth or last pass to restore the base to its original section.

If the accuracy of this theory of rail corrugation is admitted, Mr. Peterson believes that it is not difficult to explain all of the peculiar characteristics which have been observed in regard to it. For example:

(1) The corrugations always commence on the side of the tread next to the groove.

The tremendous power exerted in rolling the groove in

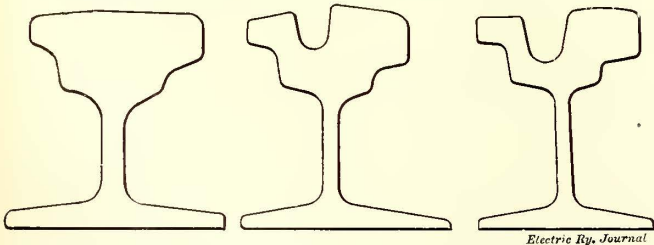


Fig. 5—Rail Corrugation—Sections at Ends of Tenth, Eleventh and Twelfth Passes

the head of the rail breaks down the structure of the metal. It is not surprising, therefore, that the first trace of corrugation should appear in this part of the head.

(2) The crests disappear after a certain period of time.

The breakdown in the structure of the metal is largely on the surface, and penetrates only to a certain depth in the head of the rail.

(3) The reappearance of the same corrugations after their temporary removal by grinding.

The grinding is not carried below the original surface far enough to reach homogeneous and unharmed metal.

(4) The reappearance of corrugations of other lengths at points where corrugation had previously been observed.

During the eleventh pass the rolls produce internal disturbances in the metal tending to produce corrugation; but these disturbances are situated in the head of the rail at a greater depth than the strains set up during the last pass, which produce the initial corrugations.

(5) The disappearance of corrugation after welding a strip of soft iron on the head of the rail.

The operation of welding by an electric arc heats the rail head to a very high temperature, and in cooling down the structure of the molecules, which was broken down by the rolling, is allowed to re-establish a certain equilibrium equivalent to annealing.

(6) The appearance of corrugations only at certain points of the same rail.

The metal while being rolled did not possess at all points a uniform temperature, or else some parts of the rail presented greater resistance during the work of rolling.

(7) T or Vignole rails are less subject to corrugation than girder rails.

The rolling of these rail sections is a more simple operation than the rolling of grooved rails.

To explain the development of the incipient corrugation existing in the rail into that noticed after the rail has been



Fig. 6—Rail Corrugation—Head of Rail, Showing Corrugations and Bridging Spots

in service for some time, Mr. Peterson quoted the following remarks on rail wear contained in an address of Dr. C. B. Dudley in 1880 before the American Institute of Mining Engineers:

No two surfaces ever have been made, or can be made, that are absolutely smooth. At the very best, the smoothest surfaces are made up of elevations and depressions, very minute, it is true—perhaps almost infinitesimal and entirely incapable of measurement—but nevertheless real elevations and depressions. When these elevations and depressions are tangible, we call the surface rough; when they are infinitesimal, we call it smooth. If, now, this reasoning is correct, the surface of the head of the rail, as well as that of the circumference of the wheel above it, are made up of elevations and depressions, which, when the two surfaces are in contact, must more or less fit into one another. And it is this fitting in of the minute elevations and depressions of the two surfaces that gives rise to friction. If the two surfaces were absolutely smooth there would be no friction, and consequently no tractive power in the locomotives, nor would the wheels under the cars turn around. Friction of this kind we are accustomed to call rolling friction. In reality, then, a rail and the wheel which rolls above it may be regarded as a rack and pinion with infinitesimal teeth, lacking, of course, the element of regularity as to the position of the teeth which characterizes a rack and pinion. \* \* \* If we are right in regard to the nature of the surfaces involved in wear and the strains produced, wear is simply the breaking or pulling off of the infinitesimal teeth by the strains to which they are subjected.

This theory of rail wear could be applied to explain corrugation in a rail whose molecules had been compressed at different regular points by the rolls by assuming the



molecules on the head of the rail to represent the alternate elevations and depressions described by Dr. Dudley. It is then evident that at the points where the molecules are farther apart there are fewer elevations to withstand the tractive effort exerted on them. Consequently the rail surface breaks off more quickly at these points than at the points where the molecules are compressed. The result is that under the effects of wheel wear valleys and crests are created and corrugation appears.

After having thus considered the causes of corrugation, Mr. Peterson took up methods of overcoming it. One was to carry out the work of the last pass of the rolling at a high temperature either by reheating the rail after the first few passes or else by heating the ingot to a higher initial temperature. The latter plan incurs the danger of a sacrifice of tensile strength, a quality for which the railroad companies have been increasing their demands. Mr. Peterson thought, however, that all reasonable requirements of tensile strength could be secured, and referred to the advantages of softer rails as given in Mr. Busse's Munich report, and to the conclusions of Dr. Dudley's report to the Railway Congress in Paris in 1900. This latter report stated that in rails with a double head or with a very simple profile the tensile strength could, without inconvenience, be carried to 85 kg per square millimeter, while for rails with a large base the tensile strength if possible ought not to exceed 75 kg per square millimeter, on account of the rapid cooling of the flanges, a cooling which creates great interior tension and increases the danger of breakage.

Another method is to use steel made in the electric furnace, as this steel seems to possess much more homogeneity of structure than that obtained by the basic converter process. Open-hearth steel, in which the period of mixing

chemical analysis. These chemical analyses had not been terminated at the time of the presentation of the paper by Mr. Peterson. Fig. 6 shows the rail which was examined; the hard points are marked in white.

Mr. Peterson terminated his remarks by stating that the section of the rail shown in Fig. 6 possessed five corrugations perfectly marked. There was, however, a somewhat remarkable bridging of one of the valleys. In place of concentrating at a crest, there was a collection of hard points spaced uniformly between two crests, as shown at the point *a* in Fig. 6, and the metal on the head of the rail at this point was at the same height as at the crests. Mr. Peterson did not have time before the meeting to investigate the cause of this singular condition, nor to examine the rail at this point further in detail.

**PREVENTING ACCIDENTS IN SYRACUSE**

The Syracuse Rapid Transit Company, of Syracuse, N. Y., has been carrying on a school of instruction for motormen and conductors for the past three years with satisfactory results. Elaborating upon the work of this school, the company has lately tried the experiment of conducting special classes for employees of the transportation department, devoted primarily to giving the men instructions relative to the things that can be done by the motormen and conductors to prevent accidents and the manner of taking care of accidents after they occur. The idea is to hold two main classes each year. One is conducted in the spring, just before the open cars are put into service, and one in the autumn before the leaves begin to fall, and trouble may be expected from slippery tracks. The classes are conducted under the general supervision of J.

**RECORD OF ACCIDENT REPORTS BY DIVISIONS**  
Showing Number of Witnesses per Accident  
From July 22 to July 29, 1909

DIVISION	Accidents	Witnesses	DAYS OF WEEK							TOTAL	TOTAL BY WEEK	TOTAL						
			SUN	MON	TUE	WED	THU	FRI	SAT				1	2	3	4		
SALINA	2	4		1		1		1										29
MIDLAND-BUTTERNUT	1	1				1												14
DUDLEY-EAST GENESEE	2	2		2		3												21
UNIVERSITY-OAKWOOD	1	1															*	7
ELMWOOD-EASTWOOD																		18
OAK-VALLEY								1										7
SOLVAY-WEST GENESEE	1	3		1		1												16
PARK-SUMMIT																	*	44
EAST SYRACUSE-MINOA								1									*	6
LIVERPOOL-ROCKWELL	1	1															*	3
REMARKS																		

Accident Record Bulletin Board

requires several hours, ought also to be valuable in the manufacture of tramway rails.

Finally, Mr. Peterson gave some results obtained by filing a piece of corrugated rail. He found that the rail could be much more easily filed in the valleys than in the crests of the corrugations. When the filing was carried more deeply into the crests, small and excessively hard grains were found, forming the backbone of the crests. An attempt was made to analyze chemically several of these grains, but the operation was difficult, for they were extremely hard, and it was difficult to obtain enough grains to make a

**Watch Out!** *Let's Beat the Record*  
For **JUNE 1908**

**BOARDING and ALIGHTING 106 Collisions 26**

**Shout Out "Wait Until The Car Stops"**  
*Look In - Out and Around Before Starting Car.  
Be Careful When Entering Curves - Not Too Fast.  
Look Back Before Starting Car.  
Do Not Drag Your Car.  
Report Everything.*

*Get All The Witnesses You Can*

June 1st, 1909 *John E. Duffy, Supt.*

Warning Placard Displayed in Lecture Room

E. Duffy, superintendent, and the lectures or talks are given by W. F. Weh, claim agent, and Dr. Francis J. Ryan, the company's surgeon. At different periods during the year other than the time at which the two regular classes are held, the men are called together and further instruction given them. It usually takes four or six sessions, held at different hours of the day and night, to cover the entire force of employees.

In addition to the courses of instruction on the prevention of accidents, the thought has been to enhance the results by creating and stimulating a spirit of rivalry and



competition among the different divisions for the credit of having the fewest accidents at the end of each week. At each operating station there is a large bulletin board the features of which will be understood from the photograph reproduction. On this blackboard are entered with chalk the number of accidents and the number of witnesses reported per accident on each division for each day, for the week, and for the month. A golden star is placed after the divisions having the fewest accidents for the month, and these are known as the "star lines."

The spirit of rivalry and the interest of the men are kept alive by issuing weekly bulletins, letting the men know the status with respect to the number of accidents for the current periods compared with previous years. The opportunity of congratulating the men for work well done is always welcomed. It is believed these bulletins are an added stimulus to the employees to keep up the good work, and especially so to those who are earnestly striving to improve the accident situation.

For use in the lecture room and also for display at the different operating stations, large placards or banners were printed, a few of which are also shown. These show the numbers and classes of accidents for the corresponding month of the previous year. They also contain short, trite phrases on the subject of avoiding accidents, such as, "Shout out, Wait until the car stops!" "Look in, out and around before starting car," etc.

Along the line of encouraging and stimulating the men to continued efforts in the prevention of accidents, cards measuring  $3\frac{1}{4}$  in. x 6 in., are issued once a month giving suggestions, reminders, lists of "don'ts," etc. The subject matter of the cards is changed each month, with the idea of sustaining the interest in them. The cards are distributed at each station on the first of the month by the car-house foremen. The text matter of the cards for July and August is printed below; the two first are for July, the other two for August. All bear the printed signature of J. E. Duffy, superintendent.

#### A FEW DON'TS FOR MOTORMEN

1. Don't think you own the street.
2. Don't hit the rig if it stays on the track all day.
3. Don't be careless at cross streets, schools or engine houses.
4. Don't drag your car. Either stop or go ahead.
5. Don't get too near the car ahead.
6. Don't start your car with a jerk or take curves too quickly.
7. Don't start your car until you have looked back for the safety of your passengers.
8. Don't take chances with anything or anybody. Be sure you are right before going ahead.
9. Don't forget your duty at railroad crossings.
10. Don't pay attention to passengers on the front seat.
11. Don't lose your head after the accident happens. Get busy and help the conductor.
12. Don't talk about your car being late or about any accident to any person except an official of this company.

#### JULY RESOLUTIONS FOR CONDUCTORS.

1. I will look in, out and around before giving two bells.
2. I will make sure that people are on or off the car before giving two bells.
3. I will get as many witnesses as possible.
4. I will do the best I can for the company's interest.
5. I will not talk unnecessarily long with any passenger.
6. I will make sure of everything and everybody.
7. I will do my whole duty at railroad crossings.
8. I will not let any passenger off in an unsafe place.
9. I will look around before giving four bells.
10. I will not have an accident during July.
11. I will not talk about my car being late or about any accident to any person excepting an official of this company.

#### AUGUST RESOLUTIONS FOR MOTORMEN.

1. I will do my best to prevent accidents on my car during this month.
2. I will be especially careful at railroad crossings.
3. I will have my car under perfect control before entering curves.
4. I will keep the chain hooked on the front part of my car.
5. I will avoid unnecessary conversation with passengers.
6. I will prevent collisions of all kinds by being on the safe side, taking no chances and keeping car under absolute control when approaching cars and vehicles of all kinds.
7. I will not start my car with a sudden jerk or stop it so abruptly that an accident may occur.
8. I will not drag my car, but will either stop or go ahead.
9. I will leave the end of the road on time.
10. I will assist the conductor in every way possible after an accident has happened.
11. I will be especially careful when passing standing cars.
12. I will not discuss accidents with strangers or others who are not officials of this company.
13. I will do my best so that no passengers on my car can alight in an unsafe place.
14. I will look around before starting my car to see that everything is safe.

#### AUGUST QUESTION BOX FOR CONDUCTORS.

1. Why don't you report everything that happens on or near your car?
2. Why don't you make your best effort to get as many witnesses as possible?
3. Why don't you keep your hand off the bell rope until you are ready to give the signal?
4. Why don't you look around before giving four bells?
5. Why don't you make sure that old people and passengers carrying babies are in a safe place before giving two bells?
6. Why don't you keep the chains hooked on your car?
7. Why don't you stop lengthy conversations with passengers?
8. Why don't you stop talking about accidents to strangers?
9. Why don't you keep passengers off the running board and steps of your car?
10. Why don't you "shout out" in a loud voice, "Wait until the car stops"?
11. Why don't you change signs and fix guard rails at the end of the line when your car is standing?
12. Why don't you try your best to prevent accidents?

When a new issue of the cards appears the contents are reproduced in the local newspapers in order to let the public know that the company is keenly alive to the importance of reducing the number of accidents and is doing all in its power to instruct its employees and the public in avoiding mishaps.

A point is made of dividing street railway accidents into two classes, those chargeable to the carelessness of employees, and those for which the public is usually responsible. Most mishaps incident to getting off and on cars are due to the carelessness of passengers, and every effort is made to instruct the public to remain seated until the car stops, as to the right and wrong method of getting on and off cars, the necessity of refraining from touching the grab handle while the car is in motion when boarding a car, etc. Accidents such as collisions of cars are usually due to the carelessness of employees, and every effort is being made to instruct the men how to avoid the things that lead to collisions and other accidents.

The management of the Syracuse Rapid Transit Company believes that its effort to secure the co-operation of employees and public in the matter of reducing accidents is having a very appreciable effect, as the number and seriousness of accidents this year show a material reduction as compared with the records of previous years.



## NEW YORK TO CHICAGO BY ELECTRIC RAILWAY

BY J. S. MOULTON, ASSISTANT ATTORNEY, INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK

As far as I am able to learn from many inquiries this is the first trip made from New York to Chicago over electric lines for so large a part of the way. To be exact, the trip started from Hudson, N. Y., because the electric street railway service from New York City extends at present only as far as Tarrytown and the time lost in going to that town and then taking a train of the New York Central & Hudson River Railroad to Hudson would add nothing of value to the journey.

Leaving New York City at 12:30 a. m. by the New York Central road, I arrived at Hudson at 4:47 a. m., which gave me a full hour before taking the car of the Albany & Hudson Traction Company at 6 o'clock. I had breakfast at Electric Park on the line of this road and shortly after leaving there A. P. Deeds, general freight and passenger agent of the company, joined me and traveled as far as Albany. I took there the car of the Schenectady Railway at 8 a. m. and arrived at Schenectady, a distance of 16 miles, at 8:45. I had a few minutes at Schenectady and went to the offices of the company and called on James F. Hamilton, superintendent of transportation. At 9 o'clock I took the car of the Fonda, Johnstown & Gloversville Railroad for Amsterdam and I was sorry to have missed R. M. Colt, general passenger agent of this road, because he gave me so many suggestions before I left New York regarding travel through this part of the country. Arriving at Amsterdam at 9:41 a. m., it is possible to go to Fonda by electric line, but the distance gained is so small that I took the New York Central road to Little Falls, a distance of 39 miles, reaching there at 12:25 p. m. It took two hours to cover the 39 miles between Amsterdam and Little Falls. Leaving Little Falls at 12:30 p. m. on the Utica & Mohawk Valley Railway, the entire route of 23 miles to Utica was a trip that was made beautiful by the scenery. This trip was made in an hour. I remained in Utica, where Albert Eastman, general passenger agent, took me to the offices of the company and I met Mr. Gowen, assistant to the vice-president. At 2:05 p. m. I took the limited car for Syracuse, a distance of 49 miles, which we traveled in one hour and 28 minutes. The country is fully as interesting as that between Little Falls and Utica. I cannot refer to this portion of my trip without thanking Mr. Frankel, the manager of the Stearn Advertising Company, of Syracuse. I called on Mr. Clark, of the Auburn & Northern Electric Railroad and the Auburn & Syracuse Electric Railroad. At 4:30 p. m. I took the car of the Auburn & Syracuse road for Auburn, 26 miles away, and a wait of 30 minutes gave me time for supper and to see a little of the city.

I left Auburn at 6:30 p. m., taking the Auburn & Northern road and the Rochester, Syracuse & Eastern Railroad, by way of Port Byron for Rochester, a distance of 66 miles. The train was on time at Rochester and, getting there at 9:45 p. m., I found I had traveled 387 miles, of which 233 miles were on electric roads. I was not fatigued in the least and, after going to the hotel, went out and walked about the city for an hour. Remaining at Rochester all night, I started at 9:50 o'clock the next morning, taking a local car to the city line, where the car of the Buffalo, Lockport & Rochester Railway started for Lockport at 10:20 a. m. J. M. Campbell, general manager of this road, met me at the Rochester end of the line and went with me to Lock-

port, a distance of 56 miles, and made my ride very enjoyable by explaining the signal system and the interesting points of the country through which we passed. Riding in the motorman's cab gives a much better view of the country. I arrived at Lockport at 12:18 p. m. within a few steps of the car of the International Railway, which leaves there at 12:20 p. m. for Buffalo, 25 miles distant. I reached the latter city at 1:25 p. m. It was remarkable to find that the electric lines, with their long runs and many stops in the different cities and villages, made almost exact schedule time. At Buffalo I called on J. C. Calisch, of the Buffalo & Lake Erie Traction Company. Mr. Calisch said he was glad to meet a man brave enough to undertake so unique a trip. He was wrong in suggesting that bravery was needed, because the trip affords pleasure all the time. At Buffalo I went through the city on a local car to the city line, now called Lackawanna City, where the Buffalo & Lake Erie Traction Company has its terminal. In this trip of 88 miles on the lines of this road to Erie, Pa., the cars pass through a great grape belt. At Fredonia, on this line, I had to wait a few minutes and met Charles G. Lohman, formerly with the Chicago, South Bend & Northern Indiana Railroad. After a beautiful ride of six hours, I reached Erie at 9 p. m., where I remained all night, having covered that day 169 miles entirely on electric roads.

### TRIP ON OHIO LINES

At 7 o'clock the following morning I started over the road of the Conneaut & Erie Traction Company for Conneaut, a distance of 33 miles, arriving there at 8:55 a. m. On this part of the trip I had with me R. W. Palmer, superintendent of the company. A wait of 30 minutes gave me time to set back my watch one hour, as I was traveling then on western time. Leaving Conneaut at 9:30 a. m. on the Pennsylvania & Ohio Railway, I traveled to Ashtabula and there took a car of the Cleveland, Painesville & Eastern Railroad via Painesville, for Cleveland. The distance from Conneaut to Cleveland is 73 miles. Cleveland was reached at 12:50 p. m. and after lunch I left at 1:30 p. m. on a limited car of the Lake Shore Electric Railway for Toledo, a distance of 120 miles, via Sandusky, which was made in four hours and 20 minutes without change. After supper at Toledo I went to the terminal of the Ohio Electric Railway and took the 8 p. m. car of that company for Fort Wayne, Ind., via Lima, Ohio. As I did not leave Toledo until so late, I did not stay on the car until Fort Wayne was reached, but thought it better to stop at Lima, where I arrived at 10:55 p. m. and was met by F. A. Burkhardt, district passenger and freight agent.

On the following morning Mr. Burkhardt met me at the hotel and we went to the offices of the company and met Mr. Dicke and they took the 10:15 a. m. car with me on their line a distance of 60 miles to Fort Wayne, which was reached at 12:10 a. m. At Van Wert, Ohio, the Manhattan limited of the Pennsylvania Railroad, which parallels the electric line at this point, came up, but we passed the steam train and kept ahead of it. At Fort Wayne I had dinner with Mr. Burkhardt, Mr. Dicke and F. I. Hardy, superintendent of transportation of the Fort Wayne & Wabash Valley Traction Company. After supper we took one of the cars of the Fort Wayne & Wabash Valley road to Wabash. Mr. Hardy left me at his home at Huntington. I remained at Wabash that night and started for Warsaw at 8:55 a. m. on the Cleveland, Cincinnati, Chicago & St. Louis steam road. After traveling a distance of 33 miles between these points I reached Warsaw at 11:36 a. m. 30 minutes late. By this fall the road will be from Fort



Wayne to Peru, Ind., on the Fort Wayne & Wabash Valley Traction Company road and thence to Warsaw by electric line, as the road now under construction will make the electric line route complete at that point, and therefore complete in the west.

I left Warsaw at 1:30 p. m. for South Bend, Ind., over the lines of the Winona Interurban Railway and the Chicago, South Bend & Northern Indiana Railway, reaching South Bend at 3:40 p. m. I remained there until 5:30 p. m., taking a limited car on the Chicago, Lake Shore & South Bend Railway for Chicago, a distance of 90 miles, passing through the industrial settlements of Michigan City, Gary and Hammond and reaching Pullman at 8:15 p. m. I took the suburban line of the Illinois Central Railroad to the central district of Chicago.

It took me three full days and 21 hours from the time I left New York City to get to the central district of Chicago. The actual running time was 45 hours and 24 minutes. I traveled 1143 miles, 956 miles on electric cars and 187 miles on steam roads. In one day of a little over 15 hours I traveled 298 miles on electric lines and the best of it all was that I saw the country pretty generally as well as the cities, towns and villages. These places are not seen by the traveler on steam roads. The electric lines pierce these places, the steam roads skirt them. About a year ago I made the trip by electric line to Philadelphia from New York, a distance of a little over 90 miles, and I thought I did well to cover it in nine hours.

The actual traveling time could be reduced several hours and as soon as I finished the trip and returned home I made a careful calculation and found that the actual traveling time could be reduced to 31 hours and 10 minutes. I had a fine and comfortable trip and shall certainly repeat it at the earliest practicable time.

The fare, including all steam fare from New York to Chicago was \$19.67 and the other expenses, including those for four nights at hotels, were \$12.

#### ROADS, FARES AND SCHEDULE

The roads on which I traveled, the time, distance and fare were as follows:

From New York City to Hudson, New York Central road, 115 miles, fare \$2.30, leaving 12:30 a. m., arriving 4:47 a. m.

From Hudson to Albany, Albany & Hudson Traction Company, 38 miles, fare 60 cents, leaving 6 a. m., arriving 8 a. m.

From Albany to Schenectady, Schenectady Railway, 16 miles, fare 25 cents, leaving 8 a. m., arriving 8:45 a. m.

From Schenectady to Amsterdam, Fonda, Johnstown & Gloversville Railroad, 15 miles, fare 25 cents, leaving 9 a. m., arriving 9:41 a. m.

From Amsterdam to Little Falls, New York Central road, 39 miles, fare 82 cents, leaving 10:26 a. m., arriving 12:03 p. m.

From Little Falls to Utica, Utica & Mohawk Valley Railway, 23 miles, fare 35 cents, leaving 12:30 p. m., arriving 1:30 p. m.

From Utica to Syracuse, Oneida Railway, 49 miles, fare 85 cents, leaving 2:05 p. m., arriving 3:33 p. m.

From Syracuse to Auburn, Auburn & Syracuse Electric Railroad, 26 miles, fare 40 cents, leaving 4:30 p. m., arriving 6 p. m.

From Auburn to Rochester, Auburn & Northern Railroad and Rochester, Syracuse & Eastern Railroad, 66 miles, fare \$1.20, leaving 6:30 p. m., arriving 9:40 p. m.

From Rochester to Lockport, Buffalo, Lockport & Rochester Railway, 56 miles, fare \$1.10, leaving 10:20 a. m., arriving 12:18 p. m.

From Lockport to Buffalo, International Railway, 25 miles, fare 40 cents, leaving 12:20 p. m., arriving 1:25 p. m.

From Buffalo to Erie, Pa., Buffalo & Lake Erie Traction Company, 88 miles, fare \$1.75, leaving 3 p. m., arriving 9 p. m.

From Erie to Conneaut, Ohio, Conneaut & Erie Traction Company, 33 miles, fare 55 cents, leaving 7:05 a. m., arriving 8:55 a. m.

From Conneaut to Cleveland, Pennsylvania & Ohio Railway and Cleveland, Painesville & Eastern Railroad, 73 miles, fare \$1.25, leaving 9:30 a. m., arriving 12:50 p. m.

From Cleveland to Toledo, Lake Shore Electric Railway, 120 miles, fare \$1.50 ticket or \$2.10 cash, leaving 1:30 p. m., arriving 5:50 p. m.

From Toledo to Fort Wayne, Ind., via Lima, Ohio, Ohio Electric Railway, 137 miles, fare \$2.10, leaving 8 p. m., arriving in Lima at 10:55, spending the night there and starting at 10:15 a. m. and arriving at Fort Wayne at 12:10 p. m.

From Fort Wayne to Wabash, Fort Wayne & Wabash Valley Traction Company, 45 miles, fare 80 cents, leaving 5:40 p. m., arriving 7:08 p. m.

From Wabash to Warsaw, Big Four Railroad (steam), 33 miles, fare 70 cents, leaving 9:55 a. m., arriving 11:06 a. m.

From Warsaw to South Bend, Winona Interurban Railway and Chicago, South Bend & Northern Indiana Railway, 56 miles, fare \$1, leaving 1:30 p. m., arriving 3:40 p. m.

From South Bend to Chicago via Pullman, Ill., Chicago, Lake Shore & South Bend Railway and Illinois Central suburban service Pullman to Chicago, 90 miles, fare \$1.50, leaving 5:30 p. m., arriving 9:00 p. m.

## THE WORK OF THE ELECTRIC RAILWAY STOREKEEPER

BY G. E. STOCKWELL, GENERAL STOREKEEPER, LOS ANGELES-PACIFIC COMPANY

As a rule, the work of the storekeeper on an electric railroad is not appreciated to anything like the same extent as that of the man occupying the same position on a steam road. The latter has been engaged for a number of years upon plans for systematizing his stock books and standards so as to keep his stock down to a minimum. This work has begun to bear fruit and has made the storekeeper an efficient and important factor in the steam railroad business. The Railway Storekeepers' Association has brought these men together and has enabled them to get results not otherwise obtainable. Many electric railway storekeepers have joined this organization, but though the main object of the storekeeper on the electric road is the same as on the steam road, the materials are different.

Possibly the reason for the lack of appreciation of the importance of the office of storekeeper on the electric road is that the electric roads are younger and many managers consider the storekeeper as a sort of necessary evil. They think that any one can run a storeroom. I know of cases where a clerk has been taken out of an office and made storekeeper. One man whom I have in mind absolutely did not know a lock-nut from a commutator.

The position of storekeeper on the average electric road requires more special knowledge than that on the steam road, because a man has under his charge not only most of the material used on the steam road, but all that used in the electrical equipment. When one considers that about 50 per cent of the operating expenses of a road are for material, it seems obvious that this material should be in charge of a good man. I do not think a road would make any mistake if it required its general storekeeper to be a competent engineer and made him responsible to the general manager alone. He would then be able, from his knowledge of the materials in his charge and the extent of their use, to keep the supply down to the minimum actu-



ally required. If this duty devolves upon the purchasing agent, serious errors of judgment may be made in regard to the rapidity with which material will be required, unless the purchasing agent is also an engineer and is acquainted with the relative demand for the different articles in store.

A storekeeper may consider that after material has been issued he has no further interest in it, but he should be always on the lookout for leaks and then try to remedy them. To secure this, the following rules are in force in the storeroom of the Los Angeles-Pacific Railway Company and every new man is required to memorize them:

- (1) Do not issue a new lamp unless a burned-out lamp or butt is turned in with the requisition for new ones.
- (2) Do not issue a trainmen's lantern without getting an old one for it.
- (3) Do not issue new finished brass goods, such as journal brasses, motor bearings, brush holders, trolley wheels, etc., without getting a scrap or second-hand piece for it.
- (4) When filling requisitions be sure to get all information as given on the bin tag—that is, the proper name and catalog number, if any.

The first rule saves lamps from being stolen from the shops and cars because it makes the foreman responsible, and if an old lamp or butt is not turned in with the requisition, the foreman must give an explanation. If it is a new installation, the requisition is forwarded to the electrical engineer for his approval.

The second rule is based upon a similar reason. On the road with which the writer is connected the trainmaster signs requisitions for the trainmen's supplies, and if an old lantern is not handed in to the storeroom, the signature of the general superintendent is required before a new one is given out. An account is kept of all lanterns by number and this account shows to whom the lanterns are charged, and when an old lantern is turned in the man is given credit for it and an entry is made of the date of return.

The desirability of the third rule is obvious. Commutators are handled in the same manner as lamps and trainmen's supplies, and the brass and copper scrap that disappears is necessarily very small. If no scrap or second-hand material is presented for exchange an explanation is required and the requisition is sent to the general superintendent for approval.

The fourth rule is important to the accounting department. The bin tag contains the data given on the invoice, and if the stock clerk is careful to get all the information on his requisition before it leaves his hands, the price clerk has no trouble in finding either the proper name or price. Under this system practically no requisitions have to be returned to the storeroom for more data.

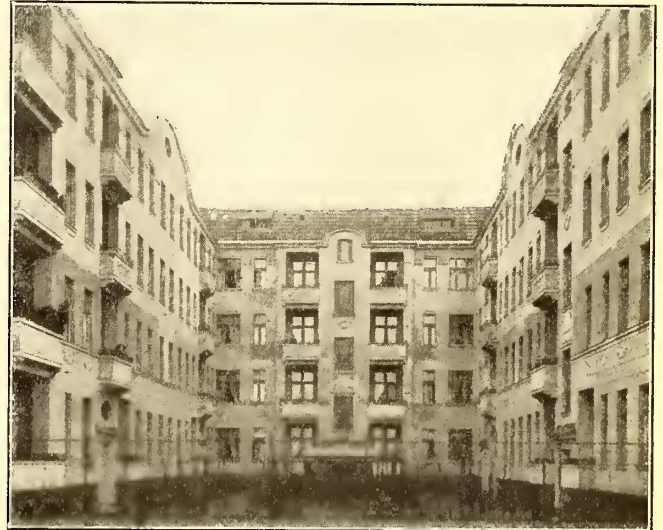
### RATES TO DENVER FROM THE SOUTH AND WEST

The following table shows the one-way Pullman and round-trip railroad fares which have been granted on account of the Denver Convention from the principal cities in Texas and California to Denver:

From.	—Pullman Rates (One Way)—			Railroad Fare. Rd. Trip.
	Berth.	Compt.	Drawing Room.	
Fresno, Cal.....	\$9.50	\$27.00	\$34.00	\$55.00
Los Angeles, Cal.....	9.50	27.00	34.00	55.00
Sacramento, Cal.....	9.50	27.00	34.00	55.00
San Bernardino, Cal.....	9.50	27.00	34.00	55.00
San Diego, Cal.....	9.50	27.00	34.00	55.00
San Francisco, Cal.....	9.50	27.00	34.00	55.00
San José, Cal.....	9.50	27.00	34.00	55.00
Austin, Tex.....	6.50	18.50	23.00	35.30
Dallas, Tex.....	5.00	14.00	18.00	28.70
El Paso, Tex.....	5.50	15.50	20.00	35.00
Ft. Worth, Tex.....	5.00	14.00	18.00	27.40
Galveston, Tex.....	7.00	20.00	25.00	39.75
Houston, Tex.....	7.00	20.00	25.00	37.75
Laredo, Tex.....	9.50	27.00	34.00	44.55
San Antonio, Tex.....	7.00	20.00	25.00	38.40

### CO-OPERATIVE BUILDING ASSOCIATION OF THE BERLIN STREET RAILWAY EMPLOYEES

Several large manufacturing organizations in this country have established building and loan associations to assist their employees in owning homes, but as yet no street railway companies, so far as is known, have undertaken that work here. This, however, is not the condition abroad, where many companies, particularly in Germany, not only assist in maintaining benevolent associations to pay sick and death benefits and pensions, but also those to erect suitable dwellings for employees in the neighborhood of their work. A typical organization of the latter kind is the "Baugenossenschaft," or building fraternity, of the Grosse Berliner Strassenbahn. This was formed in 1901 as a branch of the general employees' association in consequence of the difficulty which was then experienced in finding suitable living rooms. Berlin is pre-eminently a city of apartment houses, owing to the high cost of land. The rents in turn are also very high, and at that time were almost prohibitive, owing to the fact that the population was growing faster than the building accommodations.



Homes Built for Berlin Railway Men—Courtyard at Tempelhof

The building club now has 1639 members, or about 25 per cent of the total number of members in the general organization. A share of 300 marks (\$75) is obtained through monthly payments of one mark (\$.25). Shareholders have the privilege of drawing lots for apartments as they become vacant, and up to the present have also received an average dividend of 4 per cent on the money paid in. The association now owns five buildings, located in proximity to as many car depots. The first house was completed in August, 1903, and the last in March, 1906. Since then no additional buildings have been erected for the reason that hard times made plenty of private houses available and new construction unprofitable. During 1908, however, a plot was purchased for a sixth house, which will be erected when further construction appears profitable.

When the building club was inaugurated the railway management loaned it 1,500,000 marks (\$375,000) at 3 per cent. Part of this money was secured by mortgages on the properties. Later on, 500,000 marks (\$125,000) was furnished by the pension fund at 3½ per cent. In 1905 the latter loan was taken over at 3 per cent by the Grosse Berliner Strassenbahn, and the directors also presented



41,000 marks (\$10,250) to the emergency fund. At the end of 1908 the liabilities of the association were \$500,000 and its assets approximately \$600,000. The buildings have been ably managed, and for several years past neither a store nor apartment has remained unoccupied. In a few cases non-members of the society have been accepted as tenants when the members themselves made no application for rooms.

The total number of tenants in the five houses, including storekeepers, is 297. There are 286 apartments of one, two or three rooms; 232 of these apartments are provided with baths. It might be well to explain that the terms "house" and "room" do not mean exactly the same thing in Berlin and in New York. For example, many American flats are built on plots 25 ft. x 100 ft and house six to eight families, or two per floor. The Berlin apartment

of the buildings, which are always of stone, are very artistically designed. In fact, they are characteristic expressions of the general desire in Berlin for beautiful buildings.

The interior equipment of the houses is of the most sanitary character. The individual rooms also differ materially from those in the cheaper American flats. They are much larger, some being fully 19 ft. x 13 ft. in size. The kitchen, including the pantry equipment, does not count as a room. A three-room apartment includes a private corridor, dining room, bedroom and visitor's room. The latter, as in the two-room flats, is often used as a bedroom. Each apartment also has a clothing closet, which is 4 ft. wide and 12 ft. to 13 ft. long. When such closets are fitted with baths the tenant pays an extra monthly charge of about 43 cents. Unlike the cheaper American flats, there are no private tubs for laundry purposes. Hence no room



Homes Built for Berlin Railway Men—Front House on Eylauer Street

house is also four to five stories high, but always occupies a considerably wider lot. It is frequently built in the form of a hollow square along a courtyard, say, 65 ft. x 35 ft., which is large enough to afford ample light for every room.

A typical house of this kind was built by the association on Eylauer Street, in the fashionable suburb of Wilmersdorf. The yard is laid out as a garden with paved walks. In the center is a neat wooden shed, where the tenants beat their carpets and do other dry cleaning, since nothing of the kind may be done in the hallways or from the windows. Every apartment is provided with a loggia or balcony, which serves for growing flowers, and is large enough to place a hammock or several chairs outdoors. The exteriors



Homes Built for Berlin Railway Men—Courtyard of House in Tegel

is taken for that purpose, and all washing is done with the common laundry equipment in the attic. Every tenant also has free cellar space for storage of fuel, etc.

The rentals, of course, were fixed upon a strict investment basis, but they are rather attractive compared with the charges made by other landlords for the same facilities. The following monthly rental figures are very reasonable for the accommodations offered, bearing in mind the character of the buildings and their proximity to the tenants' working place: For two rooms and kitchen, average of \$9.50 in the part facing the street and \$7.50 in the part facing the courtyard; for a single room and kitchen facing in the street, \$6.50; facing the courtyard, \$4.50.



## THE APPLICATION OF INTEGRATING WATTMETERS TO ELECTRIC CARS\*

BY THOMAS W. HINKLE, ELECTRIC SERVICE SUPPLIES COMPANY

Electric railway companies are spending large sums of money in building modern power plants and equipping them with efficient machinery, but after the power goes out to the line no record is kept of it, and the motorman uses it either wastefully or economically, depending upon his intelligence and care. There is a great difference in motormen in the use of power, and it is my belief that if wattmeters were installed they would pay for themselves in a short while. Where integrating meters have been installed on various cars some very valuable information as to the relative efficiency of different men in handling the cars have been obtained.

With wattmeters installed on every car on a particular line or system, the total kilowatt-hours used would thus check against the station output, the difference between the totals being in transmission loss, leakage, etc. This is analogous to the comparison obtained between the total readings of the consumers' meters in electric lighting service with the station output meters, and it has been found in such service that this comparison often affords the most accurate, and really the only, method of picking out and hunting down undue losses in transmission, etc. Even with a few meters, shifted at intervals of a week or so from one car to another of a line, a series of readings could be obtained during the course of a few months, which would give a fairly good check of total car consumption against station output. This method might be practically as satisfactory, and considerably less expensive, to a railway company desiring to investigate the matter, as installing meters on all cars.

Under the present methods of inspection of equipment, motor troubles, bad brake adjustment, condition of bearings, gears and pinions, etc., are quite readily found if the road employs careful inspectors. All of these troubles, and many others which are hard for inspectors to locate, will cause undue friction and necessarily cause the car to consume too much current, but by the use of wattmeters any excessive current consumption will readily be found. That car can then be taken to the barn and the trouble eliminated, whereas without the meters the car would run indefinitely before the trouble was found.

Another use of wattmeters is in checking the relative efficiency of different equipment operating on the same line under the same condition, and comparing energy consumption on different lines of the same system.

There are also now on the market integrating ampere-hour meters, which show ampere-hours of current consumption in any circuit, entirely irrespective of voltage, differing in this respect from integrating wattmeters.

Some interesting tests have been made within the past year by different operating companies on transmission and line efficiency by using both ampere-hour and watt-hour meters on cars. Such a combination is, of course, only recommended for special tests, as it would be unnecessary and undesirable to install ampere-hour meters on cars as a general thing. The special test referred to is based on the idea that if the ampere-hour consumption of a particular car on a certain line, or section of line, is multiplied by the average station voltage during the period of a test the watt-hours thus obtained will be the station output required for that particular car, operating over the section of line during which readings have been taken. If, in the same car, a suitable integrating wattmeter is installed, its readings will show the true watt-hours consumption of the car, and the difference between the volt-ampere-hour reading and the watt-hour reading on the car will be the loss in transmission from the station for that particular car and section of the line. By taking a series of such observations with two or three different cars on various sections of line at different conditions of traffic, it has been found possible to obtain valuable data as to conditions of transmission line efficiency, of substations, feeders, etc., for different lines and sections of lines.

Until about three years ago there was no integrating

wattmeter suitable for this purpose—that is, which would withstand the severe conditions under which a meter on a car has to operate. Later, special wattmeters were brought out for this work, but owing to certain inherent and unavoidable features of their construction their use was principally confined to special test cars, or on cars where precautions were taken to eliminate as far as possible the effect of vibration and jar on the meter. On account of the special care required in the use of the meters and their expense, their application in electric railway work was very limited until during the last few years, when meters have been brought out which are so constructed as to withstand without any injury whatever the most severe conditions of street railway operation.

The mercury type meter has proven the most successful and accurate, I believe, for this class of work. I will give a brief description of it.

In general, a mercury meter consists essentially of a cylinder or disk-like motor element partly or entirely submerged in mercury, so that current can be led in and out from this element by the mercury through fixed metallic contacts set in the walls of the chamber containing the mercury and disk. The reaction of current passing radially or diametrically across the armature—that is, the metallic rotating element—with a magnetic field properly set with respect to the armature, will cause rotation, and this rotation will be proportional to the amount of current passing through the armature.

When operated on direct current, the main current passing to the load, or a proportional part of it, passes directly through the armature or the motor element. The poles of the field magnet are located in close proximity to the armature disk, and the field set up in this magnet by the shunt coil is proportional to the voltage of the circuit. The current passing through the armature, therefore, is acted upon by this field. As the current through the armature is the load current, or a fractional part of it, the torque or rotational effect produced upon this current by the field is proportional to the power or watts, and the rate of rotation of the armature becomes a measure of the power passing through the metering device at any instant. In fact, this meter is nothing more or less than a small and delicate d.c. motor, having an armature equivalent to a single turn—that is, the current passes once across the disk—and having a field with two air-gaps, similar to an ordinary bipolar motor. The mercury at the edges of the armature carrying current to and from the contact, corresponds in a sense to a commutator of the usual motor.

The armature, or rotating element, is made with a central dome or float, so that the total displacement when immersed in mercury is sufficient to buoy up the entire rotating system, including a damping disk outside of the mercury chamber, so that the difference between the true weight of the rotating system and this buoyancy effect is only about 1/10 ounce. This, then, is the effective weight or pressure upward against the top bearing jewel. This weight or pressure upon the jewel is less than one-fifth that in any other type of meter, and as the armature is completely immersed in mercury, any jar, vibration or shock upon the meter is absorbed by the mercury, so that there can be no sudden motion of the armature vertically. Therefore, the pounding and jarring of a car cannot injure the jewel in this meter, thereby impairing its accuracy.

Another good point in favor of meters of this type is that lightning has less effect on it, as the enormous choking effect of the shunt coil on its iron core protects the meter against any alternating or oscillating discharge like lightning.

Another very important and convenient feature of this type of meter is the fact that it can be operated by a shunt, allowing only a portion of the load current to pass through the meter. This enables the meters to be made smaller and more compact, and they can be located at any convenient, out-of-the-way place on a car, and connected to the shunt by small leads. Since the introduction of meters of this type their use has become quite general by a number of large operating companies in the cities and by a few of the large interurban companies, but as yet the majority of railways have not realized the valuable information which can be obtained by a proper and intelligent use of integrating wattmeters on cars.

\*Abstract of paper presented at meeting of Central Electric Railway Association, Detroit, Aug. 26.



## DEVELOPMENT OF EXPRESS BUSINESS ON INTERURBAN RAILROADS\*

BY J. H. CRALL, GENERAL PASSENGER AND FREIGHT AGENT,  
TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION  
COMPANY

Interurban express or dispatch freight is one feature of the traction business that has been the subject of more or less controversy from the time this branch of traffic has been carried on by interurban railroads, both as to the handling of this business and as to whether it could be an important revenue producer.

That the express consignments transported on passenger cars are valuable adjuncts to the carrier will be admitted by all lines carrying on this branch of business; whether this is of enough importance to demand the careful consideration which is given to the passenger and freight traffic I find has been a matter of conjecture. Did the end justify the means? I will answer this by saying that any branch of interurban traffic that is sure to result in a substantial revenue demands at least careful consideration.

There has been a difference of opinion as to the best method of handling this branch of interurban trade. When the express business was first introduced on account of the necessary outlay of capital required to make a pick-up and delivery of shipments the traction lines carried on this business by accepting shipments when delivered at their stations, transporting them and making station delivery only. That this method has been found to be universally satisfactory is evidenced by the decided increase in the amount of express matter carried by interurban roads adopting this plan. It was the same old story of the demand creating the business. Here was an opportunity for merchants to create new trade by being able to secure a guaranty of a quick delivery. This was especially true as to produce dealers and commission merchants handling perishable commodities; the country customer sends in his order by telephone and an hour later the goods are at his place of business. This, naturally, caused the carrier to realize that here was an opportunity to establish a branch of traffic that was sure to result in a satisfactory revenue, very little extra labor and no extra equipment being required; the cars had their scheduled runs to make, and, naturally, the question with the carrier was, Why not fill up the vestibules with express shipments? The cars on the lines which I represent are all provided with baggage compartments of sufficient size to transport satisfactorily both express and baggage; I am inclined to believe that this alone is a good advertisement for the interurban express business. If the shipper knows that you have the facilities for handling his goods and he has the goods to ship you can get his business with very little solicitation. Show the people that you can give them the service and you will get the business; this will apply whether it is express, passenger or freight traffic. A little judicious advertising, just enough to show the people that you have something they need and want, will do this.

I am an advocate of large express and baggage compartments in passenger cars; it is possible to solicit and materially increase the express shipments successfully only by being able to transport the consignments satisfactorily.

On the lines with which I am connected the revenue from interurban express in May, 1909, was 6.14 per cent of the passenger earnings and the space used in the cars for the express transported was 6.36 per cent of the total space in the cars. You will note that the per cent of space used in the cars for the express shipments is practically in the same ratio to the passenger space, as the express revenue is to the passenger revenue; in other words, we are earning as much from the space used for express as we are from the space used for passengers, with the chances for a material increase of this on a profitable basis. This statement shows the per cent between the express and passenger revenue only.

On these lines the revenue derived from interurban express as compared with the gross earnings increased from  $\frac{3}{4}$  of 1 per cent in 1906 to 4.01 per cent in 1909.

Several months ago a contract was made between a number of the leading interurban roads in Indiana and Ohio

and one of the old line express companies. The revenue derived by this express company, according to the contract, was to be divided on an agreed per cent of the gross receipts with a minimum amount guaranteed the traction lines making this contract. Some of the roads that were parties to this contract have practically turned over the handling of all express matter, I understand, to the old line express company. Speaking for the Terre Haute, Indianapolis & Eastern Traction Company, I will say that we relinquished none of our former methods of handling this interurban express by entering into this contract. We conduct our express business on exactly the same plan and according to the same tariffs as we did before this contract was made. We carry shipments for this express company in the vestibule of passenger cars on a certain number of trains, agreeing to give the company space in additional cars of our regular trains as the business may require.

We have experienced no decrease in our interurban express business on account of this contract, although it has not been in effect for sufficient time to determine fully the result; but, judging from the amount of consignments handled, I am inclined to believe that the result will be gratifying not only to the express company making this contract, but will also show a decided increase in the interurban express receipts. This only goes to show that there are plenty of opportunities to increase the interurban express traffic. Business secured by the old line express company and transported on interurban roads is largely new traffic; this business it secures mainly on account of the pick-up and delivery service. Much of this comes from foreign lines, being transported both to and from junction points on both steam and electric railroads.

The tariffs universally adopted by traction lines naming express rates on merchandise when carried on passenger cars are local and interdivision tariffs, and the rates are usually based on one and one-half times the first-class freight rates between points of shipment. Exceptions are made, however, where the Central Freight Association scale is in effect, in which case two times the first-class freight rate is made.

On the lines which I represent, however, we have a minimum of 20 cents per hundredweight and no package is handled for less than 25 cents; these rates are lower than the old-established express company rates. However, no provision is made for a pick-up and delivery to consignee of interurban express and the difference in charges will, in most cases, offset the cost of delivery of packages to consignee.

It has been found advisable to make exceptions on some commodities, namely, bread, ice cream, glassware, newspapers, etc., and instead a commodity tariff or flat rate is made effective.

I would advocate making effective joint express tariffs naming interline rates. I believe this would be the means of securing a surprising amount of express traffic and open up trade between connecting roads that would doubtless prove mutually profitable. Such a tariff has been made effective between Indianapolis and Dayton, Ohio, and it is the universal opinion of the traffic officials that this should be adopted between all connecting lines—billing shipments through on interline dispatch freight way-bills the same as adopted for through shipments of freight.

With interline express tariffs effective between connecting lines and equipment suitably provided to transport properly both local and interline shipments, the traction lines will find that it will open up a trade in interurban express that will surpass our expectations.

We must get away from the idea that interurban express or dispatch freight is of no importance or that it is carried on as a matter of mere accommodation; this business is not only a means of substantial revenue, but the possibilities for increasing it are more than flattering, and traction lines will without question be materially benefited by boosting the interurban express traffic.

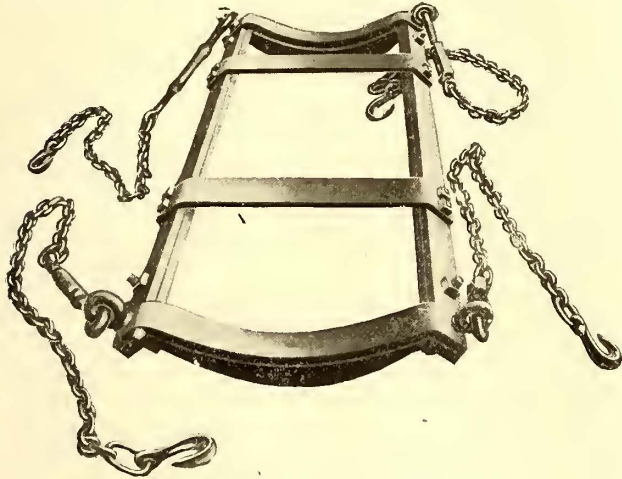
Representatives of the steam railroads and a number of Government officials have joined in a co-operative plan to conduct an inquiry into the physical properties and methods of manufacture of steel rails to ascertain what can be done to improve the rails now purchased.

\*Abstract of paper read before the Central Electric Railway Association, Detroit, Aug. 26.



**CAR SKID WRECKING DEVICE**

The accompanying engraving illustrates the Bradshaw car skid, which is designed to enable a car with a broken wheel or axle or damaged truck to be quickly and easily run in under its own power or pulled in to the shop. It consists of a rectangular steel frame and two separable shoes which slide on the track rails. At each corner of the frame is attached a stout chain, with turnbuckle and hook, by means of which the skid is securely fastened to the truck after it is slid under the wheels. The skid is of such shape that it may be slid under the truck and either the wheels or motors allowed to rest on it. The wheels are



Car Skid Wrecking Device

raised but 3 in. above the track when the skid is in place. It is adjustable to fit any single or double electric or steam railroad truck.

The shoes are made of a special composition of metal, having a low co-efficient of friction, and do not require to be lubricated, nor do they cut or wear the rails. The shoes weigh 45 lb. apiece, and when the skid is used under one end of a 28-ton car the shoes will last for from 50 to 75 miles. The frame is not subject to wear, and will last indefinitely. Crippled cars have been run around curves of 40-ft radius with one truck carried on a skid. The device is made and sold by the Lord Electric Company, New York.

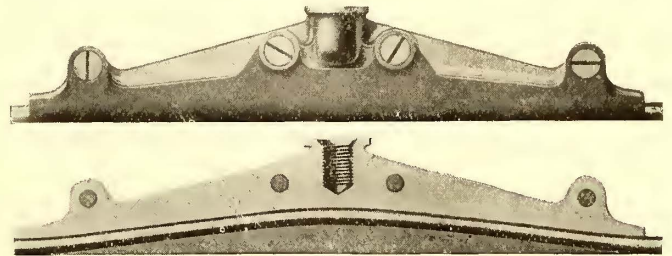
**COUPLERS FOR HUDSON TUNNEL CARS**

In the description of the new types of Van Dorn couplers published in the *ELECTRIC RAILWAY JOURNAL* of last week, page 293, illustrations were presented of an M.C.B. type of coupler, which is in use on the cars of the Hudson & Manhattan Railroad, and was referred to in the article

the Hudson & Manhattan Railroad, but has not been put into actual service as yet on that, or any, railway. The type No. 20½ coupler is shown in the accompanying engraving, from which it will be seen that it is an extra heavy pattern of the well-known Van Dorn horizontal plane type coupler. It is built to withstand the most severe service and to give a long life. The pins used are round, with a diameter of 1⅝ in. The coupler faces are 16 in. and are slightly beveled at the top and bottom to allow for vertical variations in the track.

**IMPROVED TYPE OF TROLLEY EAR**

As the result of extended experience in trolley line construction, the Westinghouse Electric and Manufacturing Company has recently designed a new type of trolley ear, with a special view to giving long service. As shown by the accompanying engraving, this ear provides a straight and smooth run for the trolley wheel, and at the same time

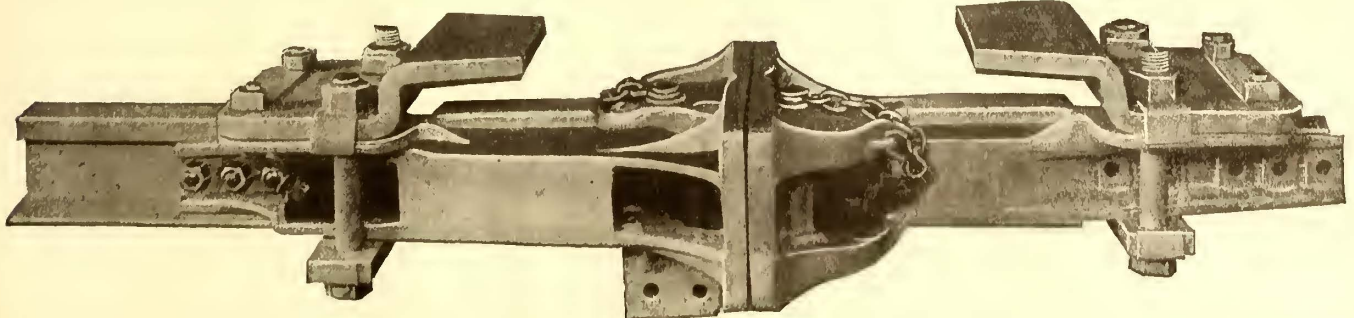


Improved Trolley Ear

the wheel is prevented from wearing the wire on account of the great depth of the bronze runner. It is therefore impossible for the conductor to become loosened or break out of the suspension. The curve given to the trolley wire when clamped in the ear prevents slipping. It is claimed this new type "R" trolley ear will last five to six times as long as any clinch ear, and its wearing part is renewable at small cost. The malleable iron yoke is attached permanently to the stud of the suspension, while the bronze runner is readily removable, to be reversed or renewed.

**OFFICIAL TRAMWAY GUIDE TO LONDON**

The London County Councils Tramways, which operates about 123 miles of street railways in London, England, has issued what is probably the most comprehensive guide of its kind published by a street railway system. The guide, which is divided in two parts, includes 132 pages (5½ in. x 8½ in.) of text, with numerous maps and illustrations. The balance of the publication is made up of advertising pages, the income from which permits the guide to be issued for the nominal price of one penny.



Couplers for Hudson Tunnel Cars

as the 20½ coupler. The illustrations were, in fact, views of a coupler which has been tried experimentally by

The first page of the guide contains an alphabetical list of places of interest in London, such as the museums, ex-



hibitions, theaters, concert and music halls, buildings, bridges, parks, hospitals, monuments, etc. In most cases the reader is advised as to the best route for reaching the place described. Where one of the Council's cars is available this information is given in the form of a reference to numbered routes. These routes, singly and in combination, are mapped out in the second part of the guide in connection with data concerning the fares and schedules. The maps of each route carry numbers to indicate the principal objects of interest on the way. The maps and particulars of fare and service were supplied by A. L. C. Fell, general manager.

**THERMO-DYNAMIC FEATURES OF A. E. G. TURBINES**

An ingenious method of illustrating the thermo-dynamic losses in steam turbines has recently been used by H. Treitel to analyze the losses in the various types of steam turbines made by the Allgemeine Elektrizitäts-Gesellschaft, of Berlin. A few of the drawings are reproduced here-with.

Fig. 1 shows the heat balance of a standard high-pressure condensing 1,000-kw a.c. turbo-generator. In this diagram the conditions assumed are a steam pressure of 170.4 lb. per sq. in. (12 kg per sq. cm) above the atmosphere, a temperature of 300 deg. C. and a vacuum equivalent to 95 per cent of the height of the local barometer. It is assumed that the machine has been guaranteed to consume no more than 15,880 lb. (7200 kg) of steam per hour operating at full load. The output of 1000 kw-hours corresponds to 858,580 calories. As the total heat in the steam is 729.5 calories for each 1 kg (or 2.204 lb.) of steam, the total number of calories in the steam is 5,252,240. Since only 858,580 are utilized, the remainder, or 83.5 per cent, is lost.

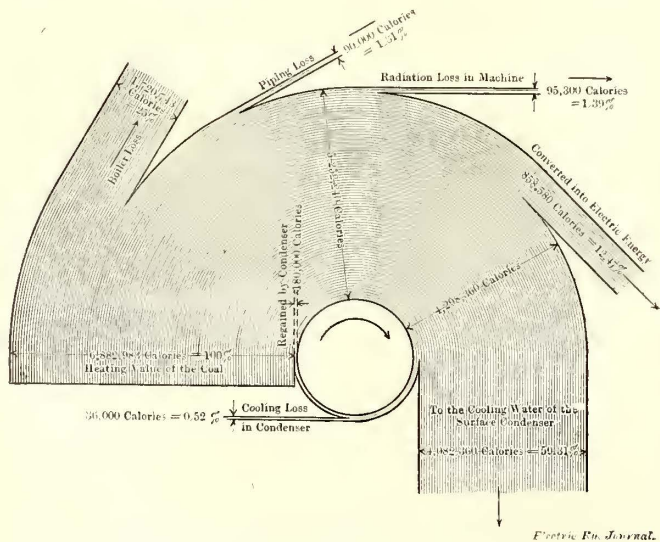


Fig. 1—Heat Balance of 1000-Kw High-Pressure Turbo-Generator Operated with Surface Condenser

The following is a summary of the total losses under the conditions assumed.

	Calories.	Percentage.
Boiler loss.....	1,720,743	25
Piping loss.....	90,000	1.31
Machine radiation.....	95,300	1.39
Converted into electrical energy.....	858,580	12.47
Condenser run-off.....	4,082,360	59.31
Condenser cooling losses.....	36,000	.52
Heat content of coal.....	.....	.....
	6,882,983	100.00

In a similar manner Fig. 2 shows the losses in an exhaust steam turbine. In this case the starting point is not the

heat value of the coal but of the exhaust. Conditions vary so greatly that no definite figures of losses are given on this diagram, but with a working pressure of the 15.6 lb. per sq. in. (1.1 kg per sq. cm) absolute, and an exhaust pressure 0.7 lb. per sq. in. (.05 kg per sq. cm), a steam consumption of 31.8 lb. (14 kg) per kw-hour can be expected. This corresponds to a transformation of about 8.5 per cent of the heat in the exhaust steam into electrical energy.

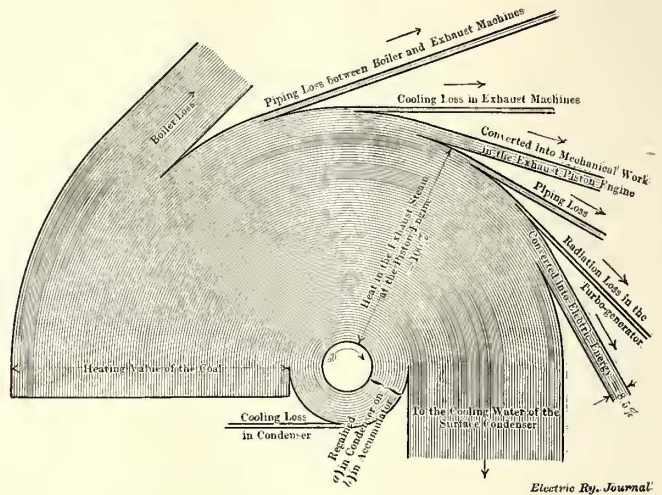


Fig. 2—Heat Balance of Exhaust Steam Turbo-Generator

In addition, the company has designed turbines for high pressure only, for use in connection with heating plants. These turbines can be of two kinds, namely, one in which the back pressure is constant; that is, in which all the exhaust steam can be utilized for heating and, second, that in which the low-pressure steam for heating is required at irregular intervals and independently of power conditions. For the latter purpose the company builds what is called a "tap" turbine. This machine operates as an ordinary con-

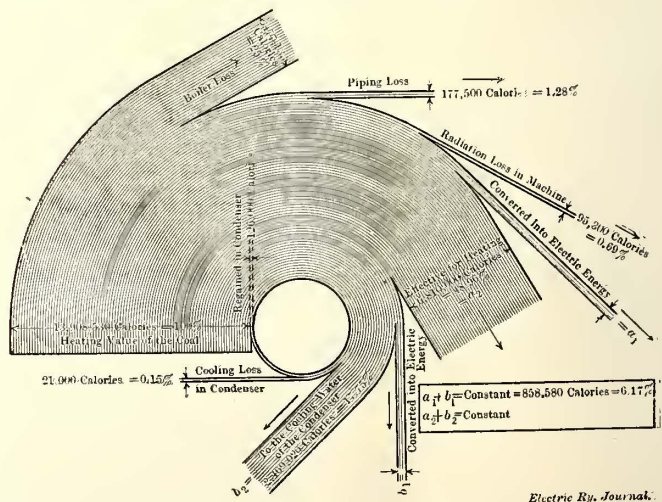


Fig. 3—Heat Balance of 1000-Kw "Tap" Turbo-Generator

densing machine when no steam is tapped for heating, but when steam required for heating is at its maximum the turbine assumes the characteristics of a non-condensing machine. At such time a small amount of steam is still allowed to pass through the low-pressure stage to the condenser, first, to carry off the frictional heat of the rotating low-pressure element and, second, to prevent the condenser pump from running dry. In the tap turbine heat balance diagram (Fig. 3) the quantities  $a_2 + b_1$  and



$a_2 + b_2$  are generally constants, though both  $b_1$  and  $b_2$  may drop to zero when the amount of steam required for heating reaches a maximum.

### AUTOMATIC FARE REGISTER AND MONEY CHANGER

The accompanying illustrations show a novel type of fare register and money-changer designed for prepayment cars and manufactured by H. R. Langslow, of Rochester, N. Y. As will be seen, the machine contains at the top a series of five slots, in which a passenger may deposit a 5-cent, 10-cent, 25-cent, 50-cent or \$1 coin. The falling coin registers a fare and also operates the change-making mechanism so that if more than 5 cents is deposited the proper amount of change falls into a change cup located under the machine. At the same time the lock of the turnstile is automatically released, leaving it free to revolve so that the passenger can pass through. As he does so he picks up his change from the cup. An important feature of the action of the change-making mechanism is that the coins do not fall immediately into and become lost in the pile of other coins

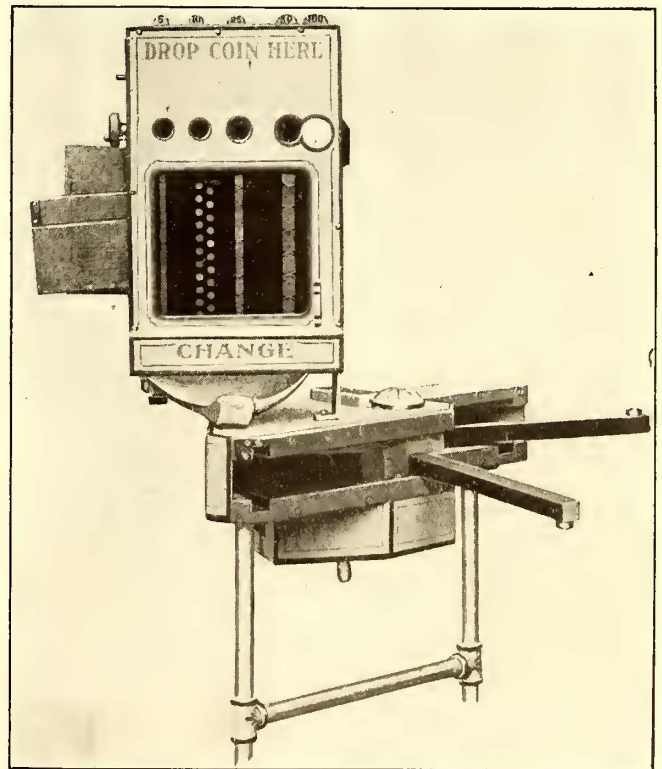
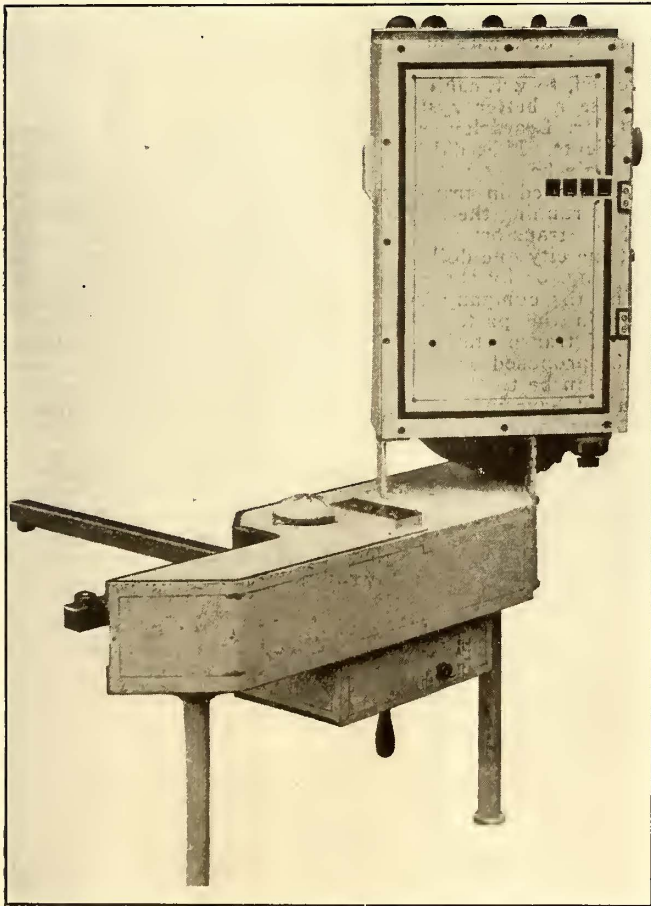
All money deposited in the fare box is available for change. If any compartment in the fare box becomes filled to its capacity with coin the surplus overflows into a surplus cash box which is accessible only to a person having a key to the door which is at the side of the case.

If a coin is deposited in the wrong slot by mistake or design, it is ejected from the case and falls into the change cup to be replaced by the passenger in the proper slot, but the passage of the coin through the machine has no effect on either the change-making mechanism or on the registration.

If any person tenders paper money for his fare the conductor supplies him with change so that he can deposit his fare in the fare box. Under this plan the conductor must, of course, turn in at the office at night the same amount of money with which he has been supplied in the morning.

With the present machine if a passenger wishes to pay the fares of two or more people, he does so by dropping the fares individually in the box, but the manufacturers control patents whereby a passenger can pay for as many persons as he desires and the change will be returned to him and the turnstile released for the corresponding number of passengers.

The turnstile is of very ingenious construction. The interior of the case has a track curved at both top and bot-



Side and Front Views of Fare Register and Money Changer

of the same denomination in the case. Instead, the last coin deposited is always upheld before the glass in the circular aperture under each slot, so that it may be seen from the front of the machine. It remains there until another coin of the same denomination is put in the slot.

To permit passengers with transfers to pass through the turnstile the machine is fitted with a lever at the bottom of the turnstile case by which the conductor can allow transfer passengers and other non-cash fares to pass through the stile and register them. The turnstile registers the number of passengers who pass through while the fare-box register records those who pay their fare.

tom. The two reciprocating arms travel one above the other through an axial case bearing upon rollers on all four faces. At each extremity of each arm there is a roller which engages its respective track. As an arm is revolved the roller comes into contact with the track and the curve is such as to make the arm which was before at its extreme length recede. At the same time the other arm is forced forward by its track to its proper full-length position. The roller bearings in the case reduce the friction of this movement to such an extent as to make it negligible.

The machine has been tested for speed and has been found to be capable of 100 to 120 operations per minute.



# News of Electric Railways

## Answer of Mr. Corrigan to Criticism of Proposed Kansas City Ordinance

Bernard Corrigan, president of the Metropolitan Street Railway of Kansas City, Mo., in a letter published in the *Kansas City Journal* of Aug. 14, answers a criticism of the proposed new ordinance made by Henry M. Beardsley, former Mayor. Mr. Corrigan says in part:

"Mr. Beardsley's first statement in his interview is that electricity had come to stay when the present contract was made in 1895, and that any changes that have taken place were to the advantage of the company. Mr. Beardsley is in error in his statement. The changes that have taken place are to the disadvantage of the company, for the reason that the company has expended large sums of money in replacing the cable system (which could have been operated for many years) with an electric system, which increased the fixed charges of the company. This change was precipitated by the demands of the public for the most up-to-date system; the cost of everything connected with the street car business has increased since that time except the car fares, which have diminished on account of the increased average haul caused by the expansion of the city and the universal transfer system. The price of copper, which enters largely into field construction, as well as machinery, has increased in price. The wages of our men have been raised several times since 1895, and will have to be raised again if the cost of living keeps up. The difference in the scale of wages paid in 1895 and now would amount to \$500 per day, or about \$180,000 per year. When you add to this the increase in price of everything the company buys (except cement), you have a yearly increase in cost of construction of operation of at least a quarter million dollars per year.

"If Mr. Beardsley is sincere, and I take it for granted he is, I have authority to make the following proposition to him: If he can secure a contract from a responsible banking house to take the renewal bonds of the Metropolitan as the old ones come due in the next four or five years, bearing 5 per cent interest, and maturing in 14 or 15 years from now, we will allow a reasonable discount on the bonds for the benefit of his banker, and we will pay Mr. Beardsley an attorney fee of \$25,000 for obtaining that kind of a contract, and, further, will withdraw the ordinance from before the public when such a contract is obtained, for the necessity will not exist then for an extension of our franchise which now exists.

"Again Mr. Beardsley says: 'According to Arthur Young & Co.'s report the company will make enough money to meet the maturing bonds.' This statement of Mr. Beardsley's is technically correct, for if you will stop the expenditure of money in the expansion of the property, and operate the property as it now exists, applying the whole earnings to the payment of maturing bonds, there would be no necessity of renewing the bonds; but would the public tolerate this? Who would prefer checking the progress of the street car system, and, incidentally, the progress of the city, to issuing renewal bonds for which the city in no way becomes responsible? Wouldn't 99 men out of every 100 in Kansas City prefer that the company keep up with the progress and growth of the city and renew its bonds, than to stop the expansion of the property and apply all its earnings to paying off the original capital that went into the property, a thing that has never been done by any growing utility corporation, for the experience of nearly all thrifty cities is that it takes all the money they can spare to keep up with the growth of the city, which necessitates the investment of large sums from the earnings or added to capital? I do not know of a case on record where the original investment of the property has been paid off from the earnings.

"Again Mr. Beardsley says: 'If the company can prove to financiers that it can make \$30,000,000 profits in 16 years, and at that time be the owners of a system of street railway adequate to the needs of Kansas City, it can't have any trouble in caring for its bonded debt of \$25,000,000.' What difference would it make to financiers what the property would be worth in 16 years from now if the company has no title to it, and relying on the liberality of your Beardsleys and Browns, who advocate partial confiscation now? The value of the property would add very little to the credit of the company when its franchise has expired, and it must be clear to every thinking man that Mr. Beardsley is proceeding on the theory that the company would be borrowing money on a fee simple title, whereas, as a matter of fact, it is borrowing on a leasehold. Cer-

tainly no expired lease would be taken by any financier as security for his money, and the voluntary statement of Mr. Beardsley that he would be in favor of dealing liberally with the company in 16 years from now would not cash in for much with the banks.

"The whole gist of Mr. Beardsley's interview is based on one theory—that money expended in the consolidation of the numerous small street car companies which existed in Kansas City in early days, and which, if continued, would mean the payment of at least three fares to go across the city, should not be allowed; that even the mistakes of the company's engineer in construction, etc., should be deducted from the value of the property, and all cost of consolidation of those properties should be ignored; that the money invested in cable construction by men like Smith and Keating, who invested their private fortunes in an enterprise which contributed largely to the building up of Kansas City and made it possible for men of the Beardsley type to land here and remain here, should be also ignored, although they never received 6 per cent on their investment.

"Mr. Beardsley and all other Christian gentlemen preach the universally accepted doctrine of 'Do unto others as you would have others do unto you.' Mr. Beardsley should practice this as well as preach it, and I want to ask him a question—why Smith and Keating, or any other investors in the Metropolitan, who put their money into what was known as the best means of transportation at the time it was invested, to wit, cable construction, should lose their money because a better system was invented. I cannot believe that Mr. Beardsley would take that position if they were his clients. If he did he would not be faithful to them.

"Again he says: 'New inventions from time to time may be developed in transportation.' Concede this to be true, who is running the risk of new inventions being discovered? Did the transformation of the cable property to electricity cost the city one dollar? Is not the risk being taken by the company, or by those who loan the company money, providing the company keeps up with, in the future as it has done in the past, and adopts the most approved methods of transportation—a condition which is provided for in the proposed ordinance—what menace then would a new invention be to the city? It might be to the company, for it might have in an event of that kind to do what it did in the transformation of the cable. Nobody runs any risk except the investor. To illustrate, it may become necessary in time, for the convenient handling of the people of this city, that a certain amount of elevated road or subway should be built. There is nothing in the proposed ordinance which would prohibit the city from granting such rights to any company that desires to build them, in the event that the old company did not keep up with the necessities of the city."

## Hearing on Valuation of Third Avenue Property

At a hearing before the Public Service Commission, First District, on Aug. 23, in the inquiry as to the "character, extent, location and value of structures, facilities and properties" of the Third Avenue Railroad, additional blueprints in relation to various parts of the property were submitted on behalf of the receiver of the company and of the receivers of the Metropolitan Street Railway. Oliver C. Semple, of counsel for the commission, stated that questions had been submitted by the law department to the two receivers relating to various stretches of track in different parts of Manhattan, about 40 in number, which are used jointly by the Third Avenue and the Metropolitan systems. Some of these stretches of track are insignificant in length, but are of the greatest importance as furnishing connecting links, without which a few routes could not be operated; for instance, the stretch in Broadway from Forty-second to Forty-fifth Street, and between Sixty-fifth and Seventieth Streets. The questions put by Mr. Semple related, first, to the company which owned the franchise; second, the company which did the work; third, what companies provided the money; and, finally, what proportion of expense and work did each company bear.

Herbert J. Bickford, counsel for the Third Avenue Railroad, described the difficulty in answering these questions as due in large part to the lack of complete records. In many cases, he said, it had been impossible to find either vouchers or time slips showing when the roads were electrified, and it was not possible, therefore, to determine which company had paid the money.

Mr. Bickford said that it would take many weeks to fix



up the records definitely, or as well as could be done, and he suggested an adjournment until October. Commissioner Maltbie would not consent to allow so long an adjournment, and the next hearing was put down for Sept. 2.

### Cleveland Traction Situation

The Cleveland Council committee of the whole did not answer at its meeting on Aug. 23 the communication of the Cleveland Railway accepting the proposal of the city that Judge Lawrence and S. H. Tolles be selected to draft the safeguard clause, with Judge Tayler as the third arbitrator.

Horace E. Andrews, president of the company, said in the letter:

"In answer to your communication of Aug. 20 and referring to the question of the city's right to name a purchaser, we find on reading over the record that Mayor Johnson objects to the plan proposed by Judge Tayler, under which a would-be purchaser may bid for the property. We see no reason why this company should not have an opportunity to meet the bid of any proposed purchaser, nor any reason why, if the company is willing to meet it, it should not retain possession of the property. This question is of vital importance and is not a minor question.

"Our position as to the question of arbitration under the ordinance we have endeavored to make plain all through the negotiations, and it is to the effect that we believe arbitration should be by disinterested persons, to the extent, at least, that no arbitrator shall be a stockholder, officer or employee of the company, or an officer or employee of the city.

"We regret your unwillingness to seek the advice of Judge Tayler on disputed questions. We are unable to understand how this would involve the shirking of responsibility, on your part, in view of the explicit statement by us that, while we would accept in advance his decision, you might reserve the right either to accept or reject it. If Judge Tayler is qualified to pass on the important question of valuation—and both parties concede that he is—we do not understand why his advice would not be desirable on other questions.

"With reference to that portion of your letter stating that we have not answered the suggestion of your chairman concerning operation in the event of failure of any safeguard of the ordinance, we would say that we attempted to answer this in our communication of the 16th inst., in which we stated, in substance, that we were willing to have a provision inserted in the ordinance that if any of the safeguards were declared invalid, the entire ordinance should be invalid except the bare right to operate, in which event the Council would have the right to fix the terms and conditions of operation. This would give the Council the right to fix the rate of fare at less than the initial rate, if it were found to be possible to give good service at such lower rate and permit the payment of 6 per cent per annum upon the capital value as fixed by the ordinance. We submit that this is a better provision for the city than the one suggested concerning the initial rate of fare, as it places it within the immediate power of the Council to get good service at cost, notwithstanding the ordinance might be held to be invalid.

"We are willing to refer the drafting of an invalidity clause to Mr. Tolles and Judge Lawrence, in conjunction with Judge Tayler, and to accept such provision as they may write on the subject."

The Cleveland Railway filed a statement with the city clerk on Aug. 16, declining to make concessions on the right of the city to nominate a purchaser. It said:

"The company believes the provision should be altogether eliminated from the ordinance, but Judge Tayler fixed the date at Jan. 1, 1919, and the company has accepted that and is still willing to abide by it.

"The only reason that has been suggested why the Council should have the right to nominate a purchaser is that the current interest rate may fall below 6 per cent. It is altogether improbable that this will happen prior to Jan. 1, 1919, and we think that the provision in the Baker ordinance would interfere with the financing of the property and the stability of the securities which are important to the city, for such matters bear direct relation to the cost of operation and the necessary rate of fare."

The company also holds its original position on the question of arbitration, saying: "Arbitration without disinterested arbitrators would not inspire the confidence or respect of either the city, the company or the general public."

The company suggests changes in the clause safeguarding the city. In the event that its proposition is not acceptable to the city the company proposed to leave its determination to Federal Judge Tayler, Solicitor Baker and Attorney S. H. Tolles as a board of arbitrators. In making this proposal the company agreed to abide absolutely by

any agreement as to safeguards the three arbitrators may reach.

With regard to valuation the company said:

"We agree to Judge Tayler as sole arbitrator. We have no objection to an itemized valuation, but we think Judge Tayler should be free to determine the true and just value of the property without limitations imposed by either party.

"We concede the provision of the Baker ordinance which provides for immediate arbitration after the passage and acceptance of the ordinance. As we have conceded the provision of the Baker ordinance which provides for the fixing of the valuation after the passage of the ordinance and before the referendum election, the fare must of necessity be fixed before the valuation.

"If the Council and the company are unable to agree upon the maximum rate of fare, we suggest the reference of the question to Judge Tayler at once. In other words, we feel that all questions should finally be passed upon by the Council and accepted by the company before the valuation, and should be filed with the Council before the referendum election."

The proposal of the company, of which an abstract is published in the foregoing, was flatly rejected by the Council committee of the whole on Aug. 17.

Mayor Johnson has left Cleveland for a vacation, saying that his physician prescribed immediate rest and change.

**Subway Rowdies Punished.**—As a result of the combined efforts of the regular police force of New York and the uniformed police of the Inghamborough Rapid Transit Company, more than 125 men and boys were arrested in the subway on Sunday, Aug. 22. Of this number 28 were sentenced to 5 and 10 days in the workhouse on Blackwell's Island by Magistrate Krotel of the night court, and many others were fined. Most of the arrests were made after 5 p. m., when the offenders boarded trains returning from a day's outing at the end of the Broadway subway line or in Bronx Park.

**Outing of New England Club.**—The New England Street Railway Club had its annual outing at Canobie Lake Park, Haverhill, Mass., on Aug. 12. The members of the club and their guests traveled in three special cars over the Boston & Northern Street Railway and the New Hampshire Electric Railways. The park was decorated in honor of the visitors and a special performance was presented at the theater, and dinner was served in the large dining hall. After seeing all the interesting sights of the park and lake, special cars were taken to Haverhill, where a special train was waiting to convey the party to Boston.

**United Railways & Electric Company of Baltimore Provides for Lecture Room and Recreation Facilities.**—The new car house of the United Railways & Electric Company, Baltimore, Md., which is now in course of construction, will contain besides the usual accommodations for its cars, offices, etc., a number of features for the benefit of its employees. A lecture room, 100 ft. x 45 ft. is provided for on the second floor of the structure. At one end there will be a platform for entertainments. This hall will be turned over to the employees at any time for whatever gatherings they desire to hold. There will also be a large reading-room, pool room and a number of bowling alleys. Another feature of the building will be an instruction room. Each man will also be provided with an individual locker, two rooms being set aside for that purpose. The building is located at Druid Avenue, Fulton Avenue and Florence Street and will be 422 ft. x 191 ft. x 433 ft. in size.

**Central Rating Committee Plan Defeated in Boston.**—At a meeting of the New England Insurance Exchange, held in Boston Aug. 21, the plan of authorizing the establishment of a central rating bureau for electric traction and lighting risks was discussed. The attendance was the largest in the history of the exchange. At the previous meeting, as described in the ELECTRIC RAILWAY JOURNAL for June 5, page 1056, the vote on the same subject had resulted in a tie. At the meeting last week a majority of the executive committee recommended the establishment of the central rating bureau as originally proposed. A substitute report, recommending that the electrical engineer of the exchange co-operate with the central committee, but insisting on the preservation of its jurisdiction on rates, rules and forms, was voted down in committee. There was an extended discussion, in which an appeal was taken from the ruling of the chairman that the measure was constitutional. The vote was 73 to 70 against upholding this ruling, and hence against the measure.

**Date for Meeting of Railway Commissioners.**—The date of the convention of the National Association of Railway Commissioners has been postponed from Oct. 12 to Nov. 16, 1909. The meeting will be in Washington, D. C.



# Financial and Corporate

## New York Stock and Money Market

August 24, 1909.

After waiting, in more or less agitation, for several days to discover the exact condition of Mr. Harriman's health upon his return, the Wall Street traders find, now that he is at home, that they know as little as they did before. The market to-day was unsettled and nervous, with rather dull trading. Although the leading issues fluctuated to a considerable extent, they stood at the close about where they were at the opening. During the last week the decline has been persistent, although the half-dozen active stocks have been the only securities that suffered seriously. The transactions were notably steady, and Third Avenue during the period of decline actually advanced 5 points.

The money market is practically unchanged from a week ago. Call money is quoted at 2¼ to 2½ per cent, 90 days, 3¼ to 3½ per cent.

### Other Markets

Rapid Transit and Union Traction continue to be the interesting features in the Philadelphia market. Other tractions are changed only slightly.

In Chicago, nothing has been done in traction shares. Even Chicago Subway has almost disappeared out of the market and the little trading has been a by-product of reduced prices.

In the Boston market, Suburban Electric, both common and preferred, have been traded in to a large extent during the last week. The former has advanced to 18 and the latter has been selling about 70. Other tractions have been quiet.

United Railways stock has been fairly active during the week in the Baltimore market, selling around 13¾.

At the weekly auction of securities in New York the following tractions were sold: \$1,000 Brooklyn Rapid Transit 4 per cent refunding bond, at 85½; \$1,000 Slate Belt Electric Street Railway (Pen Argyll, Pa.) second mortgage 4 per cent bond, at 48, and one share stock of the same road, par \$100, \$4.

Quotations of various traction securities as compared with last week follow:

	Aug. 17.	Aug. 24.
American Railways Company.....	246½	246¾
Aurora, Elgin & Chicago Railroad (common).....	249¾	249¾
Aurora, Elgin & Chicago Railroad (preferred).....	95	95
Boston Elevated Railway.....	128¾	128½
Boston & Suburban Electric Companies.....	17	18
Boston & Suburban Electric Companies (preferred).....	*70	*70
Boston & Worcester Electric Companies (common).....	10	13
Boston & Worcester Electric Companies (preferred).....	52½	53
Brooklyn Rapid Transit Company.....	79½	80¾
Brooklyn Rapid Transit Company, 1st pref., conv. 4s.....	86½	87½
Capital Traction Company, Washington.....	141	*141
Chicago City Railway.....	a190	a190
Chicago & Oak Park Elevated Railroad (common).....	*3	*3
Chicago & Oak Park Elevated Railroad (preferred).....	*12	*12
Chicago Railways, ptcptg. ctf. 1.....	a112	a112
Chicago Railways, ptcptg. ctf. 2.....	438	a38½
Chicago Railways, ptcptg. ctf. 3.....	224½	a25
Chicago Railways, ptcptg. ctf. 4s.....	*10	*9½
Cleveland Railway.....	*78	*78
Consolidated Traction Company of New Jersey.....	477½	*77½
Consolidated Traction of N. J., 5 per cent bonds.....	a106½	a106½
Detroit United Railway.....	71	a70
General Electric Company.....	169½	169
Georgia Railway & Electric Company (common).....	a93	a95
Georgia Railway & Electric Company (preferred).....	a87	a87
Interborough-Metropolitan Company (common).....	14½	15½
Interborough-Metropolitan Company (preferred).....	47½	47½
Interborough-Metropolitan Company (4½s).....	82¾	83½
Kansas City Railway & Light Company (common).....	a50	a49
Kansas City Railway & Light Company (preferred).....	a89½	a83½
Manhattan Railway.....	a145	142
Massachusetts Electric Companies (common).....	14½	a14
Massachusetts Electric Companies (preferred).....	75	74
Metropolitan West Side, Chicago (common).....	a18	a18
Metropolitan West Side, Chicago (preferred).....	a50	a50
Metropolitan Street Railway.....	a23	a24
Milwaukee Electric Railway & Light (preferred).....	*110	*110
North American Company.....	83¼	84½
Northwestern Elevated Railroad (common).....	a20	a20
Northwestern Elevated Railroad (preferred).....	a70	a71
Philadelphia Company, Pittsburg (common).....	48	48¼
Philadelphia Company, Pittsburg (preferred).....	45	a45
Philadelphia Rapid Transit Company.....	31½	30½
Philadelphia Traction Company.....	91	*91
Public Service Corporation, 5 per cent. col. notes.....	a100¼	*100¼
Public Service Corporation, ctf. s.....	a93½	*93½
Seattle Electric Company (common).....	116	116½
Seattle Electric Company (preferred).....	*106	*106¼
South Side Elevated Railroad, Chicago.....	a56	a56
Toledo Railways & Light Company.....	10	a10½
Third Avenue Railroad, New York.....	18¾	23½
Twin City Rapid Transit, Minneapolis (common).....	110	109
Union Traction Company, Philadelphia.....	55	54
United Railways & Electric Company, Baltimore.....	14¾	a14
United Railways Inv. Co., San Francisco (common).....	37½	a39½
United Railways Inv. Co., San Francisco (preferred).....	a56¼	58
Washington Railway & Electric Company (common).....	47½	*47
Washington Railway & Electric Company (preferred).....	92	*92
West End Street Railway, Boston (common).....	95½	a98
West End Street Railway, Boston (preferred).....	106½	106¾
Westinghouse Electric & Manufacturing Company.....	85½	87
Westinghouse Elec. & Mfg. Company (1st pref.).....	125	a132½

aAsked.

\*Last sale.

## Purchase of Bridge Operating Company Stock by Metropolitan Receivers Approved

Without passing upon the reasonableness of the price of \$300 a share, which the Metropolitan Street Railway receivers offered to pay the New York City Railway for 500 shares of stock of the Bridge Operating Company, of which the par value is \$100 a share, the Public Service Commission, First District, has granted its approval of the proposed transfer of the Bridge Operating stock from the New York City receiver to the Metropolitan receivers.

The commission, at the same time, ordered that an investigation under Order No. 615 be started at once to ascertain the condition of the Bridge Operating Company which, on the plea that it is a business corporation and not a railroad company, has failed to file reports with the commission. Commissioner Maltbie was designated to conduct the investigation.

It was on Commissioner Maltbie's opinion that the commission approved the proposed transfer of the stock. As the transfer had been authorized by the United States Circuit Court, which appointed the Metropolitan receivers, the commission saw no reason for withholding its approval of the stock transfer.

In recommending the approval of the transfer of 500 shares of stock in the Bridge Operating Company from the receiver of the New York City Railway to the receivers of the Metropolitan Street Railway, Commissioner Maltbie notes that the original application made by the Metropolitan receivers was for permission to purchase this stock, and that a supplemental petition had been filed asking the commission's approval of the transfer of rights and privileges under the contracts made May 21, 1904, and June 21, 1907. The two applications were considered together in one proceeding.

In his opinion, the commissioner gives the history of the Bridge Operating Company. The earlier contract is dated May 21, 1904, and signed by the Brooklyn Rapid Transit Company and the New York City Railway, which agreed to procure the formation of a corporation under the Business Corporations Law, to be known as the Bridge Operating Company with a capital stock of \$100,000 in 1000 shares of \$100 each. Each of the contracting parties agreeing to take 500 shares and pay for it in cash.

The Bridge Operating Company was formed and the certificate of incorporation filed July 29, 1904, and the purposes of the corporation were to enter into a contract for operating any portion of the Williamsburg Bridge, to operate the same and to acquire and use equipment necessary for such operation. The previous agreement was carried out and half the stock placed in the name of the Brooklyn Rapid Transit Company and half in the name of the New York City Railway.

The second contract bears the same date, namely, May 21, 1904. Although this antedates the incorporation of the Bridge Operating Company by more than two months, this contract was entered into between the city of New York by the Commissioner of Bridges, the Brooklyn Heights Railroad, the Coney Island & Brooklyn Railroad, the New York City Railway and the Bridge Operating Company for the operation of surface cars on the Williamsburg Bridge. All these companies except the Bridge Operating Company signed this agreement, and the Bridge Operating Company finally signed on Sept. 1, 1904.

The commissioner gives the terms of this agreement, which provided for the joint operation of the surface car tracks by the Brooklyn and New York companies and the operation of shuttle service by the Bridge Operating Company for a 3-cent fare.

"The above contracts," writes Commissioner Maltbie, "apparently give these companies exclusive rights to operate cars over the tracks mentioned, although there are no words expressly to this effect. We are informed that the companies so interpret the agreements, and the fact that the Manhattan company may allow other railroads in this borough to operate cars over the pair of tracks allotted to the New York City company and that similar rights are given to the two Brooklyn companies seems to indicate that such was clearly the intention of the contracting parties. An arrangement entered into over a year ago between the receivers of the Dry Dock, East Broadway & Battery Railroad and of the New York City Railway supports this contention. Prior to that time the Dry Dock, East Broadway & Battery company was not operating cars over the Williamsburg Bridge, but obtained the right to do so upon agreeing to pay to the New York City Railway the sum of 10 cents per car for each car making a round trip over the Williamsburg Bridge; that is to say, 5 cents for the amount of the toll payable to the Bridge Commissioner and in addition thereto 5 cents for the right to



use the bridge under the contract of the New York City Railway."

The third agreement dated May 21, 1904, relates to operation and accounts and purports to include the New York City Railway, the Brooklyn Heights Railroad, the Coney Island & Brooklyn Railroad and the Bridge Operating Company, but the Coney Island & Brooklyn company has never signed the agreement. It is binding, therefore, only on the other three companies. Under this agreement, the operation of local cars by the Bridge Operating Company was to be apportioned between the north and south pair of tracks, used respectively by the New York company and the Brooklyn companies and the expense of maintaining tracks and equipment on the north pair of tracks was to be divided between the Bridge Operating Company and the New York City Railway in proportion to the number of cars operated by the two companies on these tracks. The expense for the south pair of tracks was to be apportioned in like manner by the Bridge Operating Company, the Brooklyn Heights Railroad and the Coney Island & Brooklyn Railroad in proportion to the number of cars respectively operated.

On June 21, 1907, two other agreements were signed to which the New York City Railway was a party. After three years the Bridge Operating Company was relieved of its obligation to operate the cars by an agreement between it, the Brooklyn Heights company and the New York City company; the two latter companies agreeing to assume the obligations imposed by contract on the Bridge Operating Company and to operate the Bridge Company's cars and plant. The two railroad companies agreed to pay all taxes and other charges at the beginning of each fiscal year and to pay to the stockholders of the Bridge Company a 6 per cent dividend on their stock.

By another agreement of June 21, 1907, between the New York City Railway and the Brooklyn Heights Railroad, these two companies assumed responsibility in equal amounts for all expenses, losses and liability incidental to the performance of their contract with the Bridge Operating Company and agreed that all profits resulting from this contract should be divided equally between them. This contract is terminable by either party on three months' written notice.

Commissioner Maltbie says: "I do not consider that an approval of the application involves an approval of the terms of the various agreements entered into by the New York City Railway with other railroad companies and with the city of New York. The question is merely whether the transfer of the rights and privileges under these contracts and of the ownership of the stock to the receivers of the Metropolitan Street Railway will be advantageous.

"The compensation for the transfer of the stock and of the rights and privileges is stated to be \$150,000, which is equivalent to \$300 for each \$100 of investment, the stock having been fully paid for. Approval of the application should not be construed as an expression of opinion upon the reasonableness or adequacy of the compensation. It was stated by the representative of the applicants that the price has been approved by the United States Circuit Court and that the issuance of a formal order to this effect has been delayed pending action by the commission. It is also true that our approval does not bind us in any way to recognize the amount paid as a proper capital charge, or as a basis upon which the receivers of the Metropolitan Street Railway are entitled to a fair return. These matters are wholly outside of the present proceeding and are not passed upon directly or indirectly in connection with this application."

**Large Stockholders of Boston Elevated Railway**

The Boston Elevated Railway had approximately 3850 shareholders on May 1, 1909, as compared with 3500 one year before. The average holding was 34 shares per stockholder. Some of the largest shareholders, with comparisons with previous years, were as follows:

	1909.	1908.	1907.
J. J. Bright.....	2,400	2,400	2,400
W. B. Thomas.....	2,000	2,000	2,000
W. R. Evans, trustee.....	1,500	1,500	1,500
C. G. Weld, trustee.....	1,054	800	775
Boston Insurance Company.....	1,000	500	....
G. S. Bowdoin.....	1,000	....	....
G. A. Draper.....	1,000	1,000	1,000
E. D. Chamberlin.....	1,000	1,000	1,000
C. G. Weld.....	1,000	1,000	1,000
F. S. Mosley.....	500	300	300
Kidder, Peabody & Company.....	471	1,067	482
State Mutual Life Insurance Company.....	433	433	433
Hornblower & Weeks.....	401	964	677
National Shawmut Bank.....	400	400	400
R. L. Day & Company.....	410	1	....
J. P. Morgan.....	350	350	350
J. P. Morgan & Company.....	....	1,000	1,000
Old Colony Insurance Company.....	300	200	....

**Albany & Hudson Railroad, Hudson, N. Y.**—Notice is given that the time for deposit of the bonds and preferred and common stock with the Trust Company of America, New York, under the reorganization agreement of June 30, 1909, has been limited to Aug. 31, 1909, after which no deposits will be received except at the discretion of the committee and upon such terms as it may prescribe.

**Columbia Power, Light & Railways, Bloomsburg, Pa.**—This company, incorporated in Delaware with \$1,250,000 capital stock, has purchased the stock of the Danville & Bloomsburg Street Railway and of companies owning the electric lighting and gas properties of Danville, Bloomsburg and Berwick.

**Grand Rapids (Mich.) Railway.**—A. G. Hodenpyl, of Hodenpyl, Walbridge & Company, New York, says that the published report that a merger is being effected between the Saginaw-Bay City Light Company, the Kalamazoo, Jackson and Pontiac gas properties, the Grand Rapids Railway, the Flint and Cadillac gas properties, and the water power rights on the Sabule River is premature. All of these properties are controlled by the Hodenpyl firm and E. W. Clark & Company, of Philadelphia. Mr. Hodenpyl says that some investigation as to the practicability of placing these properties under one management has been made, but that the matter is still in an embryonic shape, and probably will not be taken up for some months to come.

**Hudson & Manhattan Railroad, New York, N. Y.**—Pliny Fisk has been elected a director.

**Long Island Railroad, New York, N. Y.**—Application has been made to the Public Service Commission, Second District, for permission to issue not to exceed \$16,500,000 debentures. The proceeds of the bonds are to be used in part to repay the Pennsylvania Railroad \$6,032,951, loaned by that company and expended for various improvements. The company states that it will require within the next three years additional capital for construction work and for equipment necessary to continue the improvements which have been commenced and on which large sums of money have been expended, to provide adequate and proper facilities and accommodations for continuing its business economically. Among the larger items of work which the company has planned are: Main line improvement between Woodside and Jamaica, \$2,000,000; Jamaica terminal, \$1,000,000; North Side improvement, double track and electrification, \$1,000,000; Bay Ridge improvement, elimination of grade crossings, \$1,000,000; 150 new motor cars, \$2,700,000; various freight delivery yards, passenger stations, sidings, double track, grade crossings, etc., \$912,662; electric equipment of tracks and substations, \$800,000; Glendale cut-off, \$309,382; advances to subsidiary companies for extensions, \$327,600; Montauk freight cut-off, \$287,400; completion of Atlantic Avenue improvement, \$100,000. It is stated that the Pennsylvania Railroad is willing to make further loans, in addition to its existing indebtedness of \$6,032,951, of \$10,500,000, the loans to be secured by the issue of 10-year, 4 per cent debentures, and in such years that interest thereon cannot be paid by petitioner out of earnings authority is asked for permission to issue non-interest-bearing debenture script convertible into debentures to be issued therefor; such debentures to be payable in cash or redeemed by the issue of some more permanent form of security when the financial condition of the company and its increased earnings justify an application for authority to issue such permanent securities.

**Metropolitan Street Railway Company, New York, N. Y.**—Reports published in the daily newspapers state that a partnership arrangement between the Metropolitan Street Railway and the city of New York has been suggested to the bondholders' committee by Stone & Webster, of Boston, who made recently an engineering study of the New York surface situation. This report is not available for publication. John W. Castles, president of the Union Trust Company and the chairman of the bondholders' committee, is now in Europe and the complete report will be considered by the committee as soon as he returns. Stone & Webster are said to have pointed out the advantages in a city partnership arrangement, suggesting that traffic regulations could be enforced with greater ease, making better operation possible.

**New York, New Haven & Hartford Railroad, New Haven, Conn.**—The report of the New York, New Haven & Hartford Railroad Company for the three months ended June 30, 1909, shows gross earnings of \$14,281,504, an increase of \$1,641,985, as compared with the corresponding quarter of 1908. The operating expenses were \$8,665,302, a decrease of \$257,373. The net earnings from operation were \$5,616,202, an increase of \$1,800,358. Income from other sources than operation increased \$1,931,700. Interest, rentals and taxes increased \$1,448,776. The surplus for the quarter this year was \$4,587,448, against a surplus of \$2,205,166 for the same quarter of 1908; an increase of \$2,382,282.



**New York, Westchester & Boston Railway, New York, N. Y.**—The Public Service Commission, First District, has passed a resolution calling upon the New York, Westchester & Boston Railway, and the New York & Portchester Railroad to submit their reports regularly to the Commission for the First District as well as to the Commission for the Second District.

**Salina Street & Interurban Railway, Salina, Kan.**—H. J. Smithers, president of the Trades' State Bank of Salina, has purchased the interest of E. J. Hinely, of Colorado Springs, Col., in this property.

**Staten Island Midland Railway, New York.**—A hearing was held on Aug. 16 before Commissioner Bassett of the Public Service Commission, First District, on the application of the Staten Island Midland Railway for approval to transfer 227 shares of its capital stock to the Baltimore & Ohio Railroad. It was explained that the Baltimore & Ohio Railroad plans by a further stock purchase to increase its control of the Staten Island Midland Company, which is one of the constituent properties of the Staten Island Rapid Transit Company. The Baltimore & Ohio Railroad already controls 13,558 of the 14,000 shares of the road, amounting to \$1,050,000, or 96.84 per cent, and the additional 227 shares would give that company 2 per cent more of the stock holdings. J. P. Cotton, of counsel for the Baltimore & Ohio Railroad, stated that the company had no "base designs," but wanted the outstanding shares on general principles. The stock has not received dividends for some time, owing to the large deficit in evidence, and he claimed it would not immediately. The hearing was closed and decision reserved.

**Seattle (Wash.) Electric Company.**—It is stated that the stockholders of the Seattle Electric Company will be given the right to subscribe for \$1,150,000 common stock at a price to show substantial rights. The Seattle Electric Company has an authorized issue of \$7,500,000 common stock, of which \$5,000,000 is now outstanding, while \$1,350,000 is reserved to retire convertible bonds. This common stock will be offered for subscriptions as early as possible after Sept. 15 next, to stockholders of record that date, and in the ratio of one share of new common for each 10 shares of common and preferred outstanding. Holders of convertible bonds who convert into common stock will be given the right to participate in the new issue. The proceeds realized from the sale of this stock will be used to finance new construction in and about Seattle.

**Tidewater Power Company, Wilmington, N. C.**—Baker, Ayling & Co., Boston, have offered for sale at 95 and interest, \$200,000 first mortgage 5 per cent sinking fund bonds, dated Jan. 1, 1908. A letter from A. B. Skelding, general manager of the company, says: "The proceeds of the \$200,000 bonds are to reimburse the Tidewater Power Company for cash already expended for new trackage and equipment, and to provide steam turbines, car barn and shops, motor and trail cars, and extensions to and enlarging gas mains. The replacement value of the properties (exclusive of its franchises, which are of great value) is more than \$1,650,000, against which there is outstanding (including the bonds purchased) \$766,800 of bonds, the balance being represented by stock investment."

### Philadelphia Transit Talks

Transit Talk No. 11 of the Philadelphia Rapid Transit Company, dated Aug. 19, 1909, was entitled "Ten Thousand Cars a Day Pass Three Corners." It said:

We have made a count of the cars passing three street corners in a day. We knew, of course, how many cars per hour are operated on all our lines.

But it was a surprise to find that 3740 cars pass the intersection of Eighth and Market Streets in 24 hours.

This is an average of 156 cars every hour, or more than two cars a minute. In the rush hours there are many more cars than this—one every 10 seconds.

At Eighth and Walnut Streets, two squares away, 3223 cars (134 an hour) were counted in 24 hours.

Over 2765 cars counted at Eighth and Chestnut Streets make a total of nearly 10,000 cars passing these three corners every day.

In this count we do not include 1496 subway cars that pass Eighth and Market Streets, but the enumerators at Walnut and Chestnut Streets necessarily included the northbound cars also counted at Market Street.

We print these figures to show any one who thinks that we do not run as many cars as we might that our rails in the center of the city are, in fact, crowded.

And it is to and from the central section that we are called upon to transport a large majority of our passengers.

You may have assumed that there are too few cars running between your home district and the center of town, and that it would be a very simple matter for us to increase the service. But it is not.

For example, the 12 Sixty-third and Vine street cars per hour, upon arriving in the central district, become 12 of the 732 cars operated every hour on the shopping section of Market Street. As this section is already burdened with traffic to the point of congestion, any increase in the service of even one of the lines would make frequent tie-ups inevitable.

Increase of service upon any particular line is a matter involving other considerations than the mere addition of a few cars.

# Traffic and Transportation

## New Transfer System In Richmond, Va.

The Virginia Railway & Power Company placed in effect on the lines in Richmond, Va., on Aug. 15 a new transfer system which is designed to afford the transfer privilege without permitting undue advantage to be taken. The transfer situation in Richmond has been somewhat complicated on account of the difference in the franchises of the Richmond Passenger & Power Company and the Richmond Traction Company, which operate over the same tracks in the city. The Virginia Railway & Power Company having purchased the lines of both companies, under foreclosure, has agreed to try a consolidated transfer system in place of the exchange transfer between the two companies and the transfer issued by the Traction Company to Traction lines and that issued by the Passenger & Power Company to lines of its company. The lines of Richmond, however, are not laid out at right angles and frequently loop and run over the same tracks—which prohibits a universal transfer system unless the privilege is restricted. Otherwise, there is no limit to the number of rides, or the length of rides, that a person might secure with the universal transfer system in effect, issuing transfers on transfers, as required by one of the franchises.

The notice to the public issued by the company before the system was placed in effect, states:

"In view of the general discussion of the subject of a universal transfer on the street railway lines in this city and the misunderstanding in the minds of many people as to the facts governing these transfers, the Virginia Railway & Power Company desires to make the following statement:

"The lines in Richmond are operated under two separate franchises, one granted to the Richmond Traction Company and the other to the Richmond Passenger and Power Company. While both these franchises, as well as the properties covered by same, have been acquired by the Virginia Railway & Power Company under sale by the United States Court, the franchises are still separate, and the rights of the company as to the different lines are distinct. These several franchises have contained different provisions as to transfers; for instance, the Richmond Traction Company franchise requires the company to give a transfer on a transfer, while this is not required by the Richmond Passenger & Power Company franchise as to transfers given in exchange between the two companies.

"These conditions have necessarily resulted in great confusion and embarrassment to the public as well as the companies. It has been the intention of this company, as soon as practicable after taking control of all the properties, to take up with the proper authorities of the city and, if possible, arrange an intelligent and logical transfer system, universal in its application, which would give to the people of the community served the most convenient and extensive transfer facilities consistent with proper regulations for the protection of the company against fraudulent and improper use of transfers.

"Prior to the sale of the property, the City Council passed an ordinance requiring, in effect, that transfers should be given at transfer points to the next car passing in the direction in which the transfer was desired, without regard to the company operating such car, and suit was brought by the Central Trust Company, trustee in one of the mortgages of the Richmond Passenger & Power Company, to enjoin the enforcement of this ordinance, on the ground that it was a violation of the franchise contract. A temporary injunction was granted, but the United States Court has recently decided that the franchise was valid; from which decision an appeal has been noted pending the final and logical adjustment of this whole question.

"The company fully recognizes the inconvenience and annoyance of the existing conditions, but the varying provisions of the several franchises, as well as numerous other conditions surrounding the operation of the lines in Richmond, make it very difficult for the company to give an intelligent transfer system which will not open the door to the fraudulent use of transfers, to the great injury of the company and the public.

"Owing to the great amount of work which has been thrown upon the officers of the company incident to its organization and taking over the properties, it will not be practicable to take this matter up for final adjustment until the early fall. Pending such adjustment, however, it is the purpose of the company to put into effect a transfer system which will provide for transfers to the next passing car at transfer points, without regard to the franchise under which such car is operated, which will practically give to the people the universal transfer system which they desire.



This arrangement will be tentative and experimental, with a view of satisfying the demands of the people as far as practicable, even at some loss to the company, until the subject can be taken up with the proper authorities of the city and an intelligent adjustment made; which it is hoped can be accomplished early in the fall, when a permanent and, as far as practicable, universal system of transfers will be put into effect.

"The company makes this announcement in order that the public may understand that it is its purpose to do everything in its power to promote the convenience and comfort of passengers upon its lines and meet the demand with respect to the transfer system. It desires, however, that the public may also realize the difficulties confronting the officers of the company and the danger of serious injury to its income through the improper use of transfers, and would ask the patience of the public and the co-operation of the people of this community in the efforts which will be made to remedy these conditions."

C. B. Buchanan, general superintendent of railways of the company, states that the transfer system has not been in effect a sufficient time to permit a conclusion to be formed concerning the result of the consolidated transfer on the revenues.

**Transportation of Dogs Prohibited on Syracuse Railway**

A representative of the New York State Commissioner of Agriculture in charge of quarantine has served an order on the Syracuse Rapid Transit Railway prohibiting the transportation of dogs in Syracuse and Solvay, an adjoining village, as follows:

"Take notice that a quarantine for the suppression and prevention of the spread of the disease rabies has been laid upon the city of Syracuse and village of Solvay, and by such order you are forbidden to accept for transportation any dog or dogs, except upon written order from the department authorizing such removal from the district quarantined. Information regarding this quarantine from the undersigned at the office of the sheriff of Onondaga County.

"CHARLES M. A. SMITH, in Charge of Quarantine."

As the company operates in several towns adjoining the city of Syracuse, it was impossible to differentiate between them, and a general order was issued by J. E. Duffy, superintendent, as follows, directing conductors not to transport dogs:

"Note the attached order served upon the Syracuse Rapid Transit Railway Company on Monday, Aug. 16, in relation to transportation of dogs. You will note we are ordered not to accept for transportation any dogs upon the cars of this company. Kindly see that this order is enforced."

**Negotiations for Settlement of Wage Question in Chicago**

The negotiations which were under way for a peaceful settlement of the wage controversy between the surface railway companies of Chicago and their employees came to an abrupt ending on Aug. 20, when the verbal agreement between the Chicago Railways Company and the committee of its employees was repudiated by a vote of the employees. On Monday, Aug. 23, similar action was taken by the employees of the Chicago City Railway and the entire question of increased wages was thus thrown open again for readjustment.

Although the officials of the railway companies had presented a schedule of wages that was considered a marked increase over the old salary scale, the employees took the stand that a sliding scale of wages, which allowed the maximum wage only to the older employees, was undesirable. This, they claimed, might prove to be a boomerang which would place a premium on the services of new men and might result in the discharge of the old-time men. The employees also objected to the length of the proposed contract, three and one-half years, which would mean expiration in February, 1913, at the coldest time of the year. They thought this might handicap them in making a new contract at that time.

Representatives of the railway companies have stated that they have granted all the concessions they can afford, but each of the presidents has announced a willingness to open the controversy again to listen to what the employees may care to suggest. It has been announced that the railway companies will now urge that the whole subject of wages be placed in the hands of a board of arbitration.

The situation became so threatening during the early part of this week that the chief of police of Chicago called in members of his force who were away on furloughs so as to be able to provide adequate police protection in case peace negotiations failed. The State Board of Arbitration has gone to Chicago to lend its aid in bringing about an

amicable settlement, and the Chicago City Traction legal representative, Walter L. Fisher, is doing what he can in the interest of the city to bring about a peaceable arrangement.

**Changes in Kansas City Wages**

The Metropolitan Street Railway of Kansas City posted in its car houses on Aug. 14 notice of a change in the wage schedule of trainmen, effective on Sept. 1:

"In September, 1907, the general manager of this company made a proposition to the trainmen concerning a division of certain savings in operating expenses that might be made during the following year by extra care and caution in avoiding accidents, coupled with a plan by which the trainmen were to be beneficiaries of any increase in the company's earnings per car-mile. This anticipated saving has not been realized. On the contrary, there has been a large increase in operating expenses. Such a result has not been satisfactory either to the men or to the company. In view of this fact and as a recognition of faithful service on the part of our trainmen, the company determined to abolish this former plan, and in lieu thereof to adopt a new wage scale to go into effect Sept. 1, 1909. Commencing with that date all trainmen who have been in the service of the company for less than one year will be considered as apprentices, who are learning the business and who are fitting themselves to enter the ranks as regular employees. At the end of one year's probationary service all apprentices with good records who have demonstrated their fitness will be accepted as regular employees of this company. On and after Sept. 1, 1909, the new wage scale will be as follows:

"For apprentices less than one year, 18 cents per hour. For regular employees, first to second year, 19 cents. For regular employees, second to third year, 20 cents. For regular employees, third to fifth year, 22 cents. For regular employees, fifth to sixth year, 23 cents. For regular employees, sixth to tenth year, 24 cents. For regular employees, 10 full years or over, 25 cents.

"W. W. WHEATLEY, General Manager.

"BERNARD CORRIGAN, President."

The two scales of wages compare as follows:

	New scale, per hour.	Old scale, per hour.
First year.....	18c.	18c.
First to second year.....	19c.	19c.
Second to third year.....	20c.	20c.
Third to fourth year.....	22c.	21c.
Fourth to fifth year.....	22c.	21c.
Sixth to seventh year.....	24c.	21c.
Seventh to eighth year.....	24c.	21c.
Eighth to ninth year.....	24c.	23c.
Ninth to tenth year.....	24c.	23c.
Tenth to eleventh year and thereafter.....	25c.	23c.

In the circular of September, 1907, to which reference is made in the foregoing, it was stated that for the three-year period ending May 31, 1907, the wages of trainmen had been 20.47 per cent of the gross receipts of the company. It was suggested that if the business should continue to increase the percentage could be lowered, and the promise was made that if it were lowered the company would give whatever was saved to the men in lump sums on May 31, 1908, each man to receive his share according to the time he had worked. As a means of encouraging greater care among the men in avoiding accidents, it was also promised that if they would reduce the expense to the company growing out of accidents the men should have half the savings from this source.

**Fare Collection System in Cedar Rapids, Ia.**—The Cedar Rapids & Marion City Railway, Cedar Rapids, Ia., put the Rooke system of fare collection into use on all of its cars on Aug. 18. This system, which employs a portable coin collector and register, has been adopted in Des Moines, Sioux City, Waterloo and Oskaloosa, Ia.

**Protection at Crossing of Track Used Jointly by Traction and Railroad Company.**—The Public Service Commission, Second District, has authorized the Dexter & Northern Railroad to cross at grade two streets in the village of Dexter, Jefferson County. Further protection is secured by requiring three signal boxes to be located so that upon the entrance of a train or street car of the Black River Traction Company upon a portion of track which shall be jointly used, access to such portion of track is regulated by these signals.

**Decision of Arbitrators in La Crosse, Wis.**—An increase of two cents an hour for motormen and conductors of the La Crosse City Railway is approved in the decision of the board of arbitration chosen to adjust the wage question. The sliding scale will be retained until at the end of one



year's service the men will receive the highest amount of wages. The minimum wage will be 19 cents an hour, as compared with 17 cents, the prevailing rate, and the oldest men on the road will receive 23 cents per hour instead of 22, as at present.

**Counterfeit Transfers in Chicago.**—Conductors on the lines of the Chicago City Railways have discovered counterfeit transfer tickets, and hundreds have been collected. The tickets are similar to those used by the company, except that they do not have a serial number and letter. A notice has been posted in the car barns warning the conductors to be on the alert. In case any of the tickets are found to be in the possession of a passenger the conductor is asked to secure the name and address of the person, but not to cause an arrest.

**Arrest of Accident Claimant in Oakland, Cal.**—John Ferrin, claim adjuster of the Oakland (Cal.) Traction Company, arrested in Oakland on Aug. 4 Mrs. Maude Johnson, alias Edith Strong, Grace Payton, Maria Johnson, N. L. Harrelson, May Thomas and Francis B. Raster. Mrs. Johnson secured help from the exalted ruler of the Oakland Elks and then sent for him to say that she had been injured in an accident on a car and to ask that suit be entered against the Oakland Traction Company for \$200,000. At this time Mrs. Johnson asked Mr. Reed to write her will disposing of her share in an estate in Nevada, Mo.

**Washington, Baltimore & Annapolis Road Makes Contract with Express Company.**—A contract has been made by the Washington, Baltimore & Annapolis Electric Railway with the Electric Express Company whereby the latter will inaugurate an express and freight service on the line of the railway on Sept. 1. The express company has been incorporated in Maryland with \$100,000 capital. Following are the officers and directors: T. H. Pickford, Washington, president; E. W. McCormick, Washington, secretary and treasurer; William E. Slaughter, Baltimore, vice-president and general manager; J. W. Trautwein, Annapolis; E. J. Codd, Baltimore, and W. S. Cosby, Washington.

**Steel Strikers Cause Discontinuance of Traffic on Lines in McKee's Rocks, Pa.**—J. D. Callery, president of the Pittsburgh (Pa.) Railways, announces that the company has suspended service on the Neville Island line and Schoenville line, each of which passes through the territory in which the workers of the Pressed Steel Car Company are now on strike. The railway company states that it is, and has been for some time, unable to protect its passengers from the strikers. It cites as instances the killing of Deputy Sheriff Harry Exler on Aug. 22 while a passenger on a car and the killing of three other passengers who were chased from a car before being killed. Mr. Callery declares that the service will not be resumed until the trouble is over or the authorities protect the company's property and its patrons.

**Steam Line Must Stop at Highway Crossing.**—The Public Service Commission, Second District, has ordered the Newark & Marion Railway Company to stop all its passenger trains on signal at its crossing of the highway known as Mill Street, in the village of Marion, and provide such facilities for the embarking and alighting of passengers at that point as safety requires. The petition of residents asking for a shelter at that crossing is denied. It was shown at the hearing on this matter that such a stop was formerly made commencing with the operation of the road and discontinued only a year ago. The company was incorporated as a street railroad, and although it now operates by steam the commission holds that it must be assumed to be operating a street railroad. The nearest stop now made is at Buffalo Street, Marion, nearly a ½ mile from the Mill Street crossing.

**District Electric Railway Commission of Washington Issues New Order.**—The District Electric Railway Commission of Washington, D. C., has announced a new regulation governing the stopping of street cars in the District to take on or let off passengers. The order reads as follows: "No motorman or conductor shall refuse to stop to take up a passenger at any street crossing or other regular stopping place unless all the seats in the car or train are occupied, nor shall any motorman or conductor refuse to stop to let off a passenger at any street crossing or other regular stopping places; provided that, after a blockade, motormen or conductors need not necessarily stop for passengers at every crossing adjacent to the point of said blockade. Trainmen must notice what particular streets have been skipped by the car or train in front of them so that all cars or trains shall not run past the same crossing. Cars or trains must not be run past passengers on account of being behind their schedule time unless another car or train is following within two blocks. In every case where a car or train is run past intending passengers motormen must request such persons to take the following car or train."

## Personal Mention

Mr. Harry J. Gibson has been elected vice-president of the Toledo, Bowling Green & Southern Traction Company.

Mr. John Kilgour has been elected president of the Toledo, Bowling Green & Southern Traction Company to succeed Mr. G. B. Kerper.

Mr. C. G. Young, formerly chief engineer of J. G. White & Company, has just returned from a trip around the world occupying about nine months. Mr. Young made a special study of traction properties while away.

Mr. Justin W. Lester, formerly treasurer of the Worcester (Mass.) Consolidated Street Railway, has been elected general auditor of the Tampa Northern Railroad and its allied concern, the Arizona Lumber Company, with headquarters at Tampa, Fla.

Mr. S. K. Holland has resigned as division traffic manager of the Illinois Traction System, Peoria, Ill. It is stated that Mr. Holland will accept a position with the Peoria & Galesburg Railway, Peoria, Ill., which is building an electric railway from Peoria to Galesburg and Canton.

Mr. E. D. Rasmussen has resigned as master mechanic of the Choctaw Railway & Lighting Company, McAlester, Okla., to join the Allis-Chalmers Company, Milwaukee, Wis. Mr. Rasmussen was formerly electrical engineer and superintendent of the power plant of the El Paso Southwestern System, El Paso, Tex.

Mr. Elton G. Dunlap, the present assistant treasurer of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has been employed by this company and its predecessors for the last six years, serving in almost every capacity through the accounting and treasury departments, and for the last two years as assistant chief clerk. Mr. Dunlap has received practically all of his business experience with this company or its affiliated properties.

Mr. S. L. Prenter has been appointed assistant to Mr. F. R. Glover, assistant general manager of the British Columbia Electric Railway at Vancouver, B. C., and will have special charge of the Chilliwack division of the system. Mr. Prenter was connected with the Canadian Pacific Railway for 24 years, during which time he acted in various capacities. He was chief clerk for Mr. H. E. Beasley, formerly superintendent of the Pacific division of the Canadian Pacific Railway, with headquarters in Vancouver.

Mr. C. H. McMillan, assistant superintendent of the line and superintendent of the car houses of the Chicago, Ottawa & Peoria Railway, at La Salle, Ill., has been transferred to Streator, Ill., to become superintendent of the new Ottawa-Streator division of the company. Mr. Henry Jensen, of Bureau, has been promoted to roadmaster of the Princeton-Seneca division of the line. For more than a year the Princeton-Seneca division has been divided, Mr. Jensen being the roadmaster at the west end and Mr. Joseph Williams of the east end. Mr. Williams has been transferred to Morris, where he will superintend the construction of the extension from Seneca east.

Mr. S. C. Rogers, who has held the position of both treasurer and auditor of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, since the incorporation of the company on July 1, 1905, has relinquished the title and duties of auditor to give his entire attention to the work of treasurer and direction of the financial department. It was on the recommendation of Mr. Rogers that the positions of treasurer and auditor were made independent of each other, and Mr. Emmet D. Gault and Mr. Elton G. Dunlap, who received practically all of their education in railway accounting with the present company or its predecessors, were elected to the positions of auditor and assistant treasurer, respectively.

Mr. Emmet D. Gault, the present auditor of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has been associated with these properties for nearly 12 years, and has risen from the rank of junior clerk and stenographer to his present position. In February, 1901, Mr. Gault was stenographer for the general manager of the Youngstown Consolidated Gas & Electric Company, now one of the underlying companies of the present consolidated system. Subsequently he took the position of general bookkeeper; then, as the company increased in size, he became chief clerk, a position which he held until this year, when he was elected one of the general officers of the company with the title of auditor, and Mr. Glen R. Drury was appointed chief clerk under Mr. Gault.

Mr. J. H. Hartford, general foreman of the shops of the Hartford lines of the Connecticut Company at Hartford,



Conn., was presented with a gold watch by his associates and employees on Aug. 17. Mr. Hartford left Hartford to take charge of the Bridgeport shops of the Connecticut Company as master mechanic. About 75 of the foremen, heads of departments, employees and friends were present. Mr. A. Blanchard, superintendent of shops, made the presentation, referring to Mr. Hartford's connection with the Hartford lines since he went there three years ago. Those who presented the watch were members of the electrical and mechanical departments of the Hartford, Manchester and Rockville divisions; also the storeroom, line and power house men. Before going to Hartford, three years ago, Mr. Hartford was connected with the Coney Island & Brooklyn Railroad, Brooklyn, N. Y., for 14 years in an important capacity. Mr. Hartford took charge as master mechanic at Bridgeport on Aug. 18.

Mr. F. W. Whitridge, receiver of the Third Avenue Railroad of New York, has been mentioned as a desirable candidate for Mayor of New York City if he could be induced to enter the campaign. In a recent article the *New York Evening Sun* spoke of Mr. Whitridge, who had "upset all the traditions of receiverships by actually 'running the road' instead of letting things take care of themselves until it is time to show up at the end with a demand for a big fee, is being prominently mentioned as a fusion candidate for Mayor. It is thought by his friends that he could win votes on account of his splendid record in having brought order out of the chaos in the rehabilitation of the surface railway system of which he was appointed receiver by Judge Lacombe of the United States Circuit Court last year. As receiver of the Third Avenue Railroad System, Mr. Whitridge has given some hard jolts to the bondholders of the road; to the Public Service Commissioners who, he believes, have been trying to hamper him in his determination to improve the service and make the road pay expenses so as not to destroy the equities of the stockholders, and even to some conductors and passengers who forgot to pay up. He put up temporarily the 'Thou Shalt Not Steal' signs in the cars as a gentle and Biblical reminder to careless passengers and dishonest conductors not to rob the stockholders of the company. But as soon as possible he introduced the 'pay-as-you-enter-cars,' which relieve both passengers and conductors of suspicion, thus abolishing the old-fashioned loose way of handling fares. The results have been highly satisfactory to every honest passenger and conductor, and even the Public Service Commission is beginning to recognize the genius of Mr. Whitridge in eliminating graft from the operation of a street railway system.

#### OBITUARY

**Capt. Herman P. Schuyler**, assistant treasurer of the General Electric Company and one of the best-known credit men in the country, died on Aug. 14 at his home in Albany, N. Y., aged 67 years.

**J. B. Stetson**, president of the California Street Cable Railroad of San Francisco, died on Aug. 21 at his home in San Francisco. Mr. Stetson was prominent in commercial and railroad affairs.

L. S. Storrs, president of the New England Investment & Security Company, after communicating with F. W. Rane, State Forester of Massachusetts, has issued a letter to the general managers of the street railways controlled by the company, which is designed to enlist their help in preventing forest fires. Mr. Storrs states in his letter:

"Inasmuch as our various country lines depend in a large measure for their attractions upon the forests through which they run, it is very essential that we cooperate to the fullest extent with the State authorities in their endeavor to suppress the forest fires.

"I wish that you would see that each of your division superintendents is supplied with a copy of this book (State Forester's Report on Forest Fires), together with instructions that they personally meet the forest warden in each town through which their jurisdiction extends, to ascertain their telephone numbers, in each case where they have telephone connections at their residences or places of business, and if not, the quickest way they can communicate with the warden.

"Will you then see that notices are posted in all car barns requiring the crews to report to the superintendent or dispatcher, at the first company telephone, any fires which they may observe, with exact location and condition of the fires?

"You will then require your superintendent or dispatcher to communicate this information immediately to the forest warden, who will, of course, follow instructions laid down for him by the State Forester."

The State Forester sent a letter, together with copies of the communication from Mr. Storrs on the subject, to the various railways in Massachusetts.

## Construction News

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

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

#### RECENT INCORPORATIONS

**\*Kankakee & Urbana Traction Company, Kankakee, Ill.**—Incorporated to build an electric railway from Kankakee via Urbana to Charleston, and from Champaign to Piper City. Principal office, Kankakee. Capital stock, \$200,000. Incorporators: R. F. Cummings, Geo. M. Bennett, Ira N. Palmer, W. J. West, Upton Schaub, C. E. Thrasher, F. J. Hennessy, W. J. Brock and W. D. Moore, Jr.

**\*Baltimore & Eastern Shore Railway, Baltimore, Md.**—Incorporated to build an electric railway from Baltimore to Cambridge, with a ferry connecting Bay Shore and Kent County. Capital stock, \$50,000. Incorporators: William H. Fehsenfeld, president of the Travelers & Merchants' Association; Charles H. Knapp, E. A. Davis, E. T. Jones, A. F. Saunders, R. A. McCormick, A. H. McDannald, C. W. Perkins, D. M. Fulton and G. P. Neilson, all of Baltimore.

**Eugene-Pacific Western Railroad, Eugene, Ore.**—Incorporated to take over the property, franchises and rights of the Eugene-Pacific Electric Railway, which proposed to build an electric railway from Eugene to Florence, a distance of about 40 miles. Surveys are being made. Incorporators: F. J. Bergot, Joseph Fellman and F. A. Anderson, all of Eugene. [E. R. J., May 8, '09.]

**Missouri, Tennessee & Georgia Railroad, Humboldt, Tenn.**—This company has applied for a charter to construct an electric street railway from Humboldt to Dyersburg, via Crockett Mills, Friendship and Bonicord, a distance of 35 miles. Capital stock, \$1,000,000. Incorporators: C. H. Ferrell, Dr. J. H. Thomas, C. T. Jarrell, G. D. Ferrell, C. W. Rooks, J. D. Senter, W. W. Baird, O. C. Sharp, J. M. Senter and A. R. Dodson. [E. R. J., Aug. 21, '09.]

**Port Arthur (Tex.) Traction Company.**—Incorporated to build a 6-mile electric railway system in Port Arthur. Capital stock, \$200,000. Headquarters, 503 Reibold Building, Dayton, Ohio. Incorporators: H. J. Myers, A. H. Reeder, Dayton, Ohio; A. L. Davis, Harris County. [E. R. J., Aug. 21, '09.]

**San Angelo (Tex.) Street Railway.**—Incorporated to operate a street railway system in San Angelo for the transportation of freight and passengers. This company has been organized to take over the property of the Angelo Power & Traction Company, which was sold at receiver's sale to Samuel Crowther, San Angelo, for \$38,000. About 4 miles of track were formerly operated and it is proposed to resume operation at once and add 4 miles of track to the line the first year. Capital stock, \$100,000. Incorporators: Samuel Crowther, Charles W. Hobbs, C. A. Broone, L. L. Farra, A. M. Hicks, F. W. Walker and John W. Harris. [E. R. J., June 19, '09.]

**Wichita Falls (Tex.) Traction Company.**—Incorporated to build an electric railway from Wichita Falls to Lake Wichita, a distance of 5 miles. This company has recently purchased the Wichita Falls Water & Light Company. Capital stock, \$150,000. Incorporators: J. A. Kemp, Frank Krell, Chas. C. Huff and F. P. St. Clair. [E. R. J., March 13, '09.]

**Spokane, Walla Walla & Western Railway, Walla Walla, Wash.**—Incorporated to take over the holdings of the Columbia & Walla Walla Traction Company, which proposed to build an electric railway from Dayton to Wallula, a distance of 60 miles. Capital stock, \$1,000,000. Incorporators: E. M. Symonds, M. S. Parker, G. S. Haynes, A. H. Hoffman and E. C. Maxon, Spokane; H. M. Hanger, Dayton, and W. L. Russell, Walla Walla. [E. R. J., July 3, '09.]

#### FRANCHISES

**\*Anniston, Ala.**—Col. William H. Zinn has applied to the City Council for a franchise to build a street railway system in Anniston.

**\*Globe, Ariz.**—A. H. Sterns, local representative of Los Angeles, Cal., capitalists, headed by John Deneer, has applied to the City Council for a franchise to operate a street railway in Globe. Electric or gasoline motor power is specified as the mode of operation for the system.

**Globe, Ariz.**—F. C. Jacobs, attorney for George W. Hunt, has filed an amended franchise with the City Clerk for the construction of an electric railway in Globe. Mr. Hart agrees to construct a \$12,000 bridge across Pinal Creek. [E. R. J., Jan. 2, '09.]

**San Diego, Cal.**—The City Council has granted a franchise to the San Diego Electric Railway to build a street railway from D Street to Smith Street and Congress Street.



**\*San Bernardino, Cal.**—Fred Durham, Redlands, has applied to the City Council for a franchise to build an electric railway to extend from Third Street and E Street north to Sixth Street, west to Mount Vernon Street and north to Base Line.

**Joliet, Ill.**—The Highway Commissioners have granted a 20-year franchise to the Chicago & Joliet Electric Railway to operate its system on Cass Street and Collins Street.

**Waterville, Maine.**—The Board of Municipal Officers has granted permission to the Lewiston, Augusta & Waterville Street Railway to cross the Kennebec River on a concrete bridge to be built on the south side of the present Ticonic Bridge and to join its tracks to those of the Waterville & Fairfield Railway & Light Company, and to use the latter company's tracks on Main Street. H. B. Ivers, general manager.

**Kalamazoo, Mich.**—J. P. Clarke, vice-president of the Michigan United Railways, has applied to the City Council for a franchise to build a line on South Rose Street from Main Street to South Street and on South Street to Portage Street. This route has also been selected by the Michigan & Chicago Westbound Railway, which is promoting an interurban railway to Grand Rapids.

**East Aurora, N. Y.**—The Buffalo Southern Railway, Gardenville, has applied to the Village Board for a franchise to operate its electric railway on Main Street.

**Cadiz, Ohio.**—The Wheeling, Cadiz & Tuscarawas Traction Company has applied to the City Council for a franchise to construct an electric railway over certain streets and avenues of Cadiz. A. E. Townsend, Cadiz, president and general manager. [E. R. J., Aug. 7, '09.]

**Dayton, Ohio.**—The County Commissioners have granted a 25-year franchise to Thos. A. Ferneding, of the Dayton & Xenia Transit Company, to build electric railways over the Shakertown, Dayton and Wilmington pikes. It is stated that the franchise will be transferred to the Dayton, Springfield & Xenia Southern Traction Company, which was organized some time ago to extend these lines to Washington C. H. [E. R. J., Oct. 10, '08.]

**Forest Grove, Ore.**—The United Railways, Portland, have applied to the City Council for a 25-year franchise to construct an extension into Forest Grove.

**\*Lebanon, Tenn.**—The Board of Aldermen has granted a 99-year franchise to H. B. Bond, Lebanon, to construct a street railway in Lebanon. Mr. Bond has requested that the franchise be put to a vote of the people.

**Logan, Utah.**—David Eccles, president of the Ogden (Utah) Rapid Transit Company, has applied to the City Council for a franchise for the construction of a street railway system in Logan. The proposed extension, which is to run from Ogden to Logan via the Cache Valley, 60 miles distant, has already been constructed as far as the Ogden Valley, a distance of 15 miles.

**Wheeling, W. Va.**—The City & Elm Grove Railroad has applied to the County Commissioners for a franchise to extend its railway around Wheeling Park and at Park View.

#### TRACK AND ROADWAY

**Nashville & Huntsville Railroad, Huntsville, Ala.**—It is reported that this company, which planned to build an electric railway from Huntsville, Ala., to Nashville, Tenn., has abandoned the proposition and is restoring the \$200,000 subscribed by the people of Davidson, Marshall and Giles Counties, Tennessee, and Madison County, Alabama, with 4 per cent interest added. [E. R. J., Aug. 15, '08.]

**Pacific Electric Railway, Los Angeles, Cal.**—This company has completed surveys for the proposed extension in Pomona on the Huntington Boulevard route to a point beyond Ganesha Park.

**Modesto (Cal.) Interurban Railway.**—The grade for this electric railway, to connect Modesto, Newman, Crowe's Landing, Waterford and Empire, is completed and the work of laying the ties and track will commence immediately. The Pacific Construction Company has the contract for this work, and it is expected to complete and have cars in operation by Sept. 1. T. R. Beard, Modesto, president, and W. A. Cooper, 1370 Franklin Street, Oakland, chief engineer.

**\*Rome, Ga.**—It is reported that Col. Wright Willingham, Rome, is promoting a plan to build an electric railway to extend from Chattanooga to Atlanta via Rome, a distance of 160 miles. The route of the proposed line is from Chattanooga to Ringold, then to Dalton and on to Rome.

**Savannah (Ga.) Electric Company.**—This company has contracted with the Pennsylvania Steel Company for 30 tons of 70-lb. 7-in. high T rails, which is the first order of about 250 tons to be purchased for the Barnard Street improvements.

**Belleville & Mascoutah Traction Company, Mascoutah, Ill.**—Work on the grading for the proposed electric railway to be constructed by this company has been started at Rentschler station, midway between the two cities. McCann Brothers, contractors. Among those interested are G. J. Scheve and E. R. Hagist. [E. R. J., Aug. 7, '09.]

**Chicago & Joliet Electric Railway, Joliet, Ill.**—This company, in conjunction with the Highway Commissioners, has awarded a contract to the Newkirk & Powers Constructing Company for the construction of a bridge over Spring Creek at Cass Street. The company will pay \$2,000 and the Highway Commissioners the remainder.

**Evansville, Suburban & Newburg Railway, Evansville, Ind.**—It is stated that this company is planning to extend its railway from Evansville to Henderson and Uniontown, Ky.

**Cincinnati, Madison & Western Traction Company, Madison, Ind.**—The Vienna and Lexington townships have voted subsidies amounting to \$43,000 to assist this company to construct the proposed electric railway from Madison to Scottsburg by way of Hanover and Lexington, and later to Salem and French Lick Springs. The company has requested the township of Madison to vote for \$51,000 subsidy, and the townships of Hanover and Republican for proportionate sums as subsidies. The proposed railway is to be operated in connection with the Indianapolis & Louisville Traction Company, and its promoters are also identified with the latter company, among whom are John E. Greeley, W. E. English and C. C. Tennis. [S. R. J., Feb. 8, '08.]

**Kansas Union Traction Company, Altamont, Kan.**—William J. Jones, general manager of this company, has made the people of Columbus an offer to build an electric railway from Cherryvale through Oswego to Columbus, provided they would raise a bonus of about \$6,000. The company proposes to construct an interurban railway connecting Parsons, Cherryvale, Altamont, Mound Valley, Edna and Coffeyville. The people of Coffeyville and Parsons have already raised a bonus of \$10,000 each. [E. R. J., Aug. 21, '09.]

**Joplin & Pittsburgh Railway, Pittsburgh, Kan.**—The final survey for the extension of this electric railway from Croweburg to Mulberry is being made, which completes the preliminary work.

**\*Winchester, Ky.**—It is stated that B. R. Jouett, M. T. McEldowney and John E. Garner have made a proposition to the people of Bath and Bourbon Counties to build an interurban electric railway from Winchester to Sharpsburg, if the towns interested will give the right of way and a bonus of \$100,000.

**Boston & Northern Street Railway, Boston, Mass.**—This company has recently opened a ½-mile extension of its lines from Stoneham Square through the Middlesex Falls to Spot Pond.

**\*North Wildwood, N. J.**—Augustus Hilton is said to be interested in a proposition to build an electric railway from Cape May Court House to Wildwood Junction, and on to Grassy Sound, Anglesea and Wildwood Crest. If this line is built, there will be a direct connection from Cape May to Atlantic City.

**\*Rahway, N. J.**—It is stated that A. F. Kirsten, S. H. Herman and Aaron Gries are interested in a plan to build an electric railway between Rahway and the towns along the shore opposite Staten Island, between Sewaren and the Rahway River. A meeting attended by members of the Common Councils of Rahway and Roosevelt was recently held, at which tentative plans were adopted. The proposed railway would be about 6 miles in length.

**Lake Erie & Youngstown Railway, Youngstown, Ohio.**—It is reported that grading has begun at Andover on this proposed electric railway to extend from Conneaut through Andover to Youngstown. The Stanley Contracting Company has the contract for the construction of this line. This system will connect with the Youngstown & Southern Railway, which extends from Youngstown to East Liverpool. [E. R. J., June 12, '09.]

**Toledo, Bowling Green & Southern Railway, Findlay, Ohio.**—It is said that this company is planning to extend its electric railway to Kenton within a year.

**Lebanon, Ore.**—The ELECTRIC RAILWAY JOURNAL is advised by Mealey Bros., Foster, that they have decided not to begin work on the proposed electric railway from Lebanon to Cascadia, at present, owing to the depression in the lumber market. [E. R. J., July 17, '09.]

**Irwin & Herminie Traction Company, Irwin, Pa.**—This company has been organized to take over the property of the Pittsburgh & Westmoreland Railway, now operating between Irwin and McKeesport. It is said that \$40,000 in



bonds will be issued for improvements. [E. R. J., Aug. 14, '09.]

**Wilkes-Barre & Wyoming Valley Traction Company, Wilkes-Barre, Pa.**—This company advises that it is constructing an 8-mile extension and expects to complete this work by Nov. 1. The company is doing its own construction work. T. A. Wright, superintendent.

**Rochester & Mars Street Railway, Pittsburgh, Pa.**—It is said that right of way has been secured and plans have been completed for the construction of this proposed electric railway, to extend from the Baltimore & Ohio Railroad depot at Mars to Rochester, a distance of 23 miles. The railway will cost approximately \$400,000 and will connect with the Pittsburgh & Butler Street Railway; with the Pittsburgh, Harmony, Butler & New Castle Railway, and with the Beaver Valley Traction Company. J. H. Barrett, 331 Fourth Avenue, Pittsburgh, chief engineer. The company has recently applied for a charter. [E. R. J., July 3, '09.]

**Bryan, Tex.**—Thomas L. Fountain, Houston, who has completed the survey of the proposed electric railway between Bryan and the State College, a distance of 5 miles, is preparing a report which will be submitted to J. T. Maloney, Mayor of Bryan. [E. R. J., Aug. 7, '09.]

**Dallas (Tex.) Interurban Electric Railway.**—It is reported that this company will at once begin construction on its proposed electric railway connecting Dallas, Forney, Mesquite, Terrell, Canton and Tyler. The company has secured all franchises and rights of way in Dallas. Capital stock, \$2,400,000, with \$600,000 preferred stock. Henry Dorsey, Dallas, president.

**Quanah & Medicine Mound Traction Company, Quanah, Tex.**—Charles Hagelstein, Quanah, writes that this company has not yet been incorporated and that nothing will be done until a sufficient bonus has been raised. The railway will connect Quanah and Medicine Mound, a distance of 17 miles. The repair shops and power station will be located at Quanah and the company will probably furnish power for lighting. All communications should be addressed to W. L. Johnson, Medicine Mound, Tex. [E. R. J., Aug. 14, '09.]

**Fairmont & Northern Traction Company, Fairmont, W. Va.**—This company has effected an organization in Fairmont. Directors: C. W. Watson, J. E. Watson, S. L. Watson, A. B. Fleming, J. H. Wheelwright, C. L. Shaver, Van Lear Black, W. Miller and G. T. Watson. The officers of the company will be elected at a meeting to be held next week. The company was formed with the object of building an electric railway from Fairmont to Fairview, a distance of 15 miles. The survey of the railway has been made and most of the rights of way have been secured. [E. R. J., Aug. 14, '09.]

**Parkersburg, Marietta & Interurban Railway Company, Parkersburg, W. Va.**—This company expects to extend its railway across the Little Kanawha River in Parkersburg and from Marietta past Lowell and Coal Run to Beverly, Ohio.

**\*Appleton, Wis.**—It is reported that A. L. Gettys and C. R. Robins, Chicago, Ill., are interested in a project to build an electric railway from Appleton, Wis., to Menominee, Mich., via Seymour, Oconto, Green Bay and Marinette, Wis.

**Wausau (Wis.) Street Railway.**—It is stated that this company will extend its electric railway 1 mile south of Schofield. It is also planned to extend it north to Merrill by next season.

#### SHOPS AND BUILDINGS

**Evansville, Suburban & Newburg Railway, Evansville, Ind.**—This company is preparing plans for the erection of a warehouse near the river front in Evansville.

**Indianapolis Traction & Terminal Company, Indianapolis, Ind.**—The engineer's plans for a large paint shop to be erected on West Washington Street by this company have been approved and work of construction will begin at once. The structure will occupy the site of the shops recently destroyed by fire.

**Boston (Mass.) Elevated Railway.**—This company has filed plans with the Railroad Commissioners for the reconstruction of its elevated station at Sullivan Square, necessitated by the extension of the elevated line to Malden. By these plans material changes will be made inside the building and additional structures will be erected outside. The result will be that some of the surface cars on the upper level will be able to make a loop instead of stopping at a dead end and backing out, and passengers will enter the elevated train from a new platform on the outside of the present building. At the present time the elevated train cuts a loop through the square, the line entering the building and passing through its center with a large loop swing-

ing around the building for the return. It is proposed to enlarge this loop by moving the outside track farther away from the building, so as to have room for a new platform and for a switch tower between the track and the building. The surface cars will continue out through the front end of the building on a new loop which will encircle the square in front of the building. This loop and the loading platform in Main Street will be the principal new outside structure. Connection between the unloading platforms inside and the loading platform outside will be made by means of two passages to be cut through the Main Street wall, the passages to have a rise of about two feet. An overhead bridge will be built inside the station for transfer purposes.

**United Railways & Electric Company, Baltimore, Md.**—This company has in course of construction a terminal and car house, which is located at the Fulton Avenue entrance, to Druid Hill Park. It will be 422 ft. x 191 ft. x 433 ft. and will be built of reinforced concrete. There will be a large lecture hall on the second story, 100 ft. x 45 ft., which may be used at any time by the employees. In addition to this, there will also be a reading room, a pool room and a number of bowling alleys. Another feature of the building will be an instruction room, where motormen can be put through a regular course of training. Lockers will be given to the men, and an office for the superintendent.

**Winnipeg (Man.) Electric Railway.**—This company is said to have prepared plans for the construction of a car house, repair shops and substation, to cost \$100,000, to be built at the north end of Winnipeg. Wilford Phillips, general manager and chief engineer.

**Portland (Ore.) Railway, Light & Power Company.**—It is stated that plans are being prepared by this company for the construction of a car house, to be located between East Burnside and East Ankeny Streets, east of East Twenty-eighth Street. The structure will be built of reinforced concrete and will cost, it is estimated, \$35,000. Its capacity will be 50 cars. F. I. Fuller, vice-president.

**York (Pa.) Railways.**—This company advises that it has let the contract for the building of a new car house 50 ft. x 200 ft. The new building will be located about a block from the present one, at Hartley Street and Maryland Avenue, in West Manchester township. There will be four tracks in the building with a capacity of five cars each. The building will be, for the present, only for storage out of season.

#### POWER HOUSES AND SUBSTATIONS

**Binghamton (N. Y.) Railway Company.**—This company contemplates the installation of a turbine, additional boilers and appliances for its power station, orders for which have been practically closed.

**Rochester Railways & Light Company, Rochester, N. Y.**—This company contemplates making a number of improvements to station No. 4 at Genesee Falls. A 2000-hp General Electric converter and switchboard will be installed.

**Toledo & Indiana Railway, Toledo, Ohio.**—This company has purchased and is installing one Allis-Chalmers substation equipment.

**Portland (Ore.) Railway, Light & Power Company.**—It is stated that this company is preparing to begin preliminary work on a new high-water power plant on the east side of the Willamette River at Oregon City. The plant, when completed, will have a capacity of 45,000 hp.

**Columbia Power, Light & Railways Company, Bloomsburg, Pa.**—This company has recently purchased a 250-kw railway rotary converter from the General Electric Company, a 1600-kw of 25,000-volt power transformer from Westinghouse Electric & Manufacturing Company, and a 250-kw belted railway generator.

**Seattle (Wash.) Electric Company.**—This company has let a contract to the Stone & Webster Engineering Corporation, Boston, Mass., for a brick substation at Ballard to supply current to the new railways in the northern part of Seattle. Current from this station will also be sold to the Puget Sound International Railway & Power Company, which has an interurban line under construction between Seattle and Everett. This station will have an ultimate capacity of 25,000 kw in railway motor-generator sets and 4000 kw in 2200 volt light and power capacity. It will receive power from the generating stations over a 13,800-volt, three-phase transmission line. The synchronous motors on the motor generator sets will receive this power at 13,800 volts. It is the intention to install one 500-kw motor-generator set immediately, adding a 1000-kw set and two 1000-kw, 13,800-2200-volt transformers in the fall, thus giving 1500-kw capacity in railway machines and 2000 kw in light and power capacity for the peak loads during next winter.



# Manufactures & Supplies

## ROLLING STOCK

**Northwestern Elevated Railroad, Chicago, Ill.,** is planning to purchase 20 additional cars.

**Montgomery (Ala.) Traction Company** has ordered 10 new trucks from The J. G. Brill Company.

**Kansas City Railway & Light Company, Kansas City, Mo.,** expects to order 25 motor cars this fall.

**Coney Island & Brooklyn Railroad, Brooklyn, N. Y.,** is in the market for register fittings for 401 cars.

**Central Pennsylvania Traction Company, Harrisburg, Pa.,** expects to purchase one snow sweeper within a month.

**Chicago & Southern Traction Company, Chicago, Ill.,** is remodeling 14 of its cars for pay-as-you-enter service.

**Austin (Tex.) Electric Railway** advises it will purchase several new cars during the next few months for 1910 delivery.

**Denver (Col.) City Tramway** has ordered two steel underframe snow sweepers from McGuire-Cummings Manufacturing Company, Chicago.

**Piedmont-Carolina Railway, Salisbury, N. C.,** has purchased four closed motor cars from the Dorner Railway Equipment Company, Chicago.

**Galesburg Railway & Light Company, Galesburg, Ill.,** has purchased one snow sweeper from McGuire-Cummings Manufacturing Company, Chicago.

**Quincy Horse Railway & Carrying Company, Quincy, Ill.,** has placed an order with McGuire-Cummings Manufacturing Company, of Chicago for one snow sweeper.

**Springfield (Mass.) Street Railway Company** is having six cars altered over at the works of the Wason Car Company for pay-as-you-enter operation, under license of the Pay-As-You-Enter Car Corporation.

**Fresno (Cal.) Traction Company** is in the market for 10 double-truck cars of the California type. Mention that this company would have some cars built was made in the ELECTRIC RAILWAY JOURNAL of Aug. 7, 1909.

**Hutchinson (Kan.) Inter-Urban Railway** has placed in service two 12-bench open cars, just received from the Danville Car Company. This rolling stock will be used to relieve the heavy traffic at the parks and State Fair grounds.

**Buffalo & Lackawanna Traction Company, Buffalo, N. Y.,** has specified American Locomotive Company's plate-frame swing bolster type of trucks for the 10 pay-as-you-enter cars ordered from the Cincinnati Car Company, and detailed in the ELECTRIC RAILWAY JOURNAL of Aug. 14, 1909.

**San Diego (Cal.) Electric Railway** is building 12 40-ft. car bodies in its own shops. An order has just been placed with The J. G. Brill Company for Brill 27-G trucks for these cars. Mention of the fact that this was contemplated was made in the ELECTRIC RAILWAY JOURNAL of Aug. 14, 1909.

**Grand Rapids (Wis.) Street Railroad** has ordered two motor and two trail cars from the American Car Company. They will be for interurban service and have a seating capacity of 46. Other details follow:

Weight . . . . .	18,000-20,000 lb.	Car trimmings . . . . .	bronze
Vestibule length . . . . .	5 ft. 6 in.	Couplers . . . . .	Van Dorn
Length of body . . . . .	42 ft.	Curtain material . . . . .	Pantasote
Length over vestibule . . . . .	41 ft.	Motors . . . . .	four 50-hp Allis-Chalmers
Width over sills . . . . .	8 ft. 8 in.	Sill to trolley base . . . . .	9 ft.
Body . . . . .	wood	Registers . . . . .	Ohmer
Air brakes . . . . .	Allis-Chalmers	Sanders . . . . .	Keystone
Bolsters . . . . .	steel plate truss	Seats, style . . . . .	H. & K., 99A
		Trucks, type . . . . .	Taylor

Mention of this contemplated purchase was made in the ELECTRIC RAILWAY JOURNAL of April 3, 1909. The order was placed through the Knox Engineering Company, Chicago.

## TRADE NOTES

**Curtis Motor Truck Company, Decatur, Ill.,** has received an order from the Grand Trunk Railroad for 12 trucks.

**Crocker-Wheeler Company, Ampere, N. Y.,** announces that it will establish an office in the Ford Building, Detroit, Mich., on or about Sept. 10. Charles W. Cross will be manager of this branch.

**Burton W. Mudge & Company, Inc.,** has been organized in Chicago, Ill., with a capital stock of \$50,000, to manufacture railway supplies. The incorporators are: B. W. Mudge, C. C. Roe and E. C. Wood.

**Pacific Car & Foundry Company, Richmond, Cal.,** will erect a \$1,000,000 car building plant at Richmond. The W. L. Holman Company, San Francisco, is said to be interested in the new project, which will employ 800 men.

**Keystone Lubricating Company, Philadelphia, Pa.,** now has branch offices established in Chicago, Denver and San Francisco and Harold A. Buzby, secretary of the company, is making a two-months' trip through the territory which they serve, visiting a number of the smaller sales offices in other cities as well. He will return about Sept. 1.

**Nachod Signal Company, Philadelphia, Pa.,** has received an order from the Mahoning & Shenango Railway & Light Company for equipping its entire Youngstown & Sharon division with Nachod automatic signals of type C. The order includes 24 boxes in addition to those already installed, which have been on trial for more than a year. Further signal extensions are contemplated by the railway company.

**Lang Retrieving Trolley Company, Petaluma, Cal.,** elected the following officers at a meeting held on Aug. 9: President, C. E. Lang; vice-president, J. E. Bower; secretary, C. F. Fury; treasurer, R. M. Skinner. This company has completed equipping the cars of the Pacific Electric Railway in Los Angeles with the Lang retrieving trolley and has received an order from the Denver City Tramway Company for a number of equipments.

**American General Engineering Company, New York,** has completed arrangements for a number of agencies in England to handle its line of repair-shop, labor-saving devices. George E. Austin, president of the company, has just returned from a European trip and reports that a number of coil-winding and armature-banding machines have been sold abroad and are giving good satisfaction. The company is planning to enlarge its extensive domestic business by entering foreign fields.

**The Morgan Fare Register Company, Indianapolis,** placed one of its registers on Terre Haute, Indianapolis & Eastern Traction Company car No. 72, which carried the Indianapolis delegation to the Detroit meeting of the Central Electric Railway Association, Aug. 26. This device will register the station where the passenger boarded and at the same time register the station to which the passenger has paid fare and the amount collected by the conductor. The originating point, the destination and the amount are shown at the view of conductors, employees and passengers, the information is printed on a sheet of paper. The register will accommodate any size of paper and will register any amount of money up to \$10. This register is installed on car 72 with the stations of Richmond, Dayton, Troy, Piqua, Lima, Findlay, Fostoria, Toledo and Detroit on the dial. This register is 9 in. in diameter and 5 in. thick, weighing 20 lb. The printing machine is separate and can be placed in any part of the car. It is contained in a box 12 in. x 9 in. x 8 in. and is operated at the time of registering fares by a rod running lengthwise through the car.

## ADVERTISING LITERATURE

**Dorner Railway Equipment Company, Chicago, Ill.,** in list B, dated August, 1909, catalogs for sale a number of types of open and closed street cars, railway motors and control apparatus, trucks and power-house machinery.

**Massachusetts Chemical Company, Walpole, Mass.,** has just issued a second edition of its general catalog of insulations, tapes and fabrics and molded rubber goods. Each product is listed with a brief description of its qualities and the uses to which it is specially adaptable.

**The J. G. Brill Company, Philadelphia, Pa.,** has printed an illustrated 40-page catalog of the various types of seats and seating materials for electric cars manufactured by the company. A number of order forms for the use of prospective purchasers have been bound in at the back of the catalog.

**Electric Storage Battery Company, Philadelphia, Pa.,** has published Bulletin No. 115, describing the installation of chloride accumulators in the Hudson Terminal Buildings, New York City. The storage battery has been installed in a separate room on the third floor below the street and consists of 144 cells of the chloride accumulator, having a capacity of 2000-amp hours.

**Barrett Manufacturing Company, New York, N. Y.,** has just issued an illustrated catalog descriptive of Barrett specification roofs. It contains a specification covering both materials and methods of application for roofs having a pitch not exceeding 3 in. to the foot. More than 30 photographs in the booklet show railroad buildings which have roofs laid according to this specification.

**Ohio Brass Company, Mansfield, Ohio,** has just issued its August bulletin, and in addition to the usual interesting descriptions of railway materials, it contains a number of illustrated articles entitled "The Chicago Subway," "An Interesting Catenary Installation" and "Bonding Special Work." Four pages of the booklet are devoted to a description and views of the main offices of the company.