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THE AUTO-TRUCK FOR EMERGENCY SERVICE

The recent decision of the New York Railways to use electric emergency wagons hereafter will drive the vanishing horse out of his last stronghold in railway service. The greater mileage possibilities of auto-trucks require no expatriation at this day, but attention may be called to their much greater flexibility in meeting specially arduous conditions. Thus, the shorter length of the auto-truck in comparison with a horse and wagon combined make it much easier to move through and out of congested streets. Furthermore, when it is necessary to remove a broken-down vehicle or other heavy obstruction from the track the auto-truck is equally serviceable for pulling or pushing from either end. The preference of the company in question for electric instead of gasoline trucks is also of interest. It found that, on the combined basis of first cost, operation and upkeep, the former actually were cheaper for use on streets with heavy traffic. For general city service the introduction of auto-trucks has made it feasible to operate safely those without towers at an average speed of 15 m.p.h. The stresses set up by the swaying of towers, however, do not make it advisable to operate tower trucks at more than 12 m.p.h.

CITY SUBSIDY TO AID LOCAL TRANSPORTATION

The demand of the residents of East Boston that the city assume the responsibility of the payment of the interest and sinking fund charges on the East Boston tunnel, in order that they may be relieved of a penny toll, illustrates the universal desire of individuals to transfer their charges upon the government through its power of taxation. On the other hand, the reception accorded this demand shows the growing opposition of taxpayers at large to any additions to their burdens. The question at issue is, of course, the extent to which a city should go in subsidizing transportation facilities to different localities.

While the city undoubtedly profits by the extension of every transportation line, the individual locality profits in an even greater ratio, and the practice of requiring special bonuses or assessments for improved transportation facilities is on the increase. Not long ago an insistent minority could often bring enough political pressure to bear upon authorities in most cities to secure the public assumption of a burden of this kind, but now municipal expenses have been growing so rapidly that a different condition prevails, and the opposition of organized taxpayers' associations is also becoming more pronounced. The result of the Boston referendum will throw light upon the way in which the matter is regarded in that city. The subject is an important one, because the laws governing many public service commissions permit them to require railway companies to build extensions upon order of the commission.

CAR BUILDING BY THE SMALL COMPANY

The lure of showing something as "home-made" occasionally leads the small railway to wasteful operating expense which more than offsets a real or fancied saving in first cost. The small railway rarely finds it necessary to buy a new utility car, as it is usually possible to press into service an antiquated passenger car which can be converted at a low charge, or, at the most, a new body may be assembled with old trucks, motors and brake rigging. Such service cars are likely to lack refinement in design and construction, but as their mileage is small their extra weight is of no great importance. Home design and construction of passenger cars, however, should be approached with greater caution. To begin with, as the small company cannot afford an expert designer, the finished car is likely to be much heavier than necessary and to embody crudities in construction which an experienced car engineer would have avoided. Needless weight not only implies higher first cost but excessive energy consumption, greater strain on the motors and injury to special work. Again, the narrow shop facilities of the small company and the fact that the car is built during odd moments are not conducive to the best work. In any event, if conditions do favor home construction, as when a company which is isolated from car builders can get raw materials cheaply, it would be wiser to imitate the successful designs of other companies for like conditions than to run the risk of serious errors through inexperience.

THE FINANCING OF HOLDING COMPANIES

The failure of the First-Second National Bank of Pittsburgh and the appointment of receivers for the American Water Works & Guarantee Company emphasize the dangers which lurk, particularly at the present time, in the over-extension of holding companies. The exact causes of the bank failure are under investigation by the authorities of the Treasury Department, but the facts seem to in-

dicating that the assets of the bank consisted largely of non-liquid securities, not necessarily excessive in amount, but evidently of inferior quality, upon which the government placed a lower valuation than the bank. On account of the connection between the officers of the bank and the officers of the American Water Works & Guarantee Company, presumably a considerable portion of the securities held were those of the latter company and its controlled corporations. We believe that intrinsically public utility properties, such as water companies, electric light and power companies and electric railway companies, when conservatively managed, ought to be among the most desirable classes of investments because they are less subject to fluctuations in commercial conditions than most manufacturing enterprises or trunk-line railroads. It is very difficult now, however, to market any securities except on a basis of a high interest or dividend return, and the securities of the public utility enterprises are not exempt from this condition. In fact, the uncertainty in regard to the legislation and labor conditions has accentuated the situation in regard to these securities. These special conditions, we believe, will pass away, but while they remain they have to be taken into consideration, and any attempt to pyramid upon securities not readily salable is liable to result in disaster.

THE LIMIT IN LABOR UNION ACTIVITY

Just one year ago one of the most disastrous wrecks in the history of American railroading occurred near Corning, N. Y. Forty-one passengers were killed and many were injured. Yet to-day, notwithstanding vigorous efforts on the part of the public authorities, the man whose criminal negligence obviously was the cause of the disaster stands acquitted of the charge of manslaughter which was lodged against him.

The primary cause for this miscarriage of justice is charged directly, in an open letter to a New York newspaper by one of the prosecuting attorneys, to the pernicious activities of the railroad men's unions. This procedure is by no means new, although it probably establishes a record, because the railroad brotherhoods have for some obscure reason developed the custom of fighting vigorously against every case of discipline imposed by a railroad, quite regardless of its merits.

To influence a jury to the extent where it will acquit in the face of what is described as overwhelming evidence and upon the grounds of a defense consisting largely of testimonials of good character is admittedly a logical step for the brotherhood, yet there is a vast difference between the subversion of discipline on a railroad which is willing to pay almost any price to avoid labor trouble and a perversion of justice effected by tampering, even indirectly, with a jury. If this course is to be followed in future, it is difficult to believe that public sentiment can fail to take cognizance of the fact that the trainmen's organizations have just as much regard for the public interests as a frog has for a pair of rubber boots.

Public sentiment has meant much to the railroad labor organizations in the past, and if they lose its support their present power is hardly likely to remain unimpaired. Their action in presenting themselves as lobbyists in the courts is

unwise, to say the least, and, aside from the vicious precedent which is set up, the result in the end cannot fail to be detrimental to the organizations themselves.

SEGREGATING TECHNICAL DATA

Unlike the great philosopher Bacon, who said that he had taken all knowledge to be his province, the average reader of a technical paper feels satisfied if he can read carefully all that is published on his own specialty. It is the aim of every well-edited journal to aid this purpose by the use of appropriate captions and sub-captions as guide-posts, but the application of the facts thus given necessarily depends upon the individual. Each reader of this paper probably has his own way of utilizing the information published, but the method of one which recently came to our attention may be of interest to others. His particular work was car maintenance, and his plan, briefly, was to compile the information published in this paper on that subject and to combine it with facts gained from his own experience. This material was then rewritten on a typewriter, according to the subdivision of the subject, and kept available for easy reference.

An abstract of this assembly shows the following typical arrangement: Under motor inspection he classed commutators, leads, brushes, brush holders and yokes as parts which soon expose defects, whereas neglected commutator dust caps, hand-hole plates and armature clearance rarely evince themselves until an actual breakdown occurs. The absence of commutator dust caps encourages the entrance into the motor of brakeshoe filings, dust and armature bearing oil, which find their way into the armature and field windings and burn them out eventually through excessive heating. An armature may run for months with a clearance below the safety line, but when it does go down on the pole pieces the failure is complete. The compiler's conclusion is that it is cheaper to inspect all parts frequently than to have costly repairs and loss of mileage.

The section on brakeshoes lays stress on the desirability of having an experienced man check the adjustments of small but important parts which may be made by unskilled laborers; also on saving and matching the least-worn shoes of discarded sets, or, better still, of avoiding uneven wear by keeping the brake rigging equalized. The hints on truck and wheel maintenance serve as reminders that non-equalized brake rigging, poor lubrication of center plates and side bearings and lack of clearance on side bearings produce unnecessary flange wear and that other common oversights in truck work are loose or broken bolts and lack of oil on swinging joints and places subject to the rubbing of the brake rods.

In the section on compressors the compiler set down methods of determining trouble by ear, such as a thump for crank-shaft trouble and a positive click for a loose crank pin. On the subject of controllers he added the following pointer from his experience: "Do not neglect to replace the pole piece bolt after completing inspection. Since the magnetic effect of the blow-out is inversely proportional to the square of the distance across the air gap, even a slight increase in the air gap causes a large decrease in the efficiency of the blow-out. When its bolt is not replaced the pole

piece is dependent solely upon the controller cover to keep it in place, and if the cover is loose the pole piece is free to swing back and forth to a certain extent. The consequent flashing destroys the temper of the finger springs and introduces complications which burn up the controller. Again, the use of pliers to bend back the finger spring, in order to make it easier for the shop man to start the screws, takes the life out of a spring and shortens the usefulness of the finger. The adjustment of finger tension without tightening the jam nuts causes many buckled fingers and locked controllers."

The foregoing facts have not been presented because of anything novel which they may contain, but rather to show how one busy man has harvested and bound in a single sheaf the crops of facts that were of the most direct value to him.

TRAIN DISPATCHING ON INTERURBAN RAILWAY

The wreck near Vallejo, Cal., on the line of the San Francisco, Napa & Calistoga Railroad, which occurred on June 19 and resulted in the death of thirteen passengers and serious injury to a score or more, strongly emphasizes the crying necessity for greater care and efficiency in the operating departments of many interurban electric railways. In some parts of the country there is a tendency to regard an interurban electric line in the same light as a street car system, in which the schedule is arranged by the operating department but the maintenance of the schedule is left to the individual car crews.

It is reported that a number of dangerous defects in the operation of the San Francisco, Napa & Calistoga Railroad were pointed out by the State Railroad Commission in a letter addressed to the management on the day before the accident. Specifically the defects to which attention was called were said to be the absence of train registers for checking the arrival and departure of trains, the omission of a dispatcher's book record of train orders issued, the failure to follow prescribed forms as outlined in the book of rules, and the lack of standard clocks with a daily registration of the condition of watches of motormen and conductors. The company was also warned that trainmen must make meeting points positive in case of a wire failure and an interruption to service due to trains being late.

The conductor of the northbound Calistoga flier has strongly maintained that before leaving Vallejo he telephoned to the dispatcher at Napa and received from him the reply "No orders," meaning that the train should run on regular schedule. The dispatcher has as strongly maintained that up to the time of the accident the conductor of the northbound Calistoga flier had not telephoned him for orders and that had he done so the accident would have been averted. There is little evidence to indicate which of the contradictory statements is true. Nor is it of any importance to the public whether the conductor or dispatcher neglected his duty, except that the dispute points out the inefficiency of such a system of issuing train orders. Indeed, the investigation now in progress before the State Railroad Commission of California, while it may serve to determine the liability of the company for damages, will be of little value if it does not lead to the adoption on interurban single-track electric lines of stringent dispatching regulations.

THE NEW HAVEN AND ITS TROLLEY LINES

The ownership of the trolley lines of the New Haven Railroad is condemned this week in no uncertain terms by the Interstate Commerce Commission, whose criticism is not only directed against the prices paid for the properties but includes a strong condemnation of the extension by an interstate road of its activities beyond its own direct field.

Unfortunately for its balance sheet, the New Haven railroad acquired these trolley properties either too early or too late. If it had decided upon the purchase of the Providence system five years earlier than it did, for instance, it would undoubtedly have been able to save a large part of the \$13,500,000 for which the commission considers that it secured nothing. If it had waited an equal length of time, or until 1911 or 1912, assuming that such a purchase would have been permitted by the state and federal laws, the price paid would also undoubtedly have been considerably less than in 1906. But the company embarked upon its plan of securing a monopoly of the transportation facilities in southern New England at a time when there was an exaggerated idea of the economies to be obtained from consolidated ownership and when the disadvantages of a monopoly were not so thoroughly understood as at present. At that time, too, there were exaggerated ideas of the possible profits to be derived from trolley operation.

It was also hoped, and we believe that Mr. Mellen expressed this belief on several occasions, that the service of the trolley lines and that of the through line could be combined; that is to say, that cars traveling over the street railway tracks in one town could make an interurban run over the through tracks of the steam railroad and then continue their run over the city tracks in an adjoining town. We believe that this plan has never been extensively followed on the New Haven road, and the two services have been kept quite distinct, except so far as the trolley companies have been able to benefit from the services of the engineering, accounting and transportation departments of the larger company. At all events, the commission has expressed itself as opposed to this policy of trolley control, not because it is against the law but because such ownership might be used to prevent the construction of competing lines in the future.

We do not understand this to be an order of the commission but simply an expression of opinion. If put into the form of an order, the problem might prove as complicated as that of divorcing the Union Pacific and Southern Pacific Railroads, to which so much study has lately been devoted. Moreover, we doubt whether it would accomplish the result sought. One may be skeptical of the advantages of the control of trolley lines by interstate steam railroads and yet not understand why it prevents the construction of competing trolley lines in a state where the public service commission has wide powers over service, rates and franchises. Until quite recently we were told that a monopoly, rigorously controlled and subject to revocation of its franchise if it did not obey orders, was the most desirable form of public utility. Now we are taught that there must be competition in addition to keep it in check and to make sure that it will perform its service to the public.

Recent Improvements in the Electric Railway System of Providence, R. I.

Introduction of Platform Collection Cars—Improvements in the Handling and Distribution of Traffic—Use of Automatic Block Signals on Single-Track Lines—Other Features

The system of the Rhode Island Company, of which the street railway lines of the city of Providence form the nucleus, is one of the most comprehensive in the East, embracing within its limits a combined urban and suburban trackage of about 320 miles. The service of the company extends throughout the greater part of the smallest and yet the most densely populated state in the Union and includes a passenger, freight and express business yielding a gross revenue of about \$5,000,000 per year. In general, the system radiates from Providence in all directions, including interurban lines running to points in Massachusetts and Connecticut, and providing rapid and frequent transportation between Providence, Fall River, Narragansett

ment of the smaller and relatively inefficient rolling stock in use upon the city lines. The company concurred in this view, and thirty-five cars of this type have been placed in service.

The business center of Providence is located in a flat basin whose outlets are narrow and handicapped by heavy grades. Large carrying capacity per unit of rolling stock is dictated by the traffic density and the restrictions upon schedule speed imposed by the absence of broad and level thoroughfares over which high-speed operation can safely be permitted. Providence is essentially a short-haul city, but the population of 286,000 within the 5-cent fare zone renders the use of large cars essential in the most efficient



Providence Improvements—Exchange Place Loop

Pier, Danielson, New Bedford, Worcester, Brockton and other populous centers. The operating headquarters of the company and the most pressing problems of the management center at Providence, and in the following paragraphs are given the details of some recent improvements associated with the urban lines, including the introduction of platform collection cars, improved methods of handling traffic, the enlargement of the power plant facilities and the conduct of a large express and freight business.

The traffic problems of Providence are greatly complicated by the geography of the city, the narrowness of the streets and the rapid growth of the great manufacturing, mercantile and residential district of which the city is the center. For this reason the relation of car design to the transportation needs of the system is recognized by the company to be a matter of fundamental importance. An exhaustive investigation of the traction conditions and desirable improvements within the Providence district was made in 1911 by Bion J. Arnold, who was retained by the city as its consulting engineer. Mr. Arnold's report was briefly abstracted in the *ELECTRIC RAILWAY JOURNAL* of Aug. 19, 1911, and included among other recommendations one advising the use of semi-convertible platform collection cars with lengthened vestibules and the gradual retire-

ment of the dense traffic carried. The present schedule of cars operated into or within the city of Providence comprises, with the exception of the semi-convertible platform collection cars to be described later, three principal classes having twenty-six, thirty-four and forty-two seats respectively, some being designed for urban and some for suburban service. The company owns 985 passenger cars, 435 of which are of the open type. With the exception of the suburban or long-haul cars, all have longitudinal seats, the former having cross seats or a combination of cross and longitudinal seats. A large number of open cross-seat cars are operated in the summer. The smaller cars have been retained chiefly on account of the difficulty of operating any other type of car over the College Hill approach to the East Side of the city. This obstacle will in the near future be largely overcome by the construction of a tunnel under the hill for the use of all types of rolling stock operated by the company. Prior to the introduction of the new platform collection cars, the latest type of equipment for passenger service consisted of cars seating forty-two persons each, double trucks and four motors being standardized for the service. Nearly all these cars are arranged for double-end operation and the majority have outside-hung motors. The principal objection to the use of two-motor cars in

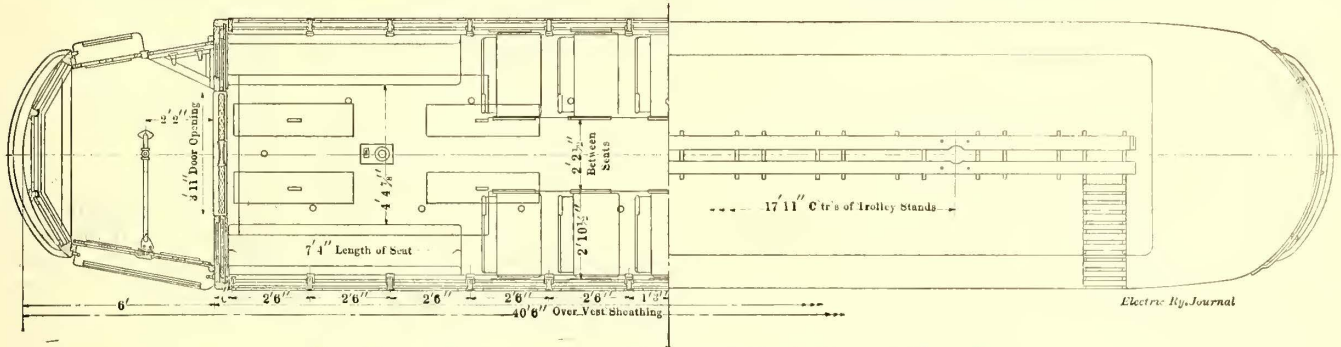
Providence is the reduced tractive effort secured on heavy grades, which range up to 8 per cent.

GENERAL ARRANGEMENT OF NEW CARS

One of the chief difficulties with the former rolling stock has been the short and narrow vestibules universally existing. On the older equipment the vestibules are set in from 8 in. to 12 in. in order to provide for a step flush with the car body. The thirty-four-seat class has a platform varying from a minimum of 4 ft. 8 in. to 5 ft. 2 in. in length over all from center posts, which permits a side door

ger is fully equal to, if not greater than, the time required for the modern type, both under rush-hour conditions. Experience with the initial platform collection cars installed has shown the company that a decided saving in loading and unloading time is accomplished in the outlying parts of the city, although the duration of stops downtown is practically unchanged. As soon as the car leaves the congested district the benefits of its capacity and arrangement are felt in reduced length of stops.

The open bulkhead or platform collection type of car



Providence Improvements—Floor and Roof Plan of New Car

of only 28½ in. and a bulkhead door of 32½ in. clear when open. The forty-two-seat cars have 5-ft. platforms, 28-in. side doors and bulkhead doors 30 in. in the clear when open. The narrow vestibules in these bodies resulted from the necessity of securing as great a seating capacity as possible in the car body and the city ordinances limiting car dimensions to 43 ft. over all. In considering the use of platform collection cars for Providence it was borne in mind that a relatively long platform would have to be provided, on account of the need of supplying adequate loading capacity while passengers are receiving change.

was selected for Providence service largely because it was originally developed to suit conditions identical with those on this system, viz., narrow streets and sharp curves. It was also favored for the reason that it is best suited to the Rooke fare-collecting system, which has been in successful use on the lines of the Rhode Island Company for the past five years. This system was described in the *ELECTRIC RAILWAY JOURNAL* for Dec. 30, 1911, as applied in Providence, and consists essentially of a portable register carried by each conductor, each fare being passed through the register as it is presented to the passenger. A register is



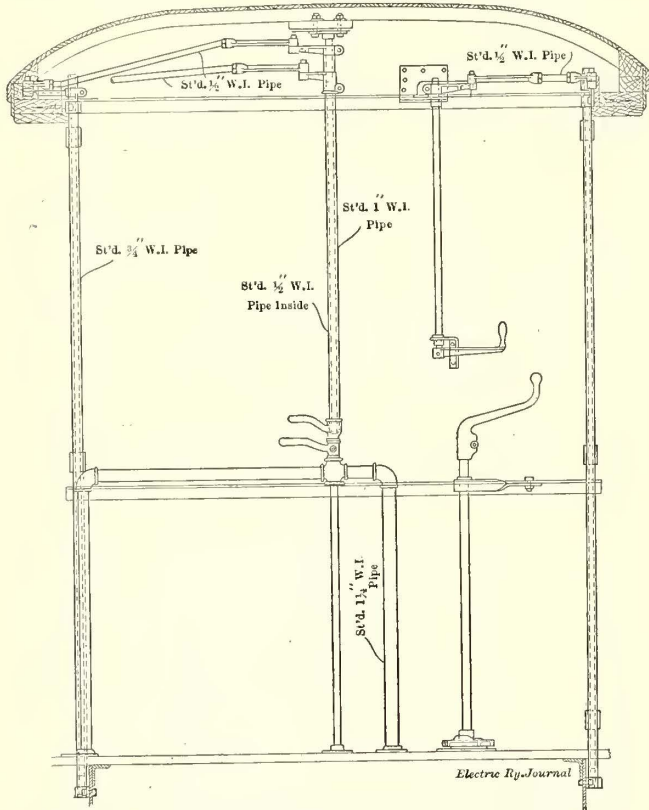
Providence Improvements—New-Type Car Arranged for Platform Fare Collection

Mr. Arnold emphasized this point particularly in discussing the advantages of platform collection car service with the public authorities, stating that persons unfamiliar with the advance payment principle are apt to criticize it severely on the score of slow loading, whereas an essential feature of prepayment car operation is the separation of passengers entering and leaving, thereby avoiding the interference which is the source of so great delay in the single-entrance type of car. Tests showed that with the present narrow platform the average time of loading per passen-

assigned to a conductor in the morning and turned in each night or during the middle of the day in case the lay-off exceeds three hours. The carhouse receiving office issues and reads the registers and checks them against the conductors' cash receipts. The car used allows much more space on the platform for incoming passengers than does the standard type. Stationed just at the entrance to the car body, the conductor also has much more latitude in receiving passengers than he would have if he was stationed outside behind a bulkhead. The conductor stands behind a

1¼-in. wrought-iron pipe railing carried about 3 ft. above the vestibule floor.

Exterior and interior views of the platform collection car used are shown herewith. These cars are being made by the Osgood Bradley Car Company, of Worcester, Mass. They are 41 ft. 6 in. long over bumpers, seat forty passen-



Providence Improvements—Door-Operating Mechanism of New Car

gers and are equipped with four G. E. No. 80 motors with 19:67 gear ratio. The principal dimensions are given in Table I.

TABLE I—DATA ON PLATFORM COLLECTION CARS, RHODE ISLAND COMPANY

Length over dasher.....	40 ft. 6 in.
Body length.....	28 ft. 6 in.
Distance between truck centers.....	17 ft. 11 in.
Inside width.....	7 ft. 11½ in.
Width of aisle.....	2 ft. 2½ in.
Number of cross seats.....	10
Number of longitudinal seats.....	4
Width of cross seats from panels.....	2 ft. 10½ in.
Length of longitudinal seats.....	7 ft. 4 in.
Width of seats.....	17 in.
Spacing of cross seats on centers.....	2 ft. 5¼ in.
Height of seats above floor.....	18 in.
Capacity each longitudinal seat.....	5
Width of aisle between longitudinal seats.....	4 ft. 4¾ in.
Type of operation.....	Double-ended
Inside dimensions vestibule, maximum.....	5 ft. 6 in. x 6 ft.
Number doors per vestibule.....	3
Width of forward exit door.....	2 ft. ¾ in.
Width of rear exit door.....	1 ft. 11 in.
Width of entrance door.....	2 ft. 2 in.
Type of steps.....	Fixed
Height of step above rail.....	17 in.
Height of platform above rail.....	2 ft. 7 in.
Height of car floor above rail.....	3 ft. 6 in.
Width of steps.....	8 in.
Maximum width of passage outside collection bar.....	36 in.
Minimum width of passage entering car.....	24 in.
Car body door opening (double doors).....	3 ft. 11 in.
Number and make of heaters.....	12 Consolidated
Extreme width of car outside over sheathing.....	8 ft. 6 in.
Width over eaves, car body outside.....	8 ft. 4 in.
Make of trucks.....	Standard Motor Truck Co.
Wheelbase.....	4 ft. 6 in.
Wheel type and diameter.....	33-in. forged steel
Axle diameter.....	4½ in.
Gear seat.....	4¾ in.
Controllers.....	"K-35"

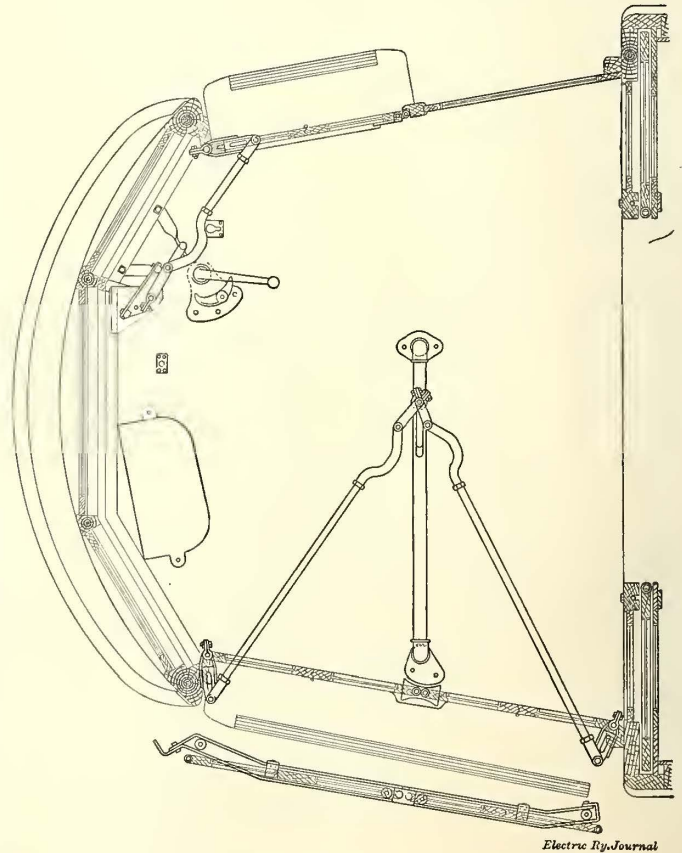
DETAILS OF EQUIPMENT

The cars are equipped with straight-air brakes with G. E. "CP-27" compressors. Providence "Consolidated" wheelguards are used. The weights of the car are as follows: Body equipped, 20,900 lb.; motors, 11,500 lb.; trucks, 13,000 lb.; total, without passengers, 45,400 lb.

The outer vestibule doors are all operated by levers and handles inside the vestibules. The forward exit door is opened and closed by the motorman by a handle brought down from the upper part of the vestibule, where a system of levers connects with the upper part of the door. The rear entrance and the rear exit doors are operated by the conductor from his position behind the rail. The doors are operated by overhead levers as in the foregoing case. The vestibule doors are all of the folding type and are equipped with rubber buffers on their outer edges. Two bulkhead doors are provided at each end of the car body, these sliding into side pockets when not in use.

OPERATING FEATURES OF NEW CARS

The first platform collection type of car was placed in service on Dec. 14, 1912, on the Broad Street line, between the Union Station and Thurber Avenue, five cars being operated under the new arrangement. For two days before the company published a notice in the daily papers announcing the introduction of the new rolling stock and stating that its use was in accordance with the recommendations of Bion J. Arnold, consulting engineer to the joint municipal committee on railroad franchises, and with the franchise agreement between the city of Providence and the Rhode Island Company, which provides that the latter shall adopt a type of car substantially as recommended in the Arnold report. The notice called attention to the stationing of the conductor in the new car, and to the plan to collect fares at the entrance and stated that, to make the system the success which Mr. Arnold and the city's representatives desired in recommending such a type of car, passengers should co-operate by having the



Providence Improvements—Platform Arrangement of New Car—Door Slide Shown Below

exact fare ready immediately upon boarding the car. Attention was also called to the importance of leaving the car so far as practicable by the front door and to the mechanical operation of the latter by the motorman. The cars were successful from the first, and in a few days the service was extended to Norwood Avenue, slightly be-

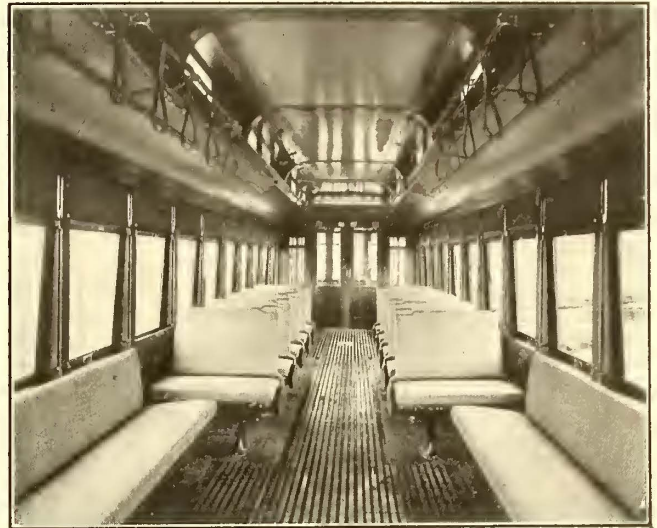
yond the city limits, and on Jan. 1, 1913, cars were operated to Pawtuxet, about 5 miles from the center of the city.

In the operation of these cars the conductor does not leave his position behind the railing except at terminals and upon arriving at transfer limits, when he enters the car and collects cash fares from all persons who have ridden on transfers. He is also permitted to leave this position in emergencies demanding his attention elsewhere. In case the conductor leaves the car all vestibule doors are closed, so that no passengers can board during his absence. In case passengers enter the car without paying fare the conductor is required to enter and make the proper collection as soon as his duties permit. Should passengers ride to the terminus of the line and return on the same car the conductor enters the car and makes collection from all passengers before starting from the terminus. Passengers are not allowed to remain upon the rear platform unless the car is overcrowded. The doors are kept closed when passengers are not using them, as in ordinary prepayment car practice.

TRAFFIC CONDITIONS

The down-town loading district of Providence extends from Market Square to the east to Cathedral Square and Hoyle Square on the west, and from the Union Station to the Providence River in the other direction. The civic center of the city is a large open area lying between the Union Station, Exchange Place, the City Hall and the Post Office, and is shown in the accompanying map, which indicates the track layout best adapted to meet the traffic conditions as determined by all the parties interested. This trackage arrangement is now practically complete and provides valuable loop facilities around the plaza contain-

are provided to enable cars operated on Washington and Francis Streets to reach and leave the railroad station. The Washington Street side of the Plaza is used largely in unloading and the Exchange Place side in loading cars, and this reserved area forms an island which provides ample refuge for passengers while waiting for particular services.



Providence Improvements—Interior View of New Car

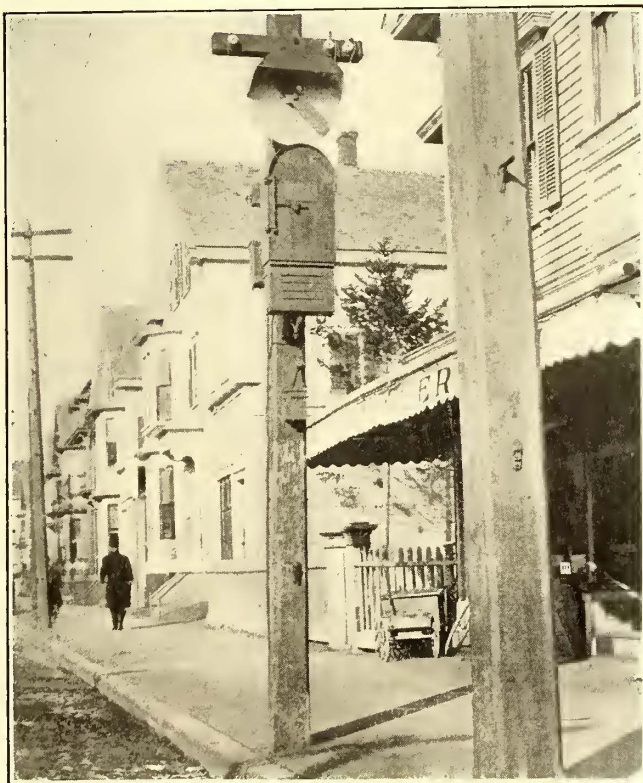
The Exchange Place loop was placed in commission in December, 1912, and has relieved congestion in adjacent thoroughfares as shown in Table II.

TABLE II—CARS RUN BETWEEN 5:30 P. M. AND 6:30 P. M. BEFORE AND AFTER INSTALLATION OF EXCHANGE PLACE LOOP

Name of Street	Direction	Between	Before	After
Weybosset	Eastward	Mathewson and Dorrance Streets	151	129
Weybosset	Eastward	Dorrance and Turk's Head	131	90
Westminster	Westward	Turk's Head and Dorrance	138	94
Westminster	Westward	Dorrance and Mathewson	123	87
Dorrance	Southward	Loop Branch-off and Westminster	103	72
Dorrance	Southward	Westminster and Weybosset	103	72
Dorrance	Northward	Weybosset and Exchange Place	84	63

In this rearrangement of traffic the car movement was increased from sixty-five to seventy-five cars per hour on Washington Street, east-bound, between Mathewson and Dorrance Streets; from fifty-eight to seventy-five per hour between the same points, west-bound; from ninety to ninety-five on Dorrance Street, south-bound, at the Washington Street branch-off into the loop; and on the north side of the loop, or on Exchange Place, west-bound, from seventy-eight to 122. Cars are run around the south side of the loop at the rate of 103 per hour. Weybosset, Westminster and Dorrance Streets are all narrow thoroughfares in the heart of the city.

The traffic conditions have also been improved by the installation of electric track switches at various points, and within a short time twenty-five of these will be in service. Thirty per cent of the white-pole stops have been removed within the city limits upon the initiative of the railway company, and the result has been a noticeable improvement in transit conditions particularly in the residential districts. Thus, on the Olneyville suburban line a saving of five minutes has been effected in the running time in a distance of about 2½ miles during certain hours as a result of the reduction in stopping points. The operating conditions on the Prairie Avenue and Ocean Street single-track lines have also been much bettered by the installation of Chapman automatic semaphore type block signals. On the former line are seven turnouts, making six track blocks in a distance of 1¾ miles. Four of these blocks are covered by signals and the other two are not equipped for the reason that a clear vision exists between the turnouts. A ten-minute headway is operated on this line and cars are in service upon it for about twenty hours per day.



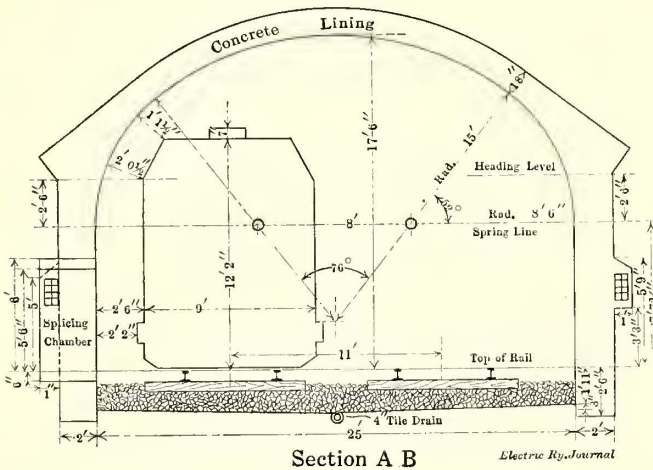
Providence Improvements—Automatic Signal on Prairie Avenue

ing the Soldiers and Sailors' Monument, increased switching connections between intersecting tracks, additional cross-over facilities and a new storage track for lay-overs. A loop serving the Union Station has been a feature of the civic center for many years, and this is retained in the new arrangement of tracks, although additional switches

The line is carried through narrow and crooked streets, and the use of the automatic signals saves time and safeguards the service. On the Ocean Street line three blocks are equipped in a distance of 1.5 miles.

TUNNEL CONSTRUCTION

The East Side tunnel, which will provide a short connection between the business district and a near-by but



Providence Improvements—Cross-Section of East Side Tunnel

comparatively undeveloped section of the city, will extend from the intersection of North Main and Waterman Streets to the west side of Thayer Street, a distance of 2165 ft., the grade being 4.8 per cent and the total rise 90 ft. The distance between portals will be 1790 ft. A cross-section of the tunnel is shown in the accompanying drawing. The tunnel is designed to accommodate two tracks spaced 11 ft. on centers and is 25 ft. wide, with an arched roof carried 17 ft. 6 in. above the top of the rail. The lining is of concrete, the roof being 18 in. and the walls 24 in. thick. The roadbed is to be of rock ballast, 18 in. deep at the center, and is drained by a 4-in. tile pipe at the bottom. The cables are to be carried in ducts located in the side walls, splicing chambers being provided on each side, staggered, and 160 ft. apart. An overhead trolley will be used.

POWER DEVELOPMENT

The supply of electrical energy for the operation of the system is the Manchester Street station, located on tide-water in the heart of Providence. This plant, which is one of the largest street railway power stations in New England, consists essentially of a double-deck boiler room containing sixteen 520-hp B. & W. water-tube boilers, of which eight are installed on each floor, and engine and turbine-driven generators aggregating 25,500 kw in rating. The boilers are fed from overhead coal bunkers having a capacity of 3000 tons and are fired by Roney stokers. Eight boilers are operated to give from 105 to 110 deg. super-heat for turbine service, the others giving saturated steam for the engines. Condensing water is drawn from the Providence River and boiler-feed water is taken from the city mains.

Prior to the installation of the present equipment, the station contained six units aggregating 12,100 kw in rating, the units being as shown in Table III.

TABLE III—FORMER INSTALLATION IN MANCHESTER STREET POWER STATION

Number	Kw Rating	Prime Mover Type	Current	Voltage	Notes
2	1,500	Engine	A.C.	11,000	Horizontal units
2	2,500	Engine	D.C.	600	Vertical units
1	1,600	Engine	D.C.	600	Vertical unit
1	2,500	Turbine	A.C.	11,000	Horizontal unit

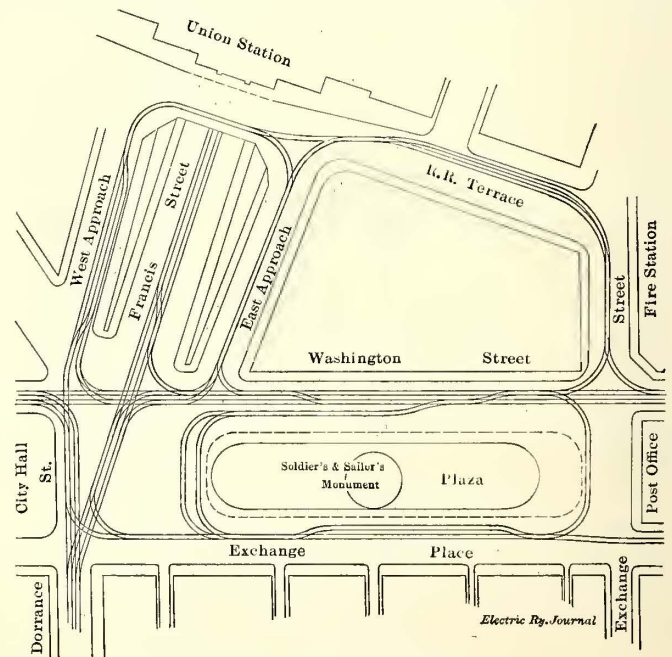
Increasing demands for power within the past few years have led to the removal of the 1600-kw unit above mentioned and the erection in its place of a 15,000-kw, 11,000-volt Curtis turbine which now carries the brunt of the

service on the entire system. No additions in the boiler room equipment were necessary on account of the installation of this unit. The turbine delivers three-phase, 25-cycle current to the station buses, and, as shown by the load curve on page 62, is ordinarily operated about twenty hours per day. The turbine is a six-stage machine and runs at 750 r.p.m. The weights of the principal parts are: rotating element, complete, 182,000 lb.; stationary armature, 170,000 lb.; turbine casing, 110,000 lb.; base, 98,000 lb.; total weight, 908,000 lb. Steam is supplied to the turbine at 150 lb. pressure through a 16-in. delivery pipe connected with a 20-in. horizontal steam main in the boiler room. The height of the unit above the foundation is about 35 ft., the base being 15 ft. 3 in. x 16 ft.

The turbine discharges through a 13.5-ft. x 5-ft. outlet into a Westinghouse-Leblanc twin condenser installed in the basement at one side of the turbine foundation. All the foundations are of concrete supported on piling. Air for the ventilation of the generator is taken from the basement just below the engine room floor level through a 50-in. circular iron duct terminating after a right-angled turn in a 9-ft. x 3-ft. inlet at the top of the generator casing. An opening in the floor of the engine room surrounds the turbine and its principal auxiliaries and facilitates handling the parts of the equipment.

AUXILIARY EQUIPMENT

The condenser is guaranteed to maintain a vacuum of 28 in. absolute when condensing 250,000 lb. of steam per hour, if supplied with injection water at a temperature not exceeding 70 deg. Fahr., the temperature of discharge being not less than 5 deg. Fahr. below that corresponding to the vacuum carried. The amount of injection water required is 8,000,000 lb. per hour at full load, the lift from the river being about 20 ft. Salt water is drawn from the river for injection purposes through a concrete conduit about 175 ft. long, discharging into a suction well from which a 36-in. pipe carries it into a manifold located on the basement floor. From the latter two 20-in. main injection pipes lead to the condenser. The main discharge of the



Providence Improvements—New Arrangement of Tracks at the Exchange Place Loop

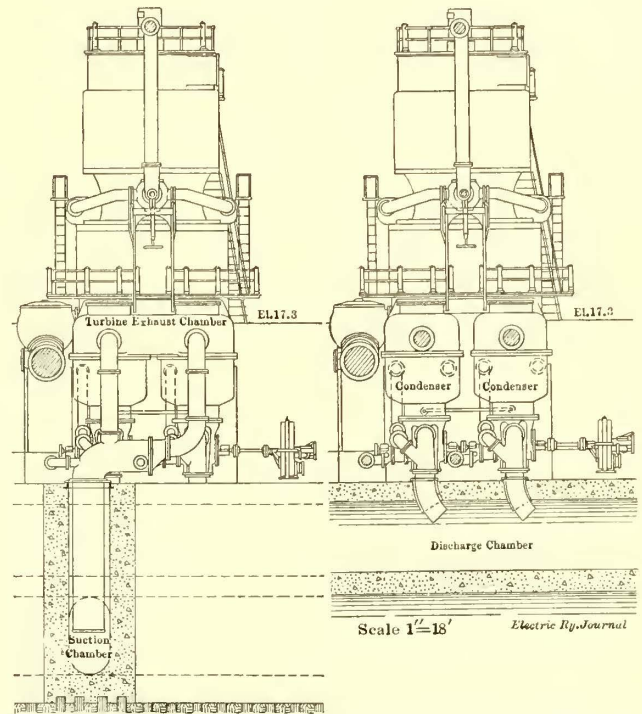
condenser consists of two 18-in. pipes emptying into a chamber of concrete, of 7-ft. x 4-ft. oval cross-section, located about 2 ft. above the top of the suction chamber. After leaving the building the discharge is carried into the river about 50 ft. above the intake by a conduit leading off at an angle of 45 deg. A 10-in. pipe leads from

the suction manifold on each side of the condenser installation to an air pump of special design in which a vacuum is produced by the passage of a series of water pistons by the outlet of a 12-in. air exhaust pipe leading from the condenser casing to the pump. The air pump discharge is delivered into the main discharge pipe of the condenser by a 12-in. connection. There are two main centrifugal pumps in the condenser equipment, and these, with the two air pumps, are direct-driven on a single horizontal shaft by a 450-hp non-condensing turbine running normally at 700 r.p.m. on 150 lb. steam pressure and 75 deg. Fahr. superheat. A 5-in. steam inlet and a 12-in. exhaust pipe are provided for the turbine. The main turbine unit is also provided with a 36-in. atmospheric spiral riveted galvanized-iron exhaust pipe which is carried up through the boiler room roof to a head located about 20 ft. above the latter.

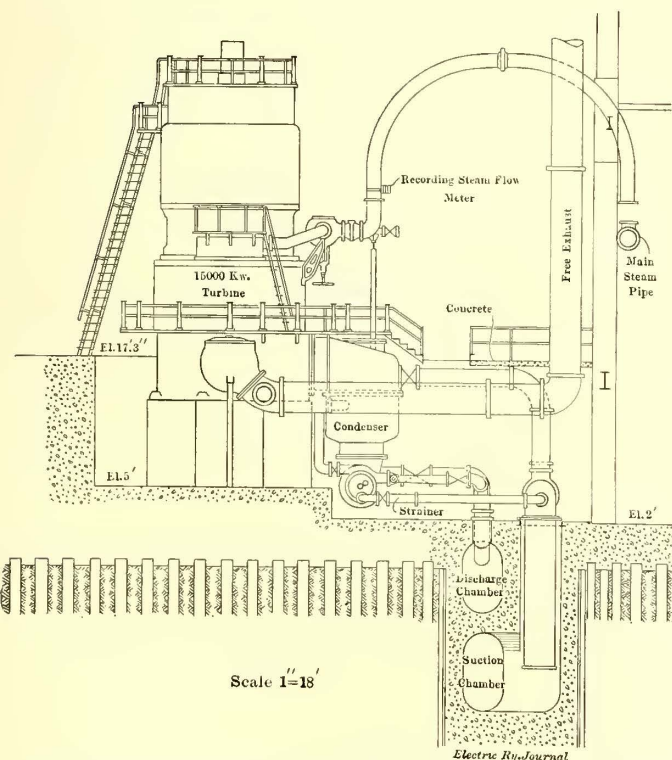
The step-bearing lubrication is provided by duplicate oil pumps of the Deane duplex type, with cylinders 14 in. x 3½ in. x 12 in., and supplying oil under a pressure of 1100 lb. per square inch to a Wood accumulator, which is located in the floor opening of the engine room. The step bearing is operated at a pressure of 700 lb. per square inch, the drop being obtained by the use of a screw baffle between the accumulator and the bearing. The supply of oil to the valve gear and upper and middle turbine bearings is furnished by duplicate 6-in. x 4-in. x 6-in. Deane duplex pumps located in the basement. The turbine oiling system exclusive of the step bearing is connected with a Turner oil filter of 50 gal. per minute capacity and a storage capacity of 2000 gal., also in the basement. A Blake twin vertical 18-in. x 20-in. x 24-in. priming pump is connected to the twin condenser.

The generator leads are carried away from the machine in a 12-in. x 14-in. sheet-iron casing leading to the basement, and thence they are carried to the switchboard gal-

The turbo-generator panel contains a power-factor indicator, field ammeter, curve-drawing kilowatt-meter, an indicating ammeter, voltmeter and wattmeter and a watt-hour meter with synchronizing connections and the usual switch control. The oil switches, on a lower gallery, are motor-operated, current for this service being supplied by the exciters. A 75-kw, 125-volt steam-turbine-driven exciter



Providence Improvements—Cross-Sections Showing Suction Piping and Discharge Piping for Condenser



Providence Improvements—Sectional Elevation Showing Piping for 15,000-kw Turbo-Generator

lery on the north side of the engine room. The operating gallery is located about 30 ft. above the turbine room floor, and the switchboard contains five a. c. feeder panels and eighteen d. c. panels for feeder service, in addition to the usual controlling panels for the generators, exciters and a rotary converter installation in the engine room.

running 3300 r.p.m. was installed in connection with the large turbo unit, the remaining exciter equipment consisting of one 35-kw engine-driven outfit and two 55-kw machines, each direct-driven by a 75-hp, 440-volt, three-phase induction motor. The rotary converter equipment of the station consists of one 1000-kw and four 2000-kw machines, located in the engine room and operated for the purpose of supplying direct current to the car service of the central Providence district in conjunction with the a. c. generators or in parallel with the d. c. engine-driven units mentioned above. The transformer equipment of the station includes three 375-kw units, three 750-kw units and three 2100-kw three-phase units, the latter being of the air-cooled type, each transformer being supplied with air by a 36-in. Sirocco blower direct-driven by a 7.5-hp induction motor running 750 r.p.m.

On the engine-room wall near the larger turbine is located a black marble panel carrying a steam gage, vacuum gage, step-bearing gage and turbine first-stage indicator, speed indicator and frequency meter. A General Electric steam-flow meter is connected with the supply pipe of the main turbo unit.

POWER STATION OPERATION

In starting the large turbine the step-bearing pumps are first thrown into service, raising the shaft off the step. The condenser pumps are started at about the same time, a steam seal being put on, and as soon as the condenser is working sufficiently the throttle is gradually opened between the steam main and the turbine proper, the machine being brought gradually up to speed and synchronized with any other apparatus which may be running. The condenser gives a vacuum of about 15 in. in the early stages of its operation, and the normal vacuum in operation is about 28.6 in., depending upon the temperature of the condensing water.

In the operation of the 15,000-kw turbine one man is stationed on the engine room floor in charge of the valve gear and oiling of the shaft, the taking of steam pressure readings half-hourly and the general oversight of the machine excluding its auxiliaries. A second attendant stationed in the basement is in charge of the auxiliary pumps, oil filter, condenser and piping and takes the temperature of the injection water and air-pump discharge hourly. Neither of these men is allowed to leave the apparatus under his care for an instant without being relieved. These two men are handling 15,000 kw, whereas with the old engine-driven equipment three additional oilers were required and the total generating capacity of the plant was but 12,100 kw, or less than 50 per cent of the capacity of the present installation. The car service of over a dozen cities and towns is carried entire by this unit throughout a large portion of the day.

Energy for car operation in the outlying districts is transmitted at 11,000 volts, three-phase, to four substations located at Pawtucket, Riverview, Farmington and

ers starting in between 8.30 a. m. and 9 a. m., the forenoon shopping influence, the noon traffic between working places and homes characteristic of a city of this size, and the homeward travel at night. The average load on the station for the entire day was 8420 kw, and the station load factor was 42.1 per cent.

Station logs are kept on 11-in. x 19½-in. sheets upon which are plotted the daily load curve and the capacity in generators in service at every quarter hour, readings of instruments being shown in figures. The charts also show the time at which each generator was placed in service and withdrawn from operation, including the service rendered by rotary converters at Manchester Street. All five rotaries were required to handle the direct-current peak local load on the day shown, besides the 2500-kw generator mentioned above. The charts provide for the plotting of the daily load curve on the basis of fifteen-minute switchboard instrument readings, and also show the number and cause of circuit-breaker openings, so far as known, when fully noted.

RETRIEVING OIL AND WASTE ON DENVER TRAMWAY SYSTEM

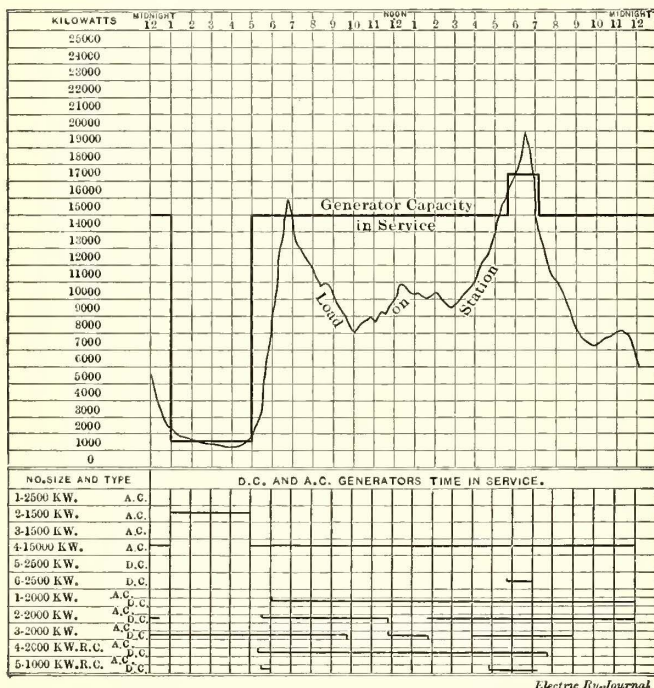
The Denver City Tramway Company has been using with excellent success a method of retrieving the oil and waste used in its car journals and armature journals. The waste removed from the car journals is first picked over by hand, and any bad or knotted parts are thrown away. The good waste is then put in a cleaning tank, which consists of an iron receptacle 5 ft. 6 in. long, 3 ft. 6 in. wide and 17 in. high. This tank contains a horizontal screen on which the waste rests. This screen extends half-way across the tank and is 13 in. from the top and 4 in. from the bottom. Clean hot oil is then poured over the waste to wash it and drips into the lower part of the tank, carrying with it such dirt and other impurities as may be in the waste. After the waste has been washed in this way and allowed to drip it is clean and ready for re-use. The company puts through this cleaner about 150 lb. of car journal and armature waste each week, and it has not been obliged to purchase any new waste since December, 1912.

The oil from this cleaning tank is filtered and then used over again. The filter is also home-made and is next to the cleaning tank. It is a round tank filter, 3 ft. wide and 4 ft. high, surrounded on the outside by a coiled live-steam pipe. The upper part of the filter contains 12 in. of excelsior, under which is a division containing 12 in. of packed waste. The filtered oil is taken out through a cock at the bottom.

In addition, in each division of the carhouse the company has a half barrel for picking up the old oil in the pit. This oil is filtered through another type of filter which is a duplicate, in outside dimensions, of the cleaning tank first mentioned. This filter has a series of four or five vertical screens and also is kept warm by steam pipes. In the first one or two chambers of this filter the oil which passes through the screens is apt to contain some grease, but in the final chambers the oil is clean. The oil containing grease is used on the side and center bearings of trucks and also on brake rods, where they run over rollers. All of the tanks are cleaned out once a week and all journal boxes are gone over once a month.

The company uses only new oil for its armature bearings but uses retrieved oil for its car journals. The standard journal oil used is the No. 639 heavy oil of the Texas Oil Company. The repair shop foreman is at work on a device for reclaiming cotton waste used in the shop for cleaning, but none has yet been built.

All motors are oiled on a time basis; ten days is the allowance for the recent type of motors and three days for the earlier types of motors. Overhauling is done on a mileage basis.



Providence Improvements—Typical Power Station Log, Showing Load Curve and Machines in Service

Westcott, two lines being carried to the first-named point to provide additional capacity and increased reliability of service.

A typical load curve is reproduced as of Thursday, Dec. 12, 1912, the peak occurring at 6.30 p. m. and reaching the value of 20,000 kw. About 460 cars were operated during the rush hour, four-fifths of which are routed in and out of Providence or within the city limits. The large turbine was operated throughout the entire day except between 1 a. m. and 5 a. m., and but one other generator was called upon while the turbine was in service, this being a 2500-kw d. c. machine which was cut into service for about an hour to assist on the evening peak. The minimum load on the system, occurring between 1 a. m. and 5 a. m., was handled by a 1500-kw alternator working through rotaries to supply the d. c. feeders. The lowest point reached by the load curve was 1200 kw, at 4 a. m. The morning rush-hour load peak was 15,900 kw, this being reached at 6.45 a. m. The territory served by the company is occupied largely by manufacturing plants whose working day begins at 7 a. m. and ends at 6 p. m., so that the peak occurred naturally just before the opening of these establishments. The curve also shows the traffic increase caused by office work-

**WORK OF THE MAINTENANCE-OF-WAY DEPARTMENT,
NEW YORK STATE RAILWAYS, AT ROCHESTER**

The Rochester Lines of the New York State Railways comprise nearly 250 miles of single track, of which about one-half is in the city. The rest is divided among the Rochester & Eastern, the Rochester & Sodus Bay and several shorter lines. The single-track mileage of the two mentioned is about 45 miles each. This extensive trackage is maintained by a maintenance-of-way department, the organization and work of which are described in the following paragraphs:

ORGANIZATION OF THE DEPARTMENT

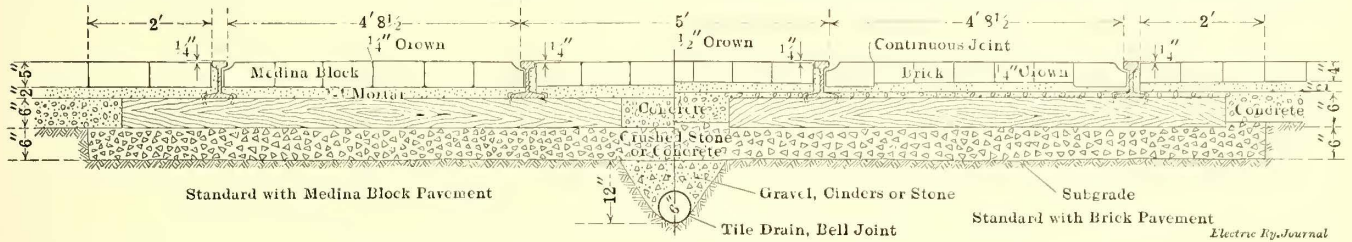
The organization of the department has been modified to meet the local conditions, particularly by specializing repair work and by systematizing the handling of reports. The accompanying chart shows the general plan of organ-

co-operates with a committee on accident prevention. Permanent platforms at park entrances are also included in the platform inspector's jurisdiction. The joint inspector checks the construction force by testing all joints for tightness.

The status of all maintenance work is shown by a weekly summary filed in the engineer's office. A record form similar to the organization chart is used for assembling the data. By means of this chart the engineer can keep up the necessary co-operation among his sub-departments. For example, if the report shows that after several days have elapsed since the completion of a piece of track repair the paving is still uncompleted, the attention of the paving foreman is called to the delay.

NEW AND OLD CONSTRUCTION COMPARED

During the present season three types of track construction will be replaced on Main Street, the principal thorough-



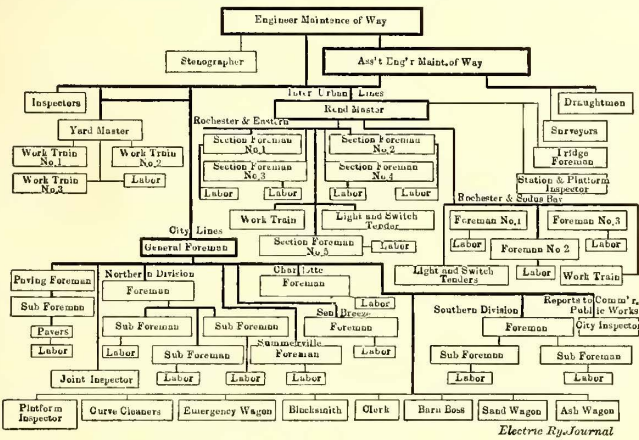
Rochester Way Department—Standard Track Construction

ization. Several features, however, which are not brought out in the diagram deserve special attention.

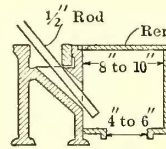
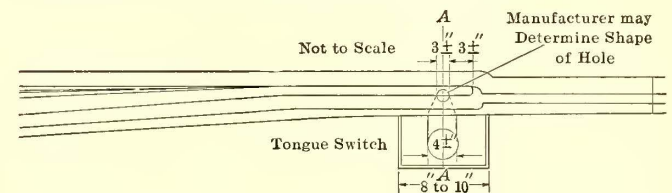
In the first place, one force of men is kept constantly at repair work. This force is divided into groups which specialize in different classes of repairs. For example, one group looks after switch and special work repairs, tightening switches, welding new points on tongues and resetting old or setting new hard centers. Another group prepares offset joints for regrinding with the Kerwin rail grinder. By having the same men do repairs of the same kind con-

fare of the city. The first one, which was laid in 1900 and 1901, consists of wooden ties, crushed-stone foundation, 9-in. girder rail and medina block pavement. This rail has been subject to very heavy traffic. Practically all of the lines in the city until recently have included this part of the street in their route.

The second section is a type laid without ties, the rails being fastened to plates which are bolted into concrete beams under the rail. The plates are spaced about 16 ft. apart excepting at the joints. Another feature of this construction is that instead of the concrete being tamped up to the base of the rail there was left a 1/2-in. space between



Rochester Way Department—Organization Chart



Rochester Way Department—Drain Box for Switch

tinually, they become exceedingly expert and uniformity of results is secured.

The system of inspection and reports is simple but complete. Beginning with the force of eight curve cleaners, who inspect and report daily the condition of all special work, the inspection of every detail of maintenance and construction is provided for. In addition to the inspectors connected with the office of the engineer of maintenance of way, others report to the general foreman of city lines, and still others, belonging to the transportation department, report track conditions requiring immediate attention. The platform inspector is charged with the responsibility of informing the foreman of unsafe conditions in temporary platforms used during construction to enable passengers to alight from cars. In this feature the department

the concrete and the rail base which was filled with asphalt mastic. This construction was laid in 1898. The joints were later taken out and electrically welded. This section of track has not been subjected to the extreme heavy traffic of the first section and for some years past has given considerable trouble, requiring a great deal of shimming and repair work to keep it in safe condition for operation.

The third section was laid in 1898 with steel ties, 7-in. girder rail and brick pavement. This track has been subjected to moderate traffic only. It has, however, required a great deal of expense in order to keep it in safe condition for operation. It was found difficult to shim this type of track construction so as to have the work effective for any length of time, the rail continually becoming loose and destroying the pavement.

The new track will consist of 7-in. T-rail and continuous rail joints carried by oak ties laid on a broken-stone ballast. In accordance with a city ordinance, concrete will be used as a foundation for the paving only. Drainage will be provided by a 6-in. tile under the center of single track and between tracks in double-track construction with paving drains located at low points at intervals of about 500 ft. Concrete has been omitted from the new construction partly because the rails and the steel ties where used have been found to loosen from the concrete under the heavy vibration of street traffic. The cost of renewal of concrete-laid track was also found to be excessive owing to the difficulty of breaking up the foundation.

JOINT TROUBLES

Much difficulty has been experienced in the past with all bolted joints. With joint plates of ordinary steel the underside of the rail head on the side of the joint ahead in the direction of travel has cut into the plate and produced a rough joint. This has been overcome by the use of nickel-steel plates. Ordinary bolts in joints have given breakage trouble which has also been eliminated by the use of nickel-steel bolts. The drainage of electric switches has also been advocated strongly and several manufacturers have expressed a willingness to cast switches with a large hole through which surface water can fall into a drained cast-iron box at the side. The drainage hole permits easy cleaning of the switch, for the tongue can be pushed to either side and a rod shoved through the hole into the drainage box. The drainage box may then be cleaned from time to time and the sewer connection flushed out.

POLES PURCHASED IN 1911

Statistics of the number of wooden poles purchased in the United States in 1911 by steam and electric railroads, electric light and power companies and telephone and telegraph companies are presented in a bulletin soon to be issued by Director Durand, of the Bureau of the Census, Department of Commerce. The figures include the pole purchases of practically all of the telephone and telegraph, electric railroad, electric light and power and steam railroad companies, and accordingly reflect very closely the actual drain upon the pole timbers of the forests of this country. The bulletin was prepared under the supervision of W. M. Steuart, chief statistician for manufactures.

In 1911 the total purchases of poles in the United States amounted to 3,418,020 sticks of timber; of these 2,402,724, or 70.3 per cent, were purchased by the telephone and telegraph companies; 787,649, or 23 per cent, by the electric railroad and electric light and power companies, and 227,647, or 6.7 per cent, by the steam railroads. The total number of poles purchased represents a decrease of 452,674 as compared with 1910 and of 320,720 as compared with 1909, but it exceeds the totals for 1908 and 1907 by 168,886 and 134,752 respectively. The decrease in the purchases of 1911 as compared with 1910 was confined to telephone and telegraph companies and steam railroads, while substantial increases in purchases were reported by the electric railroad and electric light and power companies.

Five kinds of wood—cedar, chestnut, oak, pine and cypress—supplied over 90 per cent of the pole requirements of the United States during each of the five years 1907-1911. Cedar, which has long been the preferred wood for pole purposes, supplied 61.4 per cent of the total number reported in 1911. Purchases of chestnut increased substantially from 1908 to 1911, amounting in the latter year to 177,440 more than in 1908.

The number of oak poles used increased rapidly from 1907 to 1910 but decreased greatly in 1911, in which year the number reported was more than 65,000 below the figure for 1910. Oak poles, which are marketed in relatively short lengths, have been used extensively in rural telephone lines,

the development of which has been very great in recent years. The figures indicate, however, that this development was much less marked in 1911 than in 1909 and 1910. The use of pine has increased but little since 1907.

The demand upon cypress has fallen off slowly year by year, the number of cypress poles purchased in 1911 being only about three-fourths as great as the number purchased in 1907. This falling off is due to the high price of cypress lumber and to the fact that this timber is found generally in sizes too large for poles.

The preferred species of wooden poles have the general physical qualifications of durability in the soil, strength, lightness, straightness, a surface which will take climbing irons readily and comparatively slight taper. The various species of cedar combine these qualities in high degree. Cedar poles are cut principally from the white cedar of the Lake States, the red cedar of the Northwest and the Southern white cedar of North Carolina, Virginia and New Jersey. Chestnut is cut principally in the Atlantic Coast States from Georgia to New Hampshire. Oak, a very widely distributed species, is cut for poles chiefly in the hardwood states of the Ohio and Mississippi valleys. Most of the pine reported is that commonly known as Southern yellow pine and includes several species—long-leaf pine, short-leaf pine, loblolly pine and some others. Of these, the most durable is the long-leaf pine, while the loblolly pine gives very brief service unless it is treated with a preservative. In the West another species—Western yellow pine—is reported, which also requires preservative treatment.

PRESERVATIVE TREATMENT

The woods used for poles in the United States are chiefly those which are naturally very durable in contact with the soil. The life of timber under this condition varies considerably according to the species, to differences in the wood of the same species, to the character of the soil and to climatic conditions. Cedar, chestnut, cypress, juniper and redwood usually last from ten to fifteen years, while white oak has an average life of somewhat less than ten years.

The resistance of the poles to decay can be considerably increased by the use of preservatives. Wood preservation is now on a firm footing in the United States, but the advantages which this practice affords are by no means fully utilized by the pole consumers. Preservatives not only add from three to fifteen or more years to the service of the woods now commonly used for poles but also make it possible to use cheaper woods which in their natural condition lack durability in the soil although possessing all the other qualities necessary in pole timber. The durability of woods which ordinarily last but a few years can thus be increased to more than double the normal life of cedar.

The principal preservatives used for treating poles are those classified as refined coal-tar oils. Under this heading are included creosote oil and various proprietary preservatives. Creosote oil was used in treating 159,321 poles, of which 50,021 were cedar and 83,035 yellow pine.

The cost of treating poles varies according to the wood treated, the kind of preservative and quantity used and the process employed, but it is only in rare instances that the adoption of a pole-treating policy is not economical. The United States Forest Service has a large number of poles treated by different methods under record and subject to annual inspection in order to determine the relative values of the different methods and preservatives.

By a governmental decree of May 7, 1913, authorization to work in Brazil has been accorded to the Electric Tramways of Ribeirao Preto, Brazil, Ltd. The headquarters of the company are in England, and its principal object is the exploitation of a system of tramways at Ribeirao Preto, State of Sao Paulo. The capital of this corporation is \$1,050,000.

RAILWAY CO-OPERATIVE GROCERY STORES IN NEW YORK

The institution of a co-operative depot at 816-818 Eighth Avenue on March 12, 1913, for the benefit of the employees of the Interborough Rapid Transit Company and the New York Railways Company has proved to be a wise and beneficial move, according to D. W. Ross, who is vice-president of both of the railway companies concerned. Already the interest and support of the employees have led to the opening of a second store on the southeast corner of Eighth Avenue and 152d Street and a third depot near Lexington Avenue and Ninety-eighth Street.

Business from the very outset was brisk in the new stores, and in reality the extent to which they have been patronized by employees and their families has been beyond expectations. The three heavy sales days of the week are Thursday, Friday and Saturday, with the last out-running the others. On the first Saturday, March 15, 2993 customers were served at the Fiftieth Street store, and the present average for Saturday trade lies between 2900 and 3000 people. On Saturday, May 3, at which time the second store was in operation, the trade of the first store fell off, owing to a transfer of customers, but over 2000 people were in each store during that day. The sales for Store No. 1 for the month and a half that it has been operating have averaged \$5,000 per week, and the companies expect that with the increase of customers due to Store No. 2 the gross income from sales will average fully \$8,000 per week.

At the present time the two stores are carrying a stock of goods valued at between \$6,000 and \$7,000. This is practically turned over every week, almost half of it being disposed of on Saturdays. The stock consists of all classes of foodstuffs carried by groceries and meat markets, provided they are not of an extremely perishable character. Staple groceries and meats, dairy products such as cheese, butter and eggs, canned goods, the less perishable vegetables like beets, potatoes and carrots, breadstuffs, fruits—all these are offered for sale and in several different grades, in order that the employees may have a wide basis of

tion for supplies to Mr. Gard, a representative from the purchasing department. D. W. Ross, who as vice-president in charge of contracts and supplies controls this department, was for two years general purchasing agent for all the commissary supplies with the Isthmian Canal Commission and the Panama Railroad. His assistant, Mr. Fuhrer, was also connected with this work for some time, and Mr.



New York Co-operative Stores—Canned Goods and Staple Grocery Goods Department

Gard, who has the actual supervision of the co-operative branch of the department, has had extended experience along the line of all commodities handled in the co-operative stores, having spent twelve years doing purchasing work for some of the largest firms in Washington Market. On account of the organization and equipment of this department the best possible prices can be obtained for the distributing depots, and this, when taken together with the fact that supplies for about 15,000 employees will be pur-



New York Co-operative Stores—Vegetable and Fish Departments



New York Co-operative Stores—Employees Waiting Turn at Meat Counter

choice. It has been found, however, that there is more call for the better grades of goods than for the poorer. It is expected that the important items of cream and milk will soon be added by the companies to the list of available commodities at these stores.

Thursday is the day on which the stock is replenished. Each store is in charge of a manager, who makes a requis-

ition for supplies to Mr. Gard, a representative from the purchasing department. Purchases are made as far as possible directly from the producer in order to eliminate the profits of the middleman. A storeroom is to be constructed in connection with the store at 152d Street which will serve as a general distributing center. All the supplies ordered by the purchasing agent will be stored here, debited to the various distributing points as

needed and transported to them by means of auto trucks.

The fact has been much emphasized by the officials of the companies that this co-operative move is by no means a philanthropic one. All sales are made on a cash basis and at actual cost. No profit of any kind is to be charged by the companies, but on the other hand the companies do not expect to run up a deficit. The scheme is to make both ends just meet. The two largest items of a grocery store are eliminated, delivery and advertising, and the rent and light expenses are slight, inasmuch as the stores are all operated on property owned by the company. Of the overhead charges the biggest item by far is the labor and clerk hire, and when taken as a whole it is estimated that the overhead charges will amount to only approximately 10 per cent of the gross sales. With all these figured in, it is calculated by the companies that a general average deduction of 15 per cent to 20 per cent can be made in the prices charged by private dealers. No comparative table of prices has been compiled, owing to the fact that different grades of goods are carried and it is difficult to obtain the prices of private dealers for goods of the same standard. The best indication that the prices are decidedly satisfactory is that the trade at the stores is daily increasing, although many of the customers have to travel a much longer distance than if they patronized other stores.

Careful plans have been laid and carried out to insure the success of this co-operative undertaking. The accompanying views, taken at Store No. 1, are illustrative of conditions and scenes at the new stores. They are thoroughly equipped with modern fixtures and apparatus. The new ones have ammonia refrigerating plants, and everything possible has been done to conform to the sanitary laws and the wishes of the employees. The location of the stores themselves was an important factor, and after a study of the locations of the residences of the employees, the officials endeavored to locate the stores at the centers of population near terminals, carhouses and shops, in order that the greatest number of people might best be served. Another essential point was the provision for the serving of none but employees. At present the men are allowed to enter the stores by means of their pass cards. Dependent members of their families are provided with identification cards by the companies and one of the clerks is stationed at the front door of each store to prevent the entrance of all other persons.

It has been a question whether the companies would eventually extend the co-operative system to include ice and fuel, as in the case of the Philadelphia Rapid Transit Company. In view of the fact, however, that this would necessitate a delivery system and much additional expense and that the average New York employce lives in a flat where he does not need to buy coal, it is doubted that the companies will make such extensions. Such practices may be advisable in the "city of cottages," but conservative management rules otherwise in New York.

Considerable interest has been manifested by other electric railway companies in the progress of these co-operative stores, and developments are being closely followed. As the matter stands now, sales are increasing daily, and it will probably not be long before the full chain of four stores as planned will be established. The employees have the certainty of securing good quality, full weight and complete measure at a substantial cut in price, and they have supported the movement beyond anticipations. The companies have not instituted this system as a mere grocery business or entered into a destructive competition with existing merchants, but they have simply utilized their immense buying power for the advantage of their employees. The general result has been to raise the purchasing power of the wages paid, to lower proportionately the cost of living of the employees, and at no expense to the company to make for better service and efficiency on the part of the workmen.

PSYCHOLOGICAL TESTS OF MOTORMEN

The importance of accident prevention on street railways has attracted the interest of many thoughtful students of industrial economy within the last few years. Among the investigators in the field of conservation of human life who have given particular attention to the causes of accidents on electric traction systems, Prof. Hugo Munsterberg, of Harvard University, occupies a foremost place, and in his recently published volume, "Psychology and Industrial Efficiency," he presents an outline of various researches upon the psychological characteristics of motormen in relation to the avoidance of accidents which suggests an entirely new method of attacking the important problem of selecting suitable employees for the front end of the car. The work was conducted through the co-operation of the Boston Elevated Railway Company, which furnished a large number of motormen of varying ability and lengths of service for the experiments, and while the latter are regarded as in large measure preliminary, the results obtained were consistent with the theory on which the tests were planned and indicate the possibility of discriminating between safe and unsafe motormen by psychological tests at the time of application for employment.

Without going into the minor details of the investigation, it may be pointed out that Professor Munsterberg sought at every step to reproduce by practical apparatus the mental reactions accompanying the efforts of a motorman on a car continuously to adjust himself to the changing panorama of the street. The use of model cars in a laboratory was considered inappropriate in connection with collision studies as tending to arouse ideas, feelings and volitions which have little in common with the processes of actual life. There are differences between the simulated and the real performance which appear to vitiate the reliability of such methods in testing motormen, the essential point being not the external similarity of the apparatus but exclusively the inner similarity of the mental attitude. The method of examination promised to be valuable if it showed good results with good motormen and bad results with unreliable ones and, secondly, if it vividly aroused in all the men the feeling that the mental function which they were going through during the test had the greatest possible similarity with their experience on the front platform of the electric car.

The tests were made by requiring a motorman in the laboratory to call out unit areas designated by letters on a track 13 in. long and ½ in. wide upon which an assumed pedestrian, horse-drawn vehicle or automobile would land by passing from positions outside the track across the latter in accordance with numbers designating their positions and indicating by the color and digit employed whether a given number of steps would occupy or clear the track space. The track lines were drawn upon a card 9 in. wide, and a window attached to a belt and giving the motorman an advancing view of 2½ in. down the track was passed over the card in the test at a speed determined by the rate at which a crank driving the belt was turned by the man under examination. The areas at each side of the track contained both black and red digits, the former representing vehicles and pedestrians moving parallel to the track and therefore not in dangerous positions, and the latter representing persons and vehicles crossing the track in front of the car. The man to be experimented upon ascertains as quickly as possible those points on the track which are threatened by the red or dangerous digits. In some cases the red digits are negligible because the number of unit steps which they represent would carry them clear across the track; in others they fall short of the track, and in the remaining cases they occupy it. The task is difficult, as the many black figures divert attention and as the red figures too near or too far are easily confused with those which are just at the dangerous distance.

In conducting these tests Professor Munsterberg employed a dozen such cards, timed the motormen with a stop-watch and carefully analyzed the errors and omissions made by each man in calling off the so-called dangerous digits. The motormen agreed that in undergoing the test they passed through the experiment with the feelings which they have in car service. Professor Munsterberg states that the necessity of looking out in both directions, right and left, for possible obstacles, of distinguishing those which move toward the track from the many which move along the latter, the quick discrimination among the various rates of speed, the steady forward movement of the observation points, the constant temptation to give attention to those which are still too far away or to those which are so near that they will cross the track before the approach of the car—in short, the whole complex situation with its demands on attention, imagination and quick readjustment—soon bring the men into an attitude which they themselves feel as identical with that in practical life. Again, the results show a far-reaching correspondence between efficiency in the experiment and efficiency in actual service, and for this reason the method deserves further study as a possible agency in the scientific selection of potentially competent motormen.

BRITISH TRAMWAY STATISTICS FOR 1911-1912

The British Board of Trade has issued under date of Jan. 14, 1913, statistics relating to tramways and light railways in the United Kingdom for the calendar year 1911-1912. The report includes particulars relating to 290 undertakings, 172 of which belong to the local authorities and 118 to companies or other parties. The number of passengers carried is shown to be equal to about sixty-nine times the estimated population of the United Kingdom. The total

509 was paid in relief of rates or taxes. The balance, £975,504, was carried to reserve and renewals funds. The returns show that in twenty-two cases it was necessary to obtain aid from the municipal funds to meet some part of the charges for the year. The total sum thus obtained was

TABLE I

	ELECTRIC PERIOD		Steam Period, 1898	Horse Period, 1879
	1911-12	1910-11		
Miles of route open...	2,637	2,597	1,064	321.27
Total number of passengers.....	3,127,318,732	2,907,177,120	858,485,542	150,881,515
Number of miles run by cars.....	323,354,389	310,494,243	90,593,716	19,418,373
Capital expenditure per mile of single track open:				
Lines and works....	£13,623	£13,534	£ 7,770	£7,840
All items.....	£18,005	£17,873	£10,469	£9,877
Percentage of net earnings to total capital outlay.....	7.50	6.97	6.38	3.97
Percentage of net earnings to net capital outlay (eliminating amounts expended on construction or purchase of old lines and works now superseded).....	8.15	7.60	Not available	Not available
Percentage of operating expenses to gross earnings.....	60.60	61.70	79.93	83.81
Passengers carried per mile of route open...	1,183,620	1,119,389	806,703	469,641
Passengers carried per car mile.....	9.67	9.36	9.48	7.77
Average receipts per passenger.....	1.079d	1.089d	1.23d	1.84d
Number of horses.....	1,579	1,880	38,777	10,958
Number of locomotives.....	31	32	589	17
Number of cars (electric).....	12,435	12,120	5,335	1,610
Number of cars (non-electric).....	509	589		
Kilowatt-hours used..	548,695,979	516,241,612	.....	.....

TABLE II

	1911-12	1910-11	1906-7	1903-4	1902	1900	1894	1886	1878
Total capital expended.....	£77,377,390	£75,672,826	£64,092,091	£46,451,444	£31,562,267	£21,735,988	£14,388,698	£12,573,041	£4,207,350
Miles of route open.....	2,642*	2,592	2,394	1,840	1,484	1,177	975	865	269
Number of horses.....	1,579	1,880	7,378	15,353	24,120	37,481	30,528	24,535	9,222
Number of locomotives.....	31	32	148	249	388	558	564	452	14
Numbers of cars, all kinds..	12,944	12,709	11,746	9,468	7,752	6,410	4,179	3,440	1,124
Number of electric cars.....	12,435	12,120	10,369	7,132	.....	.....	.....	.....	.....
Passengers carried.....	3,127,318,732	2,907,177,120	2,454,807,487	1,799,342,673	1,394,452,983	1,065,376,347	616,972,930	384,157,524	146,001,223
Units of energy used (kw-hours).....	548,695,979	516,241,612	369,362,473	211,112,476	.....	.....	.....	.....	.....
Gross earnings.....	£14,726,068	£13,777,001	£11,849,175	£8,604,884	£6,679,291	£5,445,620	£3,615,837	£2,630,338	£1,099,271
Operating expenses.....	£ 8,924,420	£ 8,500,941	£ 7,363,762	£5,602,774	£4,817,873	£4,075,352	£2,859,050	£2,021,556	£868,315
Net earnings.....	£ 5,801,648	£ 5,276,060	£ 4,485,413	£2,912,110	£1,861,418	£1,370,277	£ 756,781	£ 608,782	£230,956

*Including 5 miles of trackless trolley.

TABLE III

	1911-12	1910-11	1906-7	1903-4	1902	1900	1894
Number of undertakings:							
Owned by municipalities.....	172	174	179	162	118	70	37
Owned by companies.....	118	122	139	150	115	107	116
Route length (miles):							
Municipalities.....	1,782	1,744	1,571	1,148	886	585	316
Companies.....	860	853	823	692	598	592	660
Single-track length:							
Municipalities.....	3,028	2,972	2,637	1,915	1,465	936	497
Companies.....	1,275	1,261	1,212	984	871	830	814
Capital expenditure:							
Municipalities.....	£52,644,616	£51,147,236	£41,735,547	£28,060,524	£18,910,467	£10,203,604	£3,887,534
Companies.....	£24,732,774	£24,525,590	£22,356,544	£18,390,920	£12,651,800	£11,532,384	£10,501,164

capital expenditure on 2637 miles of lines open for traffic was £77,377,390, and the number of passengers carried during the year 3,127,000,000. Of the total mileage, 1777 miles of line are owned by local authorities, all but 206 miles of which are operated by the authorities themselves.

The returns also mention 5 miles of trackless trolley route operated by the Leeds and Bradford corporations. The figures show an increase of 40 miles in electric mileage. The net receipts of municipally worked tramways amounted to £4,233,874 on the year's traffic, and of this sum £1,247,908 was applied to the reduction of tramway debt, while £488,-

£62,032, as compared with £68,055 in the previous year. The net receipts from all tramways amounted to £5,801,648. The detailed figures on which the foregoing totals are based appear in three accompanying tables from the report.

Active construction is now under way on the North-South subway, the first crosstown rapid transit line of Berlin. The present subway-elevated system connects the residential districts of the west with the business district of the east, but the new line will join the factory and working-class districts.

CARING FOR LOST ARTICLES IN BOSTON

BY EDWARD DANA, ASSISTANT SUPERINTENDENT OF SURFACE LINES BOSTON ELEVATED RAILWAY

In many cities of which I have knowledge the transportation departments do not maintain an elaborate system for handling the numerous articles left on the company's cars or property. In Boston, however, a system has for some years been in vogue which, although it puts the company to considerable trouble and expense, is considered to be very

intendent of surface lines for checking purposes. Each day the official in charge of the station where the article has been received forwards promptly all turned-in articles to the receiving station of the division. He uses the manifest, Fig. 2, to insure safe arrival of the articles. The receiver checks the manifest with the articles and then returns the manifest, signed, to the local station.

The receiver classifies the articles according to a printed guide which contains ten general classes and fills out in duplicate Fig. 3, which is of convenient filing size, namely, 5 in. x 3 in. These slips are filed according to the classification number which is printed on an extension in the upper edge of the slip. The original is retained and the duplicate forwarded to the lost article clerk at the office of the superintendent of surface lines. These records are then checked against the lower portion of the tag which has

Electric Ry. Journal

Figs. 1 and 2—Boston Lost Articles—Conductor's Notification Tag and Manifest Signed by Receiver

BOSTON ELEVATED RY. CO.
Electric Ry. Journal

Fig. 3—Boston Lost Articles—White Card for Indexing According to Class of Article

efficient. The ordinary passenger, however, knows little of this burden placed upon the company and so long as he is not affected cares less. Even some who have benefited by the efficiency of the system consider that they have no reason to be grateful for the return of their property, as the company is no more than living up to its duties as a public servant in return for the valuable franchises which have been granted to it. There are many, however, who deeply appreciate a system whereby articles, sometimes of

been received through the receiving cashier from the employee as noted above.

If an article is delivered promptly either at the carhouse or at the division receiving office to the rightful owner, the form shown in Fig. 4, which is printed on blue paper, is filled out in duplicate in order to complete the record. The original is retained in the division in the dead file and the duplicate is sent to the lost article clerk in the office of the superintendent of surface lines to check with the tags re-

Electric Ry. Journal

Fig. 4—Boston Lost Articles—Colored Card for More Valuable Articles and Other Purposes

Fig. 5—Boston Lost Articles—Post Card Notification to Owner of Lost Article

considerable value, which they had lost by their own carelessness have been returned to them. These people express their appreciation and feel that the company has gone to much trouble for them. The good will which such patrons spread probably more than offsets the cost entailed. The following account of our system may be of interest.

When an employee finds an article he assumes the care of it and upon reaching a carhouse he fills out the tag form reproduced as Fig. 1 and attaches it to the article, tearing off the bottom half. This bottom half he turns in with his regular work to the receiving cashier, who in turn forwards it to the lost article clerk in the office of the super-

turned and then filed in the dead file. Each day, also, this form is filled out for all articles which have been delivered since the original classification cards (Fig. 3) were sent in and forwarded to the lost article clerk in order that these classification cards may be removed from the live files.

Valuable articles are held three days in the division and then forwarded to the treasurer's office. In this event Fig. 4, but printed on green paper, is also used. The three copies made out are forwarded to the treasurer with the valuables. One is retained by the treasurer, one forwarded to the lost article clerk and one returned to the division receiver signed as a receipt for the safe arrival of valuables.

Each month a list is prepared by the lost article clerk of the number of tags received from employees for which no "classification" or "delivered" card has been received and also a list of classification cards which have been received for which no tag was received. In this way the division authorities are advised of the failure of subordinate officials as well as of employees.

Each day the "lost and found" advertisements are clipped from the newspapers and if a similarity exists a postal card (Fig. 5) is mailed to the advertiser. When a postcard is sent on the strength of the "lost and found" advertisements the word "not" in the first sentence is crossed out. The word "not" is also eliminated in favorable replies to inquiries, but otherwise it is mailed as printed.

Many letters are received and answered in the course of a year. Approximately 3000 articles are turned in annually and about 45 per cent are returned to the owners, the remaining 55 per cent being returned to the finders at the expiration of two months. The direct cost is approximately \$2,200 a year, although there is a considerable indirect burden, all of which probably, from the modern advertising man's standpoint, does not cost too much in consideration of the good will which results from those who appreciate the company's motives.

GERMAN ELECTRIC RAILWAY STATISTICS

The official statistics relating to German electric railways for the year ended March 31, 1912, show a total of 283 undertakings, an increase of fifteen as compared with the preceding year. More than 25 per cent of the lines carry freight. The length of single track is 2983 miles, an increase of 174 miles. The average seating capacity of the cars is about thirty-five. Of the entire number 132 undertakings are owned by municipalities and 136 by private companies. There are several traction syndicates, one of which operates seven street railways with a total of 87 miles. The railways carried 2,567,155,295 passengers for 428,000,100 train miles, which included approximately 313,100,000 motor-car miles. The increase in car miles as compared with the preceding year was about 38,000,000 car miles, and the increase in passenger travel about 251,000,000. The freight traffic also increased from 1,460,664 metric tons to 1,794,585 metric tons. The greatest density of traffic was shown by the Berlin subway-elevated system, with 1,122,485 passengers per mile, while the density of traffic on the surface system in Berlin was 645,669 per mile. The subway-elevated company also carried 7.2 passengers per car mile as compared with 6.9 passengers per car mile on the surface system. The total gross earnings, exclusive of non-reporting companies which operated a total of 120 miles of track, were \$65,180,626, compared with \$59,763,595 in 1910. The highest earnings per mile of track were achieved by the Berlin subway-elevated system, with \$161,404, comparing with \$67,856 by the Berlin surface system. The operating expenses, including employees' welfare, taxes and franchise payments, amounted to 86.4 per cent of the gross earnings. Tax and franchise payments constituted 7.4 per cent of the gross earnings. Of 170 Prussian railways sixteen paid no dividend, three had a dividend up to 1 per cent, thirteen up to 2 per cent, seventeen up to 3 per cent, twenty-six up to 4 per cent, nineteen up to 5 per cent and sixty-eight of 5 per cent to 10 per cent and eight more than 10 per cent. Five of the non-dividend lines were newly constructed.

During the year 236 passengers or pedestrians and seven employees were killed and 1060 passengers or pedestrians and eighty employees severely injured. Hanover holds the record for the greatest mileage according to population, namely, 2.68 miles per 10,000 inhabitants. The total population of Hanover is 376,000. The greatest density of traffic was achieved by Dresden, namely 238 rides per annum per inhabitant, and the corresponding figures for other

German cities were: Frankfort-on-Main, 239; Cologne, 211; Leipsic, 204; Munich, 194; Düsseldorf, 187; Berlin, 186; Stuttgart, 153, and Hamburg and Breslau, 151 each. These figures are considerably less than for American cities of like size.

CARE OF STEAM BOILER ECONOMIZERS

Following an investigation of the fatal explosion of the economizers in a large Eastern power plant, in which it was shown that the principal damage resulted from an economizer unit which was idle at the time, the investigators give some pointed advice for observance in shutting down economizer units when not in service.

Two theories were brought forward to explain the accident. According to the first an explosive mixture of coal gas and tar might have been confined in the idle economizer, although this presupposes both poor combustion conditions in the furnace itself and some manner of firing the explosive gas after it was entrapped in the economizer chamber. The other and more probable theory is that the idle unit may have been fully or partly filled with water which was then so shut off that internal pressures which were generated could not be relieved. Leakage in the flue dampers might have admitted hot gases to the economizer chamber, raising the temperature and pressure of the confined water until destruction occurred.

To prevent the bursting of idle economizers, either from gas explosions or from the accumulation of water, it is important, therefore, when putting them out of service, to open up the soot clean-outs and any other openings that there may be into the gas chambers and to close the dampers as tightly as possible. When dampers become warped, or do not fit properly for any other reason, they should be promptly repaired. It is also highly important to maintain the safety valves on economizers in good condition, at all times. If they leak they should be repaired at once, instead of being screwed down tighter. In fact it would be well to adopt lock valves for economizers, so that they cannot be tampered with by irresponsible or thoughtless persons. To guard against the accumulation of steam or water within the idle economizer, its blow-off valve and air vent should be left open, so that no harm will result if the inlet should leak and admit water. If these precautions are taken in every case, according to the inspection division of the Travelers' Insurance Company, which made the investigation, the two causes of explosion that have been suggested in connection with this accident will be avoided.

NORWEGIAN RAILWAY ELECTRIFICATION

Work is well in hand on the conversion of the railway between Christiania and Drammen, Norway, a distance of about 33 miles, from 3 ft. 6 in. to standard gage, electric traction. A double track will be laid as far as Sandviken, 8¾ miles, but whether energy shall be taken from private companies or whether the government will establish its own power station has not yet been decided. As to rolling stock, seventeen electric locomotives of from 320 hp to 800 hp and eleven combined locomotives and carriages of 300 hp have been ordered. The latter are intended for use with a trailer on the Christiania-Asker section of the line, which is 14 miles long.

The Lexington (Ky.) Utilities Company, which is the local subsidiary of the Kentucky Traction & Terminal Company, has protested that 643 names on the petition which resulted in a popular referendum and consequent cancellation of its franchise are not registered or are otherwise invalid. It is now therefore possible that the referendum will be declared null and void, and in this case the franchise which was originally granted by the city commission of Lexington will become effective.

TRACK AND OVERHEAD MAINTENANCE ON THE BEEBE LINES

The general plan of inspection followed by the companies forming the so-called Beebe syndicate is based upon steam railroad practice. All track is covered by track walkers twice a day and every incentive is given the men to observe the condition of rails and ties closely. A premium of \$1 is given for each discovery of a broken rail. The bridge supervisors inspect all bridges at least once in two months. All of this inspection is recorded on report forms, and upon the inspection records are based the annual estimates of necessary renewals.

The fiscal year of the several companies making up the syndicate begins July 1, on which date the budget is adopted for the ensuing year. To be included in the budget, requisitions must have been turned in before the end of the preceding December, and preferably in September, so that the necessity for the construction and repair covered by the requisitions may be investigated before winter sets in. Requisitions originate in general with the track foremen, who are in close contact with the details and who turn them in to the four supervisors. On receiving the requisitions from the supervisors the chief engineer and the roadmaster personally investigate the condition of the track or other structure on which repairs have been recommended. Knowing approximately the amount of money which will be available during the coming year, these officials prepare a reasonable budget in detail for submission to the president. After allowances for the various divisions of the work have been made, plans are prepared for getting all track construction completed by Sept. 1 if possible so that it may be well settled by winter. Ties, rails and sundries are ordered in January for delivery between June 1 and July 15.

CATENARY CONSTRUCTION

The experience of the past few years has determined several fundamental maintenance precedents. In the first place, the type of catenary overhead construction adopted in 1909 and modified slightly after a few months' operation is an unqualified success. Future replacement of span and bracket construction will be with catenary, which costs comparatively little more. The maintenance cost of the catenary is very small, certainly less than one-half that of the wooden pole construction. The original catenary structure consisted of light steel A-frames made up of channels and stiffened with diagonal sway braces, the track being spanned with a light truss joining two A-frames and braced against side motion by means of diagonal braces. It was found, soon after commencing operation, that the sway braces made the frames too stiff in the direction of the track and they were accordingly removed. This change allowed a couple of inches motion of the top of the frame and thus removed the strain due to contraction and expansion of the messenger and trolley wires. At first the catenary hangers were spaced 10 ft. apart. Experience showed that the trolley wire thus hung was too stiff and the hangers were being twisted out of the horizontal with consequent hammering by the wheels. The interval between hangers was increased by steps up to 60 ft., which is now standard, and the flexibility of suspension is such that no trouble at the hangers is experienced. The original catenary messenger wire was a plow-steel cable, the feeders being carried on brackets attached to the A-frames.

In considering methods for reducing the cost of construction the engineers decided first to mount the feeders on top of the trusses on insulators similar to those used for the messenger wire. Further consideration led to the substitution of the 500,000-circ. mil, nineteen-strand, hard-drawn feeder cable for the steel messenger wire, and this plan has proved very satisfactory besides cutting down the cost of material and labor. Trouble was at first expected

from side-swaying of the contact wires. To prevent this the wires were side-guyed to the A-frames on both sides with insulated guy wire large enough for 1200 volts working pressure.

The first line was put in operation before all these guy wires were installed, but the side sway developing even on the unfinished work and on a stormy February day was negligible. The guys are still used at the supporting bridges, but as only 550 volts d.c. is used, the insulators were removed and the ordinary Brooklyn strains employed to insulate from the steel bridges. These bridges are placed 300 ft. apart. By these changes the construction was reduced in cost by \$800 per mile or more and the operation was improved at the same time.

TRACK CONSTRUCTION AND INSPECTION

A second fact that has been settled is that creosoted ties, if properly selected and treated, are economical. Approximately 15,000 creosoted ties have already been installed and about 50 per cent of the replacements are of this type. The ties are of long-leaf yellow pine, sound and square-edge quality, impregnated to the heart with creosote oil of the best quality and at the rate of 10 lb. per cu. ft. The railway employs R. W. Hunt & Company to inspect the ties, the creosote oil and the impregnating at the treating plant. Long-leaf yellow pine, prime quality heart timber and winter-cut second-growth chestnut ties compose the rest of the supply. These are untreated and are used to save excessive first cost. As the life of the treated ties is estimated at eighteen years, they will predominate more in numbers each year until finally practically all will be of this variety.

A third item of standard practice is the thorough inspection of all other supplies as well as ties. The whole construction of the Beebe lines was based on the principle of the scientific use of materials. Rails, ties, ballast, drainage, etc., are all expected to yield the maximum return for the cost. If a 70-lb. rail is used, it is because that weight of rail has been determined, by the consideration of loads, speed and supports, to be the economic weight and size. But this economy of material means close inspection both of material and of condition after installation. The result of this care is a present track maintenance cost of less than \$500 per mile of single track.

Following are the specifications under which ties are now being bought.

ROCHESTER, SYRACUSE & EASTERN RAILROAD COMPANY SPECIFICATIONS FOR TIES

Long-Leaf Yellow Pine—Untreated:

All ties to be freshly manufactured from live Georgia or Florida long-leaf yellow pine timber, of good sound quality, straight and free from loose or unsound knots, wind shakes or other imperfections that would affect their strength or durability. Ties to be hewn smooth on four sides with ends sawed square. One inch of sap will be allowed on each corner measured across the face.

Long-Leaf Yellow Pine—Treated:

All ties to be freshly manufactured from live Georgia or Florida long-leaf yellow pine timber, of sound and square-edge quality, hewn on four sides, with the faces true and parallel, free from deep score marks, splinters and other injurious inequalities of surface; with the ends sawed square. The variation in thickness shall not be more than $\frac{1}{2}$ in. and the variation in length not more than 1 in. On an 8-in. face tie there shall be allowed on the face of the tie 1 in. of wane, which may be either $\frac{1}{2}$ in. on each side or 1 in. on one side—giving a measurement between the waness of 7 in. They are to be creosoted, and each tie must contain 10 lb. of dead oil of coal tar per cubic foot after treatment. The coal tar to be in accordance with the following specifications:

The oil used shall be the best obtainable grade of coal-tar creosote; that is, it must be a pure product of coal-tar distillation and must be free from a mixture of oils, other tars or substances foreign to pure coal tar; it must be completely liquid at 38 deg. C. and must be free from suspended matter; the specific gravity of the oil at 38 deg. C. must be at least 1.03. When distilled according to the common method—that is, using an 8-oz. retort, asbestos covered with standard thermometers, bulb $\frac{1}{2}$ in. above the surface of the oil—the creosote calculated on the basis of the dry oil shall give no distillate below 200 deg. C., not more than 5 per cent below 210 deg. C., not more than 25 per cent below 235 deg. C., and the residue above 355 deg. C., if it exceeds 5 per cent in quantity, must be soft. The oil shall not contain more than 3 per cent water.

Chestnut Ties:

Chestnut ties to be winter cut from sound, live timber. Hewn ties to be 6 in. thick, 8 in. across faces and 8 in. long with score marks not deeper than $\frac{1}{4}$ in. Ties to have faces true and parallel and without splinters or other injurious inequalities of surface and with ends sawed square.

If "pole" ties are furnished (40 per cent of total order), they must be peeled, and the minimum face dimension shall be 6 in.

STREET CAR ADVERTISING BY RAILWAY COMPANIES

In a decision handed down on May 19, 1913, in the special term of the Supreme Court in Monroe County, N. Y., in the case of the Electric Railroad Advertising Company against the New York State Railways, Justice Sutherland warned street railway companies that they must be very careful in regard to the wording of advertisements on the dashboards of cars and also within such spaces inside cars as may be allotted to them by agents who have contracts granting exclusive privileges for street car advertising.

The Electric Railroad Advertising Company has had for a number of years an exclusive contract with the New York State Railways covering all street cars in Rochester, N. Y., and giving to the railway the right to use the dashboards of the cars and two spaces near the center of each car for its own advertising. These inside spaces have been used for cards reading as follows: "Flower Show, Convention Hall, Nov. 5-6-7-8-9. Take Lake and Monroe or Hudson and South Clinton cars," and "Take cars of Dewey, Emerson and Driving Park lines, Automobile Show, Exposition Park, Jan. 27-Feb. 1, inclusive." Recently, however, cars appeared bearing outside large posters which read: "Baseball to-day," and on a test case an injunction was secured restraining the railway company from advertising on the outside of its cars anything except destinations or routes to particular places.

Following an unsatisfactory revision of the baseball sign, the suit was next carried to the Supreme Court. In his decision Justice Sutherland said in part:

DECISION

"I do not think the placards of a flower show at Convention Hall and an automobile show at Exposition Park, with date and route, violate the injunction. The managers of the shows paid the railway company nothing for such advertising.

"It is its own legitimate advertising, under the contract, to call the attention of the people to any attraction for the purpose of getting them out and persuading them to travel upon its lines. The fact that incidentally or equally with the carrying railroad the show advertised profits by the display which the railway makes does not make the display violative of the letter or spirit of the contract or injunction.

"As to the baseball placards displayed on the dashboard of the cars, I think a different conclusion must be reached. Under the final injunction, as modified by the Appellate Division, the defendant cannot display any advertising matter on the outside of its cars, but the use of signs indicating the route or destination of its cars, or containing notice to its patrons as to the car or line to reach a particular place, is not enjoined. The 'Baseball to-day' placards were hung not only upon the cars going to the baseball grounds but upon cars on other routes. These signs advertised the fact that baseball was to be played on that day, but did not indicate the route to the grounds."

Speaking of the revised sign, when the route was added to the "Baseball to-day" sign, Justice Sutherland said:

"The baseball sign seems to violate the injunction at least by the use of the word 'to-day,' which does not contribute in any degree to the location of a place or the designation of a route.

"If the sign hung on the outside contains any matter which has nothing to do with the destination or route but is put on there for the sole purpose of calling attention to the event itself or the time when it is to be held, the sign then becomes objectionable under the judgment which has been pronounced construing the contract which the defendant made with the plaintiff with respect to advertising."

The Louisville (Ky.) Railway has instructed its conductors to wait for passengers who are near an intersection when the car passes.

CENTRAL ELECTRIC RAILWAY ASSOCIATION, TRAFFIC ASSOCIATION AND ACCOUNTANTS' ASSOCIATION BOOKS

Brown Book No. 3, issued by the Central Electric Railway Association and the Central Electric Traffic Association, gives the official list of officers, railroad members, committees, annual reports, etc., for the year 1913. The total mileage of the interurban roads in the association as of March 15, 1913, was 3874. The members of the committees as published in the Brown Book were given in the *ELECTRIC RAILWAY JOURNAL* of March 29, 1913, page 594. The charges for interchange of equipment between members of the association are given as well as the rules and regulations governing the issue and exchange of annual transportation between lines. Other information pertaining to the work of the associations is included in the book, which is issued from the office of A. L. Neereamer, the secretary, Indianapolis, Ind.

A booklet issued by the Central Electric Railway Accountants' Association contains various reports and papers presented at the meetings of the association, a list of officers and committees, a list of members, a brief history and the constitution and by-laws. The book was prepared by the compiling committee of the association as follows: H. B. Cavanaugh, chairman; C. M. Witt, F. T. Loftus, A. F. Elkins and L. T. Hixson.

The following new members have been admitted to the Central Electric Railway Association:

Railway: Mansfield Railway, Light & Power Company, Mansfield, Ohio; Stark Electric Company, Alliance, Ohio.

Supply: Harry E. Adams, Nagel Electric Company; E. G. Beatty, Galena Signal Oil Company; W. K. Archbold, Archbold-Brady Company; George Bryant, Bryant Manufacturing Company; W. H. Brainard, Carnegie Steel Company; Norman M. Hensch, Carnegie Steel Company; C. E. Slack, C. E. Slack Company; J. K. Hoffman, Hale & Kilburn Manufacturing Company; Joseph Hollis, Trolley Supply Company; W. J. Dann, R. F. Johnston Paint Company.

ELECTRIC TRAIN ORDER SIGNAL

The Union Switch & Signal Company has recently placed on the market an electric train order signal with two arms, one for each direction of traffic, and the table lever stand used to control it. The signal may be either the well-known Style "B" or Style "S." Each arm is arranged to indicate in the upper quadrant, working in three positions. The lower case may be omitted if desired. Standard automatic block signal practice is followed practically throughout. Only one lantern is needed in spite of the fact that the axes of the semaphore shaft do not coincide. The quadrants are notched in the center as well as at the ends so that the levers may be left in any one of the three positions corresponding to those of their respective signals.

WRAPPING RUSTY HANDRAILS

In many sections of the country where the humidity is comparatively high considerable difficulty is experienced in eliminating damage to clothing from rust accumulation on the hand rails. This difficulty is experienced particularly in Texas and has been overcome by the application of linen tape coated with shellac on portions of the hand rails in the vestibules of the pay-as-you-enter and pay-within cars. Those portions of the hand rails and stanchions which might come in contact with the passengers' clothing are wrapped with one layer of linen tape and receive three coats of shellac. After a comparatively short period in service, the surface of the paint wears as smooth as the iron rail, and there is no tendency for it to ravel.

MEETING OF JOINT COMMITTEE ON STANDARD CLASSIFICATION OF ACCOUNTS

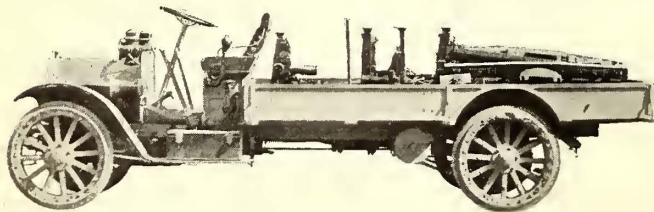
A meeting of the joint committee on standard classification of accounts of the American Electric Railway Accountants' Association and representatives of the Interstate Commerce Commission was held in Boston during the last week in June. Those present were William F. Ham, Washington Railway & Electric Company; F. E. Smith, Chicago Railways; H. L. Wilson, Boston Elevated Railway, and W. B. Brockway, Ford, Bacon & Davis, representing the Accountants' Association, and Fred W. Sweney, chief examiner of accounts, and George Geekie, assistant in charge of electric railway accounts, representing the Interstate Commerce Commission. Five full days were devoted to a consideration of a revision of the road and equipment accounts, of the operating expense accounts and of the operating revenue accounts, as well as a consideration of a revision of the income and profit and loss statements and the general balance sheet.

All of these schedules were carefully considered and are to be revised and again considered by the committee, after which the Interstate Commerce Commission proposes to publish all of these tentative schedules and send them out to all the electric railway companies for their consideration and criticism. When these have been received this committee will again meet with the Interstate Commerce Commission representatives for final approval of these classifications, and it is hoped and expected that they may be promulgated so as to be effective as of July 1, 1914. The committee has expended a good deal of time over these classifications, having spent four days in New York in January, five days in Atlantic City in April and five days in Boston in June.

EMERGENCY GASOLINE MOTOR TRUCKS FOR THE DETROIT UNITED RAILWAY

A striking example of what can be done in adapting the motor truck to emergency line repairs is found in Detroit, where the Detroit United Railway is employing with very gratifying results two gasoline motor trucks built by the Federal Motor Truck Company, Detroit, Mich. These trucks were built according to body designs supplied by E. J. Burdick, superintendent of power Detroit United Railway. One truck is used for hose jumper work, derailed cars, etc., and one is used for repairing overhead work. The trucks are housed in a building which is operated by the company on somewhat the plan of a city fire house, and emergency men are available for each wagon at any hour of the day or night.

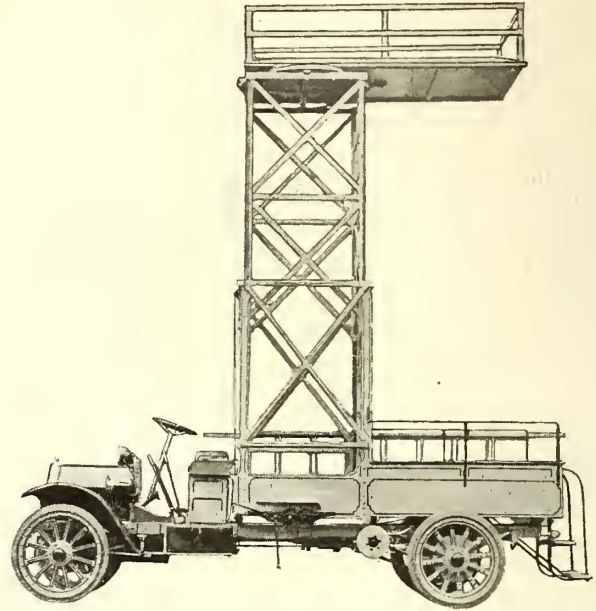
The body of the truck used as a trouble wagon is 11 ft. long and built on the frame and is about 5 ft. wide inside.



Detroit Motor Truck Equipped with Jacks and Other Means to Handle Derailed Cars, etc.

The load is carried 30 in. above the ground, holding the center of gravity as low as possible. The truck is equipped with Swinehart cellular tires and has a speed of 18 m.p.h. There is a partition 5 ft. back of the driver's seat. The back wheels are housed, leaving room for tool boxes of ample size. The load carried in front of the partition is about 1100 lb. It includes jacks, bull ropes and other equipment for replacing cars on the track, etc. This load is

always on the car. The space in the rear end of the truck, however, except that which is used for the side tool boxes, is available at all times for the use of hose jumper equipment, etc., which is always kept suspended above the car by means of an air hoist. The weight of the hose jumpers, etc., is about 2100 lb. A flexible cradle in which the hose jumpers rest is suspended from the air hoist. This cradle is made of log chains and steel tubing. If a call is received



Detroit Gasoline Motor Equipped with Tower for Emergency Wire Repairs

for a fire, the load in the cradle is dropped into the rear compartment over the wheel housing. The Detroit United Railway has an arrangement with the city fire department whereby all fire alarm calls are received at the central emergency station of the company. The company responds to all calls within the 1-mile limit which marks the most highly congested center, whether or not the fire is on a car line. The company responds to calls in the rest of the city if the fire is on a car line or if its services are specially needed by the city.

While the emergency trouble wagon, therefore, is equipped for constant use and has been found in practice to be of great value, the other truck, used for repairing overhead work, is equally valuable. This truck is also built with a low center of gravity and has installed upon it a standard Trenton tower top. The tires of this truck are also of the Swinehart cellular type. This truck likewise carries a complete set of repair equipment.

VENTILATOR FOR ARCH ROOF

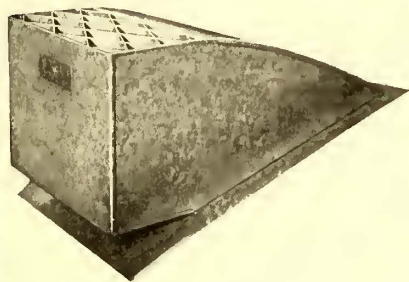
The opportunity for decreasing weight of passenger cars of all descriptions and increasing their strength and durability by the use of arch roofs has been recognized generally during the past few years by electric railways, and a marked increase has occurred in the number of new cars which have this type of roof specified by their purchasers. An important difficulty with this design, however, has been the problem of ventilation. Roof ventilators operate under many difficult conditions. They must be light in weight, they must exert a strong aspiratory effect, they must operate regardless of the direction of the wind, even when it takes the form of a down draft, and they must eliminate any possibility of rain or dust entering the car.

To meet these conditions the Railway Utility Company, of Chicago, has been experimenting with different forms of its "honeycomb" type of ventilator, originally applied to cars with monitor-deck roofs, and this has resulted in the de-

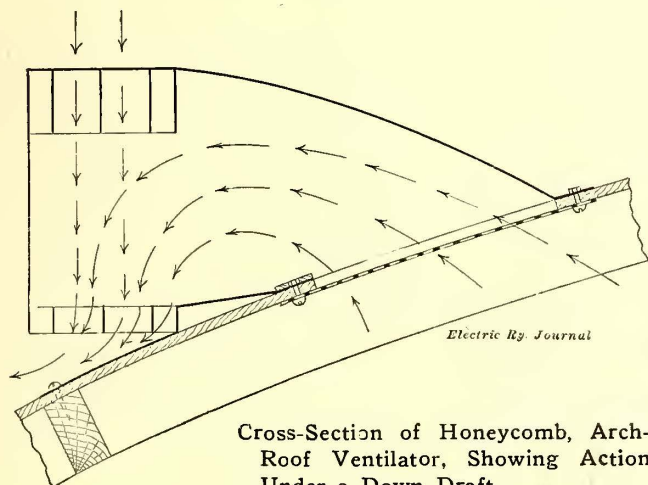
velopment of the ventilator for arch roofs shown in the accompanying illustration. The principle upon which it operates is exceedingly simple. A curved hood is extended out from a hole in the car roof, the hole being covered by a grating. The hood is blanked off at the outer end, but openings are provided in the upper and lower sides. These openings are divided up into a series of small openings by diaphragms of galvanized iron, making a structure quite similar to a honeycomb. The relatively great depth of the diaphragms in comparison to the size of each small opening compels any air which passes through the honeycomb to move absolutely in vertical lines either upward or downward.

Any current of air which passes vertically across the end of the ventilator hood naturally exerts a strong aspirating effect on the air within the hood, tending to set up horizontal currents which become intermingled with the vertical currents at the end of the hood, thus drawing air through the hood out of the car. The action of a down draft is shown by the arrows in the accompanying line cut. With a wind which is in a perfectly horizontal direction, as under the normal conditions, the honeycombs both on the upper and the lower sides of the hood exert an aspirating effect and draw air out of the hood both in an upward and in a downward direction, the currents within the hood still being generally horizontal.

Rain which beats into the upper honeycomb and cinders or dust which happen to be deflected into it are directed by the sides of each honeycomb cell straight downward through the lower honeycomb openings and out of the ventilator hood, so that there is no possibility for moisture or



Honeycomb Ventilator



Cross-Section of Honeycomb, Arch-Roof Ventilator, Showing Action Under a Down Draft

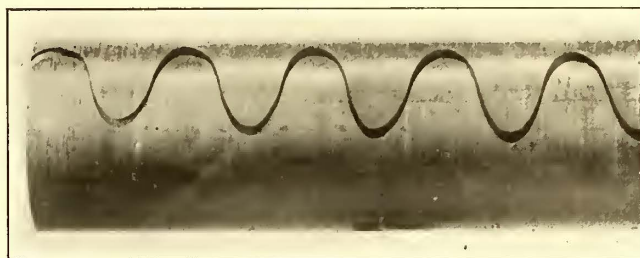
dust to be entrained or to find its way into the interior of the car.

Tests have shown that with a wind velocity of 10 m. p. h. each ventilator exhausts 110 cu. ft. of air per minute. At 20 m. p. h. the capacity rises to 230 cu. ft. of air per minute, and at 30 m. p. h. 310 cu. ft. of air is exhausted. For cars operating at the higher speeds it is generally considered advisable to install registers in place of the grating over the opening in the car roof, so that the ventilation can be controlled. These registers may of course be connected to operate simultaneously by means of a handle inside the car, similar to the customary method of opening sash in monitors.

A NEW INSULATING COMPOUND

A new material to take the place of hard fiber, glass, porcelain, hard rubber, built-up mica, pressboard, rawhide and molded compounds has been developed by the Westinghouse Electric & Manufacturing Company at East Pittsburgh, Pa. It is known as "micarta" and is used for commutator bushings, brush-holder insulation, noiseless gear blanks, light-weight conduit, refillable fuse tubes, arc shields in circuit-breakers, etc.

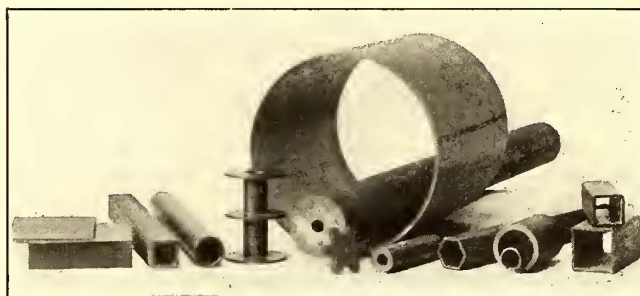
Micarta is a tan-brown colored, hard, homogeneous material having a mechanical strength about 50 per cent greater than hard fiber. It can readily be sawed, milled, turned, tapped or threaded, if a sharp-pointed tool is used and the work done on a lathe. It can, however, be punched only



New Insulating Compound—Harmonic Fracture of a Tube Showing Homogeneity of Material

in thin sheets and it cannot be molded. Micarta is not brittle and will not warp, expand or shrink with age or exposure to the weather, but takes a high polish, presenting a finished appearance.

Two grades of the material are made. The grade known as "bakelite micarta" will stand a temperature of 150 deg. C. (300 deg. Fahr.) continuously or 260 deg. C. (500 deg. Fahr.) for a short time. It is infusible and will remain unaffected by heat until a temperature sufficient to carbonize it is reached. It is claimed to withstand an electric arc better than hard fiber, hard rubber, built-up mica or any molded insulation containing fibrous or resinous materials. Its coefficient of expansion is low, being approximately 0.0002 per degree C. It is impervious to moisture. The other grade has the same mechanical and electrical prop-



New Insulating Compound—Sample Forms in Which Material May Be Shaped

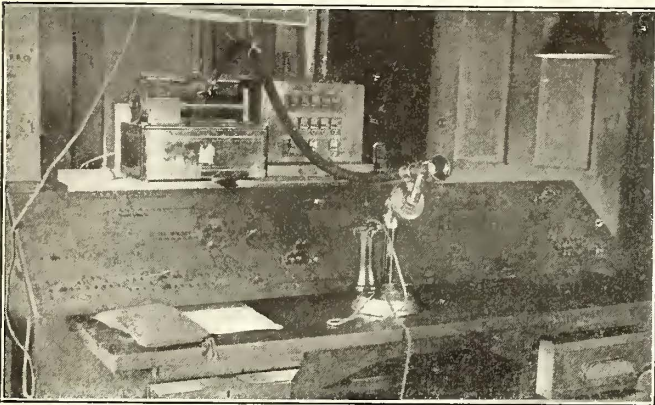
erties as the bakelite micarta but differs in its chemical and thermal properties, behaving toward chemicals and heat very much as an ordinary resin. This grade is not used in plate form.

As proof of the uniformity of structure of bakelite micarta, the accompanying illustration of a fracture is shown. This is not a saw cut, but a natural break. The tube was held tight on a metal mandrel and a compressive force was applied at one end of the tube and when the force became sufficiently great the tube split as shown. Such a break is known as a "harmonic fracture." The strains in a homogeneous material under stress follow a sine wave law. If one part of the material is weaker than the rest, the strain

at this point becomes greater and the harmonic wave is distorted. However, it will be seen from the illustration, made from a photograph, that the strain followed the true harmonic wave almost as closely as the eye can detect.

DICTAPHONE IN DISPATCHING

The Southwest Missouri Railroad operates 75 miles of track, about one-third of which is double track. Cars are run at from three to thirty minutes' headway, but the lines upon which service more frequent than thirty minutes is



Dictaphone on Telephone Dispatching Board

given are double-tracked. For the past twenty years the dispatching of cars on this road has been by telephone, none of the orders being reduced to writing, and this system has been successfully used for a decade. On March 1 last, however, a new feature was added to the telephonic system by the installation of a dictaphone in the dispatcher's room, with the effect that during the last four months every order given to trainmen by telephone has been duly recorded on the dictaphone and can be reproduced in case of any dispute or misunderstanding. These records are preserved for a period of three days, when



Manually Operated Fender Folded Up at Rear End, in Running Position and Dropped to Rails

they are scraped and the blanks are put back into service.

The officers and employees of the road are highly pleased with the results already achieved by the use of the dictaphone in the dispatching service. So far as known, the dictaphone in the Southwest Missouri Railroad Company's office in Webb City, Mo., is the first one used in train-dispatching work. In addition to the dictaphone and scraper, thirty-six blanks were purchased and the outfit has proved adequate.

A LIGHT CAR FENDER

The New Orleans Railways Company has had in operation for some time past a number of Herr car fenders. As shown in the accompanying illustrations, this type of fender is made up of two sections, one horizontal and one vertical. These are hinged one upon the other, and in addition the horizontal section is hinged to castings attached to the bumper by means of extensions of the fender frame. As this section is raised, either to raise the fender from the rails to normal running position or from normal running position to raised position at the rear end of the car, the vertical section of the fender slides upward upon two vertical guide rods, to which it is connected by bent arms or extensions of its framework.

The fender is normally carried in running position by means of a pin in each of the vertical guide rods as these pins engage with sleeves on the ends of the bent arms which slide upon these rods. The rods are, however, furnished with cranks at the bottom, and the motorman can turn them to an angle of about 45 deg. by means of a handle extending up inside of the dashboard. When it is desired to drop the fender to the rails the rods are turned, and the pins in them engage with slots in the sleeves which slide on them, thus permitting the sleeves to drop about an inch and consequently permitting the outer edge of the fender to fall upon the rail.

The fender is reset to running position by raising it enough so that the sleeves slide up above the pins on the guide rods and this permits a spring to turn the guide rods back into the normal position. The principle is much like that used in raising an umbrella except that instead of the catch for the sleeve being pressed by the fingers, the catch, which in the case of the fender is a pin, is moved around to coincide with a groove in the sleeve and thus lets the sleeve pass by it. The fender is held in raised position when it is at the rear end of the car by means of a strap in the usual manner.

The new device, which has been developed by William Dickenson, master mechanic New Orleans Railways Company, is exceptionally light and strong. The total weight

complete with fittings is but 90 lb. Its use in New Orleans has been approved by the City Council.

The Appellate Division of the Supreme Court decided, on July 10, that the Brooklyn Rapid Transit Company must obey the ruling of the Public Service Commission, First District, New York, to equip its cars with power and geared hand brakes. This order was mentioned on page 96 of the issue of this paper for July 20, 1912.

News of Electric Railways

Illinois Public Utility Law

The act providing for the regulation of public utilities in the State of Illinois has been signed by Governor Dunne and will go into effect on Jan. 1, 1914. The act substitutes for the present Railroad & Warehouse Commission a State Public Utilities Commission, consisting of five members, not more than three of whom may be affiliated with the same political party. The annual salary of each commissioner is to be \$10,000. Before entering upon the duties of his office each commissioner is required to give bond, under security approved by the Governor, in the sum of \$20,000. The usual restrictions are placed on all official connections with any corporation or person subject to regulation by the commission, and upon receiving any emoluments therefrom.

The commission will have general supervision over all public utilities, and it must examine these and keep informed as to their franchises, capitalization, rates and management and operation of property. The term "public utility," as used in the act, includes every corporation, company, association, joint stock company, partnership or individual, their lessees, trustees or receivers appointed by any court (except, however, such public utilities as are or may hereafter be owned or operated by any municipality) that owns, controls, operates or manages within the State, directly or indirectly for public use, any plant, equipment or property for the transportation of persons or property or the transmission of telegraph or telephone messages within the State, or for the production, storage, transmission, sale, delivery or furnishing of heat, cold, light, power, electricity or water, or for the conveyance of oil or gas by pipe line, or for the storage or warehousing of goods, or for the conduct of the business of wharfinger, and that may own or control any franchise, license, permit or right to engage in any such business. The term "service" is used in its broadest and most inclusive sense and includes not only the use or accommodation afforded consumers or patrons but also any product or commodity furnished by the utility and the plant or equipment and any facilities employed by the utility and devoted to the purposes of the corporation. The word "rate" includes every individual or joint rate, fare, toll, charge, rental or other compensation of any public utility or any two or more of such, and any rule, regulation, practice or contract relating thereto.

In the matter of stock and bond issues, the act states that the power of public utilities to issue evidences of indebtedness and to create liens on their property is a special privilege, the right of supervision, regulation, restriction and control of which is vested in the State to be exercised by the commission. Provision must be made for the proper identification of all issues by means of serial numbers or other devices. No issues payable at periods of more than twelve months from the date thereof may be issued except with the approval of the commission and then only for the acquisition of property for extensions, improvements or additions, for the lawful re-funding of its obligations, or for reimbursements of moneys paid from income not received from sale of evidences of indebtedness within five years after the application for authorization of the new issue. Before issuing any authorization the commission, when it is deemed necessary, "shall make an adequate physical valuation of the property of the public utility, but a valuation already made under proper public supervision may be adopted, either in whole or in part, at the discretion of the commission." Short-term notes for periods of not more than twelve months may be issued without the consent of the commission, but may not be renewed for an aggregate period of longer than two years. The commission has no power to authorize the capitalization of the right to be of a corporation, or to authorize the capitalization of any franchise, license or permit in excess of the amount (exclusive of any tax) actually paid to the State as consideration therefor. The commission also has full power of supervision and restriction over all the forms of intercorporate relations. The commission may also ascertain the value of the property of any public utility in the State.

Rates are required to be just and reasonable, and unless the commission otherwise orders no change shall be made by any public utility in any rate, classification, ruling, privilege or facility except after thirty days' notice to the commission and to the public. The commission has power, upon a hearing upon its own motion or upon complaint, to investigate any single rate, classification, etc., or the entire schedule, and to establish new rates, classifications, etc., in lieu thereof. This provision, however, does not affect the act establishing and regulating the maximum rate of charges for the transportation of passengers in the State. The establishment of through routes and joint rates is adequately provided for.

The last part of the act takes up in detail such points as the control over car distribution, standards of service, safety appliances and the character of proceedings before the commission and in the courts. The penalty for a violation of an order of the commission by a corporation is a fine of not less than \$500 nor more than \$2,000 for each offense, and a person violating its orders shall be punished by a fine not exceeding \$1,000 or one year's imprisonment, or both.

Jamestown Companies to Claim Strike Damages

The strike of the employees of the Jamestown (N. Y.) Street Railway and the Chautauqua Traction Company, which collapsed and was declared off on June 29, as noted in the *ELECTRIC RAILWAY JOURNAL* of July 5, 1913, page 45, was begun on May 1, 1913, following the refusal of the officers of the company to comply with the demands of its union employees for 25 cents an hour for the first six months' service, 27 cents an hour for the second six months, 29 cents after one year, recognition of the union and the reinstatement of a conductor who had been discharged a few days before. The company started a partial service immediately with the men who remained faithful to it, but for some time no attempt was made to run cars at night because of the fear of violence.

On May 27, following disorder by strikers and their sympathizers, Frank W. Stevens, chairman of the citizens' committee which had been named by the Mayor, called a meeting of citizens to organize a citizens' police to preserve order. Five hundred were sworn in and equipped with night sticks and badges. On May 29 Mr. Stevens received from A. N. Broadhead, president of both companies, a statement naming the conditions under which he would agree to arbitrate. These terms were published in part in the *ELECTRIC RAILWAY JOURNAL* of June 14, 1913, page 1081. The men rejected the terms proposed by Mr. Broadhead because they did not provide for recognition of the union nor for the reinstatement of all the men on strike. Several counter proposals were made, but negotiations for a settlement were finally broken off.

As previously stated in the *ELECTRIC RAILWAY JOURNAL*, the company has prepared a list of twenty-five men who went on strike who will be reinstated on the terms promised by the company about six weeks before the strike was called, but at the bottom of the extra list. These terms provide for an increase in wages of about 1½ cents an hour for the conductors and motormen, making the minimum 19 cents an hour and the maximum 25 cents an hour; also for the change from the "swing run" to "the early and late day" plan. The increase in wages which had been promised the men took effect on May 1, and all who remained with the company and the new men taken on have benefited by it. After the strike had been declared off Mr. Broadhead issued a statement, in part as follows, in which he said that a claim would be filed with the city and county for damages sustained by the company on account of the strike:

"The gambling and drunkenness that have been going on will not be tolerated and the men that have not been honest with the company will not receive jobs. There are twenty-five of the men who can come back. The rest could not work for me if they worked for nothing and paid their own board. The strike has greatly injured the city and the lake region. I think it has cost the city and lake region at least

\$500,000. We are making out our account to the city and county for our loss directly and indirectly and the damage to our property, and the county and city will have to pay it. I am going to turn in my account for damage to property to the county and for loss of business to the city because I was not protected in the rights I have here. I expect to have every dollar. As soon as the first window was broken I gave orders to have the cost of replacing it jotted down.

"Personally I would rather not open Celoron Park this year, but instead make many alterations and open a new Celoron next year. There is a lot of work to be done there."

Railroad Terminal Matters in Chicago

The City Council of Chicago voted on June 30 to appropriate \$10,000 for the employment of a commission of experts to submit a scientific railway terminal policy to the city. This action was taken by request of Alderman Geiger, chairman of the railway terminal committee, after a meeting of the committee in which a sub-committee was appointed to go into the subject. At the meeting a statement was filed by Charles H. Wacker, chairman of the Chicago Plan Commission, who urges the adoption of Twelfth Street as a location for all of the future railroad terminal development in Chicago.

Mr. Wacker makes the following arguments in favor of his plan:

"Three times passenger capacity. Can be enlarged if needed. Can be developed with office buildings as in New York. Can carry a subway beneath it. Correlation of terminals. Shortening the distance between entrance to passenger station and trains. Can carry an elevated line right through station if desired. Easy of access and non-interference with development of city's heart. Opens eight new streets."

The following criticisms of the plan proposed by the Pennsylvania Lines and associated railroads were made by Mr. Wacker:

"Lack of street car transportation and connection with proposed subways. No river roads. Trussing of viaducts above streets. No opening of Monroe Street. Provision for next fifteen years only. Natural limitation of expansion. Inaccessibility from East or North Side of city. Distance between train and coach-cleaning yards, necessitating heavy switching charges. Tracks approach over streets, leaving few unobstructed streets. Location of warehouses across proposed widened Congress Street. Places a new freight yard in heart of the city. It will remove from taxation 18 acres of down-town city property, meaning heavier taxes for West Side owners."

A. Bement, representing the Western Society of Engineers, has sent a letter to the committee on railway terminals of the City Council of Chicago in reference to the proposed railroad terminal development. Mr. Bement indorsed the suggestion made by the City Club that a scientific commission be appointed to study the problem before any action is taken on the ordinance authorizing the improvement desired by the Pennsylvania Lines and the other companies which are interested with that system in the Union Station. Mr. Bement said that he thought that the present Union Station would serve all purposes until a comprehensive study could be made of the entire problem of transportation in the city.

Final Hearing on Uniform Rules for Interlocking Plants

On June 26 the engineers for the Railroad Commissions of Indiana, Illinois, Wisconsin and Minnesota held a final hearing in the offices of the Illinois Railroad & Warehouse Commission in Chicago on uniform rules and regulations governing the construction, reconstruction, maintenance and operation of interlocking plants. On June 12, at a hearing at Madison, Wis., the engineers for the four commissions presented their revised rules to the committee representing the steam and electric roads in the four states. The final hearing held in Chicago, June 26, was to permit the engineers representing the steam and electric roads to present their objections to the revised rules.

At this hearing a number of revisions were requested by the steam road engineers as regards the mechanical details

of the plant, the various reports to the commission, and locks and seals. Under the latter provision the rules require that all interlocking cabinets, time locks, time releases, emergency switches, indicator and relay cases must be provided with suitable covers and fastenings so arranged that they may be sealed or locked as conditions require, to be opened only in case of emergency. As to special requirements affecting electric railways, the clause requiring electric railways to provide suitable guards of an approved design to prevent the trolley from leaving the wire while in the act of crossing tracks within the interlocking limits was eliminated. The objection against this requirement raised at the meeting held March 12, and reported in the *ELECTRIC RAILWAY JOURNAL* of March 22, brought about the elimination of the trolley guard clause so far as interlocking crossings are concerned. B. J. Fallon, engineer maintenance of way of the Metropolitan West Side Elevated Railway, Chicago, objected to making the minimum length of detector bars 53 ft. He stated that there was no necessity for electric roads to install a 53-ft. detector bar. Accordingly the engineers for the commission made the minimum length 33 ft. and will increase it where the character of the rolling stock requires.

The commission's engineers are now engaged in making the final revisions to the proposed set of uniform rules and they will be submitted to the four commissions for final adoption in the very near future.

Letter from Company to Council of Cleveland

In a recent letter to the City Council of Cleveland John J. Stanley, president of the Cleveland (Ohio) Railway, expressed the hope that the deficit existing in the operating balance will soon be made up through the increased charge fixed by the board of arbitration. The letter was accompanied by a resolution adopted by the board of directors at their regular June meeting authorizing the company to take such steps as may be necessary to have the deficit made good and to use every reasonable effort to prevent other deficits from being created during the succeeding months. The directors say they hope and believe that the operating expenses of the road for June will be less than the new allowance, and that the surplus will within a short time wipe out the accumulated deficit. At the same time the Council was notified that the new allowance was insufficient to meet the expenses of the past three months.

Mr. Stanley has denied the rumor that he will join Horace E. Andrews in the operation of the Eastern properties in which both are interested. He states that he will remain at the head of the Cleveland Railway.

Mr. Mellen Resigns from Boston & Maine and Maine Central Railroads

Charles S. Mellen, president of the New York, New Haven & Hartford Railroad and the Connecticut Company, resigned on July 8 as president of the Boston & Maine Railroad and the Maine Central Railroad, and Morris McDonald, vice-president and general manager of the Maine Central Railroad, was elected to succeed him with both roads. Mr. Mellen stated that in assuming the presidency of the Boston & Maine Railroad and the Maine Central Railroad, in addition to looking after the New York, New Haven & Hartford's other interests, he had taken upon himself "more than one man could satisfactorily handle with justice to each."

In a letter to the stockholders who have deposited their proxies with the committee which has been appointed to inquire into the affairs of the New York, New Haven & Hartford Railroad, the members of the committee under date of June 30, 1913, said in part:

"At a recent conference between a sub-committee of this committee and the executive committee of the company the latter offered to this committee the fullest information 'without any restriction,' including free access to the company's books, in order to aid the committee in forming its own conclusions in the most independent manner. The executive committee then appointed a sub-committee, consisting of Messrs. J. P. Morgan, Milligan, Skinner, Rea and Vail, to confer with this committee in order to facilitate its work. It is apparent that the criticisms have been gen-

eral, coming from public authorities, both federal and state, and from the press, public bodies and private individuals throughout New England. The committee, while not intending to investigate all the charges that have been preferred, desires to inform itself fully as to such transactions of the past as will enable it to discuss and suggest in the interest of the shareholders the best course in future, having especial regard to questions of operation, organization and finance, and to those matters affecting the public policy which have been so largely discussed in public."

First Public Hearing on New Detroit Ordinance

At the first public hearing on the franchise settlement plan submitted to the Council of Detroit, Mich., recently by Mayor Marx, Horace G. Williams, representing the Municipal Ownership League, argued that the Marx plan furthers private ownership. He said that if the ordinance is adopted the company will cease to be a trespasser and all the work done up to this time will be of no value, except as a precedent foreshadowing what the Supreme Court may decide in new litigation. Mr. Williams contended that municipal ownership cannot be secured by entering into a new arrangement that is likely to be the foundation for further litigation. John McVicar suggested that the present rental resolution be repealed and that a new one be adopted making the rentals \$1,000 or even \$3,000 per day, instead of \$300, for the use of the streets. Alfred Lucking, acting as the Mayor's adviser, insisted that the people's rights are safeguarded under the ordinance and that municipal ownership is not endangered. He admitted that the company will probably not accept the ordinance as it stands, but believes that a compromise can be secured that will be an improvement on conditions that now exist. He said that if the company is permitted to use the streets much longer without an agreement of some kind it will gain rights that will be difficult to recall.

Double transfers have been given on all lines of the Detroit (Mich.) United Railway since July 8 in an effort to relieve the congestion in the down-town district and facilitate travel in other ways. Patrons are permitted to transfer to crosstown lines and then transfer again to the intersecting lines that will take them to the desired destination, instead of riding to the business section of the city, changing there and going thence to their first destination. Those who use the workmen's 3-cent tickets do not receive transfers.

Strike on Chicago Suburban Lines

A strike was called on the lines of the County Traction Company and Suburban Railroad, taking effect at midnight on the night of Thursday, July 3. The County Traction Company operates the lines outside of the city of Chicago formerly controlled by the Chicago Consolidated Traction Company. About 300 employees participated in the strike. The companies have discontinued service as a result of the strike, although they have told officials of the numerous suburban towns served by the lines that they will operate the cars if the towns will protect them in so doing.

The trouble has been a long time in reaching a head. The employees of the County Traction Company were formerly organized in a local union of the Amalgamated Association. The Amalgamated Association then revoked the charter of the local union, and the men were absorbed into the union on the Chicago surface lines. The company does not pay the scale prevailing on the Chicago surface lines, holding to its maximum of 30 cents an hour as compared with the maximum wage of 32 cents per hour on the Chicago lines. The matter of a strike was before the employees of the company in the fall of last year, and it was decided at that time that a strike should take place. The officers decided that they would order the strike just before July 4. That is the best traffic period the lines have during the year. On the day before the strike took place a committee representing the employees called on Emil G. Schmidt, the president of the properties, to see whether he had changed his attitude on various questions affecting the employees since the previous conference six months before. Mr. Schmidt said that the lines were not

earning operating expenses and told the men that operation would be discontinued if they stopped work. Nevertheless the strike was ordered. At midnight the employees who were on duty at that hour ran their cars into the carhouses, made their reports and went to their homes. Everything was conducted peaceably, and some of the employees in order to get their cars to the carhouses rode 4 or 5 miles away from their homes and walked back.

The Chicago Railways Company has twenty cars which are used usually on the lines of the County Traction Company. These cars were removed from the carhouse of the County Traction Company at Oak Park just before the strike took effect in order that no issue might be raised that would involve the Chicago surface lines or employees in the controversy.

The issue between the companies and the men is partly one of wages and partly one of working conditions and union affiliations. The companies were perfectly willing to have the men in a union of their own, but when the charter of the union was revoked and the men joined the larger union of the Chicago surface lines the companies did not like the change. Their lines are entirely outside of the city of Chicago and they took the position that the men should have their own local charter from the Amalgamated Association if they chose to have a union. They are not willing to submit this question to arbitration but are willing to submit to arbitration the question of whether the men shall have the wages prevailing on the Chicago surface lines. The traffic is mainly a summer traffic made up of business to the outlying parks, suburbs and summer resorts. President Schmidt expressed the views of the management when he said that if the men went out on a strike the cars would remain in the carhouses. He said that the companies would make no attempt to operate cars and so invite riots and trouble, but that they had announced to the officials of villages and towns whose inhabitants were greatly inconvenienced by the discontinuance of operation that they would go ahead and operate if the officials would promise to give protection from the attacks of strikers. Thus far no assurance of protection has been offered to the companies and no attempt is being made to resume operation.

Judge Hook on Form of Kansas City Franchise

Judge William C. Hook in the United States Court at Kansas City, Mo., says in regard to the form of the proposed new franchises on which the receivers of the Metropolitan Street Railway and the city are now trying to agree:

"As I understand it, the important difference between the receivers and the city in the negotiations for a new contract is over the time when the participation of the stockholders in the surplus income shall begin. On the one side is the claim that it should begin at once when the contract becomes effective. On the other hand, the Mayor claims that it should be postponed until the intangible elements in the agreed capital valuation of \$30,000,000 are wiped out. To accomplish this he proposes to put back into the property the entire surplus and the city's profit in the tax fund.

"He also proposes that after this amortization is effected the stockholders may have a slightly increased percentage of participation. It is urged that the stockholders are allowed but a slight increase in the property—that is to say, the difference between the funded debt and the agreed capital value, plus the participation with the city in the surplus income—and that, as it is estimated that it will take eight years or so to effect what the Mayor wants, the participation will not only be postponed that long, but the stockholders will be brought that much nearer the time when the city will take over the property absolutely and all their interests end. There is force in this.

"On your basis it means that the stockholders yield one-fourth of about \$7,000,000, but, on the other hand, the Mayor is willing to allow by way of recompense 8½ per cent increase in participation after what he desires is accomplished. I think the Mayor's plan is based on sound business principles and will work to the advantage of the property. I think therefore you should work to an agreement with the Mayor on the difference mentioned."

First Through Train Over Oakland, Antioch & Eastern Railway

The laying of tracks on the Oakland, Antioch & Eastern Railway from Bay Point to Sacramento was completed on June 30, and the first through train from Sacramento to Oakland left the west end of the Northern Electric bridge, Sacramento, on July 2. The party on the train was composed of Samuel Naphaly, H. A. Mitchell, John I. Walter, A. W. Maltby, Henry T. Scott, W. Arnstein, G. T. Marye, C. A. Hunt and George T. Weeks. The regular electric train service will be begun on Aug. 15. The intervening time will be devoted to finishing the electrical equipment and ballasting the roadbed.

The new rolling stock equipment ordered by the company is beginning to arrive. Nine passenger coaches, including a parlor and observation car, are already in the Oakland yards and eight more steel cars are being built in Oakland. Four additional cars are due to be shipped from the East on July 15. Two 65-ton high-power electric locomotives will be shipped at the same time and two 50-ton freight locomotives are on the ground. The larger locomotives will be used in the passenger service and will be able to develop a speed of 65 m. p. h., drawing trains of five coaches each.

I. C. C. Report on Transportation in New England

The Interstate Commerce Commission made public on July 9 its report on railroad transportation conditions in New England. Referring to the increase in the capital liabilities of the New York, New Haven & Hartford Railroad since 1903, the commission says in part:

"June 30, 1903, the total capitalization of the New Haven company was approximately \$93,000,000, of which \$79,000,000 was stock and \$14,000,000 bonds. The mileage then operated was 2040 miles. On June 30, 1912, the capitalization, excluding stock premiums, was \$417,000,000, an increase of \$324,000,000, while the operated mileage was 2090, an increase of 50 miles. While the New Haven operated 2040 miles in 1903, it owned of this operated mileage only 438 miles. During the nine years this owned mileage was increased by about 800 miles, and the New Haven company expended approximately \$40,000,000 in acquiring this additional owned mileage. It expended during the nine years something over \$96,000,000 upon its railroad for betterments and equipment, making a total of \$136,000,000 devoted to its railroad property proper. This would leave the sum of \$204,000,000 which in nine years had been expended in operations outside its railroad sphere."

Referring to the activities of the company in absorbing electric railways the commission says in part:

"The first transaction to which reference will be made is the purchase of the Rhode Island trolleys. In 1902 the United Gas Improvement Company entered the electric railway field in Rhode Island. A corporation known as the Rhode Island Company was organized which issued its capital stock in the sum of \$2,000,000 to the Improvement Company, receiving in return \$2,000,000 in cash. In 1904 the New Haven purchased a block of the stock of the Rhode Island Company. In 1906 it perfected arrangements for the acquisition of the entire stock of that company by organizing a third corporation, the Providence Securities Company, which exchanged its 4 per cent debentures guaranteed by the New Haven Company for the stock, bonds and notes of the Rhode Island Securities Company substantially at par. There was a cash payment of \$10 per share by the stockholders of the Rhode Island Securities Company and an adjustment of \$3 per share against this on account of interest. In whatever aspect the transaction is viewed the New Haven gave \$13,500,000 for nothing. Since then additional money has been invested by the New Haven company in the development of the Rhode Island electric railways so that to-day the investment totals about \$24,000,000. Professor Swain in his report to the validation committee estimated the value of the investment at \$6,000,000."

Referring to the New York, Westchester & Boston Railway, the commission says in part:

"The New York, Westchester & Boston Railway is a four-track electric road extending from White Plains, N. Y.,

to a terminus at Harlem River, a distance of slightly more than 20 miles. This road was built and is owned by the New Haven. The books of the New Haven company offered but little information as to the actual process of construction. The road was completed and began operations about June 30, 1912, and on that date the New Haven had invested, including interest, almost \$34,000,000. The New York, Westchester & Boston Railway is located entirely within the State of New York and reports to the Public Service Commission of that State. The first report of this corporation, under date of Sept. 30, 1912, gives the value of its tangible property at somewhat less than \$22,000,000. Here, therefore, is an enterprise which has cost the New Haven company \$12,000,000 in excess of the value of its property upon its own showing. In the case of the Rhode Island Company it was possible to locate the corporation, if not the individual, which had ostensibly obtained the money, but in this case it is impossible from anything upon the books of the New Haven company to do this even approximately."

In its general conclusion the commission says:

"Our general conclusion is that the outside financial operations of the New Haven company for the last nine years have been wasteful in the extreme and that the methods by which those operations have been conducted are unnecessarily involved and complex. The present management started out with the purpose of controlling the transportation facilities of New England. In the accomplishment of that purpose it bought what must be had and paid what must be paid. To this purpose and its attempted execution can be traced every one of these financial misfortunes and derelictions. The Rhode Island Company, the Westchester Company, the Billard transaction, the purchase of the Connecticut electric railways and the Massachusetts electric railways all sprang from the same source. Some of these investments have been less costly than others; perhaps those expressly referred to may be the extreme cases, although the purchase of the Boston & Maine stock, made in defiance of the law of Massachusetts and perhaps of the federal statute, may prove the most disastrous of all. This much is evident: There can be no readjustment of these conditions, no advance in rates upon these systems can be sanctioned, until it is made reasonably certain that the management of these properties will be lawful and prudent. Assuming that in some form that assurance will be given, we inquire what should be done."

The commission further says:

"In our opinion the New Haven should divest itself of its trolley lines."

Analytical Study of Operating Expenses

An analytical study of electric railway operating expenses is to be conducted by the new division of electrical engineering research of the Massachusetts Institute of Technology. The cost of this study will be defrayed from a fund, of which the donor is yet anonymous, amounting to \$25,000 and is to be spent at the rate of \$5,000 a year. The division of electrical engineering research under whose direction this sum will be spent has recently been organized by the Institute with an extensive laboratory and library and will be under the direction of Dr. Harold Pender, with H. F. Thompson as secretary. In addition to the gift already mentioned the laboratory has received an endowment of \$10,000 a year for five years from the American Telephone & Telegraph Company, and the same company has also donated the Dering Library of more than 30,000 titles. The laboratory has also received a gift of \$2,000 from the Boston & Maine Railroad and the New York, New Haven & Hartford Railroad to be used for the study of handling freight at terminals both inside and outside freight houses. This research is along the lines of work which technology has been doing for the past two years, an example being shown in the study of electric motor vehicles undertaken at the initiative of the Edison Electric Illuminating Company of Boston and financed by that company to the extent of \$7,500.

Some other work on which Dr. Pender is engaged at present is a study of the effect of phase relation of harmonics in sound waves as affecting clearness of speech in telephone communications and also the resistance of con-

ductors when used for alternating currents. In connection with the latter work a 500-ft. section of a 150,000-volt transmission line has been erected on the new site of the institute in Cambridge.

Dr. Pender, who has been connected with the Massachusetts Institute of Technology since 1909, is a graduate of the Johns Hopkins University and also studied at the Sorbonne, Paris. Later he was with the Westinghouse Electric & Manufacturing Company and in the electrical engineering department of the New York Central & Hudson River Railroad and has been connected with the work of the McCall Ferry & Power Company, the International Railway and the electrification of the Cascade Tunnel of the Great Northern Railway.

Delos F. Wilcox Reports on Newark Traffic Conditions

The issues of the Newark *Evening News* for July 7, 8 and 9 contained a review by Delos F. Wilcox, formerly franchise expert of the Public Service Commission of the First District of New York, of traffic conditions in Newark with particular reference to the proposed downtown terminal of the Public Service Railway. Dr. Wilcox states that apparently there is no way in which there could be public control of the terminal operations; that the franchise for the subway would be perpetual; that the power of the city to compel the construction of half-mile extensions of trolley lines or the re-routing of cars is doubtful; that the franchise requirements by the suburban towns of Montclair, Bloomfield and Belleville, which stipulate that cars from those towns shall run to the Market Street (Newark) station of the Pennsylvania Railroad, is against public policy; that electric railway service on Broad and Market Streets, the principal business streets of Newark, is not operated to its present full capacity, and that adequate relief from existing and future congestion can be brought about only by a revision of the city's street plan. Dr. Wilcox holds that a downtown terminal is not needed at present on account of the small number of interurban and semi-interurban cars and asserts further that the terminal route would divert passengers from their natural destination and make proper transfers inconvenient. Congestion if relieved at the intersection of Broad and Market Streets would be increased at other points, particularly as the use of a tunnel and elevated structure for the terminal would prevent through traffic on certain adjacent streets. Furthermore, the terminal site is badly located for street railway operation and, if any place at all, should be near the terminal of the Hudson Companies. Some provision should also be made whereby the tunnel to the terminal would not interfere with the later development of a regular subway system. Dr. Wilcox believes that traffic may be accelerated at congested corners by using cars which do not load and unload at the same end, by the operation of trailers, by having cars cross in groups, etc. He suggests also various modifications of the proposed re-routing plan of the Public Service Railway. In conclusion, Dr. Wilcox recommends that if the railway's terminal plans are approved the contract should acknowledge the city's right to make over the system, the right to compel the re-routing of cars and the power to compel the construction of short extensions.

Strike of Linemen in Lexington.—Linemen employed by the Kentucky Utilities Company in street railway work at Lexington, Ky., have gone on strike. The strikers are demanding a nine-hour day at 30 cents an hour, instead of ten hours at 27½ cents an hour. Officers of the company have announced that the places of the strikers will be filled if they do not return to work.

Long Dispute Settled.—The Ohio Public Service Commission has arranged a settlement of the dispute between the Western Union Telegraph Company and the Cleveland, Painesville & Ashtabula Railway. The high-tension wires of the railroad and the telegraph lines were strung close together and the telegraph company complained to the commission on account of the danger to its men.

Conference Proposed in Regard to Erdman Act.—President Wilson will confer at the White House on July 14 with representatives of the railroads as well as of the

Brotherhoods of Conductors and Trainmen to seek an agreement upon legislation for the amendment of the Erdman law for the arbitration of wage controversies between railroads and their employees so as to meet the crisis which threatens to tie up the Eastern railroads with a strike.

Progress of Arbitration in Cincinnati.—The board of arbitration which is considering the differences between the employees and the Cincinnati Traction company had under consideration the latter part of the week ended on July 5 the extra pay that the men should receive for extra work. After hearing several motormen and conductors, the board suggested that the men endeavor to arrange this with the division superintendents before the boards go any further with it.

New York Registration Law.—There is some doubt in the minds of lawyers as to whether the new stock transfer tax law of New York State which went into effect on July 1 requires all corporations to file with the State Comptroller a certificate of the office where the transfers are made, etc., but as the law exacted a penalty in case these data are not filed by July 10 there was considerable activity throughout the State by corporations in applying for certificates and filing them.

Turnstiles in New Subway in New York.—The Public Service Commission of the First District of New York has granted permission to the Brooklyn Rapid Transit Company to use turnstiles in the Centre Street loop subway in collecting fares. The commission specified in granting the company's request that the use of the turnstiles should be considered experimental only and not as committing it to allowing their use in the Fourth Avenue subway, Brooklyn, and on the other new lines to be operated by the company.

Forty-Year Bonds Recommended for Municipal Line.—It has been decided by the public utilities committee to recommend to the Board of Supervisors of San Francisco, Cal., that the proposed issue of \$3,500,000 of bonds, bearing annual interest at 5 per cent, for the purpose of making extensions to the Geary Street Municipal Railway, shall run for forty years, redemption to begin five years after issuance, at the rate of \$100,000 a year. It was suggested that the city should reserve the option to redeem the bonds at any period after twenty years from date of issuance, but it was thought this might detract from the attractiveness of the offering.

The Work of the Ohio Public Service Commission.—The Ohio Public Service Commission was organized on June 1, 1911, and up to June 1, 1913, issues of stock of companies in Ohio amounting to \$39,382,289 and bond issues amounting to \$101,135,660 had been approved. During the same period authority to issue \$7,204,550 stock and \$13,275,250 bonds had been refused. Of the stock issues authorized, \$26,283,474 were for railroads and \$13,098,815 for public utilities, and of the bond issues, \$86,973,500 were for railroads and \$14,126,150 were for utility companies. Of the issue refused \$6,460,000 stock and \$12,962,000 were for railroads, while \$744,550 of stock and \$313,250 of bonds were for public utility companies.

Chicago Union Station Company Organized.—The Union Station Company has been organized in Chicago with a capital of \$50,000,000 in the interest of the Pittsburgh, Cincinnati, Chicago & St. Louis Railway, the Chicago, Burlington & Quincy Railroad and the Chicago, Milwaukee & St. Paul Railroad. Of the total capital stock, \$25,000,000 will be held by the Burlington road and \$12,500,000 by each of the other two roads. The company was incorporated in accordance with an amendment to the State railroad act which became effective on July 1. Frank J. Loesch, attorney, on whose petition the articles of incorporation were issued, said that the question of a site for the proposed new union station was not concerned in the proceedings.

Petition Dismissed in Bridge Case.—Judge Anderson at Indianapolis has dismissed the petition of the Evansville & Henderson Railway to compel the Henderson Bridge Company to permit it to use the bridge across the Ohio between the two cities. The company desires to operate an electric railway between Evansville and Henderson, and to use the bridge for that purpose. The court held, on the report of a master appointed to take evidence, that unless the

railway agreed to double-track the bridge approaches, to maintain a block system on the bridge and to furnish its own electrical equipment on the structure, its petition was without merit. The company refused to make an offer of this nature, and the case was accordingly dismissed.

Birmingham Strike Precipitate, Premature and Unwise.—Commenting editorially on the recent strike of fewer than 100 trainmen of the Birmingham Railway, Light & Power Company, Birmingham, Ala., one of the local papers said: "There appeared to be no question raised in the union committee's demand as to wages, hours or general treatment of the men. Apparently all those things were satisfactory. The only question was recognition of the union and a restoration to employment of discharged men. The grievance of the union leaders was purely the existence of a local union. They undertook to establish their position by force instead of by reason. The strike was precipitate, premature and unwise."

Proposed Municipal Extension at Cincinnati.—City Solicitor Bettman, of Cincinnati, has proposed to the City Council that the municipality construct an extension to the street railway line between Avondale and Bond Hill and that the Cincinnati Traction Company bear the interest and sinking-fund charges. He claims this will obviate the necessity of securing consents of property owners. On June 24 Judge Pugh rendered a decision to the effect that the company cannot build this line without securing the consents of property owners on Reading Road. Mr. Bettman says that, under the home rule amendment to the constitution, the city will not be compelled to obtain consents for a municipal line.

Agreement to Arbitrate Boston Differences.—An agreement has been reached on a method of arbitration by which it is expected that the differences between the Boston (Mass.) Elevated Railway and its employees will be adjusted. James L. Richards for the company and James H. Vahey, counsel to the union employees, were delegated on July 8 to select a third arbitrator to act with two others, one being named by each side. It was on the manner of choosing the third member that the strike hinged, an agreement made a year ago giving to the Mayor the power to select that official having proved unsatisfactory to the union. The men ask for increased wages and improved working conditions. The union had voted in favor of a strike.

Mayor Harrison on the Illinois Utility Law.—Mayor Harrison, of Chicago, has issued a long statement in regard to the Illinois public utility bill, declaring that the Governor knew that the people of Chicago had regulated their utilities satisfactorily in the past and that they wanted to retain in their own hands the control of the utilities for the future. Mr. Harrison referred to the "viciousness" of the bill and said that non-partisan home-rule clubs will be maintained in every ward until the Legislature restores home rule in Chicago. James G. Skinner, assistant corporation counsel of Chicago, declares that the public utilities law is unconstitutional because it gives judicial powers to a state commission, which is essentially an administrative body.

Subway Construction Bids to Be Opened.—On July 22 the Public Service Commission for the First District of New York will open bids for the construction of another section of the Broadway subway in Manhattan, to be operated by the New York Municipal Railway Corporation under the new contracts. This section extends from Union Square north under Broadway to about Twenty-sixth Street. There will be an express station at Union Square and a local station at Twenty-third Street, Madison Square. The commission has under consideration bids opened on June 24 for the construction of the section immediately south of this one, extending from Union Square down to the end of the present construction at a point midway between Houston and Bleecker Streets.

First Train Through Loop Connecting New York Bridges.—The first train was sent through the Center Street subway loop, connecting the Brooklyn, Manhattan and Williamsburg Bridges, on June 30. The loop, which has been under construction since 1907, is now nearing completion. The connection with the tracks crossing the Brooklyn

Bridge is not yet completed, although work is progressing rapidly in that direction. The Center Street loop is of four and six tracks throughout. Its cost, according to Public Service Commission figures, has been \$12,884,896. A contract will shortly be let for a connection, through Canal Street, between the Broadway subway and the Center Street loop. The loop is 6500 ft. long and will be operated by the Brooklyn Rapid Transit Company under the dual subway contracts.

Decision in Newark Gas Case Involving Intangible Values in Rate Making.—The Supreme Court of New Jersey on July 7, 1913, sustained the validity of the order of the Board of Public Utility Commissioners of New Jersey in requiring the Public Service Gas Company, a subsidiary of the Public Service Corporation of New Jersey, Newark, to establish a 90-cent gas rate within the district which embraces Passaic. The decision of the board was published in the *ELECTRIC RAILWAY JOURNAL* of Jan. 4, 1913, page 35. The principal question at issue was the valuation of the intangible property of the company, and in this matter the court upheld the ruling of the commission. To determine the correctness of the decision on which the order of the Board of Public Utility Commissioners was based the company, with the knowledge and approval of the commission, decided to obey the order and sue out a writ of certiorari in the Supreme Court of the State. The company has now announced that it will appeal the case to the Court of Errors and Appeals.

The Automatic Stop Competition.—The offer of \$10,000 made by Charles S. Mellen, president of the New York, New Haven & Hartford Railroad, for the best automatic stopping and speed control device which would safely arrest trains disregarding fixed signals expired on July 1. On that date 2816 persons in all had entered the competition, but only 704 of the applicants thus far have submitted plans in reply to the circular sent to each applicant giving the conditions and requirements of the competition. Despite the fact that not all of the requirements have been met, the railroad will proceed at once to test the more meritorious of the devices submitted. These tests will begin the middle of this month and will take place on the western division between Hartford and Newington. The two automatic stop systems coming the nearest to all of the requirements will be tested first. One is the invention of Gene Webb and is the property of the International Signal Company. The other is an invention of an engineer of the Union Switch & Signal Company.

Dual Subway System Described.—The Public Service Commission for the First District of New York has published a pamphlet describing the dual system of rapid transit, the contracts for which were signed recently by representatives of the city of New York, the Interborough Rapid Transit Company and the New York Municipal Railway Corporation. In this pamphlet it is stated that the estimated total cost of the new system is \$337,000,000, of which New York City will supply \$171,000,000 and the two companies the remainder. The Interborough company's total expenditure will be about \$105,000,000, of which \$58,000,000 will go toward the construction of city-owned lines. The New York Municipal Railway Corporation will expend about \$61,000,000, of which about \$14,000,000 will be applied to the cost of city-owned lines. The balance of each company's expenditure will be devoted to the purchase of new equipment and the construction of elevated railroads and additional tracks thereon. The city of New York has already expended, or contracted to expend, about \$76,000,000 of its contribution. This covers the work already completed or going on in the Fourth Avenue subway in Brooklyn, the Centre Street Loop subway in Manhattan, the Lexington Avenue subway in Manhattan with its branches in the Bronx, the Broadway subway in Manhattan and the elevated railroad in Queens. It is expected that the rapid transit facilities will be more than trebled upon the completion of the new system in the year 1917. The existing lines cover 296 miles of single track, whereas the total length of the new system will be 618 miles of single track. The existing lines are carrying about 800,000,000 passengers per annum, and it is expected that the dual system, used to its full capacity, will carry more than 3,000,000,000 passengers per annum.

Financial and Corporate

Receiverships for Kuhn Properties

Stock and Money Markets

July 9, 1913.

A fairly steady tone was shown in the early trading on the New York Stock Exchange to-day. The prices of nearly all the important issues shaded off slightly at the start and many issues showed fractional losses in the afternoon, among them Interborough-Metropolitan preferred. American Water Works & Guarantee Company preferred sold down from 56 to 47, whereas the most recent sale on the exchange was at 95. The common shares fell from 50 to 19. Sales of West Penn Traction preferred were reported at 30 against a recent price of 80, and the common declined from 33 to 10. Rates in the money market to-day were: Call, 2 @ 2½ per cent; sixty days, 2¾ @ 3¼ per cent; ninety days, 4¼ @ 4½ per cent; six months, 5¾ @ 6 per cent.

In the Philadelphia market further weakness in arbitrage issues was followed by fractional declines. On the recessions the offerings were quickly absorbed.

A strong tone featured the stock market in Chicago to-day. Bonds were firm.

In the Boston market to-day business was light and the price changes were small.

Increased activity was shown in the stock market in Baltimore to-day, with Baltimore Electric 5's the feature.

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

	July 1	July 9,
American Brake Shoe & Foundry (common).....	90	87½
American Brake Shoe & Foundry (preferred).....	126½	126½
American Cities Company (common).....	33¼	33¼
American Cities Company (preferred).....	63	66
American Light & Traction Company (common).....	*365	365
American Light & Traction Company (preferred).....	*106	106½
American Railways Company.....	38	38
Aurora, Elgin & Chicago Railroad (common).....	40	40
Aurora, Elgin & Chicago Railroad (preferred).....	83	85
Boston Elevated Railway.....	84	87½
Boston Suburban Electric Companies (common).....	7½	7½
Boston Suburban Electric Companies (preferred).....	*66	50
Boston & Worcester Electric Companies (common).....	a8	*8
Boston & Worcester Electric Companies (preferred).....	42	42
Brooklyn Rapid Transit Company.....	87	86¾
Capital Traction Company, Washington.....	115¾	114¾
Chicago City Railway.....	*150	165
Chicago Elevated Railways (common).....	*24½	26
Chicago Elevated Railways (preferred).....	*75	75
Chicago Railways, pteptg., ctf. 1.....	*100	95½
Chicago Railways, pteptg., ctf. 2.....	24¼	23½
Chicago Railways, pteptg., ctf. 3.....	7½	7
Chicago Railways, pteptg., ctf. 4.....	*2¾	2½
Cincinnati Street Railway.....	110	*110
Cleveland Railway.....	102½	102½
Cleveland, Southwestern & Columbus Ry. (common).....	*6	6
Cleveland, Southwestern & Columbus Ry. (preferred).....	*29	29
Columbus Railway & Light Company.....	18	12
Columbus Railway (common).....	69½	60
Columbus Railway (preferred).....	88	80
Denver & Northwestern Railway.....	*107	107
Detroit United Railway.....	70	*70
General Electric Company.....	135½	137
Georgia Railway & Electric Company (common).....	115	115¾
Georgia Railway & Electric Company (preferred).....	84	84
Interborough Metropolitan Company (common).....	15	14¾
Interborough Metropolitan Company (preferred).....	55¾	54¾
International Traction Company (common).....	*30	30
International Traction Company (preferred).....	*95	95
Kansas City Railway & Light Company (common).....	*18	18
Kansas City Railway & Light Company (preferred).....	*36	36
Lake Shore Electric Railway (common).....	*6	9
Lake Shore Electric Railway (1st preferred).....	*92	90
Lake Shore Electric Railway (2d preferred).....	*25	25
Manhattan Railway.....	125	125
Massachusetts Electric Companies (common).....	13	13½
Massachusetts Electric Companies (preferred).....	66	68¼
Milwaukee Electric Railway & Light Co. (preferred).....	*100	90
Norfolk Railway & Light Company.....	25	25
North American Company.....	65	65
Northern Ohio Light & Traction Company (common).....	80	..
Northern Ohio Light & Traction Company (preferred).....	105	..
Philadelphia Company, Pittsburgh (common).....	40½	39½
Philadelphia Company, Pittsburgh (preferred).....	39	39
Philadelphia Rapid Transit Company.....	21½	21¼
Portland Railway, Light & Power Company.....	*62	58
Public Service Corporation.....	110	109
Third Avenue Railway, New York.....	31¼	30¼
Toledo Railways & Light Company.....	2	2½
Twin City Rapid Transit Co., Minneapolis (common).....	102	101½
Union Traction Company of Indiana (common).....	*4½	4½
Union Traction Company of Indiana (1st preferred).....	*80	80
Union Traction Company of Indiana (2d preferred).....	*30	30
United Rys. & Electric Company (Baltimore).....	26	25½
United Rys. Inv. Company (common).....	19	17
United Rys. Inv. Company (preferred).....	34	31¾
Virginia Railway & Power Company (common).....	52	51
Virginia Railway & Power Company (preferred).....	87½	a92
Washington Ry. & Electric Company (common).....	89½	89
Washington Ry. & Electric Company (preferred).....	87¾	87
West End Street Railway, Boston (common).....	71	70½
West End Street Railway, Boston (preferred).....	87	85
Westinghouse Elec. & Mfg. Company.....	58¼	57
Westinghouse Elec. & Mfg. Company (1st preferred).....	105	104

*Last sale. a Asked.

The First-Second National Bank, Pittsburgh, Pa., the second largest bank in that city, was closed on July 7 by order of the Controller of the Currency. The First National Bank of McKeesport also closed its doors on the same day. Both are controlled by the J. S. & W. S. Kuhn interests. J. S. Kuhn on the same day had receivers appointed for J. S. & W. S. Kuhn, Inc., and the American Water Works & Guarantee Company. J. K. Duff, treasurer of the company, was appointed receiver for J. S. & W. S. Kuhn, Inc., and J. S. Kuhn, W. S. Kuhn, J. H. Purdy and F. G. Kay were appointed receivers of the American Water Works & Guarantee Company. W. S. Kuhn was president of the First-Second National Bank, vice-president of the American Water Works & Guarantee Company and vice-president of J. S. & W. S. Kuhn, Inc. J. S. Kuhn was president of the American Water Works & Guarantee Company and chairman of the board of directors of J. S. & W. S. Kuhn, Inc.

In a statement which he made on July 8 W. S. Kuhn said:

"The reason for the controller closing the bank in Pittsburgh was simply because the government had a different method of valuation for the securities, assets and reserve from our own estimate as to their value."

One of the members of the board of directors of the First-Second National Bank said:

"The bank is solvent. We also are convinced that the claims will be paid in full. If the Treasury Department had not subjected the bank to rigid examination by special examiners who were unable to judge values of property and securities in this community, we should have been able to work out with success the problems which, while existing, were not of our making."

J. S. & W. S. Kuhn, Inc., are incorporated in Delaware, with a capital stock of \$500,000. The Kuhn interests have centered largely of late in irrigation projects in the West. They also control the West Penn Traction & Water Power Company and the operations of a group of bituminous mines in Pennsylvania, especially the United Coal Company, of which W. S. Kuhn is president and director. W. S. Kuhn is also a director of the Colonial Trust Company, Commercial National Bank and Commonwealth Trust Company, Pittsburgh; vice-president and director First National Bank, Allegheny; director First National Bank, McKeesport; vice-president and director Pittsburgh Bank for Savings; president and director Kittanning & Leechburg Railway; president and director Sacramento Valley Irrigation Company and president and director Twin Falls North Side Land & Water Company.

James S. Kuhn, besides being president and director of the American Water Works & Guarantee Company, is president and director of the First National Bank, Allegheny; president and director of the First National Bank, McKeesport; director in the Colonial Trust Company and Freehold Bank, Pittsburgh; director in Kuhn, Fisher & Company, Inc., Boston; president and director of the Pittsburgh Bank for Savings; director of the Security Investment Company and Twin Falls North Side Land & Water Company; vice-president and director of the United Coal Company and West Penn Traction Company, also of the West Penn Traction & Water Power Company, and director in the Westinghouse Electric & Manufacturing Company.

The American Water Works & Guarantee Company is probably the largest operating water-works company in the United States, controlling more than forty such plants throughout the country. It was chartered in Pennsylvania in 1882 and has an outstanding capital stock of \$5,000,000. Since 1889 the stock has paid an annual dividend of 6 per cent, and in June last year a stock dividend of 150 per cent was declared from the surplus. This called for the disbursement of more than \$5,000,000.

The West Penn Traction Company, formerly the West Penn Railways, was incorporated Feb. 18, 1904, under the laws of Pennsylvania, and is a consolidation of the Pittsburgh, McKeesport & Connellsville Railway, the Uniontown & Monongahela Valley Railway, the Connellsville Suburban Street Railway, the Greensburg & Southern Electric Street Railway and a number of electric lighting com-

panies operating throughout the western part of Pennsylvania. In May, 1906, the West Penn Company acquired a controlling interest in the McKeesport & Duquesne Bridge Company and the entire capital stock of the Latrobe Street Railway. A year later the company secured a majority of the stock of the Pittsburgh, McKeesport & Greensburg Railway. The company was twice reorganized and has authorized \$25,000,000 in bonds, of which \$6,584,000 are outstanding. In February, 1910, the American Water Works & Guarantee Company of New Jersey agreed to guarantee all the bonds of the West Penn Traction Company, and at that time agreed to purchase all the bonds of the West Penn Traction Company that might be issued within two years from that time.

Financing the Proposed Toronto Purchases

A great deal of interest attaches to the means which are likely to be adopted if the city of Toronto should conclude the negotiations which are being conducted with the end in view of taking over the properties of the Toronto Railway and the Toronto Electric Light Company. Financial interests in Toronto point out the growing cautiousness of London in taking Canadian municipal debentures and the trouble experienced by the city of Toronto last year in trying to float \$6,000,000 of bonds. One man who specializes in municipal securities is quoted as follows:

"Money is very tight, and it is difficult to dispose of municipal securities of any kind. The English market has been flooded with Canadian municipals. Horne Payne's speech in which he warned English investors against Canadian municipal debentures may not reflect the opinion of English financial men accurately, but it at least shows there is a growing feeling against them. Toronto's experience last year is another case in point. Besides, many capitalists do not look with favor on municipally owned railways or lighting systems. As things are I am quite sure that Toronto cannot float debentures for \$25,000,000 except at a ruinously high rate."

Mayor Hocken would not say just how the city would finance the deal, but indicated that it would not be necessary to float debentures in London. He is quoted as follows:

"I do not anticipate any difficulty in the financing of the purchase of the street railway and the Toronto Electric Light Company by the city, if the citizens decide to go ahead with the project. If the city had to float \$25,000,000 of municipal debentures in the open market in order to pay cash, I would not be very sanguine of the agreement going through as we could only get the money on very high terms, if at all, and the city's credit for years to come would be curtailed."

Columbus Railway & Light Company, Columbus, Ohio.—The time for depositing securities of the Columbus Railway & Light Company and the underlying corporations has been extended to July 15.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich.—The quarterly dividends of 1½ per cent on the preferred and 1 per cent on the common stock of the Commonwealth Power, Railway & Light Company are the initial dividends on the enlarged capitalization of the corporation.

Goldsboro (N. C.) Traction Company.—The Goldsboro Traction Company has been placed in the hands of R. W. Winston, Jr., Raleigh, as receiver by Judge Henry G. Conner of the District Court of the United States for the Eastern District of North Carolina, on the application of the Mercantile Trust & Deposit Company, Baltimore, Md., trustee representing the holders of the bonds of the company. The property has not been operated for three months. The company purchased power from the plant owned by the city. This plant was taken over some time ago by the Carolina Power & Light Company, and the Goldsboro Traction Company, unable to arrange to purchase power from the new company except at terms which it considered exorbitant, suspended the service.

Lehigh Valley Transit Company, Allentown, Pa.—R. P. Stevens, president of the Lehigh Valley Traction Company, has been elected president of the Easton Consolidated Electric Company, control of which is now owned by the Le-

high Valley Transit Company. Mr. Stevens, J. C. Dawson and Albert L. Smith have been elected directors of the Easton Consolidated Electric Company to succeed Joseph S. Lovering, Robert L. Montgomery and John S. Bioren.

Ocean Shore Railroad, San Francisco, Cal.—The Railroad Commission of California has authorized the Ocean Shore Railroad to execute its promissory notes in the sum of \$22,986 to make rental payments upon locomotives which it uses, and to execute notes in the sum of \$29,615 as part payment upon forty freight cars.

Pacific Coast Railway, San Luis Obispo, Cal.—Upon motion of the Railroad Commission of California to ascertain the various elements entering into the value of the property of the Pacific Coast Railway, findings of fact were made as follows: That the "reproduction value" of the operative physical property of the company as of June 30, 1912, is \$1,970,843, and that the "present value" is \$1,529,646. Owing to the fact that the original cost records of the company were destroyed in the San Francisco fire in 1906, no report is given by the commission on the original cost of the property.

Railways Company General, New York, N. Y.—A special meeting of the stockholders of the Railways Company General has been called for July 15 to consider a proposal to decrease the capital stock of the company from \$500,000 to \$400,000. The company was incorporated in 1899 to acquire, lease, sell and operate electric railways and other utilities. The original capital stock was \$1,500,000. In September, 1905, it was reduced to \$900,000, the stockholders voting to cancel the stock bought in by the company. In September, 1906, it was further reduced to \$700,000 by similar action and again in December, 1908, a reduction to \$500,000 was authorized to be made by retiring shares owned by the company and by purchase of shares not over par. An initial dividend of 10 per cent was paid out of surplus earnings in September, 1909; in 1910 14 per cent and in 1911 9 per cent were similarly paid out of surplus earnings. In 1912, and thus far this year, regular dividends have been paid by the company quarterly at the rate of 4 per cent per year.

Southern Power Company, Charlotte, N. C.—The Southern Public Utilities Company, a subsidiary of the Southern Power Company, has taken over the Anderson Water, Light & Power Company, Anderson, S. C., and Z. V. Taylor, president of the Charlotte Electric Railway, one of the Southern Power Company properties, has been elected president of the Anderson Water, Light & Power Company.

Washington (D. C.) Utilities Company.—The Public Utility Commission of Washington, D. C., has decided that the Washington Utilities Company can hold the \$2,900,000 worth of Washington Railway & Electric Company stock under the anti-merger law, but the commission has refused to approve an issue of \$10,000,000 of bonds because the Washington Utilities Company has acquired or seeks to acquire more than 20 per cent of the common and preferred stock of the Washington-Virginia Railway. The *Washington Star* says: "The decision of the commission will not prevent the Washington Utilities Company from presenting a new bond issue plan which will not take into account the stock of the Washington-Virginia Railway, more than 20 per cent of which, the commission holds, is held by the corporation in violation of the anti-merger act. At the recent hearing before the commission, officials of the Washington Utilities Company stated that that concern, prior to the going into effect of the anti-merger law, owned a large amount of the stock of the Washington Railway & Electric Company. A sufficient number of shares of this stock subsequently were disposed of to reduce the holdings of the company to less than 20 per cent, the limit fixed by the anti-merger act, it was stated. It was further contended by the corporation representatives that Congress did not contemplate that no stocks or bonds of a local public utility could be held by another foreign or local public utility corporation, the provisions of paragraph 54 of the act being cited in support of this contention. It was learned that officials of the corporation already have taken up informally consideration of a new plan for financing the immediate and future needs of the company."

Dividends Declared

Brooklyn (N. Y.) City Railroad, quarterly, 2 per cent.
 Chicago (Ill.) Railways, 6 per cent, participating certificates, series one; 4 per cent, participating certificates, series one.
 Commonwealth Power, Railway & Light Company, Grand Rapids, Mich., quarterly, 1½ per cent, preferred; quarterly, 1 per cent, common.
 Green & Coates Streets Passenger Railway, Philadelphia, Pa., quarterly, \$1.50.
 Kentucky Securities Corporation, Lexington, Ky., quarterly, 1½ per cent, preferred.
 Lewiston, Augusta & Waterville Street Railway, Lewiston, Maine, quarterly, 1½ per cent, preferred.
 Mexico (Mex.) Tramways, quarterly, 1¾ per cent.
 Middlesex & Boston Street Railway, Newtonville, Mass., 4 per cent.
 Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent, preferred.
 West Penn Traction Company, Connellsville, Pa., quarterly, 1½ per cent, preferred.
 West Penn Traction & Water Power Company, Pittsburgh, Pa., quarterly, 1½ per cent, preferred.
 Youngstown & Ohio River Railroad, Leetonia, Ohio, quarterly, three-fourths of 1 per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.					
Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., May, '13	\$168,721	*\$105,380	\$63,341	\$33,226	\$30,114
1 " " '12	159,362	*98,089	61,273	30,966	30,207
12 " " '13	1,770,937	*1,061,547	709,390	355,288	354,102
12 " " '12	1,664,062	*985,948	678,114	348,036	330,078
CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO					
1m., May, '13	\$108,624	\$62,528	\$46,096	\$31,589	\$14,507
1 " " '12	100,774	57,921	42,854	30,638	12,216
5 " " '13	463,557	293,572	169,986	155,804	14,182
5 " " '12	435,701	271,021	164,681	151,604	13,077
DETROIT (MICH.) UNITED RAILWAY					
1m., May, '13	\$1,172,683	\$770,082	\$402,556	\$179,567	\$222,989
1 " " '12	995,581	600,362	395,218	175,635	219,583
5 " " '13	5,208,515	3,441,855	1,766,660	896,862	869,798
5 " " '12	4,445,499	2,826,804	1,618,696	889,852	728,844
MONONGAHELA VALLEY TRACTION COMPANY, FAIRMONT, W. VA.					
1m., May, '13	\$79,475	\$26,771	\$52,702	\$24,111	\$28,591
1 " " '12	71,392	30,470	40,921	18,209	22,712
5 " " '13	363,329	124,341	239,099	120,533	118,555
5 " " '12	314,624	129,103	185,521	91,252	94,269
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO					
1m., May, '13	\$279,993	\$167,697	\$112,295	\$58,131	\$54,164
1 " " '12	255,104	142,804	112,299	43,821	68,478
5 " " '13	1,205,720	750,103	455,616	284,500	171,116
5 " " '12	1,100,375	638,341	462,033	219,108	242,925
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1m., April, '13	\$13,701	*\$14,088	\$387	\$7,339	†\$7,226
1 " " '12	23,626	*16,264	7,361	7,131	230
12 " " '13	281,033	*186,886	94,146	87,276	6,871
12 " " '12	275,716	*177,896	97,819	83,289	14,530
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.					
1m., April, '13	\$689,941	*\$414,102	\$275,839	\$171,728	\$104,111
1 " " '12	969,409	*393,186	276,223	164,898	111,325
12 " " '13	8,320,185	*4,865,208	3,454,977	2,011,187	1,443,790
12 " " '12	.....	.....	.....	.....	.....
SAVANNAH (GA.) ELECTRIC COMPANY					
1m., April, '13	\$66,378	*\$43,687	\$22,691	\$22,553	\$136
1 " " '12	60,721	*44,763	15,958	15,953	5
12 " " '13	776,153	*564,357	211,795	211,289	506
12 " " '12	717,590	*529,791	187,799	186,667	1,132
ST. JOSEPH RAILWAY, LIGHT, HEAT & POWER COMPANY, ST. JOSEPH, MO.					
1m., May, '13	\$98,836	*\$61,337	\$37,499	\$20,198	\$17,301
1 " " '12	94,248	*57,618	36,630	19,710	16,920
12 " " '13	1,210,026	*683,796	526,230	238,224	288,006
12 " " '12	1,137,216	*687,325	449,891	232,882	217,009
TAMPA (FLA.) ELECTRIC COMPANY					
1m., April, '13	\$60,181	*\$33,105	\$27,075	\$4,551	\$22,524
1 " " '12	62,394	*34,077	28,317	4,262	23,956
12 " " '13	765,345	*399,198	366,147	54,810	311,337
12 " " '12	713,514	*388,234	325,280	57,671	267,609
TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.					
1m., May, '13	\$742,153	\$356,946	\$385,207	\$149,905	\$235,301
1 " " '12	690,630	331,905	358,725	143,079	215,646
5 " " '13	3,476,037	1,802,983	1,673,053	733,186	936,867
5 " " '12	3,233,703	1,712,753	1,520,950	712,395	808,554

*Includes taxes. †Deficit.

Traffic and Transportation

Brooklyn Company's Medical Inspection Bureau Made Permanent

The Brooklyn (N. Y.) Rapid Transit System has made permanent the medical inspection bureau which was organized and put on a temporary basis in December, 1912, to provide free medical attendance to the operating employees of the system and compulsory medical inspection preliminary to sick excuse. This bureau, conducted by physicians directly in the employ of the company, has made a record in the past six months in the reduction of the sick list on the system.

The idea of establishing a medical inspection service for the purpose just described grew out of an examination of the company's welfare system which T. S. Williams, president of the company, began in the fall of 1911. It appeared in the course of this examination that material variations existed between the different depots and terminals in the treatment of sick excuses, and that these variations responded more or less to local conditions and were subject to a large extent to the individual determination of assistant superintendents in charge of the various operating divisions.

There had also grown up in the operating department a custom to report sick when men wanted time off for recreation, and from this evasion of the letter of the law in the matter of sick excuses a tendency was observed to justify other evasions of operating requirements. Therefore the proposal to establish a medical inspection bureau was advanced, based fundamentally on the following propositions:

First—If a man is sick, it is contrary to the interests of the company, as well as the man, that he should be required to work.

Second—The proper individual to determine a condition of sickness or health is not an operating official but a physician.

Third—When a man is excused on account of illness it is quite as important that his recovery for work should be certified as his original sick excuse.

Fourth—A proper amount of time off should be allowed for recreation, but recreative excuses should be granted as such and not under guise of sick excuse.

A study of conditions on the system and of the medical records of the benefit association whose members had received free medical attendance from the association's physician when they asked for it resulted in a plan put into effect on Dec. 20, 1912, by which the medical inspection bureau came into existence. Dr. H. H. Stearns, the chief physician of the employees' benefit association, was placed in charge of the bureau. Medical inspection offices were established at East New York and at Thirty-ninth Street and Fifth Avenue, in South Brooklyn, at which physicians were present during certain hours of the day to conduct examinations. Dr. Stearns' headquarters in Brooklyn was availed of for consultation calls at hours other than those of the inspection offices, and a routine was laid down which very briefly may be described as follows:

When a man reports sick at his depot or terminal he receives an excuse card which entitles him to go to the nearest examination office at the next office hour to have his ailment diagnosed. The doctor at the inspection office examines him and either excuses him indefinitely, excuses him for a limited period, as in cases of minor ailments, or, in the event that it appears that the man is feigning illness, orders him to report back to his depot, where discipline is administered.

In case a man is excused indefinitely, he receives treatment during his illness at home or at the doctor's office, as the case may be, and upon recovery receives a certificate saying when he is required to report back for work. He then resumes his run in the regular course.

In case a man reports ill from his house and is not able to go to his depot, the depot notifies the headquarters of the medical inspection bureau, and within six hours a doctor calls at the man's house and issues an excuse card under the same conditions described above, or in the event of feigned illness orders him back to work. If a man is excused for a limited time and is unable to return to work at

the expiration of that time, he reports sick at his depot or from his house again and receives a new excuse card, after which the same routine is followed. This system, accompanied by constant exchange of information between the medical bureau and various depots and terminals, has worked, almost without a hitch, to the accomplishment of a very substantial reduction in the days of work lost on account of illness in the first six months of 1913 as compared with the first six months of 1912.

In that period of 1912 the aggregate sick list represented the loss of 44,459 days' work among approximately 9000 operating employees of the system, whereas in the six months ended June 30, 1913, the aggregate time lost on account of sickness was 34,148 days' work—a gain of 10,311 days' work, or 23 per cent of the entire sick list for the first six months of 1912.

The observation of the physicians in charge of the medical inspection work, entirely confirmed by the record of the last six months, indicates that the gain in the sick list is due not to a reduction in the total number of cases reported sick but to a reduction of the time lost by men who are sick—in other words, a shortening of the period of illness. Prior to the establishment of the medical bureau, Dr. Stearns and his assistants were providing medical attendance as asked for to about 7000 members of the benevolent association. The number of calls, office and house, answered by the doctors, exclusive of the examination period at the two medical inspection bureaus, was approximately double in the first six months of 1913, when about 9000 men were under attendance, the number of calls answered in the corresponding period of 1912.

In a circular to employees dated July 1 J. F. Calderwood, vice-president and general manager of the company, announced the permanent establishment of the medical bureau. Commenting upon the results attained, he said:

"The result is highly satisfactory from the point of view of the company because it means more consistent and efficient operation of the lines. It is equally fortunate from the point of view of the men who operate these lines because every day's sickness saved not only represents a gain in health and comfort but it means a gain in earning capacity. The public, in whose interest the system is operated, also shares largely in the achievement, for the satisfactory operation of our lines is in no small degree dependent upon the standard of health which we are able to maintain.

"So far as is consistent with operating requirements, the officials of the operating department have endeavored, in connection with the work of the medical inspection bureau during the past six months, to make systematic provision for excuses from work for the purpose of recreation. This effort will be continued. But all employees should remember that the first consideration in such a system as ours is to meet the demands of the public for service, and that on such days as Saturdays, Sundays and holidays, when the public requires the operation of the maximum amount of equipment, application should not be made for excuses for purely recreative purposes.

"The all-important thing in making the operation of the medical inspection bureau as satisfactory permanently as it has been during the last six months is co-operation between the management and the men in living up to the spirit of the plan under which the bureau has been established. The management has every reason to believe that the employees of the operating department will continue to co-operate in this matter as they have done during the six months ended June 30, 1913."

The company plans to widen the usefulness of the medical inspection bureau. Dr. Stearns is studying the facilities offered for first aid to the injured in the shops, power houses, depots and terminals of the company and will in the near future arrange for systematic instruction at these operating centers in first-aid treatment. The medical inspection bureau also proposes systematically to follow up cases in which men have been admitted to service suffering from some minor ailment not severe enough to warrant their rejection from employment but detracting from their general state of health. It is planned to chart such cases upon original examination for employment and require the men to report to the physicians of the medical bureau and to remain under treatment until they receive a certificate of health.

Philadelphia Co-operative Plan Indorsed

The motormen and conductors in the employ of the Philadelphia (Pa.) Rapid Transit Company voted on July 7 in favor of continuing in force for another year the Mitten co-operative plan adopted in November, 1911, under which 22 per cent of the gross receipts of the company is set aside to pay the wages of the motormen and conductors. The vote was 4320 in favor of the plan as compared with 2028 against it. In Co-operative Bulletin 19, dated July 1, 1913, in which the announcement in regard to the election was made, T. E. Mitten, chairman of the executive committee of the company, called attention to the large advance in wages and general improvement in the relations between the men and the management that has taken place under the co-operative plan. Referring to the new wage scale effective that day, ranging from 24 cents an hour for new men to 29 cents for five-year men, it is shown that the maximum pay has been raised 6 cents an hour under the present management. Men holding regular runs are guaranteed against reduction during the re-routing now going on. New regular men are guaranteed \$2.25 per day, Sundays excepted. Extra men are guaranteed \$12 per week. Mr. Mitten also repeated the assurance that on Sept. 1 there will be another wage raise, putting new men at 25 cents and five-year men at 30 cents. A striking result of the co-operative plan has been the great reduction that has taken place in the number of dismissals. Discharge is now the last resort in administering discipline. Dismissals for a number of years, ended May 31, compare as follows:

Year	Discharges	Year	Discharges
1906.....	1287	1910.....	2376
1907.....	1374	1911.....	1635
1908.....	2038	1912.....	855
1909.....	1075	1913.....	536

Schenectady Railway Ordered to Reduce Round-Trip and Commutation Fares.

The Public Service Commission of the Second District of New York has issued an order directing the Schenectady Railway to reduce its round-trip and commutation fares between Ballston Lake and Schenectady. Commissioner Hodson says that the fare charged by the company between the lake and Schenectady "is unfair and unreasonable and should be reduced." The commissioner believes the single fare is satisfactory on the present zone basis, and should not be disturbed. An order has been entered embodying the following reductions in fares:

First, that beginning July 15, 1913, the company shall sell a round-trip ticket upon its railroad between its station at Ballston Lake and any station in Schenectady, either way, at the regular rate and price of 25 cents for the round trip between such points, said round-trip ticket to be sold at its offices in Schenectady and at Ballston Lake.

Second, that beginning July 15, 1913, the company shall sell a monthly commutation ticket upon its railroad between any point in Schenectady and Ballston Lake at a rate and price of \$5.40, good for twenty-seven round trips between Ballston Lake and Schenectady, either way, within the month of its issue, such tickets to be sold at all times after July 10, 1913.

Third, that beginning Sept. 1, 1913, the company shall sell a monthly school commutation ticket upon its railroad between any point in Schenectady and Ballston Lake at the rate and price of \$4.60, good for twenty-three round trips between those points within the month of its issue. The company is requested to notify the commission on or before July 10 of its acceptance of the order.

Ruling in Regard to Indianapolis-Louisville Shipments.—The interurban electric railways which operate between Louisville, Ky., and Indianapolis, Ind., were ordered on July 9 by the Interstate Commerce Commission to establish through routes and joint rates on less-than-carload shipments between the two terminal cities and to intermediate points. Specific class rates are prescribed by the commission.

Accident Report of United Railroads of San Francisco.—The United Railroads, San Francisco, Cal., filed on June 30 its reports of accidents covering the three months which

ended on March 31. It shows six fatalities and a total of 280 injuries of all characters. One of the fatal accidents was reported to have been due to a car collision, two to collisions between cars and automobiles, one to a collision with a wagon and one to a leap from a moving car, while the sixth victim, a boy, was fatally hurt through having skated against a moving car.

Accident in Ogden Canyon.—Five persons were probably fatally injured and more than twenty-five others received serious hurts on July 4 in a head-on collision in the Ogden Canyon between two cars of the Ogden (Utah) Rapid Transit Company, each drawing trailers. P. D. Kline, general manager of the company, was quoted by the Salt Lake *Tribune* in its issue of July 5 as follows: "All of the men who were not injured in the accident are busy getting the cars in operation again and I have made no effort as yet to place the responsibility."

New High-Speed Service Between Newark and Trenton.—The Public Service Railway, Newark, N. J., has established a new high-speed through service between Newark and Trenton, cars leaving either terminal on the hour, the first car at 6 a. m. and the last at 9 p. m. The cars from Newark follow the route of the Elizabeth car to the arch in Elizabeth and proceed down South Broad Street and over Bay Way and through a private right-of-way for 12 miles to Bonhamtown. Thence the regular route is used through New Brunswick and Milltown, after which a private right-of-way is used to Trenton.

Officials and Directors Charged with Manslaughter.—Fifteen prominent officials and directors of the Metropolitan West Side Elevated Railway and the Aurora, Elgin & Chicago Railroad, Chicago, Ill., have been arrested on a charge of manslaughter. This proceeding arises from an accident which occurred recently when an automobile was struck by a train and two persons were killed. The arrests were made in accordance with a finding of the coroner's jury. The officials and directors who were arrested were forced to remain several hours in the Criminal Court building, but were finally released on bonds of \$5,000 each.

I. C. C. Decision on New Haven Commutation Rates.—The Interstate Commerce Commission decided on July 9 that the existing scale of commutation passenger fares of the New York, New Haven & Hartford Railroad from points in Connecticut to New York City was not unreasonable, generally, although certain stations were found to be unjustly discriminated against. The commission held it to be discriminatory against Connecticut commuters for the company to refuse to sell them reduced rate fifty-trip family tickets, while such tickets are sold by the road between New York City and all points situated within New York State.

Kansas Commission Reserves Decision in Transfer Case.—The Public Utilities Commission of Kansas has reserved its decision after hearing testimony relative to the transfer system maintained by the Metropolitan Street Railway and the Kansas City-Western Railway. The demand is for the interchange of transfers between the two roads. The Kansas City-Western Railway has a stub line known as the "Kensington Branch," running through the western part of the city. A 5-cent fare is charged and no transfer is given. The city contends that transfers should be exchanged between this line and the Metropolitan Street Railway.

Passes Ordered Abolished in Washington.—As the result of an opinion submitted by Corporation Counsel E. H. Thomas to the effect that the issuance of free passes in the District of Columbia is prohibited by the new utilities act, the Public Service Commission has issued an order practically abolishing the use of passes on the electric railways in the District. Street railways will be permitted to provide their own employees with free transportation. The only other exception to the ruling is the case of persons who have contracts for placing advertising in cars. The prohibition also will apply to them, however, upon the expiration of the present contracts.

Welfare Program of Lehigh Valley Transit Company.—On July 4 the Lehigh Valley Transit Company, through R. P. Stevens, president, announced an extensive plan of insurance, sick benefits and pensions financed entirely by the

company. The plan affects all employees of the company and employees also of the Lehigh Valley Light & Power Company. The plan includes the payment of \$200 death benefits, the payment of \$1 per day in case of illness and retirement at \$20 per month after twenty-five years' service with the companies. The plan also contains provisions for social affairs for the employees and their families and for free medical and surgical treatment under certain conditions.

Part of Accident Payment Returned.—The Louisville Railway reports that a recipient of damages for injuries suffered while riding on one of its cars returned part of the money on the ground that the amount paid was excessive. The person injured was a woman prominent in church and charity work in Louisville. After the accident, which it appeared was due to negligence on the part of employees, the legal department recommended a settlement without trial for \$2,000, which was paid. Recently the lady in question presented a check for \$750 to the company with the explanation that her injuries were not as serious as she feared they would be, and that the cost of medical services was also less. She believed that \$1,250 was the amount to which she was justly entitled.

Free Transportation for Policemen and Firemen in Perth Amboy.—As a result of an order of the Board of Public Utility Commissioners of New Jersey which went into effect on June 12, 1913, the Public Service Railway, which operates in Perth Amboy, N. J., must furnish free transportation within the city limits to all policemen and paid firemen while on duty. It was held by the board that nothing exists in the state laws to abrogate the city ordinances requiring such free transportation, as was claimed by the railway company. Evidence showed that the policemen of Perth Amboy might be on duty while not in uniform, and if in this case free carriage was denied to them the company would fail to observe the ordinances in question. How the company is to determine just when a man is "on duty" and the obligation of free carriage is incumbent on it the board did not state, but it did say that if it sets up tests, such as that of uniform, which work to violate its obligations under the franchise, it would become liable therefor.

Extension of Co-operative Buying in Philadelphia.—The board of trustees of the co-operative beneficial association organized among the employees of the Philadelphia (Pa.) Rapid Transit Company has approved contracts with additional merchants who are now authorized to accept coupons from members of the association in payment of goods, thereby opening up forty-two additional places at which cash coupons of the association will be accepted the same as though the cash itself was used in payment for goods. A revised list of merchants has been published covering more than 100 stores now open to the patronage of the members of this association. Under the contracts which the company has with the stores included in the list the merchants agree to accept, in payment of purchases, cash coupons of the co-operative beneficial association at the face or purchasing value, the cash coupon books being sold by the association to its members at a discount of 8 per cent.

Illinois Valley Wonderland.—The Chicago, Ottawa & Peoria Railway, Joliet, Ill., has issued a booklet descriptive of its lines entitled "Illinois Valley Wonderland." The booklet contains twenty-four pages and cover and is profusely illustrated. The cover is in colors and is especially decorated to symbolize the country as it was in its primitive state. It shows the view from Starved Rock, where the Illini Indians made their last stand. All of the historic territory thereabouts has been purchased by the State of Illinois for a public park and is being preserved in all its pristine splendor. The Chicago, Ottawa & Peoria Railway is the only means of direct transportation to the park, and the trip to the park is made down the famous Illini trail through the Valley of the Illinois. The text of the booklet, which is by Edward C. Clark, contains besides a general description of the territory served by the lines of the company brief descriptions of Joliet, Ottawa, Morris, Seneca and other cities on the line. A page at the back of the booklet is devoted to the subject of passenger rates and special cars to Starved Rock. On the outside of the back cover there is a map of the territory served by the company's line.

Personal Mention

Mr. O. P. Davis, assistant superintendent of the Southern division of the Pacific Electric Railway, Los Angeles, Cal., has been advanced to the position of superintendent of that division, to succeed Mr. F. T. Annable.

Mr. S. E. Wilson, chief dispatcher of the Pacific Electric Railway, Los Angeles, Cal., has been appointed assistant superintendent of the Southern division, to fill the vacancy created by the promotion of Mr. O. P. Davis.

Mr. R. P. Stevens, president of the Lehigh Valley Transit Company, Allentown, Pa., has been elected president of the Easton (Pa.) Consolidated Electric Company, which has been taken over by the Lehigh Valley Transit Company.

Mr. William E. Leffingwell, Watkins, N. Y., has been nominated by Governor Sulzer as a member of the Public Service Commission of the Second District of New York to succeed Mr. Frank W. Stevens. Mr. Leffingwell is a hotel proprietor.

Prof. E. A. Hitchcock has resigned from the department of mechanical engineering of the Ohio State University at Columbus to become consulting engineer for the E. W. Clark Management Corporation, Philadelphia, Pa. He will make his headquarters at Columbus.

Mr. F. L. Annable, formerly superintendent of the Southern division of the Pacific Electric Railway, Los Angeles, Cal., has been appointed superintendent of the Northern division of the company, to succeed Mr. J. C. McPherson, whose appointment to the Southern Pacific Company was noted recently in the *ELECTRIC RAILWAY JOURNAL*.

Mr. Z. V. Taylor, president of the Charlotte (N. C.) Electric Railway, one of the Southern Power Company properties, has been elected president of the Anderson Water, Light & Power Company, Anderson, S. C., which has been taken over by the Southern Public Utilities Company, a subsidiary of the Southern Power Company.

Mr. Charles J. Chase, Croton-on-the-Hudson, has been nominated by Governor Sulzer as a member of the Public Service Commission of the Second District of New York to succeed Mr. Curtis N. Douglas. Mr. Chase has been in the employ of the New York Central & Hudson River Railroad for more than twenty years as a locomotive engineer.

Mr. F. A. Nims, who has been secretary and treasurer of the Muskegon Traction & Lighting Company, Muskegon, Mich., has been elected president of the company to succeed Mr. John T. Young, who has been elected vice-president, general manager and a director of the Grand Rapids (Mich.) Gas Light Company. Mr. Young has been elected vice-president of the Muskegon Traction & Lighting Company.

Gen. George H. Harries, president of the American Electric Railway Association and an officer of several public utility properties controlled by H. M. Byllesby & Company, has been elected president of the Louisville Gas & Electric Company, chartered in Kentucky as a consolidation of the Louisville (Ky.) Gas Company and four other utility companies. Mr. H. M. Byllesby is chairman of the board of the new company.

Mr. T. W. Shelton has been appointed general superintendent of the Kankakee & Urbana Traction Company, Urbana, Ill., a newly created position with the company. Mr. Shelton was formerly master mechanic of the Fort Dodge, Des Moines & Southern Railroad, Fort Dodge, Ia., and previous to that was connected with the Indianapolis, Columbus & Southern Traction Company. He was also connected with the Northern Ohio Traction & Light Company, Akron, Ohio, the Fort Wayne & Springfield Railway, Decatur, Ind., and the Peoria (Ill.) Railway.

Mr. William F. Woerner has been appointed the fifth member of the Public Utilities Commission of Missouri by Governor Major. For several years Mr. Woerner has been identified with municipal affairs, having been associate city counselor during the administration of Mayor Rolla Wells. He was the Democratic nominee for Mayor in 1909. Mr. Woerner has been rather prominent in Democratic politics since 1898, when he was a candidate for probate judge. He

served as police commissioner for one month under Governor Dockery. He served two years as associate city counselor and was later appointed by Mayor Wells to revise the ordinances of St. Louis. Mr. Woerner holds the chair of "wills and administration" at St. Louis University school of law.

Mr. Albert Benham, formerly assistant general manager of the Ohio Electric Railway, Springfield, Ohio, who has been appointed general manager of the company, was born in Ohio in 1868. He entered railway work with the Fifth Avenue Cable Company, Pittsburgh, Pa., in 1891, and continued in the service of that company and the Consolidated Traction Company, Pittsburgh, in various departments, until January, 1901, when he became identified with the Cincinnati (Ohio) Traction Company, acting in the capacity of inspector and assistant general superintendent until March, 1906, at which time he was appointed general superintendent of the Indiana, Columbus & Eastern Traction Company, with headquarters at Columbus, Ohio. In 1908 he was appointed assistant general manager of the Ohio Electric Railway.

Mr. R. E. Lee, whose resignation as general superintendent of the Cincinnati (Ohio) Traction Company to become connected with the Firestone Rubber & Tire Company, Akron, Ohio, was noted in the *ELECTRIC RAILWAY JOURNAL* of July 5, 1913, began his street railway career in February, 1886, as a conductor on one of the horse car lines of the Baltimore (Md.) City Passenger Railway. After serving in various capacities with this company he was appointed division superintendent in October, 1894, and remained in that position until April, 1899, when he became connected with the Washington Railway & Electric Company, Washington, D. C., as general superintendent. He resigned from the Washington Railway & Electric Company in April, 1903, to become general superintendent of the Cincinnati Traction Company, which position he will relinquish on July 15.

Mr. William McClellan, who resigned a short time ago as chief and engineer of the division of light, heat and power of the Public Service Commission of the Second District, has been retained as assistant to the president of the Buffalo (N. Y.) General Electric Company. Mr. McClellan was educated at the University of Pennsylvania and is a member of the council of the University of Pennsylvania Club of New York City and president of the Associated "Pennsylvania" Clubs, an organization of the alumni associations of the University of Pennsylvania in all parts of the world. He is a member of the Railroad Club of New York, of the Engineers' Club of New York City and of the University Club of Albany. He is a fellow and manager of the American Institute of Electrical Engineers and a member of the American Society of Mechanical Engineers. He is a director of the Automatic Train Stop Company and of the Campion McClellan Company, engineer and constructor, with offices at Philadelphia. Mr. McClellan will establish offices in New York City and will assist in the operation and management of public service properties.

Mr. J. F. Rodgers has been appointed superintendent of track of the Chicago (Ill.) City Railway to succeed Mr. W. F. Graves, whose resignation was mentioned in the *ELECTRIC RAILWAY JOURNAL* for May 24. Mr. Rodgers was graduated from Tuscarora Academy in 1893. He then entered Pennsylvania State College. After leaving college he began work as assistant engineer with the Pennsylvania Traction Company, Lancaster, Pa. In 1898 he was made superintendent of construction of the Tennis Construction Company, Philadelphia. While in the employ of this company Mr. Rodgers had charge of the construction of the Williamsport & Montoursville line, now a part of the Montoursville Passenger Railway, Williamsport, Pa., and the line between Trenton and Bordentown, N. J. In 1899 he was made manager of the Philadelphia, Bristol & Trenton Street Railway, Philadelphia, Pa., following which he accepted a position with the transportation department of the North Jersey Street Railway Company, Jersey City, N. J. During the time he was there Mr. Rodgers served in various positions and was finally made assistant superintendent of one of the lines. In 1904 Mr. Rodgers accepted the position of assistant engineer with the United Railroads, San Francisco, Cal., where he was engaged in rehabilitation work

before and after the earthquake and fire. In July, 1907, he accepted a position as assistant engineer on the Board of Supervising Engineers, Chicago Traction. The following year he was made field engineer in charge of track and roadway construction, in which position he remained until January, 1913, when he was appointed engineer of track and roadway.

Mr. H. C. Hazzard, who has been elected permanent secretary of the Pacific Coast Electric Railway Association with offices in the Electric Building, Portland, Ore., was graduated from Leland



H. C. Hazzard

Stanford, Jr., University with the degree of A. B. and from Columbia University with the degree of LL. B. He was admitted to the New York State bar in 1899 and the following year began the practice of law in New York City as the junior partner of the firm of Thompson & Hazzard. In 1905, when, as the result of the legislative investigation into the gas rates charged by the Consolidated Gas Company, New York, the State Commission of Gas and Electricity was established, Mr. Hazzard was appointed secretary of the commission and held that position until Mr. Charles E. Hughes became Governor and the New York State Public Service Commissions superseded the Gas Commission, Railroad Commission and Rapid Transit Commission. Mr. Hazzard then announced his intention of retiring from public office and returning to the practice of law, but was prevailed upon by the members of the Public Service Commission of the Second District of New York to organize and become executive head of the division of light, heat and power of the commission. During the five years he served in this capacity his work was not confined to that of routine supervision over the gas and electrical matters immediately under the jurisdiction of that division, but concerned the wide responsibilities relating to fundamentals of all utilities over which the commission had supervision. The legal as well as the executive character of his work enabled Mr. Hazzard to become acquainted with problems confronting governmental regulation and the difficulties with which the public utilities have to contend. Following the ideas of Governor Hughes, the Legislature of California enacted, to take effect March 23, 1912, an act enlarging the powers and jurisdiction of the then existing railroad commission, and in the same month of that year Mr. Hazzard resigned from the Public Service Commission of New York to become assistant attorney of the State Railroad of California and continued in that capacity up to the time he accepted the position of permanent secretary of the Pacific Coast Electric Railway Association.

A new workmen's compensation act, approved by Governor McGovern of Wisconsin, which goes into effect on Sept. 1, provides that every employer of four or more persons will be subject to the provisions of the act, unless he specifically elects otherwise. The benefit to injured employees or their dependents remains almost unchanged, the chief exceptions being in the case of workmen permanently disabled, in which event the compensation is extended six years from the date of the injury. The new act abrogates the defense of contributory negligence. The act of 1911 abolished only the two defenses of assumption of risk and negligence of a fellow servant. The provision under which employers automatically will come under the law unless they elect to the contrary will affect approximately 2000 employers in the State, 1500 employers having already come under the law. The new act contains provisions of considerable importance to contractors, who are made liable for injuries to employees of sub-contractors. Special provision is made, however, for the contractor to protect himself against losses. A new section requires all employers to carry insurance unless specially exempted.

Construction News

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

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

RECENT INCORPORATIONS

***Minnesota Central Railway, Brainerd, Minn.**—Application for a charter has been made by this company in Minnesota to build an electric railway to connect Brainerd, Iron-ton, Crosby, Cuyuna, Deerwood and other towns on the North Cuyuna range, and with Barrows, on the south range. Capital stock, \$250,000. Incorporators: Joseph Ferrier, Duluth; George Reid, William F. Henry and John Hill, Iron-ton and Duluth.

***Niobrara, Sioux City & Omaha Railway, Omaha, Neb.**—Application for a charter has been made by this company, which proposes to build an interurban railway in Nebraska through the counties of Holt, Knox, Dixon, Dakota, Thurston, Burt, Cuming, Stanton, Antelope, Pierce, Madison, Platte, Colfax, Dodge, Washington and Douglas. The Baker Construction Company and the Niobrara Power Company, interrelated companies, have also filed articles of incorporation. Capital stock, \$100,000. Incorporators: Charles Baker, Herman Buhman, Henry Ruwe, Frank Gelston, Chancy Snyder, John Lowery and Peter Mangold.

***Maryville-Knoxville Interurban Railway, Knoxville, Tenn.**—Incorporated in Tennessee to build an electric railway to connect Knoxville, Marysville, Vestal, Madisonville and Vestal. Capital stock, \$10,000. Incorporators: Howard Cornick, John H. Frantz, T. G. McConnell, Charles M. Seymour and R. M. Mitchell.

***Dallas, Fairfield & Gulf Railway, Fairfield, Tex.**—Chartered in Texas to build an interurban railway to connect Dallas, Ferris, Fairfield and Jewett, a distance of 100 miles. Capital stock, \$105,000. Incorporators: T. Alexander, Teague; W. H. Miller, R. N. Compton and W. F. Storey, Fairfield; R. L. Harrer, W. J. Hall, Corsicana and J. W. Wright, Ferris.

Gulf, Freeport & Northern Railway, Freeport, Tex.—Chartered in Texas to build an 85-mile electric interurban railway between Freeport, Sealy, Brazoria and West Columbia. The power plant will be located in Freeport. Capital stock, \$100,000. Incorporators: C. L. Sharp and J. H. Bartlett, Marshall, Tex.; R. B. Loggins, J. S. Bartlett, C. E. Clark and George Edwards, Columbia, Tex.; D. A. Barr, Freeport, Tex.; William L. Hall, C. Davis, T. C. Millard and C. L. Pierce, Damon, Tex.

FRANCHISES

***Mount Pleasant, Ark.**—G. Haggard Rider, Mount Pleasant, has received a franchise from the City Council to build an electric railway in Mount Pleasant.

West Vancouver, B. C.—The Pacific Great Eastern Railway has asked the City Council for a franchise to build an electric line between West Vancouver and Dunderave. Taxpayers of West Vancouver have asked the Council to grant the request. Work will be begun as soon as the permission is granted.

Los Angeles, Cal.—The Los Angeles Railway will ask the City Council for a franchise to change its motive power from steam to electricity over Hoover Street in Los Angeles.

Santa Barbara, Cal.—The Santa Barbara & Suburban Railway has received a franchise from the Council to extend its lines to the Normal School Grounds on Mission Ridge.

Solano City, Cal.—The Sacramento Valley Electric Railroad has received a franchise through the Solano Irrigated Farms and has arranged for terminal facilities at Solano City. C. L. Donohue, Willows, president. [E. R. J., April 26, '13.]

Mount Vernon, Ill.—The Mount Vernon Traction Company has asked the City Council for a franchise in Mount Vernon on Broadway and Sixteenth Street, Casey Avenue and Twenty-fourth Street; from the south city limits on Tenth Street to Broadway; from Broadway on Ninth Street to and across Taylor Avenue, and on Pace Avenue and Oakland Avenue to and across Twelfth Street.

Tisbury, Mass.—The Martha's Vineyard Street Railway has received permission from the Board of Railroad Commissioners to extend its tracks in Beach Road to Tisbury and for location of tracks in Wamsutta Avenue, Back Alley, Circuit Avenue, Kedron Avenue, Siloam Avenue and Dukes County Avenue in Oak Bluffs.

West Orange, N. J.—The Orange Mountain Traction Company has received a fifty-year franchise from the Council in West Orange to double-track its line from the Swamp Line tracks along Olaf Place to Valley Road to Central Avenue to the Orange line.

Maryville, Tenn.—The Maryville-Knoxville Interurban Railway, the incorporation of which is noted elsewhere in this issue, has asked the County Court for a franchise along the Maryville pike from Vestal to Stock Creek or the Blount County line. A similar franchise will be filed in Maryville for the section of the line between Maryville and Stock Creek.

Jackson, Tenn.—The Jackson Railway & Light Company has asked the City Council for a fifty-year extension of its franchise in Jackson.

Richmond, Va.—The Virginia Railway & Power Company has received permission from the Council to extend its lines along Broad Street from Robinson Street to Rose-neath Road in Richmond.

Anacortes, Wash.—George W. Krebs, Anacortes, has asked the Council for a franchise over the main streets of Anacortes. He agrees to have 3 miles of the line in operation in two years.

Parkersburg, W. Va.—The Charleston, Parkersburg & Northern Railroad has received permission from the Wood County Court for right-of-way across the county roads. This 47-mile electric railway will connect Parkersburg, Charleston and Sissonville. K. B. Stephenson, Parkersburg, president. [E. R. J., May 21, '13.]

TRACK AND ROADWAY

***Leeds, Ala.**—Citizens of Leeds are taking steps to organize a company to build an electric railway to connect Leeds and Irondale.

Phoenix (Ariz.) Railway.—This company has been ordered by the Arizona Corporation Commission to double-track its West Washington Street line from Seventh Avenue to Seventeenth Avenue in Phoenix.

Northern Electric Railway, Chico, Cal.—Construction will soon be begun by this company on its 50-mile line extending from the Yuba City-Colusa line at Meridian, on the Sacramento River, and extending south through the Fair ranch to Woodland, forming a loop and giving direct connection for all points on the west side with Sacramento and San Francisco over the Vallejo & Northern Railway.

Pacific Electric Railway, Los Angeles, Cal.—Paul Shoup, president of the Pacific Electric Railway, stated recently that if the rights-of-way were secured and other conditions complied with, the work of constructing the proposed electric railway from Los Angeles to Santa Monica could be commenced within sixty days, and that the new rapid transit line would be a reality within fifteen or sixteen months. The proposed road will be 9 miles in length and will connect with the Eighth Street line in Santa Monica. Surveys will be made at once by this company for double-tracking its line on Lake Avenue in Pasadena.

Stockton Terminal & Eastern Railroad, Stockton, Cal.—This company has placed orders for rails for its Miner Avenue extension in Stockton to the water frontage on the north side of Stockton Channel. The company has received a franchise to build this extension and work will be begun in the near future.

Big Four Electric Railway, Tulare, Cal.—Grading of this railway from Tulare to Poplar, a distance of 21 miles, has been completed. Contracts for the rails have been let.

Sacramento Valley West Side Electric Railway, Willows, Cal.—This company has arranged for the sale of \$6,000,000 of bonds at 80 and will rush construction north to Redding and from Shasta City to Eureka. C. L. Donohue, Willows, president. [E. R. J., April 26, '13.]

***Buhl, Idaho.**—J. Stewart Clark, Twin Falls, and associates plan to build an electric railway between Buhl and Wendell via Hagerman, a distance of 25 miles.

Southern Traction Company of Illinois, East St. Louis, Ill.—Former United States Senator William Lorimer, of Illinois, head of the Lorimer-Gallagher Construction Company, Chicago, accompanied by M. S. Gallagher, conferred in St. Louis recently with C. G. Young, New York, and others in regard to the feasibility of adopting storage battery cars as a part of the equipment of the Southern Traction Company's extension from East St. Louis to Belleville. The line has been graded from East St. Louis to the bluffs near Belleville and will be put in operation by Nov. 1.

Public Utilities Company, Evansville, Ind.—This company plans to begin work in August on the extension of the Bell Street line from Kentucky Avenue to Walnut Lane, near the gates of Woodmere.

***Hopkinsville, Ky.**—It is reported that plans are being made in Hopkinsville to build an electric railway in Hopkinsville and extend it to surrounding towns. The names of the promoters have not been made public.

Kentucky Traction & Terminal Company, Lexington, Ky.—This company contemplates extending its line to Richmond and has begun preliminary work.

Iron River, Mich.—F. D. Sullivan, representing the proposed 12-mile electric railway in Iron County, states that surveys have been made and construction will be begun some time in July on the electric line from Spring Valley to Stambaugh and Iron River and out to the mines north of Iron River. Later a line will be built to Crystal Falls. [E. R. J., April 12, '13.]

***Owosso, Mich.**—Joseph Gibson, who with several others has been at work securing the right-of-way for an electric railway from Owosso to Corunna, states that the Michigan Railway Engineering Company, Kalamazoo, which is building a line from Kalamazoo to Grand Rapids, is behind the project. The line will eventually be extended from Owosso to Flint via Flushing or Durand.

Atlantic Coast Electric Railway, Asbury Park, N. J.—Plans are being considered by this company to build an extension to Brielle.

Chautauqua Traction Company, Jamestown, N. Y.—Work of double-tracking this company's line to Lakewood will be resumed at once.

New York State Railways, Rochester, N. Y.—This company has placed in operation its extension on West Dominick Street from Expense Street to Charles Street in Rome.

Yonkers (N. Y.) Railroad.—This company has awarded a contract to Thomas J. Crimmins & Company, New York, to double-track, construct additional turnouts and extend some of its lines in Yonkers.

***Hickory (N. C.) Railway.**—Surveys have been made by this company between Hickory River, Catawba Springs, Newton and Lincolntown. This 178-mile line will connect Hickory, Newton, Lincolntown, Taylorsville, Lisletown, Conover and Wilkesboro. M. E. Thornton, Hickory, president.

Toledo, Ottawa Beach & Northern Railway, Toledo, Ohio.—Right-of-way has been secured by this company for an extension of its line to Monroe, where a connection will be made with the Detroit, Monroe & Toledo Short Line Railway.

Ottawa & St. Lawrence Electric Railway, Ottawa, Ont.—Surveys have been completed between Ottawa and Morrisburg, 45 miles, and grading will be begun later in the summer by this company on its line to connect Ottawa, Morrisburg, Brockville and Armprior. John E. Askwith, Ottawa, president. [E. R. J., June 28, '13.]

Lehigh Valley Transit Company, Allentown, Pa.—This company has awarded a contract to the Allen Engineering & Contracting Company, Netcong, N. J., for the grading of 3 miles of track north of Quakertown, ½ mile at Sellersville and 3½ miles between Souderton and Lansdale, all on the Philadelphia division. Right-of-way has been secured for double track, but only one track will be laid this summer. This line is a revision of the existing line, but the present line is along the edge of the highway and contains numerous sharp curves and heavy grades.

***Anderson, S. C.**—Plans are being considered to build an electric railway between Clemson College and a connection with the Blue Ridge Railway, by which interurban trains could be operated between Clemson College and Anderson.

*Dallas, Tex.—J. S. Kendall and associates are said to be considering plans to build an electric railway through the Doran-Hughes property east of Dallas and near White Rock Lake.

Dallas-Denton Interurban Railway, Dallas, Tex.—Preliminary surveys are being made by this company in Denton. This is part of a plan to build an electric line to connect Dallas, Denton, Carrollton, Lewisville, Grapevine and Irving. E. P. Turner, Dallas, is interested. [E. R. J., June 28, '13.]

Texas Traction Company, Dallas, Tex.—Surveys are being made by this company for an extension of its Hull Street line into South Denison.

Utah Light & Railway Company, Salt Lake City, Utah.—This company is asked to consider plans to extend its line to Second North Street and Main Street in Salt Lake City.

Monongahela Valley Traction Company, Fairmont, W. Va.—The grading for the Lumberport extension of this company's line is completed and rails and overhead work will be finished about the time that the new bridge being built at Lumberport across the West Fork River is completed. This line will extend across the new bridge and connect Lumberport and Haywood.

Northfork, W. Va.—Plans are being made to build an electric railway between Northfork and Keystone. L. G. Toney, Northfork, is interested.

SHOPS AND BUILDINGS

Charlotte (N. C.) Electric Railway.—Material has been ordered and work will be begun at once by this company on rebuilding its carhouse in Dilworth, which was destroyed by fire recently.

Scioto Valley Traction Company, Columbus, Ohio.—The plans of the Columbus Depot Company, which is controlled by the Scioto Valley Traction Company, for a modern fireproof terminal building have been approved by the committee on railroads and viaducts of the City Council. The building will be located on property bounded by High, Front and Town Streets in Columbus and the company plans to commence construction work at an early date.

Springfield (Ohio) Railway.—Plans are being considered by this company to build new carhouses and machine shops in Springfield.

Bartlesville (Okla.) Interurban Railway.—This company has been authorized to begin at once the construction of its new carhouses and also to make other improvements in Bartlesville costing approximately \$12,000. The structure will be 150 ft. x 40 ft. and of brick and steel construction and capable of holding a dozen cars. It will be constructed on property of the company adjoining the company's power house in the east section of Bartlesville.

Salt Lake & Utah Railway, Salt Lake City, Utah.—The selection of the site for the joint terminal station in Salt Lake City of the Salt Lake & Ogden Electric Railway and the Salt Lake & Utah Railroad has been announced. The structure will be located on West Second South Street between West Temple and First Street and will cost \$40,000.

POWER HOUSES AND SUBSTATIONS

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—This company, which will build soon a 34-ft. x 142-ft. addition to its Spy Run power house, plans to install two 6250-kw General Electric turbines, which will generate at 4000 volts, three-phase, 60-cycle. The company will also install two 1000-kw motor-generator sets to take care of the Fort Wayne city service, retaining the present station. Contracts have been let with the General Electric Company for the electrical equipment, the Worthington Company for the condenser apparatus, the Adams Construction Company for the building, the Northern Engineering Works for the crane, and the Alberger Company for the pumps.

Southern Traction Company, Dallas, Tex.—Work has been begun by this company on its new substation in Ennis. The structure will be 40 ft. x 50 ft. and of brick construction. The other substations will be built at Waxahachie, Hillsboro, Corsicana and Lisbon. The stations will be equipped by the General Electric Company.

Gulf, Freeport & Northern Railway, Freeport, Tex.—This company plans to build its main power house in Freeport.

Manufactures and Supplies

ROLLING STOCK

Bartlesville (Ohio) Interurban Railway is in the market for one or more new cars.

Charleston (W. Va.) Interurban Railroad has placed an order with the Jewett Car Company for two 35-ft. interurban cars.

Cleveland (Ohio) Railway, noted in the ELECTRIC RAILWAY JOURNAL of June 14, 1913, as expecting to purchase fifty cars, has ordered these cars from the G. C. Kuhlman Car Company.

Puget Sound Traction, Light & Power Company, Seattle, Wash., noted in the ELECTRIC RAILWAY JOURNAL of May 17, 1913, as having ordered ten prepayment, semi-convertible cars from the Cincinnati Car Company, has specified the following details for these cars:

- Seating capacity..... 62
- Bolster centers, length, 29 ft. 0 in.
- Length of body....38 ft. 4 in.
- Length over vestibule, 48 ft. 4 in.
- Width over sills...8 ft. 4 in.
- Width over all....8 ft. 8 in.
- Height, rail to sills.33 3/16 in.
- Sill to trolley base, 8 ft. 6 1/16 in.
- Bodysemi-steel
- Interior trim.....mahogany
- Headlining.....carline finish
- Roof, type.....turtle-back
- Underframesteel
- Air brakes.....West.
- Bumpers, Hedley anti-climber
- Car trimmings.....Dayton
- Curtain fixtures....National
- Curtain material...Pantasote
- Destination signs....Hunter
- Hand brakesPeacock
- Sanders.....Ohio brass
- Sash fixtures.....Edwards
- Seats, style.....H. B. & W.
- Seating material.....birch
- Step treads.....Mason
- Trucks, type.....Standard

West Jersey & Seashore Railroad, Camden, N. J., noted in the ELECTRIC RAILWAY JOURNAL of June 7, 1913, as having ordered twenty-six 34-ft. cars from The J. G. Brill Company, has specified the following details:

- Seating capacity.....54
- Weight (car body only), 16,000 lb.
- Bolster centers, length, 24 ft. 6 in.
- Length of body.34 ft. 1 3/8 in.
- Length over bumper, 45 ft. 2 in.
- Width over posts..8 ft. 5 in.
- Width over all....8 ft. 6 in.
- Height, rail to sills, 2 ft. 6 3/4 in.
- Sill to trolley base.9 ft. 0 1/2 in.
- Body.....wood and metal
- Interior trim.oxidized bronze
- Headlining.....maple veneer
- Roof, type.....plain arch
- Underframemetal
- Air brakes.....G. E.
- Axles.....hammered steel
- Bumpers.....channel iron
- CablesG. E.
- Car trimmings.....Brill
- Conduits and junction boxesG. E.
- Curtain fixtures..Cur. S. Co.
- Curtain material...Pantasote
- Destination signs....Hunter
- Lifeguard.....H. B.
- Gears and pinions....G. E.
- GongsDedenda
- Hand brakes.....Brill
- HeatersCons.
- HeadlightsDayton
- Journal boxesBrill
- Motors..G. E., outside-hung
- PaintMurphy
- SandersOhio brass
- Sash fixtures.....Brill
- Seats, style...Brill "Winner"
- Seating material.spring cane
- SpringsBrill
- Step treads.....Universal
- Trolley catchers or retrieversKeystone
- Trolley base.....U. S.
- Trucks, type.....Brill
- VarnishMurphy
- VentilatorsBrill
- Wheels.....rolled steel

TRADE NOTES

George E. Austin, president, American General Engineering Company and Imperial Rubber Company, New York, N. Y., sailed for Europe this week in the interest of his export business.

P. V. Martin and E. L. Adams, New York, N. Y., formerly of the sales department of Waterbury & Company, have opened offices at 8-10 Bridge Street as manufacturers' agents for electrical material.

Curtain Supply Company, Chicago, Ill., has received an order from the Southern Pacific Company to equip eighty-nine of its new cars with curtains, using ring No. 88 fixtures and Rex all-metal rollers.

J. G. White Engineering Corporation and the J. G. White Management Corporation, New York, N. Y., both declared an initial dividend at rate of 7 per cent per annum

for five months ended June 30, 1913, on preferred stock, payable Sept. 1, 1913, to stock of record Aug. 20.

H. W. Johns-Manville Company, New York, N. Y., has recently opened a branch office at Charlotte, N. C. The new office, which is located in the Commercial Bank Building, is in charge of E. U. Heslop, who is assisted in covering the western section of North Carolina by P. J. McCusker and Paul W. Whitlock.

The J. G. Brill Company, Philadelphia, Pa., has recently received an order from the Chicago Railways for 400 39-E trucks and another from the Nashville Railway & Light Company for one pair of the same type. The Charleston Consolidated Railway & Lighting Company has also placed an order for one 21-E truck.

Van Dorn Electric Tool Company, Cleveland, Ohio, which was noted in the *ELECTRIC RAILWAY JOURNAL* of July 5, 1913, as having been formed to take over the portable tool department of the Van Dorn & Dutton Company, was through error said to have its main office in Chicago, Ill. This should have been Cleveland, Ohio, as stated above.

Siemens Company of Canada, Ltd., Montreal, Can., has appointed Arthur S. Herbert general manager of the branch offices in Australia. Mr. Herbert, who was formerly general manager of the company, is now in England, but will return to Canada for a few weeks in July, sailing for Australia about the end of August. He will be succeeded in Canada by C. A. Ablett.

Curtain Supply Company, Chicago, Ill., has received an order from the Southern Pacific Company to equip eighty-nine of its new cars with curtains, using ring No. 88 fixtures and Rex all-metal rollers, and also another curtain order from the New York State Railway to equip the twenty-five new trail and the twenty-five new motor cars, using ring No. 89 fixtures and Rex all-metal rollers.

Atlas Preservative Company of America, New York, N. Y., has received recent orders for its Atlas-A weed killer from the following electric railways: Fort Dodge, Des Moines & Southern Railroad; Elmira, Corning & Waverly Railroad and Northwestern Pennsylvania Railway. The company has also received orders for Atlas-A weed killer from the Pennsylvania Railroad and the Southern Railway.

Universal Lubricating Company, Cleveland, Ohio, has recently been reorganized in order to take better care of its rapidly growing business. Under the new organization G. W. Schofield was re-elected president and C. B. Arthur was elected secretary-treasurer and placed in active charge of sales. Edward Dreher has been appointed assistant to Mr. Arthur. C. B. Emery, who was formerly with the company, is no longer in its employ.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has sold to Kuhn, Loeb & Company an issue of \$3,250,000 of two-year 6 per cent notes to retire a like amount of the \$4,000,000 issue which matures on Aug. 1, 1913. The balance will be paid off from cash now in the company's treasury. Since April 1, 1913, the company has reduced its obligations by \$1,500,000. The new notes are to be offered to holders of the maturing issue in exchange, and the balance which is not taken by the present holders will be offered for subscription at a price around 99.

ADVERTISING LITERATURE

Green Fuel Economizer Company, Matteawan, N. Y., has issued a leaflet entitled "Green's Conical Flow Fan." This leaflet illustrates and describes the company's fan or blower, which is of novel design.

Ohmer Fare Register Company, Dayton, Ohio, has issued a folder describing its register and also contains a list of some of the companies from which new and renewal contracts and additional orders have been received since Jan. 1, 1913.

Charles N. Wood Company, Boston, Mass., general sales agent for Chapman automatic signals, has issued a very attractive catalog describing these signals and containing a number of illustrations showing them in operation throughout the country.

Ideal Case-Hardening Compound Company, New York, N. Y., has just issued for free distribution the fifth edition of its pamphlet on case-hardening. This is entitled "Case-Hardening and Heat-Treating of Steel." As its title im-

plies, the new edition has been substantially broadened in scope, although the material contained in the preceding edition has been retained. By the addition of numerous practical rules and the amplification of the theoretical discussions, the pamphlet has been developed into practically the form of a work of reference of exceptional value to every one interested in the use or fabrication of steel which is used in the manufacture of machinery.

General Electric Company, Schenectady, N. Y., has issued Bulletins Nos. A4121, A4123, A4127 and A4129. The first is a revision of its bulletin on direct-current motors of the commutating-pole design. The next describes its automatic voltage regulators for the regulation of generation voltage, which are made for use with both alternating and direct current. The third describes its straight and automatic air-brake equipment designed for use on either single cars or trains of three or more. The last illustrates and describes in considerable detail its small feeder voltage regulator, which is of the pole type and is built for use on single-phase feeders only. It is made in two designs, one for outdoor installation and automatically operated and the other for hand operation and to be installed indoors only.

Electric Service Supplies Company, Philadelphia, Pa., has issued a new supplement to Catalog 4, Volume 2, listing, describing and illustrating many new devices recently placed on the market. This new supplement catalog contains the first complete listing ever published of Imperial luminous arc head lights and parts and a full listing and description of Keystone car destination signs. Other new devices listed are the new International coin registers, Keystone vacuum sanders, Keystone pneumatic gong-ringing devices, Keystone trolley pick-ups, Union standard trolleys, sanitary hand strap covers, Keystone cord connectors, Garton-Danils lightning arresters, automotoneers, Keystone motorman's seats, Keystone lamp guards, Keystone air valves and many other devices which make it of great interest to operating men. The 172 pages contained in this book are beautifully bound in cloth. This book may be had by operating men whose requests may be sent to any of this company's offices.

Street Railway Extensions for Chicago in 1913

The local transportation committee of the City Council of Chicago, Ill., has agreed on the location of the extensions to the street railway lines for 1913, and the Chicago City Railway and the Chicago Railways have been instructed to build the following extensions: Chicago Railways Company, Western Avenue, from Lawrence Avenue to Bryn Mawr Avenue; Armitage Avenue, from Forty-eighth Avenue to Grant Avenue; Belmont Avenue, from Milwaukee Avenue to Fortieth Avenue; Division Street, from Grand Avenue to Forty-eighth Avenue. In addition to these extensions this company has already been ordered to build the following lines: Elston Avenue, from Lawrence Avenue to Montrose Avenue; Harrison Street, from Forty-eighth Avenue to Sixtieth Avenue; Fullerton Avenue, from Fortieth Avenue to Forty-eighth Avenue. All of these extensions to the Chicago Railways Company total approximately 12.4 miles of single track. Under the 1907 ordinance requirement, the Chicago Railways Company also is required to build the following extensions: Ashland Avenue, from Belmont Avenue to Fullerton Avenue, 2 miles in length; Armitage Avenue, from Milwaukee Avenue to Elston Avenue, 2.4 miles in length, and Milwaukee Avenue, from Lawrence Avenue to the city limits, 6 miles in length.

The Chicago City Railway has been instructed to build the following extensions this year: Forty-third Street, from Ashland Avenue to Kedzie Avenue, and Robey Street, from Forty-seventh Street to Sixty-third Street, a total distance of 8 miles of single track. In addition to these the Chicago City Railway is required to build an extension on Forty-seventh Street, from Kedzie Avenue to Archer Avenue, a distance of 1 mile. The total mileage represented in the foregoing extensions is 33.8 miles of single track.

In addition to this construction work considerable rehabilitation of existing tracks will be undertaken this year by both companies.