

# Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

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## Harbingers of the Day of Better Appreciation of Electric Railways

**D**URING the recent storm period the railway in a certain New England city was "stalled" by snow and ice. The situation far more than overtaxed the resources available to the management. Fortunately the citizens realized what transportation means to them, and they turned out *en masse*, armed with pick and shovel, and dug the railway out. They thus had a lot of fun and beneficial exercise, did the railway a good turn and saved themselves in the aggregate much time and money. May their tribe increase! In many localities where the patrons of the railway did not pitch in with pick and shovel they showed appreciation of the way in which the railways cleared a way for their own cars and, incidentally, in many cases, provided a runway for competing jitneys as well! Especially was this appreciation reflected in the newspapers, many of which were converted (at least for a time) from knockers to boosters.

It is only a question of time until good service will be appreciated. A little deprivation stimulates appreciation. To paraphrase an old saying, "You never miss the street cars till the snow banks high."

## The Farmers Want to Help

**A**PROPOS of several recent articles in this paper on the development of interurban electric railway freight transportation, our attention has been called to some press reports which indicate that the farmers in certain localities of the Middle West are keenly alive to some of the possibilities of freight transportation *a la* interurban. The inability of the steam railways to furnish cars for livestock transportation has resulted in serious loss to the farmers in those communities where livestock raising is an important industry. The transportation requirements of this industry are: first, transportation should be available when the stock is ready for the market; second, the stock, once loaded on the cars, should spend a minimum of time enroute to the destination market.

That the farmers are beginning to realize that the average interurban can meet these requirements in an admirable manner is evidenced by the efforts now being made by county and state agricultural organizations to secure this kind of transportation service from the electric railways. It is emphasized that where the farmers are able to ship their stock via traction, consignments can be delivered at the large depot stockyards, in the majority of cases two or three hours after they have been loaded. The secretary of the Farmers' Federation in one state is quoted as saying that if the interurbans were allowed to handle car-load shipments of livestock

on a large scale, thousands of dollars would be saved each year to the farmers of that state on the weight shrinkage item alone.

It is true, of course, that freight cars, particularly those loaded with livestock, are not permitted on the streets in many cities. It is, however, a hopeful augury when powerful organizations outside of the railway industry begin to take an active interest in transportation matters and to demand rights for the transportation companies which they do not now possess.

## The Electric Railway a Decade Hence

**P**ROPHECY is risky unless the would-be prophet has accurate and ample knowledge in the field of his proposed prognostications. At the same time some kind of vision of the future is necessary in any line of endeavor if effort in that line is to be more than mere drudgery. Every wide-awake railway man is looking ahead, some farther than others, and the picture which enlightened imagination paints for him adds zest to his work, or takes the "pep" out of him as the picture is rosy or dun-colored.

A writer in a recent issue of a popular magazine forecasts some of the changes that the next ten years will bring in our habits of living and doing business, an important factor in which is the expected great development of air craft. He is very specific as to details and to insure a checking of his estimates at the proper time he suggests that his article be laid aside and his statements compared with the facts ten years hence. His advice suggests that a similar comparison of the electric railway situation in 1930 with the tendencies pointed out in the columns of this paper by many writers during the current year will be interesting, especially to those who have stayed by the business through the present trying period.

It would be extremely unwise to predict in detail what the traction business will be in 1930, but to the writer it appears certain that the industry will be here and that it will be prosperous. Traction securities will be securities in fact because the fares will be automatically adjusted to the cost of service, although there will be no speculative interest in them because the return will be limited. City cars will be much lighter, due to the use of special materials and to their average smaller size. Rails will still be in use, not only because the rails of 1920 will not have been worn out, but also because the necessity for them will still be realized. Among the convincing reasons for this necessity will have proved to be that electric power is increasingly cheaper with relation to other forms of power; that the series electric motor is the ideal motor equipment on account of its good starting, load-carrying and self-regulating qualities; that the maximum of passenger comfort can be

provided with a vehicle operated on a perfectly smooth runway, and that the railway car gives the greatest passenger-carrying capacity per mile of street per hour. While some of these advantages would also be inherent in the trackless trolley, that system will have been found adaptable in only a limited number of cases wherein the traffic would not support a rail line. The auto motor bus will be in large use as auxiliary to the electric railway, on extension of routes beyond zones profitable for the railway, on cross connecting lines and on routes where rails for one reason or another are not feasible.

The interurban business will be more highly developed than now, with lighter cars and more frequent service. A scheme of co-operation with the steam roads will have been worked out so that electric and steam lines will be given complementary rather than competitive service, each doing its share of the total business to which it is inherently best suited. Real progress will also have been made in electrification of steam trackage, following a logical program worked out on a co-operative basis to give the best over-all operating efficiency.

### Merchants Know That They Need the Street Railway

THE electric railway manager who, upon looking out of his office window, sees one of his own trainmen driving to the carhouse in an automobile needs a bracer to maintain his optimism in the continued necessity for electric railway service. He will get that bracer the moment he begins to talk to the merchants about the relation of good business to good transportation. He may have supposed that they were quite indifferent to the decline of the service because of the increasing number of automobiles. They will soon make it clear to him with various degrees of forcefulness that they consider frequent electric railway service about 100 times as important as the possession of automobiles by everybody in the city. Mr. Merchant is a shrewd business man and he knows very well that if only five or six machines should park in front of his store—if they are allowed to park at all on a main street—automobile shopping becomes far more troublesome than street car shopping. The fact that the automobilist is more likely to carry off all or part of his purchases is not a sufficient set-off to the larger personal patronage that would come from a 50 cent increase in street railway service.

The anguished cries of downtown merchants which immediately follow the calling of a strike or of an increase in fare afford additional evidence of the worth that they attach to the cheapest and most capacious form of mass transportation. On such occasions they are quick to realize that their downtown corners are worth precious little more than a corner in the suburbs, if there is any material withdrawal of electric railway service or a discouraging increase in the cost thereof to the rider. At the same time, human selfishness is such that most business men do not realize their obligation to the electric railway until it is too late.

One would have to be an extreme optimist indeed to expect merchants to agree to any plan that would make them pay for the benefits that the electric railway brings them. Yet, it is not beyond hoping that they can be induced to lend at fair interest such amounts as the local railway needs to give that increased, lower-cost service which restores street railway travel to the volume of pre-automobile days and better. There are many arguments, constitutional and otherwise, against

subsidizing a private corporation from public funds, but there are no legal obstacles against soliciting loans from those who would be most benefited by the continuance and improvement of electric railway service.

### Pulverized Coal Burning Receives Impetus from Several Directions

THE burning of pulverized coal has for many years appealed to inventors as a possibly fruitful, and a certainly fascinating field for their endeavors. They realized that when coal reaches the furnace in dry, impalpable form it is in ideal condition for combustion, and that with suitable combustion space and careful attention to tube cleaning it can be burned with good furnace efficiency. The practical difficulties in the past have been largely in producing equipment for drying and pulverizing which would not too greatly complicate the fuel supply and too greatly increase equipment and operating costs. That these difficulties are being rapidly conquered is attested by an accumulating weight of evidence, a little of which will be adduced here.

Before we refer to specific cases, however, it may be worth while to point out that there is nothing radically new in the apparatus for preparing pulverized coal. A large part of it consists in conveyors, elevators, crushers, dryers, pulverizers, cyclone separators, exhaust fans, etc., all standard devices. Materials of many kinds have been dried and pulverized in the past, but under space and other limitations more liberal in most cases than are present in most electric power stations. Such an installation, however, is just another application of well-known processes which would have been made earlier if the past prices of good coal and fuel oil had not been so low. Present conditions render highly desirable the ability to burn low-grade coal, which can be done readily with the pulverizing system.

Readers of this paper will recall a description of an experiment made in 1917 by the Puget Sound Traction, Light & Power Company in pulverizing and burning culm. The outcome was the equipping of a number of boilers in one of its plants in Seattle for this purpose. An account of this installation and some facts regarding its operation are given this week. Here is a plant burning successfully what but a few years ago was considered mine waste. Again, within the next few months a large boiler room in one of the Philadelphia Rapid Transit Company's plants will also be outfitted to reclaim waste coal. This will be a peak-load proposition, the flexibility of the powdered coal "stoking" having appealed forcibly to the P. R. T. management.

The test run recently made at Milwaukee of five boilers fired with pulverized coal will give the further study of this method of firing in large power stations a real impetus. The test was personally observed by P. W. Thompson, a responsible engineer from what is generally spoken of as one of the most efficient stoker plants in the country, namely, the Detroit Edison Company. This observer might be considered to be biased, if prejudiced at all, in favor of stokers, yet he reaches the conclusions in his written discussion of the paper by John Anderson appearing elsewhere in this issue, that the boiler-room operation with pulverized coal as compared to stoker firing is much simpler; that from the standpoint of reliability the odds are in favor of pulverized coal, and that the elimination of many vari-

able conditions entering into stoker operation will result in higher efficiency for the pulverized fuel installation. These are certainly significant statements.

Mr. Anderson has substantiated his faith in the economies possible with pulverized coal burning based on two years' experience and experimenting, by announcing that the new Lakeside power plant of the Milwaukee system, the construction of which has been begun, will be originally laid out and equipped for using pulverized coal. The savings which he has demonstrated to be possible at the old remodeled Oneida Street plant, he thinks, can be realized and improved upon in the new plant by virtue of a design primarily for burning pulverized coal. The new plant will contain an initial installation of two 20,000-kw. generating units and eight 1,306-hp. boilers.

Both Mr. Anderson and Mr. Thompson point out that there are many improvements which can be made in the design of a new plant, particularly in the design of the furnaces, the location of drying and coal-pulverizing equipment, the method of coal handling, drying and pulverizing, the method of handling ash, the prevention of slag formation, etc. The working out of these improvements will undoubtedly add to the advantages of the system. There will also be found many weaknesses which will have to be eliminated as experience develops their existence. All these things indicate a vast amount of work yet to be done by designing engineers before the powdered coal system of firing can be pronounced a complete success. But the Milwaukee test will serve to arouse great interest not only in perfecting this system, but also in improving the general overall efficiency of stoker fired boilers. This augurs some good healthy competition, out of which the power plant industry is sure to derive benefit.

It is very fitting that the Engineering Association executive committee should have assigned the subject of burning pulverized fuel to the committee on power generation this year. The experiences of the companies mentioned above would alone be enough to make a good foundation for a report.

### Some Valuation and Rate of Return Theories May Be Crystallized

ONE benefit to be derived from a commission decision which is detailed is that, upon appeal, more clear definitions of some theories may be obtained. Apparently our valuation and rate regulation practice is being formulated, a point at a time, by decision and rules as cases are appealed. And now another case, involving many interesting arguments and facts, goes to a court review. We refer to the appeals taken by the various Washington, D. C., railway companies from the decisions of the District Commission. These decisions have been mentioned before in these columns, but we print this week a more complete and analytical review by A. E. Knowlton. We speak of these several cases as one because they are so closely related and because several questions arise on account of the competing companies and the inter-company relations.

The District Commissioners, in both majority and minority opinions, have given detailed reasons for many of their findings, and it may be possible, from a court analysis of the case, to fix more definitely some of our ideas on valuation and the rate of return of competing companies operating with widely variant costs. Mr.

Knowlton has called attention to some of the main features which must be considered on appeal. He has also mentioned what is certainly somewhat novel, namely, a company forced to appeal from a decision on principle, though the decision apparently allows a rate of return of over 14 per cent!

### Why Jitneys Aren't Driven Out

THE electric railway manager, who long ceased to ride on his own street cars, is often sorely puzzled and hurt at the tepid reception which he gets from the public when he calls for the removal of the jitney. "Yes," says the public in effect, "We know that the jitney doesn't run on rainy days, that it doesn't pay its fair share of taxes, that it soaks us to the limit when the soaking is good and that our grandfathers gave you the sole right of carrying the common people; but the jitney is giving us some things in the way of speed and service that we are not getting from the electric cars and that is the reason we patronize them."

In a specific, though undoubtedly rather an extreme case, which came to attention recently, the railway is permitted to charge a 10-cent fare to an outlying community, while it costs 15 cents by jitney, yet the jitney gets the greater part of the business. If we look for the reason we find that it is because people do not have to wait more than two or three minutes for the six-passenger touring-car (for that's what it is) and they are delivered to destination in fifteen minutes. If they wanted to take a trolley car to the same locality the chances are that they would have to wait ten minutes and the ride would last thirty minutes at least, and in an old car at that. Can the people be blamed for preferring what is practically a taxicab service even if it costs 50 per cent more? What a lesson is there in this to those who believe that the public is really unwilling to pay a reasonable fare to get good service.

Another objection to the operation of jitneys, which their higher speed will not overcome, is the irresponsible character of the average jitney operator. A serious jitney accident will some time awaken a community for a brief interval to the fact that damages for personal injuries cannot be collected from the jitney owner, but the lesson is soon forgotten and the jitneys will be patronized again as freely as before. The average American is careless and is usually willing to take a chance when he can save time. But such a reckless point of view is inexcusable for those in charge of the interests of the community as a whole. If the public wants a system of mass transportation faster than that which can be supplied by the electric cars and auxiliary to it and is willing to pay a higher price for this kind of transportation, the authorities should see that it is supplied by a responsible organization, and surely there is no organization in any community so well trained in traffic methods as that of the local electric railway.

By this statement we do not mean that we are urging railway companies to engage in the bus business. But we do think, first, that modern operating methods and equipment will drive out a large part of the jitneys and, second, that insistence by the authorities on responsible operation and regular schedules will drive out most of those which remain. After all this has been done, if there are any bus routes left, the authorities could well approach the railway company to see if it would conduct their operation.



MULTIPLE-UNIT TRAIN OF CENTER-  
ENTRANCE MOTOR CARS

## Brooklyn Adopts Surface Car Trains

Trains With Three Different Classes of Equipment Are Now in Use  
and a Total of 100 New Trail Cars and 208 Motor  
Cars Will Soon Be in Service

**T**HE Brooklyn Rapid Transit and Brooklyn City Railroad Companies have been operating two-car trains on certain of their surface car lines for some time. The service has met with pronounced success and is popular with the traveling public, so that it has gained for itself a permanent place in street railway operation in Brooklyn.

Brooklyn's rush-hour service lends itself admirably to surface-train operation. It consists essentially of carrying large groups of people to and from New York across the Williamsburg and Brooklyn bridges, and picking up and distributing passengers through the business sections of Brooklyn. These business sections are located at the Brooklyn end of the bridges and extend back a distance of from a mile to 2 miles. These bridges and business sections form the necks of bottles through which it is necessary to operate as many cars as possible. The real problem in rush-hour transportation is then, how to increase the carrying capacity of the lines through these sections, and it appears that train operation affords the greatest prospect for success.

At present the loops which form the terminals at the New York end of the bridges are not adapted to receive trains, so that train operation has been confined to runs in Brooklyn which enter and pass through the business sections and no train service is operated across the bridges. This train service has proved of greatest value in relieving the congestion caused by carrying large numbers of people to the business districts.

### CHARACTER OF SERVICE FURNISHED

The Flatbush Avenue line was the first one on which train operation was attempted. The train service on this line runs from the Flatbush Ave. depot to Borough Hall, Brooklyn, a distance of 6½ miles. The morning rush-hour service consists of picking up passengers in

a district 1½ miles in length, which is suburban in character and stops average five or six per mile. These stops are of comparatively short duration, due to the small number of persons that board and alight at each point.

The second class of service is through a more closely populated residence section for a distance of about 3 miles. The stops in this section average from seven to nine per mile, and there are some transfer points with a correspondingly longer time for stops.

The remaining class of operation is through a business section of Brooklyn where the stops average from twelve to sixteen per mile and where headway between cars is so short, due to the operation of several lines over the same track, that there is very little operation beyond the series position of the controller. Frequent slowdowns for traffic also add somewhat to the congestion. The length of this business district is about .2 miles.

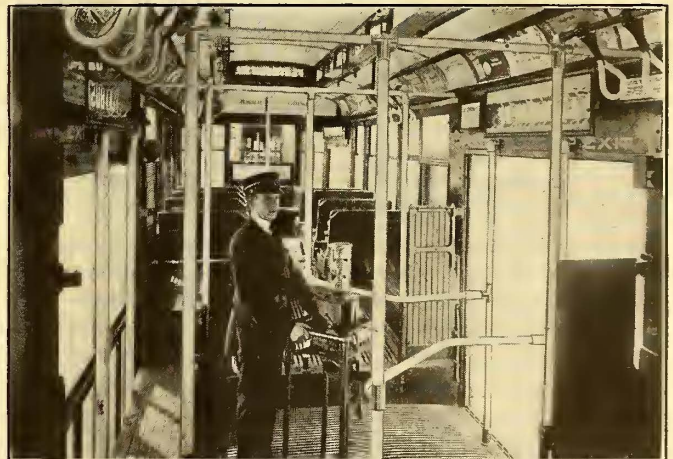
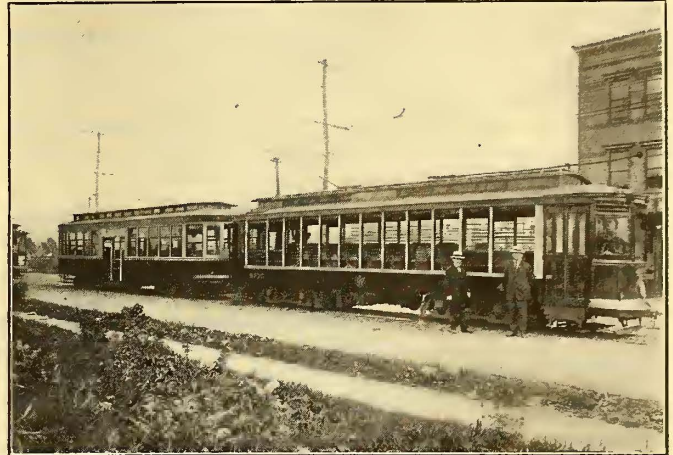
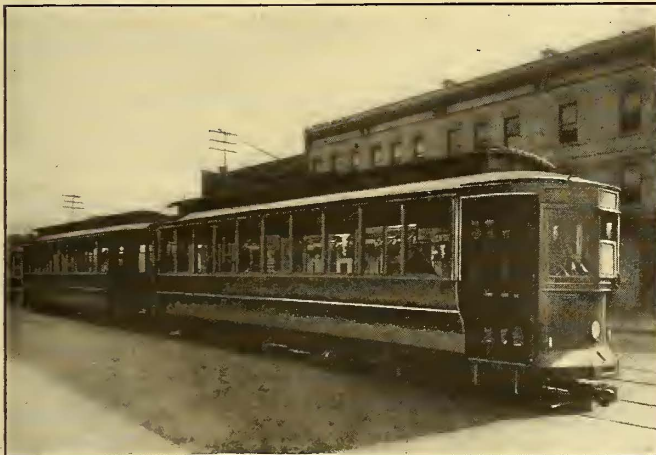
At present in Brooklyn the entire rush-hour service on any one particular line is not taken care of by trains alone, but single cars are intermingled with the trains. Train service is provided during the rush-hour period only. On the Flatbush Ave. line twenty-one trains are operated a total of eight hours per day and, in addition to this, forty single-car units are operated to make up the service. The shortest interval for this line is forty seconds, so a fair idea can be gained as to the density of the traffic. In starting either cars or trains, the interval is adjusted so as to give a definite number of cars in a given time interval regardless of whether single cars or trains are operated. Thus, where trains are operated on a three-minute interval, and it is necessary to replace a train by single units, two cars would be operated on a two-minute interval.

During the heavy traffic hours, the schedule speed for a two-car train is slightly slower than that for a

single car. This is due mainly to two conditions. First, trains made up of either two center-entrance motor cars or of a motor and a trailer have either center entrance doors or folding steps and doors, so that it is impossible for passengers to board or alight while the train is in motion. The single cars are not provided with folding steps and doors and are of the end-platform type so that many passengers board and alight before the car comes to a complete stop. This reduces the length of the stop and helps to speed up the service somewhat. The second fact referred to is the greater number of stops made by a two-car train as compared with a single car.

The advantages of train operation for certain classes of the Brooklyn service was recognized at the time

There are two different "make-ups" used for the Brooklyn train service. The first consists of the two center-entrance motor cars just referred to and the second a motor car with trailer. The motor cars used to haul the trailers are of the convertible type. They were purchased in 1905 and were described in the *ELECTRIC RAILWAY JOURNAL* of March 11, 1905. These cars weigh 25½ tons, seat forty-eight passengers and have four 40-hp. motors each. At the time they were purchased it was considered the best practice to buy large heavy cars with an excess of motor capacity. These cars have been in almost constant use since their purchase, in the most severe of Brooklyn's service often being operated twenty-four hours a day for long periods. The maintenance costs have been very low



TOP VIEW, MULTIPLE-UNIT TRAIN WITH PAY-AS-YOU-ENTER CARS. AT BOTTOM, INTERIOR OF CONVERTIBLE MOTOR CAR

TOP VIEW, MOTOR AND TRAILER TRAIN. AT BOTTOM, VIEW OF INTERIOR OF NEW TRAIL CAR

when center-entrance cars were purchased in 1913. Accordingly, the multiple-unit equipments of these cars was arranged so that they could be adapted for train operation by adding automatic air and electric couplers and without relocating or reconnecting the equipment. The surface companies have 101 cars of this type, and additions necessary to permit of their use for train operation are now being carried out as rapidly as possible. Each car is 45 ft. 8 in. long and weighs 38,350 lb. A seating capacity of fifty-eight persons per car and a total capacity of 123 persons brings the carrying capacity for rush-hour service of a two-car train up to 246 passengers. Additional details of the equipment and construction of these cars were given in the *ELECTRIC RAILWAY JOURNAL* for March 30, 1912, June 22, 1912, and April 19, 1913.

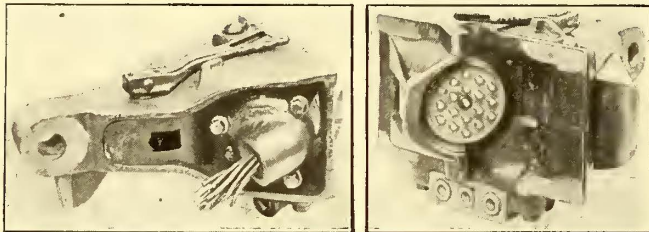
and from the operating man's point of view they have been most satisfactory.

When train operation was decided on for Brooklyn it was realized that the reserve capacity of these cars could be used to very good advantage in hauling trailers. An extended test was made to insure against overloading of the motors. One of the convertible motor cars was equipped for this test and a center-entrance motor car was stripped of its operating equipment to serve as a trailer during the test. Both cars were loaded to give a weight equal to that with standing load. This train was operated over various lines under conditions approximating as nearly as possible those of actual service. Results indicated that the motor equipment of these convertible cars was of capacity sufficient for the service and accordingly 100 trailer cars were ordered.

The trailer cars are of a low-floor center-entrance type. They are 45 ft. 6 in. long, 8 ft. 6 in. wide, 11 ft. 3 in. high from rail to roof and have 22-in. wheels. They are similar in appearance to the center-entrance motor cars used for train operation but have a monitor roof instead of the "turtle back" roof of the motor cars. They have a seating capacity of sixty-one and weigh 14 tons. Further information regarding their equipment was given in the *ELECTRIC RAILWAY JOURNAL* for June 8, 1918, page 1121.

#### ALL EQUIPMENT IS INTERCHANGEABLE

The equipment which it was necessary to add to the motor cars to permit of train operation was made uniform as far as possible. The couplers for all cars are Westinghouse type K-1-A automatic car, air and electric. Couplers were installed at both ends of the center-entrance motor cars of the "5,000 Series," but on one end only of the convertible motor cars and trailers. These latter units therefore operate in but one direction when made up for train operation. The couplers are unlocked manually by the pulling of a handle located on top of the coupler. After unlocking, the pulling apart of the cars returns the coupler mechanism to the locking position automatically. This is accomplished by a trigger with a projection to engage the coupler when in the unlocked position. The pulling apart resets the trigger. Should the handle be thrown to the unlocked position after the cars have separated, the mechanism



Side View    End View  
AUTOMATIC CAR, AIR AND ELECTRIC COUPLER

remains in this position until the operation of coupling is again carried out. The sliding together of the couplers then acts automatically on the trigger mechanism and returns the parts to the locking position. The coupling will then be made automatically with the couplers in either the locking or unlocking position.

#### NEW TYPE OF ELECTRIC COUPLER WAS ADOPTED

Accompanying illustrations show the type of coupler used. The electric portion is located in the central part of the coupler and has nineteen contacts with fourteen active circuits. There are fewer circuits than contacts because some of the contacts are connected in parallel to take care of large current values and to provide for reversal of ends of the multiple-unit cars without affecting operation. For the motor-trailer operation the circuits carried through the couplers are for lights, heaters, door operation, register operation, automatic signal circuits, bell and buzzer connections. For multiple-unit train operation, each car has its own power supply but connections are carried through the couplers for the control operation. A very ingenious arrangement of connections was worked out by the engineers of the railway so that no harm can result from coupling together of dissimilar equipments. Thus a convertible motor car which in regular service is operated with a trailer could be coupled to a multiple-unit motor car without complication. This arrange-

ment is highly desirable for emergency conditions as it might be necessary to couple up to a crippled car or train in order to prevent a tie-up. Both ends of all cars are also arranged for coupling with a link or bar-type coupling, so that trains may be coupled mechanically to any car of the system.

The contacts in the electric portion of the couplers are arranged for butt contact at both back and front. A coil spring between the stationary and movable portions provides the necessary pressure. The back part of the movable contacts has a spiral thread and this gives a turning action to the contacts as they are compressed and insures good electrical contact. The wires are brought into the back ends of the electric portion through flexible conduit and are soldered into terminals attached to stationary studs. To facilitate the making of these connections and any repairs that may be necessary, this back portion can be removed as a unit without disturbing the contacts. The various parts of the electric head have rubber gaskets between them, and the front is also provided with a rubber gasket around the contacts to prevent water, snow or dirt from getting to the contacts when two cars are coupled together. A hardwood cover fitting tightly over the contacts protects them when they are not in use.

#### TWO AIR LINES ARE PROVIDED

The air connections for brake operation are carried through the coupler at the bottom. Three openings are provided; the center one being for straight air operation and the two outside ones being connected together for emergency application of the brakes. This arrangement provides for reversing the ends of the multiple-unit cars and also gives increased area for the emergency passage so as to insure rapid brake application. In addition to the couplers, Westinghouse type M-18-B brake valves and type D emergency valves were installed on all cars. This gives a straight air-brake equipment with an automatic emergency feature. The flexibility and simplicity of the straight air brake is thus retained for ordinary service operation and additional protection is afforded by the automatic application of the brakes in case of a "break-in-two" or bursting of a hose.

The principal features of this equipment with type D emergency valves are: straight-air operation for service stops; brake cylinder release locally through the emergency valve on each car; prompt service application and release operation; automatic maintenance of brake-cylinder leakage; uniform brake cylinder pressure independent of variations in piston travel or leakage; practically uniform compressor labor insured without the necessity of governor synchronizing system; automatic application of the brakes in case of ruptured piping, burst hose or parting of train; retarded release after an emergency application, as a penalty to discourage unnecessary use of this feature; need for but one size of emergency valve for any size of brake cylinder, and arrangement so the conductor can set the brakes in emergency by means of the conductor's valve.

The "H-B" life guards used on the center-entrance motor cars and those of the "4,100 series" and "4,300 series" interfered with the installation of the couplers, so that it was necessary to cut out the back of the life guards to provide clearance and also to do away with the apron for tripping. A new type of tripping mechanism was designed and installed. This extends out to the front end of the car and the front portion is constructed of ½-in. wrought iron pipe. On the "4,100" and "4,300"

motors and trailers, where but one coupler is applied per car, no changes were made in the life guards at the other end of the car. On the center-entrance motor cars of the "5,000 Series" the previous type of coupler also interfered with the installation of the new type. This was removed and a slot was cut through the buffer immediately above the coupler to accommodate the coupler bar for use in case it is necessary to couple up to a car of another type which may be disabled. The installation of the couplers adds somewhat to the overall length of the cars, and in order that this additional length may not reduce the number of cars which can be stored in the space available in the different car houses, provision is made for swinging the coupler to one side and hooking it in position so that the cars can be laid up end to end. The couplers are the same for all types of car so that cars can be coupled up for use if necessary, but the present make-up of train service provides for the center-entrance motor cars to be made up together to make up a two-car train, both cars being motor cars, while the trailers are connected to motor cars of the "4,100" or "4,300 Series."

The electrical connections are carried from the couplers to a junction box located just back of the coupler through flexible conduit and the three air connections which are necessary in the coupler are made with flexible hose.

#### CHANGES MADE IN ELECTRICAL EQUIPMENT

In order to provide for train operation of cars of the "4,100" and "4,300 Series" a Westinghouse No. 806-C line switch has been installed and the tripping mechanism has been removed from the circuit breakers located on the front platforms of the cars so that these act only as switches to open the circuit by hand. The line switches take care of overload conditions. Provision for operating the line switches is made at the bottom of the K-28-B controllers, which are used on these cars. The main circuit as rearranged is from the trolley through the fuses and then to the line switch. From this, connections are made to the two circuit breakers on the front of each platform, and from these to the controllers.

The signal system used consists of a motorman's light which indicates when all doors of both the operating car and the trailer are closed. For passing signals from conductor to conductor and from car to car and to the motorman a buzzer system is installed.

Advantage is taken of the fact that these cars must be put through the shops for the addition of this new equipment to make other changes and submit them to a general overhauling, and painting. On the "4,100" and "4,300 Series" cars the inside bulkhead has been removed at both ends, and new doors and folding steps have been installed for entrance and exit. In this reconstruction, provision is made for the use of the electrically operated cash register, and push buttons are installed for the use of the conductor in operating the registers.

A second class of multiple-unit train is also in operation on the Brooklyn lines. There is but one of these units at present and it consists of two cars of the "3,300 Series," with end platforms, which have been altered by the addition of new safety doors and folding steps. Multiple-unit operation of the control has been accomplished by the addition of a Westinghouse PK head to one controller of each car. These cars are slightly over 37 ft. in length, seat thirty-five passengers and each have two 60-hp. motors.

## Daylight Saving Again Discussed by A. I. E. E.

Lighting Expert, on Basis of Investigation, Concludes That Daylight Saving on the Whole Costs More Than It Saves—Others Disagree on This Point

PRESTON S. MILLER, general manager Electrical Testing Laboratories, New York City, presented a paper on daylight saving at the recent midwinter convention of the American Institute of Electrical Engineers, stating that the paper was the result of an impartial investigation by himself of the various factors relating to daylight saving. He found that the total output of certain central stations of one gas company was reduced by about 3 per cent during the seven summer months. For lighting alone the reduction was 8 per cent. If these fragmentary data were applied to the whole country, the estimated annual saving is \$19,250,000 in expenditure for artificial light and nearly 500,000 tons per annum in coal consumption.

He named the several advantages of daylight saving as outdoor recreation, saving in expenditure for artificial light and saving of fuel. The disadvantages are experienced principally by farmers, dairymen, truck gardeners and miners. He concluded that economic losses probably far outweigh the gains.

In analyzing the present allocation of hours for work, sleep and play, Mr. Miller argued that these have been evolved through long experience and are the result not of the periods of darkness and light but the combined results of the natural distribution of darkness and light and of temperature, throughout the twenty-four hours of the day. He claimed that our sleeping habits are a compromise between the natural desire to sleep in the dark and the natural desire to sleep during the cooler part of the day, and that any arbitrary disarrangement of this schedule is wrong physiologically. He presented a chart upon which were plotted the distribution of light and temperature throughout typical days in June, September and December.

Mr. Miller contended that the advancement of clocks had served the interests of only one part of the population and had proved very disadvantageous to another part, which appears to be a large part of the total population.

In the subsequent discussion, R. S. Hale, of Boston, suggested a more accurate method of comparing central-station output during daylight saving and during normal times, stating that the output should be compared on sun-time basis and not on clock-time basis. Others, in discussing the paper, brought out the point that the only farmers seriously affected were those near large centers. The effect on central stations along the New Jersey Coast supplying summer resorts was said to be much more aggravated than the average of the country, as in some instances a 20 per cent reduction was noticed. This is particularly disadvantageous because these companies operate chiefly in summer and a 20 per cent reduction for a few months means practically a 20 per cent reduction for the entire yearly output of the power station.

Although Mr. Miller brought into the discussion of daylight saving some new elements, the members of the meeting were not entirely convinced that the repeal of the daylight-saving law will, in general, prove to be beneficial to the country.

## Comparison of Steam Power-Plant Performance

At A. I. E. E. Meeting Engineer of Interborough Rapid Transit Company Pleads for Uniformity in Statistics to Permit More Accurate Analysis

AT THE recent New York convention of the American Institute of Electrical Engineers, W. S. Gorsuch, engineer of economics Interborough Rapid Transit Company, New York City, presented a plan which he claims will make possible more accurate comparison of steam power-plant performance. This is discussed largely on the basis of attempts to compare operating statistics of steam power plants as published today by various state and governmental bodies. Complaint is made that there is no present uniformity in reporting the output of a power plant, the gross output being used in some cases and the net output in others. Load-factor figures as given are often misleading because they are computed upon different bases.

It is not proposed to make an analysis of the thermal characteristics or cost of generation in power plants,

DATA NEEDED TO PERMIT ACCURATE COMPARISON OF POWER PLANT PERFORMANCE

	Plant A	Plant B
I. Coal Characteristics of the Plant		
1. Average B.t.u. supplied to plant per kw-hr. net output.....	22,400	25,600
2. Thermal efficiency of plant in per cent.....	15.24	13.34
3. Average B.t.u. per dollar, coal as received (moist basis).....	5,226,666	5,734,400
4. Coal factor, or pounds of coal per kw-hr. net output (moist basis).....	1.60	2.00
5. Average B.t.u. per pound coal, as received (moist basis).....	14,000	12,800
6. Cost of coal per ton (2,240 lb.) delivered alongside plant.....	6.00	5.00
7. Kind of coal.....	Bituminous	Bituminous
8. Cost of coal in cents per kw-hr. net output....	0.428	0.446
II. Load Characteristics of the Plant		
9. Average daily factor of load.....	50	54
10. Maximum load for one year.....	90,000	80,000
11. Yearly load factor of load.....	40	38
12. Kw-hr. net output for the year—(kw-hr. sent out from the a-c. bus).....	315,460,000	217,248,000
13. Installed rated capacity, that is, the aggregate maximum continuous rating of the generators in kw.....	125,000	100,000
14. Average kw-hr. net output per kw. installed rated capacity.....	2,525	2,173

but rather to adopt as a criterion for comparing power plants the commercial efficiency, that is, the total cost per kilowatt-hour sent out from the alternating-current power station bus, which is the ultimate test of design and operation. To render such a comparison accurate would require a uniform system of accounting and many other impracticable uniform practices. For that reason Mr. Gorsuch has evolved a means of comparison which is limited to the cost of coal, the largest single item in the cost of generation in coal fuel power stations.

The fourteen items given in Table I are those desired by Mr. Gorsuch in order to get a reasonably accurate comparison between two power plants. Figures are given for two power plants to show the application of the system to specific cases. In this comparison chief dependence is based upon an accurate knowledge of the quality of the coal used and a uniform method of analyzing the load characteristics of the plant.

With the present method of recording power-plant statistics, item 4 in the table would be given, but items 1, 2, 3 and 5 would not. In this case it would be impossible to tell whether or not any part of the difference in the coal factor was due to the quality of coal. If the relative merits of the two plants were judged from the coal factors alone, a comparison would be misleading for the reason that while the coal factor for plant B is

25 per cent higher than for plant A, the B.t.u. supplied per kilowatt-hour net output is only 14 per cent higher.

In the subsequent discussion, R. S. Hale of Boston suggested that load factor be taken for eight hours per day or ten hours per day instead of twenty-four. In case a monthly load factor of 80 per cent is given, does the plant run day and night or does it run in day time only? This is an important factor to include in the data.

Philip Torchio, of New York, chairman of the power station committee of the Institute, in contributing to the discussion by letter, stated that the object in gathering statistics of this sort is for state and government reports and it is hoped that government agencies will standardize questionnaires. A comparison of gross thermal efficiency of steam plants is not contemplated, in fact it cannot be undertaken by the government, but much useful information could be obtained if state and governmental bodies would adopt a uniform plan for a questionnaire upon some such basis as suggested.

Edward J. Cheney, engineering division Public Service Commission, New York, rose to say how difficult it is to fit various requirements in the questionnaires sent out by governmental bodies. This particular suggestion of Mr. Gorsuch might be satisfactory for power men, but how about the meter men who would want statistics on cost of reading, setting, etc., and the outside distribution man on his costs, etc.?

In answer to this, it was argued that if the governmental bodies will merely shape their questionnaires so that the information is useful for comparison that is all that is required. No great increase of data obtained is wanted.

## Rail Failure Statistics

A REPORT on rail failure statistics for 1918 has recently been published by the American Railway Engineering Association. This report covers rail failures on steam railroads throughout the United States and Canada.

As a comparison between open-hearth and bessemer steel rails, failures per 100 track-miles are recorded. For rails rolled during the years 1913, 1914, 1915 and 1916, giving respectively five, four, three and two years of service, the report shows that bessemer rails had respectively 19, 134, 86 and 49 per cent more failures. As bessemer rails were in general in less severe service than open-hearth rails, the actual difference in the same service would undoubtedly have been greater.

The average failures per 100 track-miles of the rollings for the years from 1908 to 1918 inclusive covering both bessemer and open-hearth rails are tabulated. The 1908 to 1913 rollings show successively decreased numbers of failures compared on a basis of five years of service, and the 1914 rolling shows a further decrease when compared on a basis of four years of service. The more recent rollings, according to the report, are not starting out so well.

According to a statement in the *Engineer*, London, electrification work in Switzerland is advancing steadily. It is hoped that the Gothard line between, approximately, Erstfeld and Faido, may be in electrical operation about July 1, 1920. The work on this line has been delayed through difficulty in installing the electrical equipment. Insulators have been particularly difficult to obtain.



# Washington, D. C., Valuations Reviewed

Orders of the District Commission Show Thorough Arguments on Practically All Points Considered — Some New Stands Taken by the Commission

BY A. E. KNOWLTON

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THE District of Columbia Public Utilities Commission issued, last fall, two orders with reference to the two railway systems in the District. These were referred to by the ELECTRIC RAILWAY JOURNAL in the issue of Sept. 13, 1919, showing the valuations fixed, and again in the issue of Oct. 11, 1919, showing the increased rates of fare authorized. An appeal for a higher fare was filed by one company, as mentioned in the issue of Jan. 10, 1920, and all valuation figures were appealed by both companies as mentioned in the issue of Jan. 17, 1920. The orders in these cases are now available for analysis in Public Utility Reports, 1919F.

These decisions are notable in that, considered together, they present most of the questions that arise in connection with current rate cases, and one is especially significant because of a practically unprecedented action with reference to competing traction companies. Both present majority and minority opinions with unusually good expositions of the diametrically opposed conclusions.

One case was that in which the Washington Railway & Electric Company petitioned for an increase of fare for itself and its subsidiaries. A previous ruling of the commission authorizing a charge for inter-company transfers at once involved the other principal system, the Capital Traction Company, and this reason, as well as that a broad discussion of the desirability of some form of measured service might be had, led the commission to make the Capital Traction Company a party to the proceeding. The initial fare asked for was 7 cents, and other items were the abolition of transfers between constituent companies and the abandonment of certain through routes. The chief point in favor of a zone system, in the opinion of the commission, was that it would serve to reduce the great disparity in net operating revenues of these two principal systems. Congress had, however, established and observed a certain civic practice relative to the development of the numerous suburban districts of Washington, and the commission deemed it inadvisable to upset this practice. As will be seen shortly, this feature leads to a decision of considerable moment and one practically unprecedented—that the fares of competing systems should be equal regardless of the resulting net rates of return to the two companies.

The commission discarded the suggestion that the Washington Railway & Electric Company derive its needed increase in revenue by increasing its existing rates for electric light and power, with the remark that such a procedure was "not only inequitable and unjust, but illegal." Commissioner Gardiner, in his dissenting opinion, supplies the items numbered 5 to 12 inclusive, in the accompanying table, and argues from these that the approving order is as susceptible to injunction as an order raising the light and power rates of the Wash-

ington Railway & Electric Company rather than its traction rates in order to provide a fair return on traction capital. Congress had in 1900 permitted the Washington Railway & Electric Company to acquire the stock of the Potomac Electric Power Company as well as of its present railway subsidiaries, and Commissioner Gardiner construes the intention of Congress to have been that "the system as a whole, operated as one, would be a benefit to the riding public as a whole." In his opinion, this act and intention of Congress as readily justifies a raise in power rates to provide a fair return on traction capital as it does the application of the instant order which in effect raises fares on the now profitable city lines to compensate for losses on suburban lines.

Part of the disparity in net incomes of the two companies is attributed to the long-standing tax of 4 per cent on gross income and the commission announces its

	Washington Railway and Electric Company System	Capital Traction Company System
1. Trackage in Dist. of Columbia (miles) . . . . .	135	64
2. Cars per day . . . . .	350	250
3. Passengers per day . . . . .	230,000	230,000
4. Suburban lines (miles) . . . . .	10	2
5. Fair value as of June 30, 1919 . . . . .	\$16,106,368.14	\$14,270,495.51
6. 6 per cent return should be . . . . .	\$978,514.88	\$856,229.73
7. Taxes (4 per cent tax on gross income) 1918 . . . . .	\$138,000.00	.....
8. Net return should be . . . . .	\$1,116,514.88	.....
9. Actual net earnings (7 mos. 1918) . . . . .	\$65,000.00	\$780,000.00
10. Difference from 6 per cent return (7 mos. 1918) . . . . .	—\$586,000.30	+\$280,532.64
11. Existing rate of return, per cent . . . . .	0.588	9.36
12. Estimated rate on approved fares, per cent . . . . .	6±	14.22
13. Wages to car crews (7 mos. 1918) . . . . .	\$750,000.00	\$600,000.00
14. Other operating expenses and taxes . . . . .	\$1,815,000.00	\$1,110,000.00
15. Cost per car mile . . . . .	\$0.3625	\$0.3185
16. Cost per passenger carried . . . . .	\$0.052346	\$0.035146

intention of advocating before Congress the substitution of a sliding scale tax on net income.

There is tabulated below a list of comparative physical and financial items, some of the latter reflecting the marked difference in physical character of the two systems and the areas they serve and also the effect of the commission's equal raise in rates for the two systems.

Many important questions arose in connection with the other case, that of the Capital Traction Company, and it is of interest to examine the manner in which these questions were disposed of. The company's experts and the commission's accounting expert followed two widely different methods of determining "historical cost" and "both, in the opinion of the commission, have merit and must be very carefully considered in the determination of" the total valuation. The company claimed values based on the actual cost of the property to the present owner. With reference to this method, the commission says:

"Much of the investment may be represented by expenditures of an abnormal nature or which relate to other than physical property; such as increased book value resulting from the transfer of property, discount on stocks and bonds, cost of financing, promoters' fees,

and additions to capital account by reason of the revaluation of the property. Probably the greatest of these consists of increasing the investment account upon the transfer of property, in order to bury in plant account the bonus, which is paid generally in securities, to acquire operating control." The commission outlines the procedure of its accounting experts in arriving at a total "historical cost" as follows:

"Under the second method, i.e., the ascertainment of the actual cost of the existing units of a property used and useful for the public at the date of valuation, an entirely different course of procedure from that followed in the first method becomes necessary. A thorough and detailed analysis of the plant account must now be made in order to ascertain just what items are included in the investment account. The various units of property must then be classified or grouped and their cost and date of installation determined . . . the more serious and exacting duty of the investigator" is then "to determine the amount of property that has gone out of existence, but is still included in the plant account. This disappearance of property is due to various causes, such as losses by fire, abandonment, sale, changes in the art, experimentation, and obsolescence, such losses not being properly adjusted in the books."

The commission excluded from the total amount stated to be the historical cost of the property early losses incurred by one of the constituent companies for the reason "that such losses are not a part of the amount of money expended" but "constitute an intangible element to be considered in finding fair value." An item of \$8,000 for cable patents was disallowed, the patents having expired. "Such items as patents under any circumstances should be taken care of by earnings, and should not be allowed to remain in the plant account." On the other hand, the cost of right of way for a line later abandoned and the land dedicated to the District of Columbia for park purposes was allowed as a development loss. Profits received from the sale of various parcels of land were, however, applied to reduce the total of development loss allowances. Another allowance in connection with development losses was one of about \$84,000 to cover the value of "cars abandoned as the result of an order of the Interstate Commerce Commission forbidding the use of single-truck cars." Perhaps the most interesting development loss allowance, though, is one of about \$450,000, representing the loss incurred by reason of the fire that destroyed the old cable power station, not fully covered by insurance. The company had either to rebuild for cable or construct for electricity, then under contemplation, and the latter plan was adopted. The commission made the allowance on the company's contention that, even if the fire had not occurred, underground electric motive power would have been adopted soon and the abandonment of the cable plant would have followed with probably greater loss.

The company also asked to have included as development loss one item of \$50,000 as estimated loss in connection with rebuilding a car barn and office building and another of \$13,421.79, the difference between original cost and amount received from sale of an engine-generator set. These "items . . . cannot, in the opinion of the commission, be considered in the light of development losses. Upon any accounting theory losses brought about by the reconstruction of buildings or sale of superseded equipment in the usual course of business should be taken care of by charges to depreciation."

Taking up the details of the appraisal, one finds a very instructive tabulation (according to Interstate Commerce Commission classifications) of reproduction cost, residual value, depreciable value, annual depreciation per cent, etc. That they may be available for purposes of comparison, certain of the percentage items are tabulated below, Chief Engineer Pillsbury defining "per cent remaining" as the ratio of the "remaining life" to the sum of "age" and "remaining life."

The commission made an allowance of \$108,000 as working capital, this amount being arrived at by taking one-twelfth of the annual operating expenses and real property taxes. In approaching the matter of "established business" as an element of fair value, the commission ruled that the appraised value of some \$5,000,000 for a part of the company's property for which it paid over \$10,000,000 called for treating the \$5,000,000 difference, not as associated with cost of reproduction, but rather "with that other element of fair value," namely, actual or historical cost. In claiming that the commission must allow as part of the fair value of the entire purchase price of this property, the company cites the U. S. Supreme Court decision in Willcox vs. Consolidated Gas Company, 212 U. S. 19,-

Inventory Division	Per cent Remaining	Annual Desrecia-tion Per cent	Ratio of Reproduc-tion Cost Less Depreciation to Reproduction Cost
A. Land.....	100.00	0	100.00
A1. Removal of obstructions...	100.00	0	100.00
B. Way (track and roadway)...	76.71	3.41	77.42
C. Structures (buildings)....	84.93	1.54	86.18
D. Power plant and substation equipment.....	77.18	4.17	78.84
E. Transmission and distribu-tion system.....	70.51	3.23	78.52
F. Rolling stock.....	74.84	4.22	76.08
G. General equipment: office, shop, store, stable, garage etc.....	69.52	8.87	72.12
H. General costs: legal, organiza-tion, engineering, super-intendence, insurance, taxes, etc.....	90.12	1.45	90.07
Materials and supplies.....	100.00	0	100.00
Working capital.....	100.00	0	100.00
On total physical property devo-ted to railway service in the District of Columbia.....	81.82	*2.67	82.51

\* This applies to depreciable cost, not to total cost of reproduction.

and further contends that the "purchase was specifically authorized by Congress; that it had been acquiesced in by the public for many years; that the stock issued in pursuance thereof had been largely traded on, on the faith of this transaction; and that the condition created at that time was a fixed condition not to be changed or made the subject of any sort of disturbing analysis." But the commission finds little parallel between the Capital Traction and Consolidated Gas cases, analyzes the financial history of the purchased road, and, without specifying any amounts, says:

"This transaction has neither been ignored as an evidence of value by the Commission, nor has the amount been completely disallowed, the fullest consideration having been given to the intangible elements of value represented in this amount."

It is thus seen that in this case, which presents an unusually varied group of problems, the regulatory body has found grounds for deviating from precedents established in cases which are to some extent parallels and it is certain to be a matter of much interest to see the attitude the District Supreme Court will take as to these points when the appeal is ruled upon. In passing, it is not often the case that a utility, whose rates have in effect been advanced to a resultant 14 per cent return, finds that the circumstances necessitate or even warrant an appeal from the decision.

## Sidelights on Some Fare Situations

On Recent Visits to Toledo, Cleveland, Buffalo, Rochester, Syracuse and Utica a Number of Significant Items Were Noted

By "SPECTATOR"

**I**N THE COURSE of his regular duties, the "Spectator" happened recently to drop in on electric railway friends at a number of cities along the line of the New York Central Railroad, in which, as a group, the fare situation presents itself in several different aspects. In fact, if they had been selected for the purpose, no better choice of cities could have been made to illustrate the difficulties against which railway operators are now contending. While the situations in all of these cities have been depicted from week to week in the news columns of this paper, a few sidelights such as would be noted by a sympathetic visitor may be of interest.

### ALL QUIET ON THE SURFACE AT TOLEDO

After reading of the sensational street railway "stunts" which had been "pulled off" in Toledo, Ohio, within recent months, the "Spectator" was agreeably surprised to find the car service normal and popular. In spite of the obstacles in the way of working out a satisfactory franchise, there was evidence of friendly good feeling all around on the personal side, due no doubt to the individual popularity of Frank R. Coates, president of the Toledo Railways & Light Company, and his associates, A. C. Van Driesen, J. M. Enright, A. Swartz, and others. It was evident also that the public appreciates the fact that Henry L. Doherty ardently desires to give the city good service. The deadlock which had developed regarding the financial and operating conditions of the hoped-for franchise seems almost inexplicable to a casual observer.

One thing stands out very clearly in Toledo, namely, that the city is becoming very much ashamed of the reputation which it is getting throughout the country, although locally it is thought that this reputation is not deserved. A movement is now on foot to stimulate "boosting" of the city to offset the popular practice of "knocking" which patriotic citizens say has infected the city itself. Good friends of Toledo feel, however, that by hampering its electric railway development, the city has set itself back many years in its growth, and the pity of it all is that if given a reasonable opportunity the management of the railway would take pride in giving as nearly ideal service as is enjoyed anywhere.

As for the company itself a wonderfully fine spirit pervades all departments. Mr. Doherty's strong and helpful personality pervades the whole institution, and the spirit of solidarity is conspicuous. The fact that the company supplies a quadrilateral service—transportation, light and power, heat and gas—makes it very broad in its interests. A few months ago the administration offices were consolidated in an attractive building, especially fitted to their needs, and an auditorium seating 500 or more for the use of the joint company sections of the four national societies representing the four departments of the company was provided. The effect of this move is already evident in the greater spirit of company unity and loyalty. At Toledo the wel-

fare work of the company is handled by the company section, which has a much broader function and greater responsibility than most organizations of its class. The section has nearly 1,500 members and it is the expectation of the local officers that shortly it will also include the few hundred employees still outside the fold. A man of proved ability in promoting friendly relations with employees has been engaged to give his entire time to the personal side of the company section work, and another man, with suitable clerical assistants, will look after the office routine. The "Spectator" will be greatly surprised if within the current year "Rail-Light," as the company is locally known, does not make a notable improvement in its already remarkably successful work for employees.

### FAIR PLAY FOR THE INVESTOR AT CLEVELAND

As the home of the Tayler franchise, Cleveland is of all cities the one most frequently referred to in connection with fare cases, although Philadelphia is coming to be a close second. In spite of the publicity forced upon it, the Cleveland Railway is much misunderstood because the name Cleveland and the 3-cent fare are indissolubly associated in the public mind. By "pinching" the investors, it has been possible to make ends meet on the present 5-cent fare in Cleveland, because traffic conditions have been unusually favorable lately due to the prosperity of the city. Men in responsible circles now appear to favor an increase in the return to investors above the original 6 per cent prescribed. The people must now decide the matter, and it is to be hoped that they will realize the importance to themselves of maintaining the attractiveness of the property as an investment.

As has been the case for many years a fine democratic spirit permeates the organization, typified by the unconventionality and friendliness of President John J. Stanley. Colonel J. H. Alexander is back "on the job," full of vigor and enthusiasm from his war experience, already making his influence felt strongly in co-operating with Mr. Stanley, General Manager George L. Radcliffe, and their associates, in solving some very pressing problems. Among these problems the "Spectator" found that one of the most serious is the reduction of accident costs. For many years Cleveland has been a great place for automobilists, who have seriously hampered rail transportation. Of course, this is a worrisome proposition in all cities, but somehow Cleveland seems to have been particularly hard hit of late. Colonel Alexander has organized his department in such a way as to co-operate with the traffic, engineering and other departments through especially qualified assistants, and is planning to get better control of the accident situation. The "Spectator" predicts that the results of this arrangement will be good.

The impression of the Cleveland situation which one carries away is one of hope that the citizens of the city will blaze a trail by acquiescing cheerfully to an increase

in the rate of return to the stockholders. If by so doing they show appreciation of their fine local transportation system, they will encourage the management to carry out desired and needed improvements. They will also help in getting justice for investors elsewhere.

#### MUTATIONS IN PROGRESS AT BUFFALO

The fare situation in Buffalo is unique in that, while the company has permission to charge a 7-cent fare or to sell four tickets for a quarter, the fare is still held at the old 5-cent level. In taking over the control of the property, the bondholders apparently feel that the time is not propitious for taking advantage of permission to raise the fare.

After long and somewhat bitter controversy between the railway company and the city, the jurisdiction of the Public Service Commission over the local fare situation was clearly established, but undoubtedly this has left a considerable resentment in the city among those who lack confidence in the justice of the awards of the State court. While the present management has not yet fully stated its policy in regard to the matter of fares, one can easily surmise that the policy of conciliation with respect to the fare increase is to be adopted. The "Spectator" has noted elsewhere that when there is a change of management, the public is inclined to give the newcomers a chance to show what they can do, and presumably this rule will hold in Buffalo. This spirit of toleration would obviously be intensified if the new management said in effect that it desired to go into all possible details of operating economies to see if any less than the permitted maximum increase would meet its needs. In any event, the Buffalo situation will prove very interesting from the railway news standpoint for some time to come.

#### ROCHESTER IS STOLID ON THE FARE QUESTION

From the standpoint of reasonable fare, Rochester is one of the most discouraging cities in the country. The unfortunate "Quinby" decision of the Supreme Court of New York State hit Rochester especially hard. When the "Spectator" called, he found that Vice-President J. F. Hamilton and most of the heads of departments were in New York City improvising an operating organization for the Fourth Avenue-Madison Avenue line, which was taken over Feb. 1 by the financial interests behind the New York State Railways. However, it was possible to size up the local situation about as follows: In many ways public sentiment in Rochester favors a reasonable return to its transportation utility investors, and the company has the backing of the leading business interests. On the other hand, the city council is unwilling to risk popular disapproval of a decision to permit a fare increase. Mr. Hamilton and his associates apparently have the confidence of the people, but somehow this confidence does not take the desired concrete form as yet. The company has under way an advertising campaign which ought to bear fruit. Numerous small "cards" averaging, say, a single column wide and 2 in. high, have been carried in the local papers, each impressing one or more facts regarding the fare situation. These are signed by Mr. Hamilton, and are very frank in stressing the deplorable financial condition of the property.

In Syracuse the situation is much more favorable than that just described as obtaining in nearby Rochester. The people in Syracuse are reasonable, and acquiesced with good grace in the 6-cent fare proposition. How-

ever, this fare is far from meeting the needs of the company and the situation in the city is really deplorable. Money is not available for necessary maintenance, to say nothing of service improvement. The city lines are blessed with excellent shops, however, so that it is possible to maintain the cars with reasonable expenditure.

The conviction is growing in Syracuse that the city and the local lines operated by the New York State Railways must get together on some kind of a service-at-cost proposition. It is the hope of the management that when the city has really become convinced that, even with its reasonable attitude toward the company, some radically different means must be provided if good service is to be maintained, results will follow promptly.

A number of very fine interurban lines center at Syracuse, and in their case the outlook is better. The interurban mileage rate in the vicinity is as high as competition with the steam railroads will permit. All kinds of operating economies have been introduced, and one of the important companies is now contemplating a complete equipment of automatic substations along its main line. This company is also installing meters on its cars to induce energy saving. Another finds that by the use of reasonably light cars of large capacity a profitable business can be carried on.

As Utica is operated under the same managership as Syracuse, and as the fare situation in the two cities is the same, what has been said with regard to Syracuse may be said to apply here. The city is much smaller than Syracuse, but as the two cities show the same spirit in connection with the fare increase, presumably they would follow the same course if a service-at-cost franchise could be worked out.

Syracuse and Utica are connected by the electrified West Shore line, or Oneida line, on which is the Manlius Center automatic substation, mentioned several times in this paper. This station has given a very good account of itself, and while it has come in for criticism occasionally, in some cases this criticism was not properly directed against the automatic equipment. The station shows an actual saving in labor cost greater than estimated, and is having a marked effect in holding the operating cost of the distribution departments in spite of the large increases in labor and material prices.

In conclusion, the "Spectator" wishes to emphasize the fact that the observations made above are not designed to be comprehensive, but as stated earlier merely throw sidelights on a few salient features on the several properties mentioned.

#### New Cars for Metropolitan Railway, London

The first train of an improved type of cars has been commissioned by the Metropolitan Railway, London. This contains six cars, the first installment of an order for 100 cars. Pictures and diagrams of the cars were given in a recent issue of the *Electric Railway and Tramway Journal*, which states that the feature of the new train is the provision of five swing doors on each side of each car in place of the two or three sliding doors hitherto prevailing. The underframes and trucks of the cars are identical with earlier ones, but the seating has been rearranged to give a total of 292 seats as compared with 268 seats previously furnished. No straps are provided for the use of "standees," but in their place "steading" rails are provided on seat backs and doors.

# Pulverized Coal for Fuel Makes Good Saving in Milwaukee\*

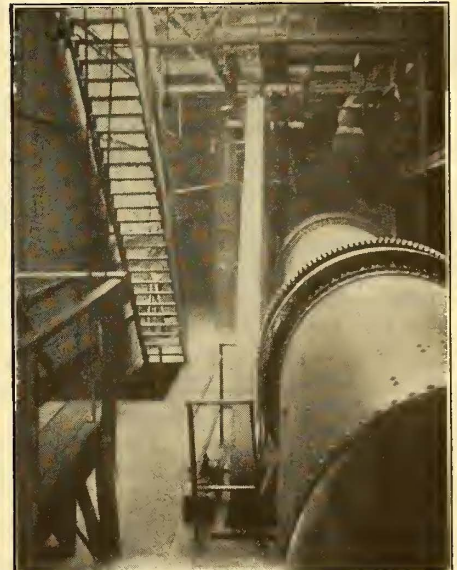
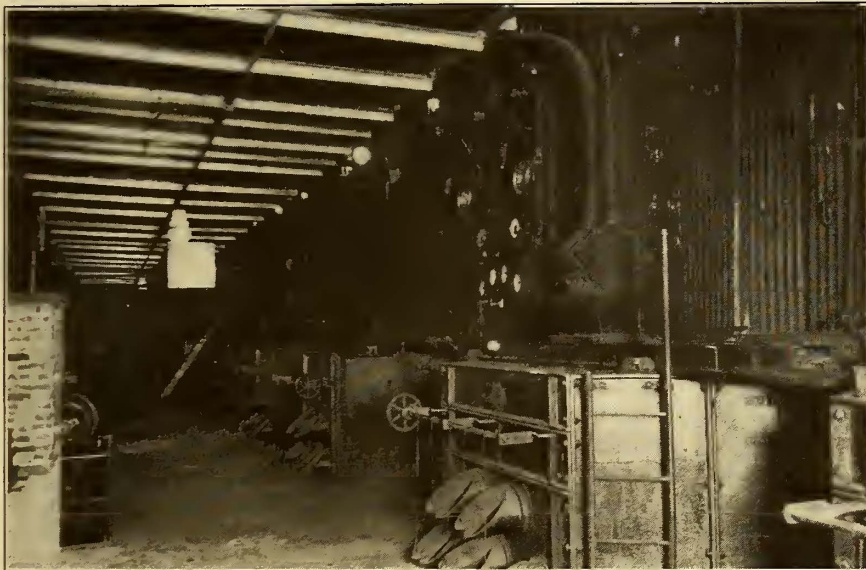
**Ease With Which Fuel Feed and Draft Are Controlled, Ability to Take and Drop Heavy Overloads Quickly Without Waste, Thorough Combustion and Uniformly High Efficiency Are Chief Advantages of Pulverized Coal**

By JOHN ANDERSON

Chief Engineer of Power Plants, The Milwaukee Electric Railway & Light Company

**T**HE cost of installing and operating the plant necessary for pulverizing and drying will always determine the advisability of adopting powdered coal for steam generation in any one location. This plant comprises equipment for separating tramp iron from the coal, for crushing the coal to a size suitable for drying and feeding to the pulverizer, for removing the moisture, and finally grinding it to the desired

which it leaves the mines, it is necessary to pass it over a magnetic separator which removes all tramp iron, such as bolts, nuts, pick-points, etc., as a safeguard against damage to the pulverizing and conveying machinery. A crusher must be used to reduce the green coal to a size suitable for proper drying and pulverizing, unless coal can be procured in sizes smaller than  $\frac{1}{2}$  in. screenings without sacrificing heat value.



AT LEFT—FRONT VIEW OF PULVERIZED COAL FURNACE IN ONEIDA STREET POWER PLANT, MILWAUKEE.  
AT RIGHT—THE REVOLVING COAL-DRYING CYLINDER

fineness. In recent times the extra investment required for the burning of pulverized coal has become less an obstacle than formerly. The soaring price of coal has prompted thorough investigation of any process which holds promise of greater efficiency.

These considerations led the Milwaukee company to begin two years ago the installation of pulverized fuel-burning furnaces and the necessary equipment on first one and later four additional 468-hp. boilers in the old Oneida Street power plant. This station contains ten boilers, the other five being equipped with Riley stokers. After much development work and many changes in design, these five boilers, burning pulverized coal, were put on comparative test with the five stoker-fired boilers in the same plant. The summary of this test is given later in this paper. The general experience gained from the use of the pulverized coal plant and furnaces is summarized in what follows:

As the coal is received at the plant in the form in

The fuel is next dried. The object is to bring it to a condition in which it can be most easily pulverized and most uniformly controlled by feeders into furnaces. In a pulverized-coal-fired furnace, most uniform temperature conditions are obtained with dry coal. Moisture in varying or large quantities in pulverized fuel definitely prevents a regular controllable flow of mixed fuel and air to the burners. For the removal of moisture, a mechanical dryer which reduces the water content of the fuel to about 1 or 2 per cent, is installed. This dryer usually consists of a double rotating cylinder, so arranged that hot gases from a small furnace are passed through the coal as it travels by gravity through the shell of the dryer and is delivered to the pulverizers.

The dried coal is next fed into the pulverizers. The fuel is ground to an impalpable powder, varying in fineness to pass from 80 per cent to 85 per cent through a 200-mesh screen. This process completes the preparation cycle and the coal in this form, after being conveyed to storage bunkers adjacent to the furnaces, is ready for firing.

Dust collecting and reclaiming equipment, although

\*Abstract of paper presented at Feb. 19 meeting of the technical section of the Employees' Mutual Benefit Association, The Milwaukee Electric Railway & Light Company.

only auxiliary to the drying and pulverizing machinery, is of great importance in securing the most economical, as well as the cleanest operation of a preparation plant.

The cost per ton of preparing coal depends upon the size of the plant and the quantity of fuel handled, but ordinarily will vary between the limits of 25 and 50 cents. It would seem that a great deal of work toward reducing this cost remains to be done, especially along lines of utilizing waste gases for drying, in plants not provided with economizers. Development of a furnace design which will permit of burning a large percentage of finely divided coal, but capable of taking care of a smaller amount of larger sized particles, presents further study along this line. This is possible in view of the fact that the pulverizers consume about 86 per cent of the total electric energy required for all moving parts of the coal preparation equipment. Both of the items mentioned above, if capable of being reduced as suggested, will also cause a reduction in the cost of the pulverizing department labor.

Continuous and uniform operation of the pulverizing division of a plant is dependent largely upon the ability of the operators to recognize and meet the varying properties of the coal as it arrives. Dryer operation especially must be changed frequently so as to handle varying sizes of coal (from high percentages of dust to high percentages of small nut) and varying amounts of moisture, both inherent and surface, and yet supply continuously a coal of uniformly low moisture. Irregularities in the drying process usually manifest themselves throughout the entire coal cycle, and very often with the result that the fuel feeding system becomes plugged at points most readily affected by wet coal.

Little need be said concerning the equipment which feeds the fuel to the furnaces. Feeder screws driven by variable-speed motors carry the fuel from the storage bins to the air mixing chambers from which it is blown as a mixture through pipes to the burners and then into the furnaces. The feeder motor controls at the Oneida Street plant are all provided with cutouts and if at any time the air blast to the mixing chambers and burners is lost due to a blower shut down all coal feeders are automatically stopped, thereby preventing serious plugging with attendant interruption to operation of boilers for what could easily be a considerable period. Air in addition to that used for carrying the fuel into the furnace is taken through auxiliary inlets located in the furnace front, and this can be varied in amount by manipulation of the stack damper which serves to change the gas velocities through the boiler and thus the volume taken into the furnace. With coal and air supplies easily adjustable, perfect fire control is assured and it becomes at once obvious why coal is burned so efficiently in pulverized form.

#### MORE EFFICIENT COMBUSTION CAN BE SECURED

In further explanation of this it is well to consider briefly the indications of efficient combustion applied to the steam boiler. Chief among these is the percentage of carbon dioxide,  $\text{CO}_2$ , the product of complete combustion, which is found in flue gases. Next in importance is the percentage of monoxide,  $\text{CO}$ , a product of incomplete combustion, which may be found at the same time.

The condition desirable is that with the percentage of  $\text{CO}_2$  as high as practical there should be no  $\text{CO}$ —a condition obtainable to a greater degree in a pulverized

feed furnace than in any other type. Complete combustion with the least amount of excess air requires the best distribution of that air and the problem of furnace efficiency therefore resolves itself mainly into one of air supply, not to the furnace alone but to each particle of coal. With a fuel finely pulverized, air can be made at once available to each particle since the surface exposed to air is increased to many times that of a lump and combustion is rapid, complete and efficient. With fuel in lump form, air must be supplied through a bed, the outer surface of the lumps must be burned off, the process of combustion eating into the lumps slowly. As a result combustion is often gradual and unequal. Where the fire is thin too much air is passed; where it is heavy there is too little air. To insure complete combustion in any furnace some excess air must therefore be provided. The use of pulverized fuel reduces this excess to a minimum, gives a higher and more uniform percentage of  $\text{CO}_2$  and therefore a higher and more uniform efficiency.

The percentage of  $\text{CO}_2$  to be maintained in pulverized fuel practice is determined to a great degree by furnace limitations rather than combustion consideration. From 16 to 17 per cent  $\text{CO}_2$  in the flue gases is easily obtainable but it cannot be maintained in actual operation due to the exceedingly high flame temperatures that result and the consequent destruction of the brick work. The temperature of the furnace therefore must be regulated by varying the volume of excess air. The temperature of the flame should not be above 3,000 deg. F. and that of the brick work in the flame zone not more than 2,400 deg. or 2,500 deg. F. Higher temperatures than these usually result in fusion of the ash particles and formation of a molten slag which is very destructive to the brick work with which it comes in contact.

In attempting to carry combustion conditions of a furnace so as to obtain exceedingly high percentages of  $\text{CO}_2$  usually too little attention is given to the losses resulting from the formation of carbon monoxide,  $\text{CO}$ . Carbon monoxide, a highly combustible gas, is formed when the excess air admitted to the furnace is insufficient properly to surround and completely oxidize all the coal particles. Heat losses occurring when  $\text{CO}$  is present in the gases of combustion, outweigh any gains that may be effected by an exceedingly high  $\text{CO}_2$  percentage.

#### ADAPTABILITY TO VARIOUS GRADES OF COAL

In the discussion of furnace efficiencies consideration should be given to the adaptability of a pulverized fuel fired furnace to the use of widely varying grades of coal without resultant losses in economy. Further, boiler capacity, even under heavy overloads, is in no way effected when an inferior quality of coal is burned. It is known that the combined efficiency of a boiler and furnace does not decrease when the fuel is poor, which condition does not hold true for the stoker. In the case of the stoker, the dropping off in efficiency is at a more rapid rate than the B.t.u. value of the fuel would indicate as normal, and so much so, that the point is rapidly reached when proper combustion cannot be maintained.

Operation of a pulverized fuel fired boiler, equipped with proper instruments, can be varied to take big fluctuations in load over very brief periods of time. A heavy overload can be quickly taken on or dropped off by adjustment of the coal and air feeds, and without any waste of fuel as always occurs under like conditions in stoker practice. No losses occur due to clinkering of coal or cleaning of fires, this condition of operation being

entirely eliminated. Irregularities caused by change in quality and variation in size of coal, such as the fireman cannot successfully cope with on stokers, are also eliminated. Furnace conditions necessary to most economical combustion are more perfectly obtained and hence a horizontal combined efficiency curve is possible of approximate attainment.

Due to its easily regulated coal and air supply and its perfectly controlled rate of combustion, the pulverized fuel furnace practically eliminates losses of combustible in ash. Ordinarily this loss is relatively large and varies according to the nature of the coal, type of stoker and the boiler load carried. In pulverized fuel practice the loss is very small and these variations do not occur.

An additional economy is effected during banked boiler hours. Banking conditions when operating with pulverized fuel are somewhat different from those obtained in stoker practice. By stopping the fuel supply and closing up all dampers and auxiliary air inlets, a boiler fitted for use of pulverized fuel can be held up to pressure for several hours. The furnace brick work having been heated to incandescence during operation, gives off a radiant heat which is almost all absorbed by the boiler rather than escaping up the stack intermixed with an excess of cooling air. Radiation losses only occur as against radiation plus stack and grate losses with the stoker.

**MAINTENANCE FEATURES GOOD NOW BUT CAN BE IMPROVED**

Commenting for a moment on the maintenance features of such a plant as has been described it is the writer's belief, based on two years operating experience, that the furnace brick work in a pulverized fuel furnace will stand up equally as well as a stoker installation, with a very great advantage in favor of the former due to the elimination of all iron work in the furnace or anywhere near the high temperature zones of the boiler furnace. Regarding the maintenance of the pulverizing plant equipment it has not been found that any great amount of maintenance is likely to be necessary, as all the equipment is of the slow moving type and many opportunities are afforded for applying the same concentration of effort that has been typical of the stationary engineer's work in improving equipment when defects or fast wearing parts are discovered. The pulverizing machinery manufacturers have done a great deal along this line, but there are still matters that can be improved upon by the engineer looking for the least troublesome as well as most economical plant from a maintenance standpoint.

Powdered fuel installations are not feasible in every location. The one limitation is the size of boiler plant to be served. A plant of less than 2,500 developed b.h.p. on a 24-hour operating basis should not consider using powdered fuel. The amount of coal pulverized per day, the cost of installation, and the labor for operating the preparation plant, when properly studied, will bring before those interested the reasons therefor.

In general, we have found the powdered fuel method applied to our furnaces a distinctly advantageous one. Our firemen prefer to operate such equipment rather than the stokers when it becomes a matter of choice. It has proved more economical as evidenced by the monthly coal bill. It seems to form less scale than in stoker fired boilers. There is absolutely no trouble from smoke, consequently no reduction in the ability of the boiler to absorb heat due to soot on the tubes.

The use of high sulphur coal which is so destructive

to boiler tubes, breechings, smoke stack, and all other steel equipment found in a boiler plant is much less unsatisfactory when in pulverized form, since the low moisture content of the prepared coal reduces the opportunity for attack from sulphuric acid.

Although frequently cautioned against explosions, we have had no evidence that such caution is necessary. The reason for our freedom from such unpleasant occurrences is due almost entirely to a proper care in preventing coal from being dried too much and pulverized to a fineness beyond that necessary. Matters of this kind are in the hands of the operating engineers and do

**COMPARISON OF COSTS AND NET EFFICIENCIES**

**ELECTRIC ENERGY AND FUEL CONSUMPTION PER TON OF COAL BURNED**

	Pulverized Fuel System	Stokers and Blowers, kw.-hr.	Modern Stoker
Energy consumed by conveyors, crusher, elevators, dryers, fans and feeders, kw.-hr.	5.73		10.94
Energy consumed by pulverizer, kw.-hr.	16.72		
Total energy, kw.-hr.	22.45		10.94
Coal equivalent at 1.5 lb. per kw.-hr. lb.	33.68		16.41
Coal consumed in dryer furnace, lb.	25.66		
Total coal and equivalent, lb.	59.34		16.41

**COST OF FUEL PREPARATION, FIRING AND ASH DISPOSAL**

Labor—coal preparation	\$0.143	\$0.000
Labor—firing	0.112	0.140
Labor—ash removal (in plant)	0.025	0.064
Dryer fuel—coal at \$4.00 per ton	0.051	0.000
Electric energy—coal per kw.-hr. at 1.5 lb.	0.068	0.033

**MAINTENANCE**

Labor at \$0.036—material at \$0.020		Labor at \$0.046	
Manufacturer's estimate (Lubricants at \$0.007)	0.063	Material at \$0.049	0.097
Total cost of fuel preparation, firing, ash disposal and maintenance	0.462		0.334
Price of coal as purchased, per ton	4.000		4.000
Total cost, per ton	4.462		4.334
Cost per ton of coal in p. f. system over modern stoker	0.128		

**EFFICIENCY**

Actual gross efficiency, per cent.	80.67	76.80
Net efficiency after all incidental costs have been accounted for, per cent.	72.32	70.88
Difference in favor of pulverized fuel system, per cent.	1.44	

not benefit by highbrow application of theories. The engineer who is careful of his every-day equipment and keeps his plant free from accidents of every nature, can operate a pulverized fuel plant successfully without other assistance than his own experience.

**PULVERIZED COAL EQUIPMENT AT ONEIDA STREET STATION**

In the Oneida Street plant the equipment and the route of the fuel through the drying and pulverizing plant are in outline, about as follows: The coal is delivered to the station by barge and run over an automatic scale, discharged onto a short belt conveyor equipped with magnetic separator pulley for removal of tramp iron, and then into a Peck carrier, which takes it to the green coal storage bunkers, the starting point of the plant proper. From there it is conveyed and elevated to a Jeffrey disintegrator where it is prepared for drying by being crushed, and then discharged into a small storage bin and fed to the dryer. The dryer is of a double shell type and is so arranged that the gases exhausted from it are discharged through a cyclone separator where coal dust, carried from the shell, is reclaimed and conveyed to the pulverizers. The gases discharged from the separator are vented into the smoke stack. The dried coal is carried from the dryer discharge by a bucket elevator to the dry coal storage bins, to which are connected the pulverizer feeders. The pul-

verizers are of the five-roll Raymond type. Pulverized coal from the mill outlets is conveyed by screw conveyors to the pulverized fuel storage bins. Screw feeders take the fuel to the air mixing chamber from where it is blown to the furnace.

#### COMPARATIVE TESTS OF FIRING SYSTEMS

In order to learn the relative operating costs and net efficiencies of pulverized coal and modern stoker firing, a test of 99 hours' duration, 495 boiler hours, was run on Nov. 11 to 15. Complete data were taken on the five stoker-fired Edge Moor water tube boilers and this compared with corresponding data on the stoker-fired boilers taken at another time, but with the boilers maintained at 120 per cent full load in each case to secure similar conditions. The summary comparison is given in the table on page 475.

#### Discussion of Mr. Anderson's Paper

BY PAUL W. THOMPSON

Technical Engineer of Power Plants, Detroit Edison Company

There is at the present time a considerable difference in opinion among engineers as to the feasibility of burning pulverized coal in central generating stations, and as to whether, taking all facts into consideration, the use of pulverized fuel will result in a net saving over the results obtained with modern stoker installations. It is to be presumed that a general comparison of any two plants, one equipped with stokers and one equipped for the preparation and burning of pulverized fuel, would probably not give results which could be readily comparable in determining the ultimate relative value of one method of burning fuel over the other because of the probable different conditions of operation and the difference in design, kind and cost of fuel, cost of labor, etc.

It is unnecessary to go into the details of the Milwaukee test. It is sufficient to say that the test was properly conducted and particular care exercised in obtaining an accurate record of all quantities involved. The water and coal were weighed and the scales checked for accuracy at frequent intervals. All blow-off piping was disconnected from the boilers to preclude any possibility of error due to leakage. The boilers were subjected to regular normal operation except the rating was held at practically a constant figure, and no special effort was made to obtain an efficiency which would not be obtained under normal plant operation.

During the test the writer availed himself of the opportunity of watching carefully the boiler room operation and also the operation of the pulverizing, drying, and coal handling equipment and was very favorably impressed with the installation from an operating viewpoint.

The boiler room operation was indeed much simpler than is obtained with a stoker installation. The rate of steaming of the boiler is controlled by varying the speed of the feeder motor and adjusting the damper to take care of the different quantity of flue gas. It is unnecessary to look into the furnace at any frequent interval as is the case when firing with stokers and where holes in the fire or heavy spots must be corrected. In fact when once the feeder speed is set to give a certain rate of steaming of the boiler there seems to be no reason why this rating could not be maintained continuously, as far as the furnace is concerned, without it being necessary to make any changes whatever. Variations in the kind and quality of fuel burned seemed to

have no effect on the operation except that when fed at a constant quantity, the rating of the boiler varied with the heating value of the coal. At one time during the test Youghioghney was used, which coal had a higher heating value, higher volatile content, less ash and less sulphur than the mixture of Youghioghney and Kentucky coal which was used throughout the remainder of the test.

Losses which are inherent in stoker practice such as, breakdowns in the stoker itself, breaking up clinkers, loosening clinkers, continually watching the fire to maintain correct and uniform thickness, watching the gas passes of the boiler to see that there are no large sparks which indicate a carrying away of combustibles, dumping and the many other operations that are necessary in stoker operation, are eliminated. In other words, efficient combustion is obtained at all times without continual supervision by an experienced operator and from the standpoint of reliability of operation the odds are in favor of the pulverized fuel. This is an item for serious consideration in plants designed with 4.5 kw. capacity or more per installed boiler horse power, where the losing of a boiler due to stoker trouble at the time of maximum load on the station may seriously overload the remaining boilers or make it necessary to drop a portion of the load on the plant.

The handling of the ash resulting from combustion of the pulverized fuel is a very simple matter due to the very small quantity which is deposited in the furnace. It is in the form of a very fine impalpable powder which during the test was removed twice each 24 hr. On several occasions during the first and second day of the test, slagging occurred in a furnace due to not admitting a sufficient quantity of air. The direct cause of this was the over-anxiousness on the part of the men conducting the test, to obtain a higher per cent of CO<sub>2</sub> in the flue gas, and the reduction in the excess air permitted the furnace temperature to rise to a point where slagging occurred. The removing of this slag from the bottom or floor of the furnace presented more difficulty than is usually experienced in removing the refuse from the ash hopper of a stoker fired boiler. This slag had to be broken up and pulled out before it fused to the brick lining of the furnace.

It appeared to the writer that this formation of slag could have been almost entirely eliminated by a more frequent inspection of the floor of the furnace and the admitting of more air through the openings in the front of the furnace if it was found that slag was beginning to form. Even at times of removing this slag it was possible to maintain the rating on the boiler by increasing the coal feed, which, however, resulted in a decreased efficiency during this time amounting to about 45 min. in 24 hr. for each boiler. A large portion of the ash resulting from combustion is carried on through the passes of the boiler and out of the stack. Owing to the fineness of this ash it is apparently carried a considerable distance even in a moderate wind before being precipitated. Throughout the test there was a moderate wind blowing probably between 4 and 8 m.p.h. and the writer was unable to find any noticeable deposit in the streets. Even at the time of blowing the deposit of ash from the boiler tubes, which was done three times a day, requiring about 20 min. per boiler for each blow, no noticeable precipitation of ash could be found in the streets. At no time during the test was there any tendency for slag to form on the tubes of the boiler.

Strictly speaking there is no such thing as a banked



boiler when using pulverized fuel, since all that is necessary when it is desired to cut out a boiler is to shut off the coal feed and close all the dampers and auxiliary air inlets to the furnace. In this way the Milwaukee company found by test that it is possible to hold the boiler up to pressure for about 10 hr. by the radiant heat stored up in the furnace and boiler setting which is gradually absorbed by the boiler.

The loss which occurs and which can be compared to the banking loss in a stoker fired boiler is the heat which is radiated from the boiler and setting and equivalent in amount to that required to heat up the boiler and setting again to the temperature attained when steaming. In a plant where the ratio of boiler hours to boiler steaming hours averages 43 per cent or greater, which corresponds to an average daily plant load factor of 67 per cent, the saving resulting from the use of pulverized fuel is worth considering. Assuming 0.2 lb. coal consumed per boiler-horsepower banking hour in a plant equipped with underfeed stokers, this loss amounts to about 1.5 per cent, which, in a pulverized fuel burning plant, should easily be reduced to one-half this figure, resulting in a net saving of 0.7 per cent on this one item of the banking alone.

#### OPERATING CONDITIONS DURING THE TEST

The conveying and preparation of pulverized fuel presents a somewhat more complex problem, although the present equipment in the Oneida Street Station is operating satisfactorily, and during the test operated without any serious interruptions. Moisture in the pulverized fuel caused by sweating on the inside of the pulverized fuel bins resulted in some feeder troubles but this was only a temporary condition and was overcome by closing the windows just above the bins, stopping the cold air from blowing directly on them. One of the feeder pipes between the bin and the furnace became partially plugged up due to a paper composition gasket becoming lodged in the pipe just above the burner. The boiler on which this occurred was operated for at least 24 hr. at the desired rating by increasing the feeder speed on the other burner until the trouble was located and removed. During this period the efficiency of combustion was undoubtedly below the average as the coal which did come through the plugged feeder was not fed in with the correct quantity of air due to the obstruction in the feeder pipe. No trouble was experienced with the dryer or pulverizing mills at any time during the test.

The writer does not believe that under *test* conditions over a period of constant boiler rating the efficiency obtained with the use of pulverized fuel will exceed that which has been obtained from the best stoker practice under similar operating conditions. However, under normal operation it is believed that the elimination of the many variable conditions entering into stoker operation will result in higher efficiency for the pulverized fuel installation. Overall efficiencies of boiler, furnace, and grate as high as 82 or 83 per cent, have been obtained on test with stoker fired boilers but normal operation day in and day out seldom exceeds 76 per cent in the very best practice where highly skilled help is employed in supervising the boiler room operation. The gross overall efficiency of boiler and furnace of 70.6 per cent as obtained from the results of this test would unquestionably have been higher had the boiler been cleaned prior to the test. As a matter of fact each boiler had been in operation prior to the test approxi-

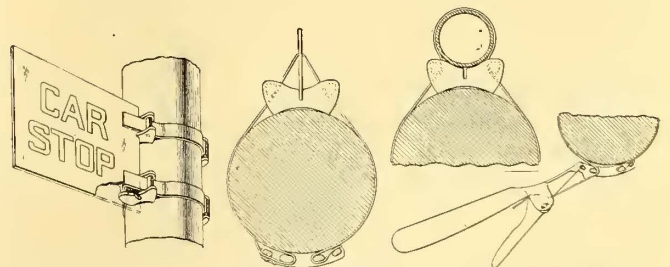
mately 600 hr. since being entirely cleaned, including approximately 300 hr. on three of the boilers since cleaning the first four rows.

Inasmuch as the boiler feed water consisted of approximately 90 per cent untreated water, the scale formation in the tubes would tend to give a lower efficiency than would have been obtained with clean boilers. At the time of writing this paper it has not been possible to open up the boilers and ascertain the exact amount of scale on the tubes.

Certainly the results obtained in the pulverized fuel burning plant as a whole, where the equipment was installed and made to fit into an old plant originally equipped with Jones stokers, are encouraging enough to warrant serious consideration of the use of this kind of fuel in stations to be built in the future. There are many improvements which can be made in the design of a new plant, especially in the design of furnace, location of drying and coal pulverizing equipment, method of coal handling, drying and pulverizing, method of ash handling, slag prevention, possibility of using waste gases for the drying of fuel—all of which will have an effect on the efficiency which may ultimately be obtained. The application of pulverized fuel to central generating stations has been in use to a very limited extent for several years, but there still remains much experimental work to be done before we can hope to exhaust all the possibilities for increased efficiency, and bring it to as high a state of development as is the stoker at the present time.

#### New Fastening for Pole Attachments

A NEW fastening for car stop signs, conduits or other fittings which require attaching to tubular steel or concrete poles has been placed on the market by the Bush Electric Company, Cleveland, Ohio. Accompanying illustrations show how the fastening is applied. It consists of a band placed around the pole, drawn through a seating clip and clamped in such a manner as to hold the sign or conduit firmly against the pole. This tightening is made of a cinching tool which may be set at



CAR STOP SIGN APPLIED TO POLE, AND METHOD OF FASTENING

any point on the loose end of the band to give the desired tension. After the cinching tool has been brought around against the pole, the loose end of the band is fastened by bending over the fastening lugs.

The principal advantage claimed for this fastening is that it will fit any pole, regardless of size, including tubular steel poles which are built in sections, the diameter decreasing towards the top, and concrete poles which are tapered from the ground up. The same equipment may be used on all sizes and shapes of poles and the bands can be carried in rolls and cut off to any desired length. All parts are weatherproofed to prevent rusting.

# Revised Schedules Bring Gain

The International Railway of Buffalo Is Giving Better Service with Fewer Car-Miles—  
The Methods of Determining the Number of Cars Required and of  
Drafting the Time-tables Are Described

THE tables in the accompanying panel show what was done by the International Railway in one year by adjusting service to traffic. During the war the heavy demands on the system for the transportation of war-workers, added to the severe cold and storms experienced during the winter 1916-17, affected the operation adversely, and there was considerable criticism of the schedules in consequence. This led the company to make an extended review of the entire subject of the make-up of its time-tables.

In this study a special effort was made to adjust the service to the actual traffic demands. As will be explained later, certain notable savings in car miles and car hours were made principally in turnbacks, although few or no changes were made in the downtown district except in some cases to add cars. There was also some re-routing. By these changes, during the first nine months of 1919, under the new schedule, the passenger revenue was increased more than a million dollars, while by a coincidence the car hours were just one less. The figures for the twelve months are of a like nature.

In explanation of these changes in schedules it should be said that the company exerted every effort to keep the cars on time, the theory being that a 5-minute schedule well maintained is more satisfactory to the public than a 4-minute schedule not kept up. The improvement in service thus effected was generally acknowledged in the public press, and the mayor as late as July 17, 1919, expressed the opinion that the company was giving "super service." It should be added that the figures given are those of the company as a whole and that the same fare was charged on the city lines during both periods. On the interurban lines, by order of the Public Service Commission, an increased fare was collected, beginning May 1, 1919. The total additional revenue thus collected was \$206,379, but this amount of money is not included in the passenger revenue totals for the year, as given in the tables on this page.

It is the purpose of this article to describe the way in which the investigation was conducted, and how the time-tables were prepared. The work was undertaken by John O. Weigel, general superintendent of transportation. Mr. Weigel came to the International Railway from

Statement of Operations, International Railway			
For Calendar Year			
	1919	1918	
Passenger revenue.....	\$8,970,689	\$7,167,371	
Car-hours.....	2,442,434	2,284,352	
Receipts per car-hour....	\$3.67	\$3.13	
Car-miles.....	22,355,365	20,655,019	
Receipts per car-mile.....	\$0.401	\$0.347	
Speed in miles per hour..	9.1	9.1	
For Nine Months Ended September 30			
	1919	1918	
Passenger revenue.....	\$6,694,808	\$5,689,744	
Car-hours.....	1,833,314	1,833,315	
Receipts per car-hour....	\$3.65	\$3.10	
Car-miles.....	16,739,825	16,582,453	
Receipts per car-mile....	\$0.400	\$0.343	
Speed in miles per hour..	9.1	9.0	

the Brooklyn Rapid Transit Company, where he had had charge of the construction of time-tables.

The first step was to take a traffic count at certain strategic points on each line. These counts were taken by checkers, of whom only a small number was required, because they would go from line to line and would check only at the times when a preliminary investigation by a higher transportation official indicated that a check was necessary. The blanks used gave the car number, time, headway, number of passengers passing the point, and weather. As a rule, the points selected for such

counts were half or two-thirds of the way out from the center of the city, where there were cross-overs, so that cars could be turned back. Most of the changes in the time-tables were made in the non-rush hours.

A typical record passenger count is shown in the forms below. From the conclusions indicated by these counts the time-table was made up.

Several fundamental principles were recognized in the time tables thus drafted. The first of these was that if possible at least every other car would be run through

PASSENGER COUNT											
TAKEN AT <i>Edgewood Forest</i>											
In						Out					
Car No.	Time	Headway	Pass.	Wet	Trace	Car No.	Time	Headway	Pass.	Wet	Trace
5075	119	4	15			5067	116	4	8		
6252	122	3	8			5015	119	3	9		
5011	126	4	10			5036	124	5	16		
5070	130	4	7			5037	128	4	7		
4-170			40			4-160			40		
5065	134	4	7			5081	133	5	19		
5060	137	3	9			5074	138	5	17		
5062	141	4	20			5010	144	4	7		
3-120			36			3-120			33		
5115	146	4	8			5017	147	5	15		
5026	150	4	17			5020	151	4	7		
5067	154	4	20			5023	156	5	30		
5081	158	4	7			3-120			52		
4-160			42								
5024	162	4	18			5027	161	5	12		
6229	166	4	10			5077	165	4	40		
5010	169	3	2			5064	169	4	13		
5017	174	5	7			5075	174	3	9		
4-170			37			4-160			74		
5020	177	3	10			6252	177	5	19		
5023	181	4	7			5011	181	4	8		
5027	184	4	10			5055	185	4	11		
5077	190	5	7			5065	188	3	11		
4-160			29			4-170			59		
5064	194	4	17			6242	193	5	10		
5075	198	4	7			5062	198	5	23		
6252	241	3	7			5015	241	4	12		
3-120			37			5036	245	4	22		
						2-120			50		

(516) *Ames* DATE: 3/19 1919

PASSENGER COUNT											
TAKEN AT <i>Edgewood Forest</i>											
In						Out					
Car No.	Time	Headway	Pass.	Wet	Trace	Car No.	Time	Headway	Pass.	Wet	Trace
5086	116	7	17			5064	119	6	10		
5069	124	8	28			5058	128	9	16		
2-80			46			2-80			36		
5065	132	8	32			5054	136	8	18		
5044	140	8	24			5083	145	9	17		
7-80			56			7-80			35		
5064	149	9	24			5067	157	7	67		
5058	156	7	25			1-40	(67)		67		
7-80			39								
5054	163	7	24			5057	161	9	24		
5083	171	9	16			5056	170	9	12		
7-80			40			7-80			47		
5067	170	8	19			5069	178	8	18		
5057	178	8	34			5065	176	8	35		
7-80			63			2-80			53		
5056	236	8	18			5044	234	8	38		
5069	244	8	14			5064	242	8	24		
2-80			57			2-80			67		

(518) *Ames* DATE: 5/5 1919

TYPICAL PAGES FROM PASSENGER COUNTS



Contrary to the conditions on some properties, Sunday is a day of light traffic. This fact is emphasized in the chart of car miles, car hours and receipts for the first two quarters of the last three years, in which the weekly peaks represent Saturdays and the weekly valleys represent Sundays.

While much was done in the way of schedule adjustment to secure the results shown in this chart some re-routing was also done on the downtown lines. This relieved the congestion during the rush periods on Main Street and also made quite a material saving in car hours per mile.

The number of cars required to operate the schedule in force during January, 1920, was:

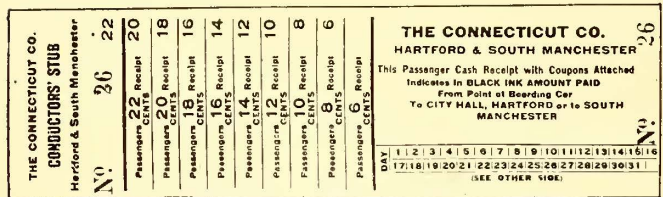
During the morning rush period.....	584
During mid-day .....	303
During the afternoon rush period.....	692

## New Ticket for Zone System

### Connecticut Company Adopts New Method to Facilitate Unloading at Termini of Heavy Interurban Runs

IN ORDER to facilitate unloading at the end of heavy interurban runs, the Connecticut Company is inaugurating on Sunday, March 7, a new method of zone fare collections for all passengers who go through to the terminus. This is being applied to two lines at first—the Hartford-South Manchester and the New Haven-Waterbury. One of the tickets used under the new method is shown in the accompanying cut.

As previously described in these columns, under the present zone system of the Connecticut Company each passenger is given a "zone check" by the motorman as



NEW TICKET FOR ZONE FARE COLLECTION ON INTER-URBAN LINES

the former boards the car; the fare deposited in the fare box is then calculated by the passenger and conductor from this zone check. This system has worked well in general, but at the termini of heavy interurban runs there has been some delay in unloading the usual large number of passengers at the one point, owing to the time consumed in making change and collecting from passengers coming from so many different zones.

Under the new scheme, the same method of fare payment is followed for all passengers getting off before the terminal zone is reached. But for those going through to the terminus, the conductor will collect fare and give receipt en route, or under a "pay within" plan. Fare is calculated on the same basis as before and figured from the zone check the passenger holds. Then, if the fare is 16 cents, the conductor tears the ticket on the line between 16 cents and 18 cents in the central line of figures, punches the date in the body of the "Passenger Cash Receipt" attached. This is handed to the passenger and is to be deposited by him in the receipt box as he leaves the car at the terminus. The other portion of the receipt is turned in by the con-

ductor with his other daily records and shows, in red, at the lowest right hand figure the fare he has collected on each ticket.

As seen, this method does not preclude the payment of zone fares according to present practice in case the conductor has not collected from all passengers, but is merely a means to facilitate the unloading of cars at the termini.

## Closed System of Turbo-Alternator Ventilation

IN AN article in the current issue of the *General Electric Review*, George Monson gives valuable information on turbo-generator cooling. He points out the importance of sending clean air through the ventilating ducts because the volume required is so great that even a small amount of dust in a unit of volume may seriously clog up the spaces. For example, some conception of the magnitude of the quantities involved may be had from the fact that a 30,000-kw. machine requires approximately 6,000,000 lb. (81,000,000 cu.ft.) of ventilating air in a 20-hr. run.

The closed air circuit system of ventilation offers certain advantages in insuring cool clean air. It operates in the following manner: The air enters the rectifier cooling chamber directly after leaving the generator. This chamber contains the water sprays which produce the cooling action. It then flows to the speed-reducing chamber where the water particles are segregated from the air flow, then through an eliminator chamber where the last vestige of water is removed from the air before it re-enters the generator. This system uses the same air continuously, and can be made to occupy a relatively small and compact space as compared with the present system.

The foundation directly under the generator is usually provided with a space which is occupied by the inlet and outlet air duct pipes. This space can be utilized to advantage for mounting the air rectifier. The cumbersome station ventilating ducts, including the room occupied by the air washing apparatus, will be eliminated, thereby simplifying the station construction considerably and saving space.

The air washer is used for cleaning and cooling the incoming air. By using the same air continually, and without any possible way for it to mix with impurities, the problem of cleaning is eliminated.

## Engineering in Canada

In his inaugural address, delivered on taking the chair of the Toronto branch of the Engineering Institute of Canada, R. O. Wynne-Roberts discussed "A generation of engineering in Canada." In connection with the electric railways of Canada, he said that the first ones were built in 1890 from Windsor to Walkerville, and from St. Catherines to Thorold, but there may also have been a short exhibition line in Toronto at that time. These were followed by four miles each at Victoria and Vancouver and short lengths in one or two other cities. Official annual statistics in this field were compiled beginning with 1901, when the electric railway mileage in operation in Canada was 674. It is now 2,300. The capital invested is about \$170,000,000 and approximately 500,000,000 passengers are carried annually.

# New Power Supply for the St. Paul

## Water Power Plants at Long Lake and Snoqualmie Falls Supply Electrical Energy at 100,000 Volts to Eight Motor-Generator Substations

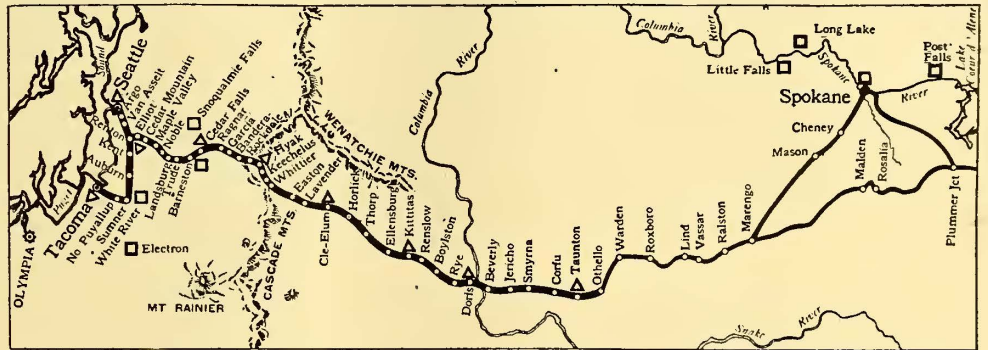
THE formal inauguration of electric service on the coast division of the Chicago, Milwaukee & St. Paul Railroad was scheduled for March 5, the day on which this issue of the ELECTRIC RAILWAY JOURNAL goes to press. An account of the inauguration will be given in a later issue. Readers of the paper are familiar with the details of the line and the locomotives from the several articles which have appeared in it during the past three years. Two pictures of one of the substations have just come to hand and are reproduced herewith. They were furnished by the General Electric Company. An outline map of the line is reproduced from the January, 1920, issue of the *Electric Journal*, from which a part of the following information is abstracted:

The electrification of the coast division adds 207.4 miles to the 440 previously electrified in Montana on the Rocky Mountain and Missoula divisions, and it extends from Othello in central Washington to the shops in Tacoma at the Puget Sound end. There is still a 212-mile gap between the Montana and Washington sections to be electrified.

All of the energy used on the new electrification is developed from water power, by the Washington Water Power Company and the Puget Sound Traction, Light & Power Company, through an organization known as the Intermountain Power Company. The Long Lake plant of the Washington Company and the Snoqualmie plant of the Puget Sound Company are the chief sources of power. This is delivered at 100,000 volts along the railroad's right-of-way, to eight substations as indicated by triangles on the map.

The contract between the Intermountain Power Company and the Chicago, Milwaukee & St. Paul Railroad specifies that the total demand of the railway company must not exceed a stated amount when integrated over

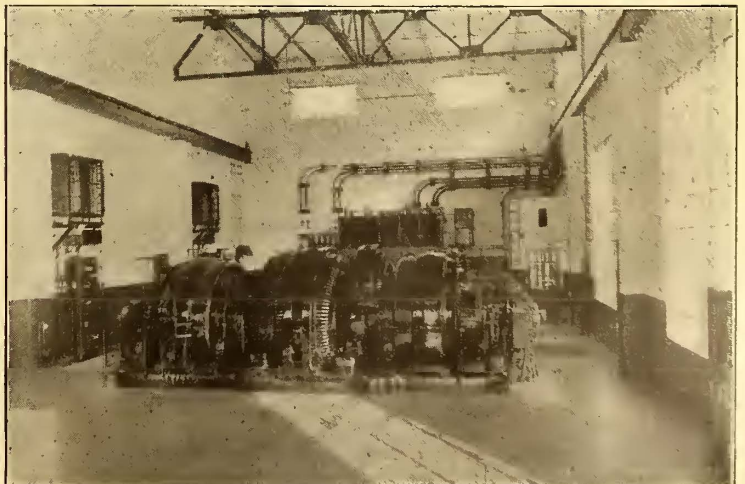
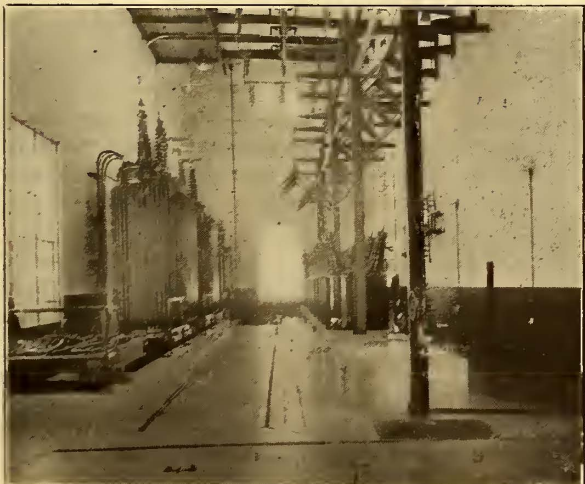
a period of five minutes, and that the power payment be based upon this amount, with a maximum load factor of 60 per cent. For instance, if the denominated maximum is 10,000 kw., the railway company will pay for 6,000 kw. integrated over the month, whether this amount is used or not, and for amounts in excess of 6,000 kw., will pay at the same rate per kilowatt-hour. This requirement gives the railway company the benefits in cost of power generation that accrue because of high load factor. In order to meet the conditions of the contract it becomes necessary to totalize at every instant the whole load being taken into the railway system at the substations located at Taunton, Cedar Falls, Renton and eventually Tacoma. This load must be totalized in such manner that it can be measured by a maximum demand meter with a five-minute interval, as well as indicated and recorded. Also, in order to prevent the peaks of load usual to railway service from penalizing the road in additional power cost, the voltage generated at the substations is reduced automatically when the



MAP OF PART OF C., M. & ST. P. R.R. SHOWING NEWLY ELECTRIFIED SECTION

total load reaches such proportions that the nominated maximum demand is in danger of being exceeded. The result is a smoothing out of the load curve of the system by slowing down trains during the peak and spreading some of this load over the valleys of the curve.

Equipment for the substations is being supplied by the Westinghouse Electric & Manufacturing Company and the General Electric Company. Each of these companies has taken special precautions to guard against the occurrence of flash-overs on the direct-current generators at times of short-circuit on the 3,000-volt system. The substations whose equipment is supplied by the General Electric Company are provided with high-



AT LEFT, HIGH-TENSION ROOM IN CEDAR FALLS SUBSTATION. AT RIGHT, MOTOR GENERATOR ROOM

speed circuit breakers with a view to opening the circuit before the current has had opportunity to build up. The machines furnished by the Westinghouse Company are protected by the "flash suppressor," a device developed especially for this electrification.

## Powdered Coal Plant at Seattle

**Following Extensive Experiments the Puget Sound Company Installed 4,100-hp. Plant — Well Arranged Equipment Increases Economy and Efficiency**

THE Puget Sound Traction, Light & Power Company, Seattle, Wash., installed in one of its boiler plants, used for steam heating purposes, a complete equipment for burning pulverized coal, following the experiments described in the issue of the *ELECTRIC RAILWAY JOURNAL* for May 19, 1917. Fuel oil was previously burned in this plant, but the presence of a 225,000-ton culm heap near by, and the possibility of effecting considerable economy by utilizing it, induced the company to install a pulverizing and drying plant. The culm is from Washington lignite coal which has a fuel value of about 9,000 B.t.u. with 18 per cent moisture and 16 per cent ash. The culm itself contains 7,300 B.t.u. with moisture of 25 per cent, volatile matter 28 per cent, fixed carbon 26 per cent and ash 20 per cent. It costs \$1.80 per ton f.o.b. the raw-coal bunkers.

Briefly the equipment may be divided into several parts, namely, that for handling raw coal, that for drying, that for pulverizing, that for burning and that for handling the ashes.

There are three wooden raw-coal bunkers, lined with galvanized iron, of a total capacity of 725 tons. The raw coal passes first through a gate and an auxiliary hopper (provided to prevent clogging) to a Mead-Morrison crusher, next by way of a belt conveyor to a bucket elevator, thence to a raw-coal flight conveyor, which distributes it over the bin provided for raw crushed coal. The capacity of the plant to this point is 75 tons per hour.

The 325-ton crushed coal bunker is of reinforced concrete. It branches into two hoppers with 10 in. x 5 ft. discharge openings in the bottom. From these 30-in. apron feeders convey the coal to dryers through 10-in. pipes, so arranged that either or both of the two dryers can be used. In these pipes are lines of paddles, motor-driven, to insure continuous flow. One horsepower is required for the set of paddles in each pipe.

The two dryers are of the indirect-fired rotary type, one of 7 tons and the other 10 tons capacity per hour. Induced draft for these is provided by two Sirocco fans, each driven by a Terry steam turbine. These fans discharge through cyclone separator heads. The dryers discharge into a dry-coal elevator, through magnetic separators which take out iron scrap. Thence the coal is distributed by means of a 12-in. screw conveyor over a dry coal bin through eight steel extension spouts. The dry-coal bunker is of reinforced concrete, with a total capacity of 160 tons. It is divided into four hoppers.

The pulverizing mill equipment comprises four Fuller-Lehigh 42-in. mills and one Raymond mill, the total capacity being 16 tons per hour. Each mill requires a 75-hp. motor. From the mills the spouts lead to a 12-in.

screw conveyor and the powdered coal passes over an elevator to another 12-in. screw conveyor, leading to the bins above the boilers.

No cyclone separators or dust collectors are used with the Fuller mills, but the excess air is removed by a small induced draft fan, and is fed directly to the furnace. From the Raymond mill a large exhaust fan, driven by a 30-hp. motor, drives the air through a cyclone separator, from which the discharge leads to the above mentioned screw conveyor. There is also a small pressure relief fan connected to the separator to prevent accumulation of pressure.

As previously mentioned, a screw conveyor leads to the bins over the boilers, and across this are four 12-in. conveyors, each driven by a 5-hp. motor, feeding a bin of 16 tons capacity. Connecting with the bins are twenty-two screw-conveyor feeders. After experiments with several types of feeder, it was found that for the local conditions the Santmyer feeder was best and this is now used throughout.

Air for the feeders comes from two 50,000-cu.ft. Sirocco fans and two 3,000-cu.ft. Sturtevant fans, the latter being used for individual feeders. The feeders are driven by 1½-hp. Crocker-Wheeler motors.

The burners are especially designed elbows with three openings, one for the fuel, a smaller one for the air feed and a third for the discharge.

In adapting the boilers for the new fuel supply, Dutch ovens were added so as to give ample combustion chamber space. Ash crushers were installed also and a drag-chain conveyor was provided to transfer the ashes to an elevator which raises them to the ash bin.

The culm is loaded at the mines directly into coal cars by means of a Bagley scraper. It is delivered to the storage bunkers at night, two additional men being furnished to help the train crew in unloading the cars. One man takes care of the raw coal equipment, coal being transferred from the storage bunkers to the crushed coal bunkers sufficient for the twenty-four-hour run during an eight-hour shift. One man looks after the feeders supplying the dryers which, owing to the higher temperatures of the discharge, tend to clog up. Another man operates the dryers and mills. He has an assistant to look after the distribution of the dry coal and pulverized coal in the bunkers above.

Both mills and dryers are operated continuously. Pulverized coal is used as a fuel for drying, approximately one ton of pulverized coal being burned to dry twenty tons of raw coal.

The water tender takes care of feeders, which are regulated by controllers located on the boiler room floor. The machinery is kept in operating condition by an oiler. Two helpers keep the tubes clean by operating the soot blowers and a special steam jet inserted through the front of the setting. This operation is performed at 4-hour intervals. In addition to this the men also blow down the tubes.

Three additional helpers remove the ashes from the dryer settings, clean the combustion chambers when necessary and remove the ash deposits back of the bridge wall at regular intervals. This deposit is wetted down in the setting to facilitate handling and to avoid spreading of the dust. One cleaning a week is sufficient to take care of this deposit. The slag accumulating on the sides of the combustion chamber is removed at intervals varying from six to ten weeks.

The ash falling into the pit below is removed with

long rakes. The ashmen look after this work, while the third operates the drag chain and ash elevator and feeds the ash crusher. The ash in the pit consists of slag and powdered dust. The slag is pulled out near the door and cooled off with a stream of water. When sufficiently cool, it is pulled out under the runway in front of the ash pit where it is again drenched to speed up the cooling, after which it is fed to the crusher.

The above information is taken from an article in the *Stone & Webster Journal*, where additional details can be found.

## Association News

### Mr. Henry to Head Washington Office

W. V. HILL has resigned as manager of the Washington office to resume his duties as manager of the California Electric Railway Association, and Charles L. Henry, president Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., and chairman of the committee on national relations will take over the active supervision of the affairs of that office. The office will be open continuously and all communications pertaining to matters of federal legislation, the Interstate Commerce Commission, or other federal departments or bureaus, addressed to Charles L. Henry, chairman committee on national relations, American Electric Railway Association, 950 Munsey Building, Washington, D. C., will receive prompt attention.

The Washington office is equipped to act as agent before the Interstate Commerce Commission for companies requiring this service and such companies as are not so represented or who desire to make a change in their present arrangement should communicate with Mr. Henry at Washington for the necessary authorization blanks. There will be no charge for the performance of this service other than a documentary tax of 25 cents required by the government and cost of telegrams or other unusual service involved.

Executives and others connected with member companies having business in Washington are urged by Secretary Burritt to make the Association's rooms their headquarters.

### Information Bureau Activities

DURING February the following very considerable group of special reports and compilations was prepared by the association information bureau under the direction of its special engineer, J. W. Welsh:

*Typical Exhibits of Electric Railways Used in Settlements of Wages and Working Conditions:* This is an outline of a typical wage arbitration case, showing the essential elements, a brief statement of arguments and a number of actual exhibits used by member companies recently in the presentation of such cases.

*Confidential Information Concerning Wages of Trainmen:* Supplement No. 1 to bulletin No. 122, dated March 1, 1920. This supplement follows the plan of the original bulletin, showing the name of the company, miles of track, wage rates for each period of service and the dates of establishment and expiration of the scale.

*Practice of Electric Railway Companies in Adjusting With Shipper Shrinkage in Coal Received by Boat or Rail:* In

response to a request by a member company, a questionnaire was sent to a limited number of companies to determine their practice in allowing for shrinkage in the weight of coal as shown by bill of lading and as actually measured on receipt.

*Elements Entering Into the Determination of Fair Value of Public Utilities, Dated February 10, 1920:* This is an appendix to a former compilation on "Official Valuation of Electric Railway Properties" and is based on extracts from decisions of courts and public service commissions.

*Recent Decisions of Public Utility Commissions, Regarding One-Man Car Operation, Dated February 19, 1920:* This is a compilation of abstracts of decisions and orders of public utility commissions regarding the operation of one-man cars.

*Rentals Paid by Electric Railway Companies for High Tension Lines and Cables Over Bridges, Dated February 17, 1920:* This report was prepared in response to a request by a member company and is based on replies received to a circular letter sent out by the association to a limited number of companies.

*Effect of Increased Rates of Fares in Cities Having a Population Under 100,000, Dated February 16, 1920:* This compilation is supplemental to the one reported last month which covered companies operating in cities having a population over 100,000. It shows the results for 57 companies.

*Effect of Increased Fares for Companies Operating in Interurban Service, Dated February 16, 1920:* This report covers a total of 28 companies.

*Summary of Cities of Over 25,000 Population in Which the Fares Have Not as Yet Been Increased, Dated February 19, 1920:* This shows the population, the operating company, present rate of fare and details as to pending applications.

*Bibliography on Motor Bus Design and Motor Bus and Jitney Costs, Dated February 19, 1920.*

Copies of the above will be sent to member companies upon request.

### Some Safety Precautions in Winding Armatures

IN A RECENT issue of the *Safety Bulletin*, issued by the Bureau of Safety, Chicago, some precautions are enumerated which can be advantageously employed by armature winders. Among these precautions are the following:

Never allow water to drop into hot solder or babbitt metal.

Never stand directly in front of a banding lathe, where a banding wire is apt to strike you if it breaks.

Goggles should be worn when banding armatures and when slotting or turning commutators. A neat guard with an adjustable glass screen can sometimes be added to a slotting machine to prevent copper chips from striking the eyes.

Do not allow insulating paints that are mixed with alcohol, naphtha or other inflammable liquids to be poured from cans while near furnaces or torches. A 5-gal. can with about one quart of shellac in it exploded while a young man was shaking it within a few feet of a furnace. The explosion caused severe burns on his face and arms, and had it not been for the shopmen present, these might have proved more serious, if not fatal.

Make sure that the tailstock of the lathe is secure before starting to turn a commutator. Watch carefully the condition of slings, hooks or chain tackles and make certain that armatures are properly balanced so that they cannot slip.

Gears on turning lathes or field winders should be properly guarded.

Remember that fooling, horseplay or practical joking has no place in the armature room. Neglect of this will lead to accidents, poor standards of work and general demoralization of an otherwise efficient force.

## Recent Happenings in Great Britain

### Railway Wages Arranged — London Wants Four-Track Lines — Practically All Municipal Roads Have Raised Fares

*From Our Regular Correspondent*

The railway trouble is over. On Jan. 15 the negotiating committee of the National Union of Railwaymen accepted the terms as to standardized wages offered by the Government substantially in the same form as that in which they had originally refused them. The leaders of the men succeeded in persuading the latter to accept the Government proposal, but the course was adopted by only a very narrow majority.

#### SLIDING WAGE SCALE

The standard wage in each grade is to be the average of the pre-war rate of grade plus 33s. war bonus plus 5s. A sliding scale is adopted by which wages move up or down by 1s. a week after September next as the cost of living goes up or down five points from 125 per cent above the pre-war rate. Should the cost of living fall to the pre-war rate, wages will never fall below double the pre-war rate. This settlement, along with the scheme of the Wages Board's, which I explained in my last article, should go far to prevent trouble in the future. Before the war the railway wages bill amounted to £47,000,000 a year. It will now come to £110,000,000.

A remarkable suggestion was made on Jan. 16 by Lord Ashfield (before his elevation to the Peerage, Sir Albert Stanley), chairman of the London underground railways. Speaking at a gathering of the London American Luncheon Club on the problems of traffic congestion in the metropolis, he threw out the proposal that not only should additional underground electric railways be constructed, but also that underground roads should be made, to be devoted exclusively to the use of fast automobile traffic, and connected in the outer districts with boulevards.

In dealing with the need of greater facilities for transportation, Lord Ashfield pointed out that a population of about 8,000,000 has to be dealt with over an area having a radius from the center of London of 20 to 25 miles. Not only is London the most populous, but it is the greatest riding city in the world. In 1914 the number of journeys per head of population was 303, while now it is 393 per annum. In reference to his proposal for more underground railways, he thought they should be brought up more to the standard of those in New York where there were local and express services.

#### UNIONS SUPPORT FARE BILL

The executive of the National Union of Railwaymen, contrary to the latitude of other trade unions, decided early in February to support the Parliamentary Bill of the London underground railway companies for an increase of fares. The N. U. R. sees that without the increase the under-

ground companies will not be able to pay the higher wages under the recent agreement.

Some figures submitted by C. Owen Silvers, general manager of the Wolverhampton Corporation Tramways, to the Town Council in regard to fares indicate pretty clearly what has been done generally in England. A proposal was brought before the Council to reinstate the 1d. fare for short-distance journeys, but acting on the advice of the manager it was decided to adhere to the increased minimum of 1½d. Mr. Silvers stated that the running costs of the Wolverhampton cars were 6.651d. per car mile in 1913-14, but in 1918-19 they amounted to 12.366d. People, he said, seemed to have realized that in everything except tramway fares 2d. was now required where 1d. was enough in pre-war times. He found from returns he had received that fares had been raised on practically all the municipal tramway undertakings in the kingdom, and that the 1½d. minimum was now the usual practice.

#### EXTENSION OF PARCEL SERVICE

A good many of the British tramway undertakings have for several years carried on a parcel service successfully. In Leeds a new arrangement has now been adopted for the carrying of market produce on the cars. Suburban retailers make their purchases in a central market early in the morning, and they have hitherto taken their parcels with them on the ordinary cars, paying for them at the time they paid their own fares. Under the new arrangement the traders have to take their packages to a weighing machine in the market, where a tramway employee is in attendance to weigh and stamp the packages. The car conductors do not accept the parcels unless they have been stamped.

On the occasion of the amalgamation of the Metropolitan Carriage Wagon & Finance Company, with Dickers, Ltd., Mr. F. Dudley Docker, chairman of the former company, was presented by the shareholders with an illuminated address and a sum of money for the creation of scholarships at Birmingham University bearing Mr. Docker's name, to be competed for by employees of the Metropolitan Company, in subjects selected by him. The subscribers numbered about 1,100. Mrs. Docker received miniature portraits of herself and her husband mounted in gold. Mr. Docker occupies one of the most prominent positions in the British manufacturing world. He is a leader of the British Industries Federation.

The lorry omnibuses which had begun service in June last year were finally withdrawn from the streets of London in the end of January. Owing to the large number of omnibuses which

had been sent to France for the purposes of the war and owing to the impossibility at the time of obtaining new ones, the London omnibus traffic became very congested. The War Office placed at the disposal of the London General Omnibus Company a number of military motor lorries. These were fitted for bus purposes by providing cross seats, an overhead canopy, and a door and steps at the rear. These vehicles reached a maximum number in service of 176 last November. They were never popular, though they eased the situation, because their springs were made to carry three tons, while the weight of the twenty-six passengers each could carry was only about a ton and a half. The company found that the working expenses exceeded the revenue by no less than 5d. per mile run, partly owing to low receipts and partly to high petrol consumption. Regarding the latter, the best result that could be got was 5½ miles to the gallon, compared with 7 miles in the case of the ordinary omnibus, which carries 50 per cent more passengers. The company has got so many buses back from France it can now dispense with the use of the lorries.

The interesting statement was made at a meeting of the London County Council in the end of January that the average speed of the Council's cars is higher than that of the cars in any other city in the kingdom. In view of the great congestion of general traffic on many of the routes, this achievement is highly creditable.

#### EDINBURGH BUSES SATISFACTORY

Not long ago the Edinburgh Town Council as an experiment began running a service of five motor omnibuses as supplementary to the tramways. The plan has proved so satisfactory that it is now proposed to purchase thirty additional omnibuses at an estimated cost of £55,000. The tramways, which are still worked by cable traction, are congested owing to increase in the number of passengers.

Disaster fell on the English Electricity (supply) bill during December. So much opposition developed to it in the House of Lords that the Government dropped the part opposed till next year, when there will be more time, and proceeded only with the part on which there was general agreement. There has thus been cut out of the bill all the compulsory powers for the establishment of district electricity boards and for the acquisition of generating stations and main transmission lines.

The financial provisions have also been deleted, except one for an expenditure up to £20,000,000 for the erection of power stations and transmission lines. The part of the bill remaining provides for the establishment of a body called electricity commissioners, and the exercise through them of present powers and duties of the Board of Trade under the Electric Lighting Acts, with power to the commissioners to conduct experiments, and power to set up advisory committees.



# News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

## Sliding Scale for Toledo

New Service-at-Cost Measure Provides for Added Return to Company for Efficient Operation

The service-at-cost ordinance drafted by a commission appointed by Federal Judge John M. Killits for settlement of the railway problem at Toledo, Ohio, will be submitted to the City Council for preliminary action on the evening of March 8. Council hopes to have the proposed ordinance ready for a referendum in connection with the presidential primaries on April 27. A month's notice must be given before the election.

### SOME SLIGHT MODIFICATIONS

The commissioners met during the week ended March 6 for the first time since the measure was submitted to Henry L. Doherty two weeks ago. Mr. Doherty has sent no reply yet. The commissioners heard the written reports of six lawyers who scanned the measure for technical errors and have since adopted a few new principles to go into the franchise ordinance.

Those who drew up the franchise have decided that it should contain a provision for a premium in the form of increased rate of return for economical operation of the system by the company, which will take over the traction business when the ordinance is adopted by the people. This premium is to consist of a one-quarter of 1 per cent increased return on the capital value for each half cent the rate of fare is lowered. Figured on an estimated capitalization of \$10,000,000 and 60,000,000 riders annually, this would mean that the car riders would be saved \$300,000 for each \$25,000 the company receives in the way of increased return.

Chairman W. L. Milner, of the commission, declared such a provision would make the securities of the company more saleable and in that way help the financing of the railway. It was agreed that the increased return should accrue to the stockholders. With low fare and consequent high rate of return the stock would sell above par, the commissioners believe.

### MAXIMUM FARE PROVISION RETAINED

The maximum fare provision will be kept in the ordinance to win the popular support necessary for the adoption of the measure. Some commissioners believed it would be possible to eliminate the maximum fare provision with the premium on economical operation incorporated in the ordinance.

Mr. Doherty has never yielded on the maximum fare objection which he registered with the commissioners some time ago. This and the valuation ques-

tion are the only major issues not definitely decided.

The commissioners also considered the cost of current which will be bought from the Water Street power station and the Acme Power Company, both Doherty properties. It is understood that the Acme plant does not come under the authority of the Public Utilities Commission as it sells power only to the Water Street station and other commercial users in Toledo. The commissioners will probably make the Acme Power Company a party to the contract in the ordinance and in that way secure the rate-fixing restrictions imposed by the Public Utilities Commission.

The ordinance must be passed by Council not later than March 22 if it is to be submitted at the presidential primary election.

The decision of the Supreme Court on the municipal ownership test case is expected soon. If it is favorable to public ownership and is received in time another ordinance providing for the bonding of the general tax duplicate for the purchase of the traction system will be submitted to the voters.

## Franchise Extension Refused

The application of the Hudson & Manhattan Railroad, New York, N. Y., for another extension of time in which to begin building its line from Thirty-third Street and Broadway, its present terminus, to the Grand Central Terminal, was denied on Feb. 28 by Acting Transit Commissioner Daniel L. Ryan.

It was the seventeenth time the company had asked for an extension, and it will be the last, for the reason that its franchise expired on Feb. 29 and its options of real estate has lapsed. It cannot proceed with the work now without obtaining from the Board of Estimate another franchise. It was said that this would probably be denied by the board, for the reason that it would be deemed unwise to advance any project that would compete with city-owned transit lines.

The plan of the Hudson & Manhattan Company was to reach the Grand Central Terminal by extending its line to a point at or near Sixth Avenue and Fortieth Street, then running under Bryant Park to a point near Fifth Avenue and Forty-second Street, to a terminal under the latter street between Madison and Lexington Avenues.

Fear that the proposed extension would restrict the development of the city-owned lines was one of the reasons why property owners in the borough of Manhattan opposed the proposed extension.

## Denver Arbitration Closed

Decision Expected Soon by Board Which Has Been Considering Wage Question

Indications pointed on Feb. 24 to a decision being reached very soon, by the board which has been considering the question of pay for the employees of the Denver (Col.) Tramway. Commencing on Jan. 19 public meetings were held by the arbitration board in the Council Chamber. Final argument was made on Feb. 10. Since then the arbitration board has held numerous conferences for the consideration of the data and the evidence submitted.

The demands of the men were made on Nov. 19, 1919, to a local board of arbitration under the agreement of Sept. 4, 1919, between the company and the union. The trainmen want an increase from the National War Labor Board award of 43 cents the first three months, 46 cents the next nine months and 48 cents thereafter, to 60 cents the first three months, 65 cents the next nine months and 70 cents thereafter with corresponding increases for the employees in the other departments, also time and a half for overtime, and changes in working conditions. The board of arbitration consists of two members, one appointed by the company and one by the union. The company's appointee was William G. Evans, former president of the Denver Tramway, while William C. Thornton, general agent of the Continental Life Insurance Company and also identified with local labor circles, was selected by the union.

The failure of the two members of this board to come to an agreement regarding the questions at issue and also regarding the selection of a third arbitrator led to intervention by the State Industrial Commission, which assumed jurisdiction on Dec. 29 in the effort to avert the possibility of a cessation of service.

Through the efforts of the Industrial Commission Hamilton Armstrong, chief of police of the city of Denver, was agreed upon as the third member of the Arbitration Board, the appointment being accepted by him and the Board completed on Jan. 13.

The railway is now collecting the 6-cent fare authorized by the municipal authorities during November, 1919. This ordinance, which contains no time limit, was passed by the municipal authorities following the defeat at a special election held on Oct. 22, 1919, of the tramway measures which were on the ballot and the subsequent expiration on Oct. 29, 1919, of the second 6-cent fare ordinance which had been granted. This last measure was limited to ninety days.

## Detroit's Battle on in Earnest

### Opposing Forces Line Up in Fight on Piece-Meal Railway Construction by City

As the date set for voting on the \$15,000,000 bond issue for financing Mayor Couzens' proposed municipal railway system in Detroit, Mich., approaches, both parties to the controversy, the Mayor and his followers in favor of the plan and the Detroit United Railway officials who oppose it are taking advantage of all possible opportunities to express their views to the taxpayers.

#### CAMPAIGNING BEGUN

Either the Mayor or his adherents in the matter are appearing daily before different organizations to discuss the issue and clear up points of doubt in the minds of the car riders who will decide the question on April 5.

The Detroit United Railway officials are endeavoring to justify the company's conduct in the matter of providing extensions by reviewing conditions as they have existed in the past years. The company's views are being expressed through its official weekly publication and by paid advertisements in the local papers.

The greatest organized opposition to the municipal ownership plan was expressed at a meeting of the street railway men's union, Division No. 26 of the Amalgamated Association, when a resolution was adopted denouncing the Mayor's plan as a piece-meal experiment sure to result in a useless duplication of equipment, shops and machinery, and "in confusion and inconvenience to the car riders rather than improvement and relief." The declaration was made by the railway men that the service-at-cost plan will solve the problem if properly put into operation.

The proposed bond issue for piece-meal construction is opposed as a waste of time and funds and the entire membership of the organization will be called upon to oppose the Mayor's proposition and to work for its defeat until the date set for voting upon the question.

The Detroit United Railway maintains that it has built in the city of Detroit every foot of railway tracks that the city authorities would allow it to build and when restrained from building in the city, went outside the city and by outside authority built many miles of railways later included in the city and one-fare zone when the city limits were extended.

#### COMPANY RETURNS TO THE ATTACK

Admitting that the city is short on railway service and reviewing past circumstances including the World War, instructions from city authorities to avoid construction in Detroit pending the popular vote on municipal ownership in 1915, and similar conditions in 1919 when another like vote was taken, the company maintains that it is unfair for those who have prevented it from extending service to now make

inadequate service the sole basis of attack.

In discussing the bond issue the company's publicity department points out that Detroit's municipal pot is shy in many ways, including schools, watermains, municipal lighting plant, police department, and even jails.

The cost of construction of the proposed piece-meal system, if approved by the city, will not come out of the taxes, as all construction costs will be met by the sale of bonds issued against the faith and credit of the city itself. The city charter provides that "the faith, credit and property of the city of Detroit shall remain pledged for final payment of all bonds issued and of all moneys borrowed by authority of, and in accordance with this charter or any act of the legislature of this state."

If, however, by any chance or under any circumstances enough money does not come in from railway operation, resulting in deficits, even though the fares were boosted again and again, the bonds will be paid because they are bonds upon the entire city and taxpayers' money is used to pay bonds.

Commenting favorably upon the Mayor's plan, and branding the claims of the railway as false, the supporters of the plan advanced no argument with the man constitutionally opposed to municipal ownership as long as his opposition is based upon facts. The four-to-one vote in favor of the municipal ownership charter proves these opponents are a small minority.

#### WHY PREVIOUS PLANS FAILED

One objection to previous settlement plans was that more service was not provided. The present plan is supremely a service-at-cost plan providing 100 miles of new tracks and 550 new cars at once.

The Mayor's plan involves no contracts with the Detroit United Railway, thus eliminating objections of those who feared the expense and trouble which would come from entering into contracts with the private company. As it is intended to take advantage of the right the Supreme Court gave the city to oust the railway from Fort and other streets where franchises have expired, another objection to previous settlement plans has been met.

The fourth objection was to the purchase of the Detroit United Railway's equipment at a price either too high or not definitely determined. This objection is met by the present plan inasmuch as the purchase of new cars and equipment will make the purchase of the company's cars unnecessary.

Meeting the objection that municipal ownership is not efficient, that it does not give service, city officials state that in the last ten years municipal authorities have increased sewerage systems 50 per cent, increased mileage of paved

streets by 80 per cent, increased mileage of watermains by 90 per cent, all at the cost of construction, while in these ten years when the population of the city has increased more than 100 per cent the Detroit United Railway has increased its service a meager 25 per cent.

It is also maintained that the city can borrow money to build and equip 155 miles of new trackage at 4½ per cent or 5 per cent where the Detroit United Railway would have to pay 10½ per cent to get the money to build similar lines, thus providing a saving annually of \$900,000 in interest charges alone.

Mayor Couzens has sounded the warning that if the proposed plan does not go through it will be years before the much needed car line extensions, some 200 miles in extent, can be built and that they may never be built. A private company cannot build the needed extensions without a vote of the people. Either a vote is required or the lines must be built on a day-to-day agreement and the company says it cannot finance a day-to-day agreement.

#### MAYOR SOUNDS WARNING

Detroit can expand only if it gives proper transportation to its workmen. Something must be done to remedy present traffic conditions and the Mayor's claim is that Detroit will not get anywhere by relying on private capital while his proposed plan means development and progress for the city. He has also sounded the warning that only four out of every ten voters need vote against the plan to kill it.

#### Seeks to Reduce Paving Cost

An agreement has been reached by the San Diego (Cal.) Electric Railway, the City Council of San Diego and the California Railroad Commission to permit the railway to try out a crushed rock paving on streets where traffic is not as heavy as in the business district of the city.

According to specifications submitted by the railway company's engineers, the new paving is to consist of a layer of coarse crushed rock, with a surface of finely crushed rock, but no cement is to be used with it as a binder. Concrete curbs will be laid to hold the paving in place.

Reed Dilworth, general counsel for the railway company, stated at the conference that it was impossible for the company to put down the regular asphalt pavement because of financial conditions at this time.

Engineer Sachse of the Railroad Commission stated that a pavement similar to that proposed to be used in San Diego was put down between the tracks of the "Key Route" between Oakland and Richmond.

Engineer A. Ervast of the San Diego Electric Railway refused to give out for publication any figures as to the relative cost of the proposed paving, saying that such figures would be available only after an experimental section had been put down.

## Commissioner Paints a Drab Picture

### Legislature Hears That More Than One-Third New York City Mileage Is in Hands of Receiver

Lewis Nixon, Public Service Commissioner for the First District, of New York on March 2 submitted a special report to the Legislature upon the traction situation in New York City in response to a concurrent resolution passed in January. The report is in a pamphlet of seventy-seven pages, which are summarized in certain general conclusions.

#### SUBWAY ALONE PROFITABLE

Mr. Nixon holds that the Interborough subway if operated alone can very probably survive under the present rate of fare, but that the Interborough system, including the Manhattan Elevated line, can avoid a receivership only by a subordination of the investment interest charges or through securing additional revenue.

Mr. Nixon also holds that it is doubtful if the New York Consolidated Railroad which operates certain city subways in connection with the Brooklyn Elevated road, can continue at the present rate of fare under existing contracts and pay interest on municipal and company bonds. As to the surface lines, both those in Manhattan and other boroughs, he expresses the view that they must either have more revenue or that their deterioration, disintegration and further suspension of service may be expected to continue.

The commissioner suggests a plan of reorganization of all the companies into one company for the entire city, or, if that is not possible, one large company with a single management in the area now served by the Interborough Rapid Transit Company, and one for the area served by the Brooklyn Rapid Transit Company. He says a simple increase of fare without corresponding concessions from the companies should not be considered under any circumstances. Perpetual franchises for surface lines should be abolished and a proper form of indeterminate franchise substituted. The securities should be refunded and based in amounts upon a fair appraisal of the properties and amortization should be provided to vest title in the city after a certain term of years. A flexible cost-of-service fare should be established, controlled by a surplus fund and consideration should be given to the remission of taxes and paving charges, because all expenditures are reflected in the fares charged.

#### SUGGESTS EXPERIMENT WITH FARES AT COST

The commissioner suggests the tentative establishment for six months of such a cost-of-service fare, the receipts from which should be used only for cost of operation and maintenance, and not one cent for dividends of any nature. Accounts should be kept of receipts and expenditures for the first four months and these subjected to an analysis to be completed within the six months, after

which time the fare for the next six months could be determined.

Mr. Nixon says the reorganization plan should include the modification of the dual subway contracts. The provisions for preferential payments to the companies under these contracts should be opened and a fair adjustment made after full investigation. The revenues from a cost-of-service fare on rapid transit lines should be sufficient to meet the contract requirements for the payment of interest and sinking fund on the city's rapid transit bonds, or at least on a substantial portion of them, so that they may be relieved from the operation of the debt limit.

After explaining the different methods of ownership of the various lines, the report reads:

As the result of corporate extravagance in the past and municipal inaction, the city of New York is now reaping a whirlwind in transportation shortage, bankruptcy of companies, disintegration of long-established and efficient systems into less effective units, double and in some cases triple fares resulting therefrom, the absolute stoppage of several important lines, and the ever-present threat of further demoralization and bankruptcy.

The consequences of this policy of inaction may be seen today in the deplorable conditions existing, of which the following is a summary:

Street railroad trackage abandoned and service discontinued, 77.82 miles.

Street railroad trackage cut off from parent systems and now operated separately under additional fare, 266.22 miles.

Nine operating companies in the hands of receivers, representing a total of nearly 700 miles of track—more than one-third of the total trackage in the city. (Two of these receiverships, namely, the Second Avenue and the Manhattan and Queens companies, with 44 miles of track, antedate 1918.)

Combined deficits of street railroad companies for the fiscal year ended June 30, 1919, \$8,083,820, which shows the companies worse off by \$13,350,346 than the year before.

Deferred maintenance already amounting to \$6,000,000, and consequently growing, which will have to be made up if the property is to be kept in condition.

About 1,575 free transfer points abolished, 1,500 in Brooklyn and 75 in Manhattan.

Tremendous shrinkage in values of street railroad securities, entailing heavy losses to investors.

The companies' distress is the city's opportunity. They will, they must make concessions to the city in return for permission to raise rates, and if the municipal authorities would enter into negotiations to that end I feel confident that the situation can be saved with satisfaction to the carriers and with profit to the city.

The report says that if the Manhattan Elevated Railway still serves to drag the Interborough down the latter may fall into the hands of a receiver in June.

## P. R. T. Accomplishments Reviewed

### Relations Between Philadelphia Rapid Transit Company and Its Employees Described in Year Book

The record of accomplishment of half a decade of co-operative management is summed up in the 1919 Year Book of the Co-operative Welfare Association of the Philadelphia (Pa.) Rapid Transit Company. The book, which was published recently, is a profusely illustrated pamphlet, and in its forty-odd pages one catches a glimpse of the "Philadelphia plan" in action.

#### FEATURES OF PLAN WELL KNOWN

The essential features of this "Philadelphia Plan" are too-well known to make their repetition necessary beyond a bare outline. The scheme was worked out by Thomas E. Mitten shortly after he became president of the Philadelphia Rapid Transit Company. Briefly, it provides for settlement of wage and other disputes between company and men through an employees' organization, the Co-operative Welfare Association. Wages are regulated by the average pay for the same kind of work prevailing in four other cities.

The 1919 Year Book contains the minutes of the association's annual mid-winter meeting and the speeches made at the president's dinner on Sept. 4 last and at the association's picnic and "get-together" meeting, held on Sept. 3 and 4. At the mid-winter meeting, held on Dec. 27, 1919, the officers of the association and the committee chairmen submitted their reports. George W. Jackel, president of the association, announced that the membership included more than 99 per cent of the company's employees.

The beneficial results which the organization has accomplished in the direction of stimulating good will between the company and the public, are well brought out in the talks of prominent Pennsylvanians who addressed the meeting. W. D. B. Ainey, chairman of the State Public Service Commission, said, speaking of service-at-cost:

But there is one fundamental weakness in all these plans, which leads me to say to you, that you have gone a step further than any other plan that I have heard of, or seen, in the solving of street railway problems, and that is, you have, by your plan of co-operation, solved all the points of difference that sometimes come up between management and labor.

Coming down on the train this morning from Harrisburg, discussing street railway problems casually with a gentleman with whom I was sitting, we adverted to your Philadelphia Plan. I am going to tell you that I made this remark, that the focal point which has lifted the P. R. T. system above many others of the country, is the work that you gentlemen of these committees have done in your co-operative efforts to make the management a success.

So I, as a member of the Public Service Commission, interested in the success of all the utilities, am very proud of your efforts, because you are enabling this company to serve this locality and be the kind of a carrier and public service body that the Commission at Harrisburg is anxious to see engaged in all lines.

Hon. Samuel M. Clement, Jr., Commissioner, Public Service Commission of Pennsylvania, said in part:

I want to say to this audience that Governor Sproul, Mayor Moore, City Solicitor Smyth, and every other prominent man in this room today—real, full-blooded Philadelphians—all are mighty proud that there is one organization in the United States where labor and capital can get together and work for the welfare of humanity as you men are doing. You are doing a wonderful work, and there is not a Bolshevik in the audience—not one. If you keep up the work that you have done,

Philadelphia will have something to be proud of. I do not care so much about the rate of fare—I care more about the contentment and the happiness of the people of Philadelphia that you represent.

Mayor-elect J. Hampton Moore of Philadelphia, said:

I have witnessed here today in the few brief moments that I have been in this hall a picture which I shall not forget. It is so different from some of the pictures I have seen in days gone by in the City of Philadelphia. How many of you recall the early strike troubles, way back in 1888 and 1889, when the men, finding they could not exist decently upon the wages paid, when they were receiving less than 20 cents an hour, finally determined upon the force of the strike to obtain what they claimed at that time was justice? I remember those days, the cars tied up, men out all over the city, and finally, under the benign influence of the compromise and the conference, going back with better pay. We can decently contrast that condition, less than 20 cents an hour, with the rather remarkable statement made by Mr. Mitten today, that the maximum rate is 58 cents an hour, a percentage of increase that is a great credit to the officers and management of this company. That explains why, instead of having Bolsheviks, anarchists and rioters in the City of Philadelphia, we have now a peaceful co-operation, between the traction company and its 10,000 employees, that is a model for the rest of the country.

Governor William C. Sproul of Pennsylvania was also among the speakers. He paid a tribute to the association's work in these words:

I am glad to have an opportunity of testifying to the appreciation we have of the good effect that this plan is having on the rest of the State.

I know a great many of the men who work on the cars here in Philadelphia, went to school with a good many of them and see them every once in a while. Let me say that they are better qualified, better appearing, better looking generally, and more courteous and attentive, than any people that I know of anywhere in service in the other cities of the country.

### Arbitration Agreement in Atlanta

An agreement for 1920 has been reached between the Georgia Railway & Power Company, Atlanta, Ga., and a committee representing the railway union. Every point at issue is covered in the agreement except the question of hourly wages. This question will be submitted to arbitration. Luther Rosser will represent the company and Madison Bell the union. A third member of the board of arbitration will be chosen by these two.

Preston S. Arkwright, president of the company, would not give out the details of the contract. He stated, however, that the "closed shop" is not included in the new agreement. All matters referring to the relations of the members of the union to the company and the operation of the company's cars in Fulton, DeKalb and Cobb counties were fully agreed upon by both parties, with the exception of the straight hourly wage.

On Feb. 26 Mr. Bell submitted the name of Mayor James L. Key as the third member of the board of arbitration to act as umpire, but Mr. Rosser declined to accept him. This resulted in the employees calling a mass meeting on the night of Feb. 27 which was attended by more than 1,000 union men, most of them railway employees. At 3:00 a.m. on Feb. 28 a motion to strike was presented at the meeting, but the appeals of the executive committeemen

had the desired effect and the men finally agreed to let the matter rest until an umpire is named and board of arbitration can meet to settle the wage matters.

Mr. Rosser refused to accept Mayor Key as umpire because the Mayor has been more or less hostile to the company in the past.

### City Threatens to Seize Railway

Corporation Counsel Burr of New York announced on March 4 that unless the Interborough Rapid Transit Company improved its service greatly on the subway lines within ninety days steps would be taken for the seizure and operation of the property by the city. The announcement followed instructions to Mr. Burr by the Board of Estimate on March 3 to take action to deprive the New York Railways of its franchises for failing to furnish adequate service.

In reference to the subway lines, Mr. Burr said he would call upon the Public Service Commission and insist that the terms of the Interborough Company's contract with the city be lived up to. He explained that a clause in the dual subway contract provides that the Interborough Company shall furnish adequate service, and that if it fails to do so, and the warning of the city is disregarded for ninety days, the city could take over the lines and either operate them itself or turn them over to an operating agency.

On March 1 Public Service Commissioner Lewis Nixon issued an order directing the Interborough Company to add 600 more cars to its subway service not later than March 10. The order practically provides for a service equal to the present rush-hour periods during the entire day. Mr. Burr, in his statement, referred to this order by Mr. Nixon as follows:

There is ample proof of the inadequacy of the present service and unless the 600 additional cars are provided the present serious congestion will continue. At present there appears to be no doubt that the contract with the city has been violated. Recent hearings have proved this beyond a doubt.

### Thirty Lines Still Tied Up

Surface railway lines in three boroughs of Greater New York were still out of commission on March 3 through the blizzard responsible for their break-down begun four weeks ago. The following lines, thirty in number, are still idle:

NEW YORK RAILWAYS—Eighty-sixth Street and Spring Street.

THIRD AVENUE—West Side belt: Avenue B, from Fourteenth to Fifty-ninth Streets.

SECOND AVENUE—Second Avenue, Canal to Worth Streets; First Avenue shuttle.

EIGHTH AND NINTH AVENUE—Ninth Avenue; Eighth Avenue, from 116th to 125th Streets.

B. R. T. AND BROOKLYN CITY—Montague Street; Metropolitan Avenue, from Dry Harbor road to Jamaica Avenue; Wyckoff Avenue; Avenue C, one track; Bergen Beach, one track; Flatbush Avenue shuttle; Holy Cross shuttle; Nostrand Avenue shuttle, one track; Ocean Avenue, one track; Utica Avenue shuttle; Ralph

Avenue shuttle; Canarsie shuttle, Avenue K to Canarsie; Grand Street, Metropolitan Avenue to Fresh Pond Road and Jackson Avenue to North Beach.

NEW YORK & QUEENS COUNTY—Calvary Cemetery, Lutheran Cemetery to point one-fourth mile west; Steinway, Riker Avenue to North Beach; Corona, Fisk Avenue, Woodside, to Leona Avenue, Corona; Flushing Avenue, Second Avenue to North Beach; Vernon Avenue, one track; Fourteenth Street to Broadway; Dutch Kills, entire line.

LONG ISLAND ELECTRIC—Hollis to Belmont Park.

NEW YORK & LONG ISLAND—Hempstead to Jamaica and Mineola to Jamaica.

### Bank Comments on Electrification Prospects

Fuel saving and increased track capacity would be two of the important results from the electrification of the railroads of the country, it is stated by the National Bank of Commerce in New York in the March issue of its magazine, *Commerce Monthly*. However, chiefly because of the great expense involved in the transition from steam to electrically operated railroads, it is unlikely that any general move toward electrification will be made in the near future. The bank says:

It would not be without precedent if the next decade witnessed England and the continent outstripping this country in the exploitation of another industry which, while possibly not conceived here, has certainly been more fully developed in America than elsewhere.

It is plain that we must take a long-sighted view of the future of our railroads. They must be given such freedom to develop and to improve their facilities that they will not be required to enlarge their facilities merely on the basis of the immediate pinch, but will be able to introduce improvements from the standpoint of return a decade or two decades hence. Electrification thus has its greatest argument in the future, for with the rapidly increasing cost of fuel and rate of traffic, the ultimate return on any amount now invested in electrification will be more than generous compared with the return on the accumulated amount which might be spent year by year over a long period in patching up our steam railway system.

Traffic on our railroads normally doubles every twelve years. Practically all improvements have been postponed for a long period. When the process of rehabilitation begins, it will be well to consider devoting to electrification part of the tremendous sum which will have to be spent.

The magazine points out that it is estimated that \$2,500,000,000 must be spent in the next three years to meet the accumulated and the current annual need for improvements. It then cites the fact that plans for future electrification are more extensive abroad than at home. It says:

Conditions in the United States are not favorable for putting into effect any extensive scheme for electrification. The political and economic situation of the American railroads is at best uncertain. Without going into the effect of governmental regulation on the railroads during the past few years, it is fairly evident that capital is not seeking railroad investment. Also, the fuel situation in the United States is so much more favorable than is that of most other nations that the problem of conservation and efficient utilization of our coal supply has not become so acute as in Europe.

### Mr. Beeler in Chicago

John A. Beeler has been employed by Henry A. Blair to study the routes, schedules and equipment of the Chicago Surface Lines and to make such recommendations for improvements as he finds advantageous.

## News Notes

**Two-Cent Wage Advance at Covington.**—The Cincinnati, Newport & Covington Railway, Covington, Ky., has granted its carmen an increase in wages of 2 cents an hour. Under the new scale the maximum rates are raised to 45 cents and 50 cents an hour.

**Appeal for Wage Increase.**—The employees of the Joplin & Pittsburg Railway, Pittsburg, Kan., have filed a complaint with the Kansas Industrial Court asking for increased wages and better working hours and conditions on that line. The employees were awarded a raise in wages by the War Labor Board, but it is said that the increase was never placed in effect.

**Jury Inquiry in Richmond.**—The Richmond County Grand Jury has been instructed to investigate all the circumstances attending the suspension of service by the Staten Island Midland Railway, which ceased operation after its failure to make the city officials of New York realize the need of the company for increased fares. Residents of Staten Island, deprived of car service, have indicated their willingness to pay a 10-cent fare if necessary.

**Governor Vetoes Fare Bill.**—Governor James M. Cox, of Ohio denied to the State Public Utilities Commission the right to interfere with the Toledo railway situation by fixing of rates for two years, when he vetoed the bill presented by Representative Evans of Lucas County, after it had passed both houses of the Assembly with little or no general debate. The bill gave to the commission the power of rate determination of city tractions such as it has in the case of other utilities and interurbans at the present time.

**An Echo of the Past.**—Municipal ownership, once so strongly advocated by the Mayor of Atlanta, Ga., has never received the smallest encouragement from the taxpayers. Since the State Legislature of Georgia a year ago turned down a proposition looking toward municipal ownership, little if anything has been heard on the subject. It is not regarded as probable that a municipal ownership program, which has been discussed in some sections of the State, will find any favor with the law makers at the June session of the Legislature.

**Explains Service-at-Cost.**—Harry Reid, president of the Kentucky Utilities Company, the Louisville & Southern Indiana Traction Company, the Louisville & Northern Railway and the road between Louisville and Indianapolis, explained the service-at-cost plan of operation in an interview in one of the Louisville papers recently. Mr. Reid is a resident of that city. He said

that he did not care to be placed in the attitude of giving advice either to the city authorities or to the new administrative body of the Louisville Railway, but merely was pointing out at the request of the paper how the system had worked out satisfactorily in other cities.

**Suggestions Welcome.**—Believing that the men on the job, who are in very close touch with conditions, can offer suggestions to the officials of the Monongahela Valley Traction Company, Fairmont, W. Va., that will improve service and better conditions in general, George M. Alexander, president of that corporation, is going to make an effort to avail himself of these suggestions. Compensation of an adequate nature will be offered for those that are accepted. All suggestions will receive the earnest consideration which is due them. A committee has been appointed to devise means and a system of compensation for such suggestions.

**Municipal Railway an Election Issue.**—It is expected that the election in Seattle, Wash., on March 5 will bring about a change of administration in city affairs, as both Hugh M. Caldwell, former corporation counsel, and James A. Duncan, the labor candidate, defeated the present Mayor at the primaries. Mr. Caldwell, who will very probably be elected, has expressed himself as bitterly opposed to the municipal railway management, and in fact the entire project. He has even intimated that he will, if elected, take steps to revoke the \$15,000,000 deal whereby the city took over the railway lines of the Puget Sound Traction, Light & Power Company.

**City Commission Against One-Man Cars.**—The City Commission of Nashville, Tenn., has passed on third and final reading an ordinance abolishing one-man cars in that city. The Mayor and Commissioner Tompkins voted against the proposal. The measure becomes effective in ninety days. The Nashville Railway & Light Company has invested \$150,000 in one-man cars. It protested the passage of the measure abolishing the cars. Representatives of local schools and colleges and of local manufacturing companies appeared in opposition to the bill. For the company, Walter Jackson explained the operation of the cars and reviewed their history and development. He called particular attention to the fact that one-man cars originated in and enjoyed the greatest popularity in the South.

**Snow Affects Connecticut Trolleys.**—While other electric railways in New England temporarily abandoned large portions of their systems during the recent series of severe snowstorms, the Connecticut Company at no time failed to provide some sort of service on all parts of its system and kept schedules even during the most trying days of the period on 85 per cent of its lines. On March 1 the company was able to announce 100 per cent service on all lines. The Hartford & Springfield Street Railway, which operates on both banks of the Connecticut River be-

tween the two cities, had its first through service in more than a week on the east side on March 1, and hoped to get back to normal on the west side during the week. The Shore Line Electric Railway has had intermittent service on its lines during the storms.

**To Close North Hampton Branch.**—The New Hampshire Public Service Commission on Feb. 24 gave the Portsmouth Electric Railway authority to suspend traffic on its North Hampton branch, connecting the town of North Hampton with Hampton Beach, unless an agreement between town and company is reached before May 1. Authority to close for the time being the North Beach branch was refused, as rail communication between Portsmouth and Hampton Beach would thereby be severed. The company will not be required this winter, however, to clear out about 200 yards of ice-filled tracks, so that transfer of passengers will temporarily be necessary at that point.

## Program of Meeting

### Central Electric Railway Association

The program of papers has been announced for the annual meeting of the Central Electric Railway Association at the Seelbach Hotel, Louisville, Ky., on March 10 and 11. Sessions will be held at 2 p.m. on March 10 and 9 a.m. on March 11. The dinner for association members, their families and invited guests will be at 7 p.m., on March 10. The executive committee will meet at 9 a.m., on March 10. The Interstate Public Service Company has arranged to furnish a special car to be operated between Indianapolis, Ind., and Louisville, Ky., on March 9.

The session on March 10 will be opened with the annual address by J. F. Collins, president of the association. This will be followed by the business session and the reading of reports of committees. Ralph H. Rice, principal assistant engineer, Board of Supervising Engineers, Chicago Traction, will then read a paper "Rail Bonding." The discussion will be participated in by M. B. Lambert, assistant manager of the railway department of the Westinghouse Electric & Manufacturing Company; Ralph W. Palmer, engineer with the General Electric Company; E. W. Rowland, bond engineer with the Ohio Brass Company; R. J. Custer, engineer of ways and structures of the Interstate Public Service Company.

Following the business session on March 11 there will be a paper by D. D. Ewing, professor of electric railway engineering at Purdue University, "Economical Use of Electricity for Car Purposes." The discussion of this paper will be led by L. E. Gould, president of the Economy Electric Devices Company, and by L. M. Clark of the Railway Improvement Company.

The regular session will close with the presentation of the annual report of the secretary and treasurer and the election and installation of officers for the ensuing year.

# Financial and Corporate

## Increase in Revenue for November

### Fare Increases, One-Man Cars and Absence of Epidemic Lead to More Favorable Conditions

A comparison of returns for the month of November, 1919, with those for the same month in 1918 of those companies reporting their operating statistics to the information bureau of the American Electric Railway Association, shows results quite favorable to 1919. This is probably due, in part at least, to the effect of the influenza epidemic, which although it had passed its climax at the end of October, 1918, in the East and South still lingered with enough force to make itself felt in those sections of the country throughout the month of November.

#### NOVEMBER WORST IN WEST

In the West, the disease did not reach its full malevolence until after it had been gotten well under control in the other sections of the country. November was probably the worst month in the West, and this is very clearly reflected in the attached tables in which the West makes the most favorable showing in the comparison of 1919 with 1918.

The South seems to be enjoying an unusual degree of prosperity which has shown up consistently in its operating statistics for the last few months. Several factors are contributing to this prosperity, or at any rate are contributing to the favorable showing made in the latter months of 1919 when compared with the corresponding months of 1918. First there are the lingering effects of the influenza mentioned above. Second, there are the numerous oil booms occurring there, bringing in their train large additions to the population and building up the traffic of the local street railways. Third, there is the introduction of one-man cars during 1919 on a large proportion of the mileage represented in the accompanying tables, with the consequent reduction of expenses and tendency to secure the maximum amount of traffic possible.

#### TABLES ANALYZED

In Tables III and IV an analysis of the operating expenses is given, Table III showing the actual amount spent by the different departments and Table IV showing the same amounts on a per car-mile basis.

A study of these tables shows that the heaviest increases have occurred in the way department, with the transportation department second. For the country as a whole the cost of maintaining way and structures rose from 2.7 cents per car-mile in November, 1918, to 4.24 cents per car-mile in November, 1919, an increase of 57.03 per

cent. The heaviest increase in this department occurred in the West, where it jumped from 1.81 cents per car-mile in 1918 to 5.11 cents per car-mile in 1919, or 182.32 per cent.

The cost of conducting transportation for the country as a whole increased 25.54 per cent per car-mile, rising from 11.08 cents per car-mile in 1918 to 13.91 cents in 1919. The West showed the heaviest increase in this department also, the increase being 33.23 per cent per car-mile.

The only item of expense showing an actual decrease in any part of the country was that for power. In the East the cost of power dropped from 6.2 cents per car-mile in 1918 to 5.83 cents in 1919, a decrease of 5.97 per cent per car-mile. The South also showed a slight decrease in power expense, amounting to 0.71 per cent per car-mile, but as some of the Southern companies include their power expenses in their expenses for conducting transportation, the figures for these items are probably not strictly accurate.

#### USUAL TERRITORIAL ARRANGEMENT FOLLOWED

As in the past the returns from both city and interurban companies have been classified according to the following geographic grouping: Eastern district—east of the Mississippi River and north of the Ohio River; Southern district—south of the Ohio River and east of the Mississippi River; Western district—west of the Mississippi River.

### Boston Has Fairly Good January

The financial statement of the month of January as given out by the Boston (Mass.) Elevated Railway shows a net gain of \$99,727 as compared with \$343,333 for the preceding month. The difference is due mainly to the fact that the month of January was a particularly stormy one. The total receipts for the month were \$2,868,841. The total cost of service was \$2,769,113. The total operating expenses were \$2,071,950, of which \$1,373,223, was for wages. During the month there were 28,467,646 revenue passengers and the cost of service per passenger was 9.727 cents. The receipts per revenue passenger amounted to 10.078 cents. Due to the particularly favorable balance now resulting from the 10-cent fare, it is very likely that the end of the year 1920 will find the Boston Elevated Railway able to continue its programme without the necessity of resorting to special assessments upon the cities and towns served.

### Connecticut Loss \$177,110

Increased Revenues Under Zone Plan Offset by Mounting Expenses — Figures for Three Months

The Connecticut Company went \$177,110 behind in the first three months of operation under the zone system, despite greatly increased gross revenues. This was learned at the final hearing on the zone system before the Public Utilities Commission in the State capitol at Hartford, Conn.

Greatly increased costs of operation were responsible for this condition, according to President Lucius S. Storrs, who said that a statement on the situation would be issued by the company shortly. He and Walter J. Flickinger, his assistant, expressed the belief that under the 6-cent system, in force up to Nov. 2 of last year, the loss would have been much greater. In the year ended October 31, 1919, the company had a deficit of little more than \$10,000.

In each month since the establishment of the zone system the company's gross revenue has shown an increase over that of the corresponding month in the preceding year. February was a banner month so far as gross receipts were concerned, but the great expense of keeping the lines open during the series of storms that has swept Connecticut has eaten into this increased revenue and sometimes more than nullified it.

During November, the first month of the zone system, the deficit of the company after taking out the amount required for fixed charges was \$82,999. In December the deficit was only \$110 because of the great volume of holiday season riding. The January deficit was \$94,000. During February, with a large number of snow storms that kept the jitneys off the streets, the volume of riding was approximately 25 per cent greater than that in the same period of 1919, but the work of keeping the lines clear was very expensive.

Attorneys for most of the sixteen towns protesting against the zone system were heard in final argument. Joseph F. Berry, attorney for the company, told the commission that under the law he did not believe that body had the power to set rates for passenger service and then grant a lower rate for commuters.

The commission intimated that its decision would be given early in April.

### Court Orders Service Discontinued

Judge Mayer in the Federal Court at New York on Feb. 27 authorized Job E. Hedges, receiver of the New York, N. Y., to discontinue the operation of the Seventh Avenue line and of the Fourteenth Street line across the Williamsburg Bridge. The date for the discontinuance was set for March 7. The order was made on the grounds that the company has no franchise for service over the bridge. The franchise is owned by the Fourth and Madison Avenue line, which was recently separated from the rest of the New York Railways.

TABLE I—INCOME STATEMENT OF THIRTY-THREE RAILWAYS FOR NOVEMBER, 1919, COMPARED WITH NOVEMBER, 1918

Table with 10 columns: Item, United States (1919, 1918), East (1919, 1918), South (1919, 1918), West (1919, 1918). Rows include operating revenues, expenses, net revenue, taxes, operating income, non-operating income, gross income, deductions, net income, operating ratio, and car miles.

TABLE II—INCOME STATEMENT IN CENTS PER CAR-MILE OF THIRTY-THREE RAILWAYS APPEARING IN TABLE I, COMPARING NOVEMBER, 1919, WITH NOVEMBER, 1918

Table with 10 columns: Item, United States (1919, 1918, Per Cent Increase), East (1919, 1918, Per Cent Increase), South (1919, 1918, Per Cent Increase), West (1919, 1918, Per Cent Increase). Rows include operating revenues, expenses, net revenue, taxes, operating income, non-operating income, gross income, deductions, net income, operating ratio, and car miles.

TABLE III—OPERATING EXPENSES OF THIRTY-SEVEN RAILWAYS FOR NOVEMBER, 1919, COMPARED WITH NOVEMBER, 1918

Table with 10 columns: Item, United States (1919, 1918), East (1919, 1918), South (1919, 1918), West (1919, 1918). Rows include operating expenses (Way and structures, Equipment, Power, Conducting transportation, General and miscellaneous), Transportation for investment, and Car-miles operated.

\* NOTE—This table includes the expenses of the 33 companies shown in Tables I and II, and in addition 4 other companies which are not included in Tables I and II, because of the fact that they do a power and light business and do not separate their railway taxes and fixed charges from the taxes and fixed charges of their other business.

- 1 Includes \$166,576 undistributed depreciation and express and freight charges.
2 Includes \$33,576 for express and freight charges.
3 Includes \$133,000 undistributed depreciation.

TABLE IV—OPERATING EXPENSES IN CENTS PER CAR-MILE OF THIRTY-SEVEN COMPANIES APPEARING IN TABLE III, FOR NOVEMBER, 1919, COMPARED WITH NOVEMBER, 1918

Table with 10 columns: Item, United States (1919, 1918, Per Cent Increase), East (1919, 1918, Per Cent Increase), South (1919, 1918, Per Cent Increase), West (1919, 1918, Per Cent Increase). Rows include operating expenses, traffic, and car-miles operated.

- 1 Includes 0.94 cents per car-mile undistributed depreciation and express and freight charges.
2 Includes 0.40 cents per car-mile for express and freight charges.
3 Includes 2.01 cents per car-mile undistributed depreciation.

TABLE V—COMBINED INCOME STATEMENT OF EIGHTY-SEVEN RAILWAYS FOR NOVEMBER, 1919

Table with 5 columns: Item, United States, East, South, West. Rows include operating revenues, expenses, net revenue, taxes, operating income, non-operating income, gross income, deductions, net income, and car-miles operated.

\* Includes the companies shown in Tables I to IV to others for which the 1918 figures are not available.

TABLE VI—COMBINED INCOME STATEMENT OF TABLE V, SHOWING THE AMOUNTS IN CENTS PER CAR-MILE

Table with 5 columns: Item, United States, East, South, West. Rows include operating revenues, expenses, net revenue, taxes, operating income, non-operating income, gross income, deductions, net income, operating ratio, and car-miles operated.

TABLE VII—DETAILED STATEMENT OF THE OPERATING EXPENSES OF ONE HUNDRED RAILWAYS FOR NOVEMBER, 1919

Table with 5 columns: Item, United States, East, South, West. Rows include operating expenses (Way and structures, Equipment, Power, Conducting transportation, Traffic, General and miscellaneous), Transportation for investment, and Car-miles operated.

\* This table includes the expenses of the 87 companies shown in Tables V and VI and in addition 13 other companies which are not included in Tables V and VI because of the fact that they do a power and light business and do not separate their railway taxes and fixed charges from the taxes and fixed charges of their other business.

- 1 Includes \$165,936 undistributed depreciation.
2 Includes \$5,277 undistributed depreciation.
3 Includes \$160,659 undistributed depreciation.

TABLE VIII—DETAILED STATEMENT OF OPERATING EXPENSES OF THE ONE HUNDRED COMPANIES APPEARING IN TABLE VII, IN CENTS PER CAR-MILE

Table with 5 columns: Item, United States, East, South, West. Rows include operating expenses (Way and structures, Equipment, Power, Conducting transportation, Traffic, General and miscellaneous), Transportation for investment, and Car-miles operated.

- 1 Includes 0.39 cents per car-mile undistributed depreciation.
2 Includes 0.02 cents per car-mile undistributed depreciation.
3 Includes 1.04 cents per car-mile undistributed depreciation.

## Twin City Conditions Fair Company Able to Meet Dividend Payments—Hopes Current Year Will Show Greater Improvement

The annual report for the year 1919 recently issued by the Twin City Rapid Transit Company, Minneapolis, Minn., indicates that the financial condition of the company has slightly improved and

ment maintenance is also attributed to the continued increase in the cost of labor and material and the fact that during 1918 a large amount of maintenance work, especially as regards the equipment, had to be deferred because of the inability to secure sufficient labor to maintain the property in its past high physical condition of excellence.

Because the city claimed that the

pay a sufficient fare to insure adequate service and provide a reasonable return on the fair value of the property. Already the officials of the city of St. Paul are considering submitting to the voters of that city an amendment to the franchise ordinance under which service is now rendered, which will permit raising the fare from 5 cents to 7 cents. The company, however, in consideration of receiving this increase in unit rate of fare must furnish adequate equipment and service. Pending the outcome of this referendum, operation will continue and the best possible service rendered under the existing conditions.

To facilitate the handling of traffic and further economies of operation the company is planning to use a part of the renewal reserve fund for improvements in the equipment and the construction of certain extensions which it is hoped will somewhat reduce the congestion and thereby expedite traffic.

During the year an agreement was made with the Northwestern Terminal Company whereby that company financed an extension into a new industrial district. The notes covering the loan do not mature until the line is self-supporting and produces a return on the investment. The terminal company also guarantees the railway against operating losses.

### INCOME STATEMENT OF THE TWIN CITY RAPID TRANSIT COMPANY

	1919	1918	Per Cent Change + Increase - Decrease
Revenue from transportation	\$11,351,739	\$9,618,501	+18.02
Revenue from other railway operations	90,705	77,479	+17.11
<b>Total railway operating revenue</b>	<b>\$11,442,444</b>	<b>\$9,695,980</b>	<b>+18.02</b>
Way and structures	\$1,102,567	\$1,005,629	+9.69
Equipment	1,245,070	823,048	+51.40
Power	1,175,293	1,132,335	+3.79
Conducting transportation	3,788,711	3,142,150	+20.58
Traffic	62,450	37,422	+66.80
General and miscellaneous	1,090,669	873,962	+24.82
Transportation for investment Cr.	*19,701	*10,572	-86.40
<b>Total railway operating expenses</b>	<b>\$8,445,059</b>	<b>\$7,003,974</b>	<b>+20.60</b>
Net operating revenue	2,997,385	2,692,006	+11.33
Taxes assignable to railway operating	1,126,338	936,451	+20.25
<b>Operating income</b>	<b>\$1,871,047</b>	<b>\$1,755,555</b>	<b>+6.08</b>
Non-operating income	51,034	15,215	+235.50
<b>Gross income</b>	<b>\$1,922,081</b>	<b>\$1,770,770</b>	<b>+8.05</b>
Rent for leased roads	3,000	3,000	.....
Interest on funded debt	1,087,446	1,034,428	+5.13
Net loss miscellaneous physical property	32,829	27,334	+20.15
Miscellaneous debits	10,454	14,706	-28.92
<b>Total deductions from gross income</b>	<b>\$1,133,729</b>	<b>\$1,079,468</b>	<b>+5.02</b>
<b>Net income transferred to profit and loss</b>	<b>\$788,352</b>	<b>\$691,302</b>	<b>+14.02</b>

\* Deficit.

as yet the point has not been reached when it is necessary to pass the stock dividends entirely, although it is true that the dividend rate on the common stock has been below normal for the past two years.

An analysis of the accompanying table shows that operating expenses increased more than the revenues, due especially to large increases in the equipment, conducting transportation and general and miscellaneous accounts. The increase in these accounts resulted from the substantial increase in wages made to all employees on Aug. 20, 1919. The net income transferred to Profit and Loss for the year was slightly more than in the previous year,—thus making it possible to increase the dividend rate on the common stock by half of 1 per cent.

The increase in the track and equip-

franchises of the company in Minneapolis expired in 1923, no track extensions or new rolling stock were added during the year. On Dec. 9, 1919, the voters in referendum refused to ratify an agreement resulting from four years' continuous and painstaking effort on the part of the company and Minneapolis city officials, providing for a service-at-cost franchise.

The company, although defeated for the time being in obtaining sufficient revenue to meet the ever increasing cost of service rendered, believes that an ultimate solution of the transportation problem in the Twin Cities will be worked out as the public more and more understands and appreciates that much of the prosperity of the community depends upon good transportation. The situation is rapidly adjusting itself to a point where the people are willing to

### Abrogation of Lease Postponed

The Shore Line Electric Railway, which had planned to turn back to the Connecticut Company, New Haven, Conn., the New London and other lines operated under lease, will continue to run the lines indefinitely. This is in accordance with the wishes of the Connecticut Company. This permission was granted by Judge John P. Kellogg in the Superior Court in New London who passed an order approving of the extension of the agreement made by Robert W. Perkins, receiver of the Shore Line Electric Railway, with the Connecticut Company regarding the annulment of its lease of the local lines.

On Dec. 19 Mr. Perkins applied to the Superior Court for permission to annul the ninety-nine year lease of the New London lines with the Connecticut Company and the court passed an order terminating the lease and authorizing the delivery of the property to the Connecticut Company.

The application of Mr. Perkins stated that on account of the exigencies connected with the operation of its railway, the Connecticut Company finds it difficult and practically impossible to take over the operation of the leased lines and requested Mr. Perkins to continue the operation until one week after the Connecticut Company notifies the receiver that it is ready to take over the lines or until one week after the receiver notified the Connecticut Company of his unwillingness to continue further operation. Mr. Perkins states that it is for the best interest of the receivership estate and the public that the Shore Line continue the operation of the New London lines.

### STATISTICAL INFORMATION OF THE TWIN CITY RAPID TRANSIT COMPANY

	1919	1918	Per Cent Change + Increase - Decrease
Mileage—First track	243.07	243.03	.....
Second track	177.40	176.80	+0.34
<b>Total mileage—All tracks</b>	<b>422.65</b>	<b>420.83</b>	<b>+0.26</b>
Average total miles operated	451.70	.....	.....
Revenue passengers	222,186,823	188,930,268	+17.60
Transfer passengers	73,458,262	67,985,059	+8.06
<b>Total passengers</b>	<b>295,645,085</b>	<b>256,915,327</b>	<b>+15.05</b>
Gross passenger revenue	\$11,179,535	.....	.....
Total per mile of line	46,000	.....	.....
Total per mile of single track	24,750	.....	.....
Average fare:			
Per revenue passenger (cents)	5.04	.....	.....
Per total passenger (cents)	3.73	.....	.....
Operating ratio (per cent)	73.7	72.2	.....
Taxes (per cent of gross revenue)	9.80	9.65	.....
Dividends paid:			
7 per cent on preferred stock	210,000	210,000	.....
On common stock	2.5% 550,000	2% 440,000	.....



## Spokane Sale Confirmed

The Federal Court at Tacoma, Wash., has approved the sale under foreclosure of the properties of the Spokane & Inland Empire Railroad, referred to previously in the *ELECTRIC RAILWAY JOURNAL*.

The Spokane & Eastern Railway & Power Company has accordingly taken over the former properties and holdings of the old company known as the Nine Mile power plant, and all transmission lines, all the city lines of the Spokane Traction Company, the interurban line extending east into the Spokane valley to Coeur d'Alene and Hayden Lake, the terminal properties in the city of Spokane, both passenger and freight, and the line extending into the Spokane valley known as the Vera line.

The other company, known as the Inland Empire Railroad, has taken over the property from a junction on Sprague Avenue in Spokane, extending south to Moscow and Colfax. Both companies will be officered and operated by the same individuals, who are as follows:

George H. Taylor, Chicago, president.  
F. E. Connors, vice-president and general manager.

Waldo G. Paine, vice-president and traffic manager.

Elmo Edwards, secretary.

The directorate is composed of George H. Taylor, Albert W. Harris, Chester Corey, Chester A. Cook and Holmes Forsyth, all of Chicago, and E. D. Adler and John C. Partridge of Milwaukee and F. E. Connors and Waldo G. Paine of Spokane.

According to the tabulated report submitted to Mayor Fleming by Mr. Connors, the local lines carried 72,306 more passengers in January, 1920, than in January, 1919, and collected an increase in cash fares of \$9,680 in the same period. In the last month the company's cars carried 823,425 passengers, as against 751,119 in January, 1919, and 940,031 in 1918.

## New Haven Wants Its Trolleys Back

The New York, New Haven & Hartford Railroad would like to get back the lines of the Connecticut Company, which operates more than 90 per cent of the electric railway mileage in that State, and which is run by federal trustees under a federal court order that it be divorced from the steam road system.

Edward G. Buckland, president of the New Haven road during the period of federal control, told the correspondent of the *ELECTRIC RAILWAY JOURNAL* of the desire of his road on Feb. 28 as he finished his work as head of the road. Mr. Buckland said:

I think that a unified system of transportation by steam road, trolley and steamboat is most desirable for southern New England. For this reason the New Haven would like to operate the electric railways in Connecticut, under the provisions of the railroad law which gives the Interstate Commerce Commission great regulatory powers. The Rhode Island electric railway properties are in receivership, and the

Massachusetts and New York properties do not lend themselves to consolidation with the steam railroad.

It is likely that the New Haven will petition the Interstate Commerce Commission within the next year for a recommendation to the United States Courts asking that the steam road be allowed to take back the Connecticut Company's lines.

## Financial News Notes

**Average Fare Reported Incorrectly.**—In the second paragraph from the last in the article on the Toronto (Ont.) Railway in the *ELECTRIC RAILWAY JOURNAL* for Feb. 14, page 352, the average fare during 1919 was quoted at 8.9 cents per revenue passenger. This should have read 3.9 cents.

**Town Votes to Take Over Road.**—The town of Turner, Me., has voted to take over the electric railway between Turner and Auburn, the operation of which was not resumed by the Androscoggin & Kennebec Railway, the successor under foreclosure to the Lewiston, Augusta & Waterville Street Railway.

**Wants Service Decision Hurried.**—A petition carrying the names of 600 citizens of Racine, Wis., has been presented to the Wisconsin Railroad Commission urging that body to speed its decision in the investigation of railway service in Racine as furnished by the Milwaukee Electric Railway & Light Company there.

**Plan to Study Service-at-Cost.**—The managing committee of directors now in active charge of the officers of the Louisville (Ky.) Railway pending the election of a successor to T. J. Minary as president, plans a tour to study at first hand the workings of service-at-cost grants where such ordinances have been in operation sufficiently long to establish authentic data.

**Atlanta Bond Issues Authorized.**—The Georgia Railroad Commission has authorized the Georgia Railway & Power Company, Atlanta, Ga., to issue additional bonds in the amount of \$601,000, and the Georgia Railway & Electric Company to issue bonds in the amount of \$189,000. Both issues are under the original mortgage to cover improvements for the six months ended Dec. 31, 1919.

**Spokane Officers Re-elected.**—At the annual meeting of the Washington Water Power Company, Spokane, Wash. recently, the officers and trustees were re-elected. J. D. Porter takes the place of Dr. N. Fred Essig, deceased. During the year 18,478,611 passengers were carried on the Water Power lines. This total was greater than in any year since 1913, but still 6,000,000 short of the maximum number in 1910.

**Equipment Trust Securities Asked.**—The New York & Stamford Railway has applied to the Public Service Commission for the Second District of New York for authority to issue at par \$30,000 in 7 per cent equipment trust notes to be used for purchasing seven steel one-man safety cars. The road operates between New Rochelle, N. Y., and Stamford, Conn. The cars have a seating capacity of thirty-two.

**Agree to Bond Extension.**—F. H. Dewey, president of the Worcester (Mass.) Consolidated Street Railway, is quoted as authority for the statement that holders of the \$700,000 of 4½ per cent debenture bonds due on Mar. 1, 1920, will be offered the right to extend the bonds to Mar. 1, 1925 at 7 per cent. Holders of \$500,000 have agreed to extend.

**Recommends Short-Term Financing.**—State Treasurer Burrill of Massachusetts has recommended to the Governor a change in act providing for purchase of Cambridge subway, deciding to finance purchase with short term notes rather than with fifty-year bonds as provided in the act. He expresses the opinion that the money market will fall a full point during next year, and, if such proves to be the case, the Commonwealth, he says, will save at least \$500,000 by deferring the issuance of bonds.

**Boston Elevated to Issue Bonds.**—The Public Utilities Department of Massachusetts has authorized the Boston Elevated Railway to issue notes or negotiable bonds to an amount not exceeding at par value \$1,500,000, said notes or bonds to be payable in a period not exceeding thirty years from the date of issue and to bear interest at a rate not to exceed 7 per cent per annum. These notes or bonds are to be used for paying and refunding bonds to the amount of \$1,500,000 due on March 1, 1920.

**Court Will Pass on Service Discontinuance.**—Three judges of the Supreme Court of Nevada sat *en banc* recently to hear the proceedings on the injunction which was brought by citizens of Reno, Nev., to prevent the Reno Traction Company from discontinuing local service. The case was concluded and the judges now have the matter under advisement. Decision may be rendered in from two days to two weeks. Meantime, the local system has been stopped entirely, but the interurban service between Reno and Sparks is continued.

**Suggests Valuation at Akron.**—The Northern Ohio Traction & Light Company, Akron, Ohio, has requested that the railway lines of the company in that city be valued by a board of arbitration as a step in the direction of affording relief to the company from the burdensome conditions under which it is now operating. A. C. Blinn, general manager of the company, has suggested a board of three, one member to be appointed to the company, one by the city and the third by the two so chosen. The Council has taken the matter under advisement.

# Traffic and Transportation

## Sees Hope for I. R. T.

Can Continue to Operate Temporarily at Present Fare, Says President Hedley at Traction Inquiry

Frank Hedley, president of the Interborough Rapid Transit Company, admitted under questioning at the resumption of the hearings before the New York City Board of Estimate on March 3 that the company could continue to operate, for the present, at least, on a 5-cent fare. While urging the necessity of an increase in the company's revenue, Mr. Hedley stated that the lines would not go out of business on July 5 next unless an 8-cent fare were obtained before that date, when, it had previously been predicted, the system would be driven into bankruptcy.

Mr. Hedley stated it as his personal conviction that the company would be able to continue beyond July 5 next and still pay its debts. Comptroller Craig thereupon asked why the company could not put up with a 5-cent fare until July 5, 1921. The witness replied that "the company has certain obligations to meet." He further declared that it was not he who had named July 5 next as the day of fate for the Interborough. Asked concerning the quality of the service furnished by the company, Mr. Hedley said:

With the revenue as it is at present, I consider the state of the subway highly efficient. We are carrying more passengers than any other road in the world, and we are doing it with a higher degree of safety.

The Comptroller then asked if Mr. Hedley considered it fair for the Interborough to fall down on its part of the contract, and for the people to continue to pay the fare. "Supposing the people regarded the fare as too high and refused to pay?" he asked.

Mr. Hedley said that he was willing at any time to sit down with the board and devise any practical means of solving the problem. He added that it was absolutely essential that the people eventually should pay an adequate fare, something between 8 and 10 cents. At present, he said, the Interborough has not funds enough to meet the returns on its investments, and capital under these circumstances cannot be attracted.

The Comptroller then inquired whether the Interborough was willing to permit the city to buy the security holders out, and cancel all contracts. After this, he said, the city could arrange the rate of fare to its own satisfaction. Mr. Hedley said that he would consider any proposition offered, and that in the case the city was able to raise sufficient funds, which he much doubted, he would recommend to the board of directors that they sell out. The price, he said, would be in the neighborhood of \$400,000,000.

Mr. Hedley maintained, in answer to questions by Corporation Counsel Burr, that the railroad was giving comfortable and adequate rapid transit to the best of its ability. Asked what prevented the railroad from giving complete accommodation to the traveling public, the witness replied the construction work under the contracts had not been finished.

## Temporary Increase Urged Public Service Commissioner Recommends Fare Agreement in Rochester as Solution of Service Problem

A temporary agreement between the New York State Railways and the city of Rochester, N. Y., under which the company would be permitted to increase its fares on its Rochester lines for a period of three months, was proposed by Public Service Commissioner John A. Barhite of the Second District at a hearing in Rochester on Feb. 28. Commissioner Barhite made his suggestion for a temporary suspension of the 5-cent fare provision of the company's franchise as offering the best hope of a solution of the city's transit difficulties, which the company contends cannot be reached without an increase in revenue.

Commissioner Barhite urged the company and the city to "get together" and agree on the points at issue to improve the service in Rochester, admitted by company officials to be inadequate. The Public Service Commission had ordered the company to show cause why it should not improve the service. In all, three hearings were held, at which Commissioner Barhite examined witnesses for the company and the city. The hearings are now concluded. It is believed that under existing conditions the commission will refuse to order the company to improve the service.

### COMPANY WELCOMES AGREEMENT

Under the temporary agreement the company would be granted a fare of 6 or 7 cents for a limited period, during which its books would be open to public inspection. The company has already expressed its willingness to accept such an agreement. Daniel M. Beach, its counsel, said in this connection:

We are not asking that the contract with the city by which we are required to furnish a 5-cent fare be abrogated. We are simply asking for its suspension and the right to charge a just fare while operating costs are too much to permit of good service at that rate. When the time comes that a 5-cent fare is sufficient the suspension could and should be lifted.

The company's books showed a balance of \$300,000 for the year 1919, according to testimony at the hearing by representatives of the city. The attorneys for the company, declared, however, that this sum did not allow for deferred maintenance, the cost of trackage, equipment need renewals and replacements which they said aggregated several hundred thousand dollars. The attorneys stated that the increase in service demanded by the city authorities would cost the company \$500,000 additional, and together with the future raises in employees' salaries would total \$553,000. It was contended that in order to give better

service the company would have to abolish the present 5-cent fare and charge 7, 8 or even 9 cents.

General Auditor Joseph M. Joel of the company, while under cross-examination, testified as to the value of the company's property within the city of Rochester. Asked as to the allocation of the salary of President James F. Hamilton and the expenses of administering the offices of the New York State Railways, Mr. Joel said that slightly more than a third is paid by the Rochester lines.

Corporation Counsel Charles L. Pierce asked representatives of the company for a statement of its expenditures for renewals and replacements for the years from 1909 to 1917 inclusive. It was said that it would take six weeks of searching through vouchers to give the information. On the Charlotte line, which is an appendage to the Rochester lines, a 6-cent fare has been charged and for the past three years subject to a decision by the Public Service Commission as to whether or not that rate is more than should be asked, rebate slips have been issued to patrons on this line. It was said on March 1 that the slips issued to date amount to approximately \$223,443.

## New Jersey Fixes Fare Rights

The New Jersey Supreme Court at Trenton has affirmed with costs the findings of the Second District Court in the matter involving Mayor Charles P. Gillen, of Newark, and the Public Service Railway. The decision holds that the railroad companies possess the legal right to raise rates of fares at will, subject, of course, to suspension later by the Board of Public Utility Commissioners. Mayor Gillen, a passenger on a Public Service Railway car, refused to pay a 7-cent fare after the Utility Board had set a rate of 6 cents for the company. The matter was threshed out in the Newark District court, and the verdict rendered was favorable to the railway. Mayor Gillen took an appeal.

The court says that the legal question is whether the railway could lawfully raise its fares without an order of the commission and a delay of twenty days before proceeding under the order. The court said:

This question was definitely settled in the case of O'Brien against the Public Utility board, and where it was held that the railway possessed such a right, and that case is controlling here. It was made clear in the case referred to that the raising of the rates was, as a matter of course, subject to intervention by the Public Utility Board, who may suspend the fares. The proposition is self-demonstrating that if the defendant company had the right to raise the fare, it needed no order and no twenty days' delay before putting the order into effect. The judgment of the District Court is affirmed with costs.

## Safety Cars Did It

### Terre Haute's Rejuvenated Traction System Bears Witness To Their Accomplishments

"Safety Cars." These two words sum up very largely the history of the Terre Haute Traction & Light Company, Terre Haute, Ind., for the past year as far as public relations are concerned. They even do more than that. They stand for a revolution in the habits of a community of more than 60,000 persons. Two years ago Terre Haute's railway equipment was worn out. The company had no funds for replacements. Everybody was disgruntled.

Then something happened. Through strenuous efforts the company secured a loan for the purchase of thirty one-man safety cars. Even the local investors subscribed. The first batch of new cars arrived at Terre Haute in November, 1918. Everyone wondered how they would work. They had not long to wait. From the time the cars arrived a change for the better was apparent. With their advent the whole traction system began to speed up. The improvement continued. Today there are fifty-six one-man cars operating in Terre Haute. The people who ride in the cars now say that their city has the best railway service in the country. They are the ones who know. The safety cars are admitted to have been the chief factor in bringing about the change.

Not only are the people of Terre Haute proud of their revamped trolley system. They like to talk about it. In fact, they take delight in putting it through its paces. When ex-Secretaries of State, movie queens or other visiting dignitaries arrive in town the residents do not take the illustrious strangers on a tour of the public library or the scene of the latest divorce scandal. Oh, no! They are too good salesmen for that. They want their guests to see Terre Haute at her best. So they take them for a ride on the "safeties."

Even the local newspapers "boost" the trolley. Most editors are more afraid of praising railway managers than a husband of two weeks is of being five minutes late for dinner. Not so the Terre Haute scribes. They believe in being different. Or perhaps it is merely that they appreciate getting to the office on time. Anyway, they laud the trolley management. The accompanying article, which recently appeared in the Terre Haute *Star*, is concrete evidence of their attitude. Through it runs an unmistakable note of pride in the local system. A portrait of E. M. Walker, general manager of the company, accompanied it. Here is the article:

With an announcement by General Manager E. M. Walker yesterday that more people were carried on Terre Haute street cars this month than any other January in the history of the city, attention was directed to the metamorphosis that the local street-car system has experienced in a little over a year.

From a small number of old style cars, many of them out of repair, because no one of them could be spared from service long enough for an overhauling, to a fleet of more than sixty, fifty-six of which are

brand new and of the latest design—from one of the poorest street-car services in the country to one of the very best, has been the experience of this system, much to the satisfaction of the citizens of Terre Haute. There were short periods in the year 1918 when less than twenty cars were in operation at one time on the streets of the city. Rejuvenation of the system began in November, 1918, with the delivery of the first five or six of the thirty safety cars that had been ordered some months previously. These cars were put into service as fast as they arrived here, the South Seventh Street line being equipped first.

#### MORE CARS ORDERED

No sooner had the thirty cars embraced in the first order been delivered than plans were set in motion to obtain almost as many more, and with the aid of some local bankers, money was obtained to buy twenty-six more cars. The last of these were installed more than two months ago, with the result that every line in the city is operated with safety cars, with the exception of Wabash Avenue.

The new cars enabled the company to give much more frequent service, three and four minute schedules being maintained on nearly all lines during the rush hours of mornings and evenings, while six, seven and eight minute service is maintained at other hours.

"Of course we have to do more business to make this better service pay," said General Manager Walker, "but with improvement in the service, there has been a corresponding increase in the number of passengers carried. This increase has been going on right along as our service improved, and in point of gross receipts, that is, of passengers carried, this January is the best January we ever had. I think I am safe in saying that as a result of the public's response to our efforts to give the best street-car service in the United States, there is no indication that we will anyways soon have to ask for an increased fare. In other words, while other cities are asking and receiving a fare of from 6 to 10 cents, we are getting along very comfortably on a 5-cent fare and our business is showing a healthy increase over the same period a year ago."

#### SAFETY CAR PROVES A SUCCESS

This situation is said to be due to the flexibility and economy of the safety car, which other cities are rapidly adopting. The success of these cars here has been so great that there has hardly been a week during the last six or eight months that delegations have not come from other cities to inspect our street-car system with a view of modeling theirs after it. Just a few months ago a delegation was here from Brooklyn, N. Y., and as a result of what they saw more than 200 safety cars were ordered for that city.

One of the noteworthy things about this improvement in service and the thing that indicates the greatest confidence in the city of Terre Haute, is the fact that money to make these improvements could be obtained at a time when street-car systems in other places were barely able to pay their running expenses. All of the money for the Terre Haute improvements was borrowed in Indiana, and not in considerable part of it came from Terre Haute.

#### MORE IMPROVEMENTS PLANNED

Mr. Walker states that the program of improvements is not completed by any means and that these will be carried on as fast as money can be obtained for them. It is not improbable that more safety cars will be ordered before the year is much older, and it is probable also that the Water Street power station, which is already one of the finest in Indiana, will be enlarged by the addition of boilers and machinery of the latest and most improved type.

### Fare Increase Anti-Parking Alternative

The Los Angeles (Cal.) Railway will be compelled to raise its fare if the plan worked out by the State Railroad Commission for the relief of congestion in Los Angeles is defeated through rejection of the "no parking" ordinance recently passed by the City Council. Warnings to this effect have been issued by Assistant City Attorney Stephens, who points out that the "no parking" ordinance is part of a comprehensive plan worked out by the city

and by engineers of the State commission for general relief of congestion. Petitions for a referendum election to pass on the ordinance are being circulated. Mr. Stephens urged all persons not to sign these.

Representatives of the Railroad Commission repeatedly warned the councilmen during a hearing on the new ordinance that failure on the part of the city to enact such legislation would block the plan outlined for rerouting cars. The car rerouting plan was worked out by the State officials as the only means for preventing increases in car fares in Los Angeles. Commissioners Edgerton and Brundidge of the commission pointedly informed city officials that the present traffic congestion in the downtown streets was such that the street cars could not be operated on schedule. The ordinance has been published and will become effective April 10, at which time the rerouting plan will be put into effect, unless halted by the referendum.

### Appeals for Public's Co-operation

The "home rule" committee recently appointed to manage the Quincy (Mass.) division of the Eastern Massachusetts Street Railway, has appealed to the people of Quincy for their support. The committee asks the public's co-operation in giving the city the best street railway in the State. The appeal, which was placed in all Quincy cars in the form of display posters, follows:

#### FOR QUINCY'S SAKE

The Quincy Street Railway is now operated by a Home Rule Citizens' Committee composed of Quincy business men.

Fares, service and other problems are to be settled by this purely local committee. Everyone's help is needed.

More cars, better cars, quicker service and the lowest possible fares are our aims. Praise or criticism of the road and its employees is desired.

Let's get together for Quincy's sake and give the city the best street railway in the State. It can be done if you'll help.

Therefore send in your suggestions or criticisms either by letter or personally to any member of the committee:

Forest I. Neal, chairman; Henry L. Kincaide, S. W. Wakeman, Charles L. Gilliatt, Walter E. Barry, Herbert S. Barker and C. L. Young.

### Staggered Hours Tried in Richmond

The Lorillard Tobacco Company, Richmond, Va., has voluntarily adopted as a permanent plan the staggered-hour system of assembling and dismissing employees. The employees are divided into groups who come to work at 7, 7:15, 7:30, 7:45 and 8:00 a.m., and leave at intervals from 4:30 to 5:30 p.m. The plan was first put in on trial and it worked out so well that it has been adopted permanently. This scattering of the load throughout an hour, both morning and evening, practically removes the peak for the railway company in connection with this particular plant. The idea is gaining in favor with other Richmond employers. In a letter to the Virginia Railway & Power Company, in regard to this matter, J.

N. Dart, general manager of the tobacco company, wrote as follows:

As you know, we have at all times tried to co-operate with the Virginia Railway & Power Company, as we realized that it is to our interest as much as to theirs to get our people to work at such times as will enable them to avoid the rush, both coming to work and going home.

It might further interest you to know about the plan which we have recently put into effect, whereby we sell our employees street-car tickets in the building. This enables them always to have a ticket when they get on the car and so they do not have to wait for change. This scheme works very nicely, and our employees are taking advantage of it, having bought \$250\* worth of tickets within the past ten days.

## Transportation News Notes

**Increase on New York Interurban.**—Increased rates have been authorized for the Utica and Oneida lines of the New York State Railways, Syracuse, N. Y., the schedule of increase affecting all lines between Utica, Little Falls, Frankfort, Ilion, Mohawk and Herkimer.

**Asks Seven Cents in Oneonta.**—The Southern New York Power & Railway Corporation, Cooperstown, N. Y., has applied to the Public Service Commission for the Second District for authority to charge a 7-cent fare on its lines in Oneonta. The present fare is 5 cents.

**Lower Fare for Revere.**—The public trustees of the Eastern Massachusetts Street Railway have reduced the fare in Revere, Mass., from 10 cents straight to sixteen tickets for \$1. The reduction was made in accordance with the company's policy of reducing fares wherever conditions warrant such a course.

**Fare Reduced in Montpelier.**—The City Council of Montpelier, Vt., has authorized Mayor Shurtleff to sign an agreement with the Montpelier & Barre Traction Company by which the fare in Montpelier will be 5 cents instead of 6 cents, as heretofore. The Council has permitted the company to increase its rate between Barre and Montpelier from 15 cents to 18 cents.

**"Complaint Cards" in Detroit.**—The cars of the Detroit (Mich.) United Railway have been equipped with "complaint card boxes," placed at the exit end of the car together with a supply of complaint cards so that violation of traffic ordinances observed by passengers may be reported easily and quickly. The cards are collected each night at the carhouses and sent to the complaint bureau.

**Fare Briefs Filed.**—The city's brief in the hearing of the Portland Railway, Light & Power Company, Portland, Ore., before the Public Service Commission asking for an increase in revenue, has been filed with the commission by City Attorney Stanley Myers. The

company's brief has also been filed, and the Public Service Commission hopes to arrive at some decision in the matter within thirty days.

**Seven-Cent Fare Urged.**—In applying for a 7-cent fare in the District of Columbia, William F. Ham, president of the Washington Railway & Electric Company, declared that at the present rate of income his company is earning only 3½ per cent on its investment. Mr. Ham expressed the opinion that the Public Utilities Commission should allow a 7-cent fare with 2 cents for transfers for the period beginning May 1.

**Staggered Hours Helpful.**—Very satisfactory results are reported by the railways in Washington as a result of staggered hours in the Government departments. The congestion on cars has been measurably relieved, both in the rush hours of the morning and in the afternoon by spreading the hour for reporting for duty between 8:45 and 9:15 o'clock, instead of all reporting at 9 o'clock as formerly was the custom.

**Safety Campaign in Toledo.**—"Safety" posters are a feature of a campaign which the Toledo Railways & Light Company, Toledo, Ohio, is conducting for the reduction of the number of accidents on its lines. The company has placed the posters in its cars and in other public places. Accidents involving the company's cars numbered 169 in January, 1920, as compared with seventy-four for the same month of 1919.

**Suspends Seven-Cent Rate.**—Owing to protests from the city authorities of Phillipsburg, N. J., the Phillipsburg Transit Company did not raise its fare to 7 cents on March 1 as it had proposed doing. The municipality has applied to the Interstate Commerce Commission for a hearing on the company's petition for a rate increase. The company operates in Phillipsburg and neighboring New Jersey and Pennsylvania towns.

**Will Grant Six-Cent Fare.**—The City Council of Little Rock, Ark., has directed the city attorney to prepare an ordinance granting the Little Rock Railway & Electric Company a 6-cent fare for a period of three years. This action was taken after the approval by the Council of the report of the public utilities committee, which urged financial relief for the company through a higher fare. The company's petition for an increase has been under advisement for several months. The present fare is 5 cents.

**Jitneys Under Ban in Lowell.**—Operation of jitneys in Lowell, Mass., ceased on March 1 by order of the City Council. The Council had previously passed an ordinance barring the jitneys from all streets served by the Eastern Massachusetts Street Railway. This action was taken at the instance of the "home rule" committee recently appointed to manage the Lowell division of the company. Company officials estimated that the annual loss in revenue due to jitney competition in the Lowell district amounted to \$50,000.

**Would Carry Fare Plea to Courts.**—The New York, Westchester & Boston Railway, New York, N. Y., has applied to Supreme Court Justice Platzek for a writ of certiorari to compel Lewis Nixon, Public Service Commissioner for the First District, to produce in court all documents relating to the hearings on the company's application for a higher fare. The company seeks to raise the rate for passengers riding within the corporate limits of New York City from 5 cents to 7 cents. Commissioner Nixon has refused to grant the increase.

**Fare Case Still Pending.**—The matter of fares on the Memphis (Tenn.) Street Railway is still up for discussion at Nashville before the State Utility Commission. The railway is seeking to raise its fare from 6 cents to 7 cents with a charge for transfers. This is bitterly opposed by the Memphis city government, Mayor Rowlett Paine having appeared in person before the commission. It is intimated that a fight in the courts will ensue if the rate is raised above 6 cents. There is also considerable talk in Memphis of re-routing many of the lines.

**Theatres Advertise Subway Advantages.**—The Shuberts, New York theatrical producers, have distributed among their patrons a leaflet containing directions for reaching their theatres via the Broadway subway, operated by the New York Consolidated Railroad. The location of the twenty Shubert theatres along the "Rialto," or Broadway theatre district, is shown on a map, on which the route of the Broadway line is also marked. The leaflet also contains information concerning important buildings and other points of interest along the line.

**Freight Rates Up Twenty Per Cent.**—The Aurora, Elgin & Chicago Railroad, Aurora, Ill., has filed tariffs with the Illinois Public Utilities Commission providing increases of approximately 20 per cent in its freight rates. The company seeks to abandon its collection and delivery service to the Interurban Motor Despatch Company, a freight and express company operating over its lines. The new tariffs raise the rate from 30 to 40 cents on shipments between Elgin and St. Charles and Geneva. Corresponding increases are made between other points. The new rates are now in effect pending approval by the commission.

**Eight Cents on Hudson Tubes.**—The Hudson & Manhattan Railroad, operating the tubes under the Hudson River connecting New York City with New Jersey points, has posted a new local passenger tariff schedule effective April 4, under which it proposes to raise the fare between the Hudson Terminal, Manhattan, and Jersey City and Hoboken from 5 cents to 8 cents. The fare between stations in New Jersey and stations in New York City other than the Hudson Terminal, now 7 cents, is also to be raised to 8 cents. The only 5-cent fare left is for a ride between the Jersey City and Hoboken

stations and between stations in Manhattan.

**Lower Ticket Rate Ordered**—The Indiana Public Service Commission has ordered the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., to cancel all commutation fares calculated on the basis of 2 cents a mile and to establish in lieu thereof fares on the basis of \$.01875 a mile, the rate charged by the Chicago, Lake Shore & South Bend Railway, which operates in the same territory. Commutation books are to be made up of forty tickets with a minimum charge of \$4 a book and 10 cents a ride. The Chicago, Lake Shore & South Bend Railway has been authorized to establish a minimum commutation fare of \$4 for forty rides, or ten cents a ride.

**City Backs Five-Cent Fare Suit.**—Justice Clark, of the Appellate Term of the Supreme Court in Brooklyn, has given permission to Corporation Counsel Burr of New York City to intervene in the suit instituted by Julius Merksamer, to recover 5 cents charged him by the Brooklyn Rapid Transit Company. It is claimed that the extra 5 cents was charged for a ride to Coney Island, on the Sea Beach line, and that not more than 5 cents should have been charged. The suit was tried in the Municipal Court in Brooklyn, and resulted in a victory for the company. If the appeal is successful, the fare to Coney Island on the Rapid Transit lines will be only 5 cents thereafter.

**Revocation of Jitney Licenses Upheld.**—The repeal of jitney licenses in the city of Brockton, Mass., by the City Council after the Eastern Massachusetts Street Railway had threatened to discontinue service unless jitneys were eliminated as competitors was upheld by the Supreme Court of Massachusetts in a recent decision handed down by Chief Justice Rugg. The opinion of the court says that the Aldermen acted in good faith and in the exercise of a reasonable discretion in the interest of public safety and convenience as they believed, to the end that the mode of transportation which they thought best calculated to serve the best interest of the entire population of the city might be preserved and maintained.

**Less Traffic in Kansas City.**—The Kansas City (Mo.) Railways reports that it now has in service during the evening rush hours 641 cars and twelve trailers, and in the morning rush hours 555 cars and twelve trailers. This is almost exactly the same service that was supplied in July, 1917, but the average daily number of passengers now is 310,000 as against 370,000 in 1917. This decrease is attributed largely to the jitneys and the growing habit of auto owners in picking up passengers on the street and carrying them downtown. The increase in population of Kansas City is estimated at 50,000 within the last three years. The increase in the number of automobile owners is about 13,000 in the same period.

**Asks Riders' Support to Prevent Breakdown.**—James F. Hamilton, president of the New York State Railways, has addressed to the people of Rochester an open letter asking their support in the company's effort to obtain financial relief for the Rochester lines through an increase in fare. Mr. Hamilton points out that the Rochester lines carry 275,000 passengers daily, although the population of the city is less than 300,000. He calls attention to the fact that the company needs \$1,000,000 to put its tracks and equipment in good condition. Mr. Hamilton suggests that car riders use their influence with the city authorities to prevent a total breakdown in the city's transportation system which threatens because of lack of funds.

**Appeals for "Safety First."**—H. O. Allen, safety engineer of the Beaver Valley Traction Company, New Brighton, Pa., believes in carrying the message of "safety first" into the homes of the company's men. He recently drew up and sent to each employee a series of talks in letter form, dealing with the problem of eliminating accidents on the company's lines. Mr. Allen discussed among other topics, proper braking of cars, the operation of door devices, and the regulation of car speed. He called the men's attention to the fact that, if they had any questions to ask regarding proper car operation, they should come to him for their answers, and that, while it was his business to show them the correct methods, they should not feel that he would report them for mistakes.

**Six Cents in Charleston.**—The Charleston (W. Va.) Interurban Railway has received permission from the State Public Service Commission to raise its fare within the Charleston city limits and its interurban rates. The commission has authorized a 6-cent city fare. The company had applied for a 7-cent fare. The increase in interurban rates asked by the company was granted without objection. The books of the company showed gross earnings of \$261,000 with operating expenses of \$244,500 and net earnings of \$17,000. George R. C. Wiles, chairman of the commission, stated that the company was entitled to earn 11 per cent upon its investment to include depreciation and risk. It is estimated that the increase in fares will raise the net earnings to \$22,000.

**Referendum on Columbus Fares.**—The 6-cent fare ordinance recently passed by the City Council of Columbus, Ohio, will be submitted to the voters of that city at a referendum election on April 27. The ordinance as passed by the Council grants the Columbus Railway, Power & Light Company a 6-cent cash fare for a six-year period. During the first two years the company is to sell five tickets for 25 cents and during the remaining four years six tickets for 25 cents. The company is permitted to charge 10-cent "owl car" fare. Free transfers are retained. Under the

terms of the ordinance the company binds itself to improve service, pay its share of necessary street paving, and make not more than six miles of extensions within the six-year period at a cost of not more than \$3,000,000.

**Further Transfer Curtailment.**—The Public Service Commission for the First District of New York has issued an order permitting the Belt Line Railway Corporation to file a new schedule on short notice, showing the elimination of transfers between the Fifty-ninth Street Crosstown line and the Madison Avenue line. The Fifty-ninth Street Line is owned by the Belt Line Railway Corporation, a part of the Third Avenue system, while the Madison Avenue line is being operated by the New York & Harlem Railroad, the owner of the property, to which company it was returned by an order of the court a few weeks ago. The New York & Harlem Railroad recently notified the Belt Line Corporation that, beginning March 1, it would discontinue giving transfers to, or accepting them from, the Fifty-ninth Street line.

**Unprecedented Traffic Increase in Brooklyn.**—Directions have been given by the Public Service Commission for the First District of New York to the operating officials of the Brooklyn Rapid Transit elevated and subway lines, the effect of which is to call for improvement in the service on those lines. Owing to the recent storm, which greatly delayed surface railroad operation, an enormous amount of traffic was diverted to the subway and elevated lines, so that for the month of February the total increase of traffic upon these lines aggregated 40 per cent. This great growth has had the effect of overloading the company's facilities. Investigations made by the commission have recently shown that at times there was as high as 20 per cent of the rolling stock of the elevated and subway lines in the shops awaiting repairs. This fact has also helped to make the present congestion a serious one.

**Plans Fight on One-Man Cars.**—The city of Richmond, Va., will shortly begin legal proceedings to bar the use of one-man cars by the Virginia Railway & Power Company, according to an announcement on Feb. 24 by Commonwealth's Attorney George E. Wise. Mr. Wise stated that he was preparing a petition for a writ of quo warranto against the company. Action against the one-man cars was first taken by John Hirschberg, candidate for mayor, who filed injunction proceedings in the Law and Equity Court, declaring that the operation of the cars was contrary to the charter of the city and a direct violation of the franchise of the company. He further claimed in the proceedings that the cars were unsafe. Judge Beverly T. Crump decided that he was without jurisdiction unless action was filed by legal representatives of the city, and Mr. Hirschberg then asked the Commonwealth's attorney to act. It is charged that the cars violate flagging regulations at grade crossings.

## Personal Mention

### Mr. Fish Again in Chicago

Leaves West Penn Railways to Become General Manager of Chicago Surface Lines—Other Changes

The Board of Operation of the Chicago (Ill.) Surface Lines at its meeting on Feb. 24 appointed Williston Fish, vice-president of the West Penn Railways, Pittsburgh, Pa., to the position of general manager of the system. Mr. Fish's appointment was briefly noted in the *ELECTRIC RAILWAY JOURNAL* for Feb. 28. Mr. Fish was general manager of the Chicago Railways until the time of the operating consolidation with the Chicago City Railway in 1914, when he became connected with the West Penn System. He therefore returns to Chicago thoroughly familiar with operating conditions in that city and well equipped to cope with the problems confronting the surface lines.

#### OTHER CHANGES ANNOUNCED

At the meeting on Feb. 24 the Board of Operation also made the following appointments:

Frank L. Hupp, formerly assistant secretary, was advanced to secretary. Mr. Hupp is also secretary of the Chicago Railways.

F. D. Hoffmann, formerly secretary and assistant treasurer, was appointed assistant secretary and assistant treasurer. Mr. Hoffmann is also secretary and treasurer of the Chicago City Railway.

M. B. Orde was made treasurer of the Chicago Surface Lines. He is also treasurer of the Chicago Railways.

John J. Duck was reappointed general auditor. Mr. Duck is auditor of the Chicago City Railway.

W. W. Gurley was reappointed general counsel.

No changes in the department heads, further than those already published in the *JOURNAL*, have been announced by President Blair, and the former heads are being continued until further notice.

#### CAREER OF MR. FISH

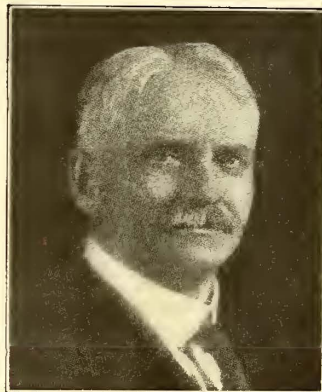
Mr. Fish was born at Berlin Heights, Ohio, in 1858. He entered Oberlin College in 1876 and in the following year was appointed to West Point. Graduating from the military academy in 1881 with high standing in mathematics, engineering, law and languages, he was appointed a second lieutenant of the Fourth U. S. Artillery. He served with that regiment for several years at San Francisco, New London, Conn., and Fort Snelling, Minn., meanwhile continuing the study of law.

Resigning from the army in 1887, he entered the employ of the Crane Elevator Company, of Chicago, as a salesman. He remained with the company

for a little more than a year. He meanwhile resumed the study of law in the school of Judge Thomas Moran, and was admitted to the bar in 1897.

Mr. Fish's connection with the street railway industry began in 1890, when he joined the South Chicago City Railway. For the next nine years he served as right-of-way and claim agent and assistant counsel of the company. During this period he acquired most of the right-of-way for the company and drew up all the contracts.

In 1899 Mr. Fish was appointed assistant to Jesse Spaulding, president of the Chicago Union Traction Company, continuing in the same capacity under John M. Roach, Mr. Spaulding's



WILLISTON FISH

successor. As aide to Mr. Roach he had an important part in the valuation of the property of the Chicago Union Traction Company and in the negotiations for the settlement ordinance of 1907. When Mr. Roach became president of the newly-organized Chicago Railways, Mr. Fish remained with him as his assistant. In February, 1912, he was elected vice-president and general manager of the company.

Upon the operating consolidation of the Chicago Railways and the Chicago City Railway to form the Chicago Surface Lines in 1914, Mr. Fish was made vice-president of the system, resigning, however, in the same year. About the same time he was chosen vice-president of the West Penn Traction & Water Power Company and the West Penn Railways.

In addition to his duties with the West Penn Railways, Mr. Fish has served as president of the Wheeling (W. Va.) Traction Company and as an official of several other companies controlled by the West Penn Railways. He has taken an active interest in the work of the American Electric Railway Association, presenting a paper on the

subject of depreciation before the recent mid-year meeting of the Association at Cleveland.

Col. R. A. Mitchell of Gadsden has been elected a vice-president of the Alabama Power Company, Anniston, Ala.

George R. Hart has been appointed assistant general manager of the Sacramento Northern Railroad, Sacramento, Cal.

R. E. Luellen has been appointed safety engineer of the Union Traction Company of Indiana, Anderson, Ind. Mr. Luellen is the editor of *Safety*, the company's magazine.

J. W. McNeely, superintendent of transportation of the Paducah (Ky.) Traction & Light Company, has been appointed superintendent of the Paducah Railway, which recently took over the property of the former company.

Archibald Page, general manager of the Glasgow Corporation Tramways Department, Glasgow, Scotland, has resigned. Mr. Page has been appointed a member of the Commission under the Ministry of Transport for the control of the electrical supply of Scotland.

H. M. Aldrich, formerly superintendent of the Northampton Street Railway, has been appointed by the Massachusetts Department of Public Utilities to be inspector of street railways and street railway equipment for the western district of the State.

John M. Johnson, traffic superintendent of the Trenton & Mercer County Traction Corporation, Trenton, N. J. has resigned. Mr. Johnson joined the company in the fall of 1919. He was formerly superintendent of the Ithaca (N. Y.) Traction Company.

Leslie W. Spraggon has resigned his position with the Connecticut Company where he has been inspector of rolling stock for the past two years, to take effect March 1. He goes to the Boston office of the Westinghouse Electric & Manufacturing Company as travelling salesman.

James T. Hutchings has resigned as president of the Rochester Gas & Electric Corporation, Rochester, N. Y., to become assistant general manager of the United Gas Improvement Company, Philadelphia, Pa. Mr. Hutchings was president of the Rochester Railway & Light Company from 1904 to 1909.

T. K. Glenn has been elected president of the Georgia Railway & Electric Company, Atlanta, Ga., to succeed the late Frank E. Block. Mr. Glenn is vice-president of the Georgia Railway & Power Company, which operates the lines of the Georgia Railway & Electric Company.

G. M. Rozelle has been appointed division superintendent of the Union Traction Company of Indiana, Anderson, Ind., with headquarters at Muncie. Mr. Rozelle succeeds A. G. Snell, resigned. Prior to his appointment as superintendent he was an inspector for the company.

Maurice Dooley, superintendent of the Barre & Montpelier Traction & Power Company, Montpelier, Vt., has tendered his resignation to take effect on March 22. Mr. Dooley has been superintendent of the company for several years. He was formerly assistant superintendent.

J. C. Hallman has been elected vice-president of the Georgia Railway & Electric Company, Atlanta, Ga., the lines of which are operated under lease by the Georgia Railway & Power Company. Mr. Hallman succeeds T. K. Glenn, who has been chosen president of the company.

John J. Dempsey, who resigned some months ago as vice-president and general manager of the Brooklyn (N. Y.) Rapid Transit Company to become vice-president of the Seamans Oil Company, has been transferred by the company from New York to Oklahoma City, Okla., where he will hereafter live and make his headquarters.

W. E. Herring, for the last seven years industrial agent of the Puget Sound Traction, Light & Power Company, Seattle, Wash., has been transferred to the Boston offices of Stone & Webster. He is to be connected with the engineering department of the division of engineering and construction. Mr. Herring went to the company at Seattle from the position of chief engineer of the U. S. Forestry Service.

A. C. Colby, who has been master mechanic in the Bridgeport shops of the Connecticut Company, New Haven, Conn., for the past two years, has been transferred to the New Haven general offices with the title of mechanical engineer. He will take over the duties of Leslie W. Spraggon in connection with the company's reclamation shop. Before joining the Connecticut Company Mr. Colby was master mechanic with companies at Pittsfield, Mass., and Birmingham, Ala. He was appointed master mechanic of the Connecticut Company's Bridgeport shops in October, 1918, succeeding William F. McCoy.

G. J. Smith, superintendent of rolling stock and shops of the Kansas City (Mo.) Railways, resigned from that position on Jan. 31 and will engage in the automobile business. Mr. Smith has been actively engaged in electric railway work for the past thirty years, having organized the South Covington & Cincinnati Street Railway in 1890. In 1899 he resigned as master mechanic of that company to become master mechanic of the St. Louis & Suburban Railway, where he remained for two years. At the end of that time he joined the St. Louis Car Company as superintendent, in which position he accomplished important work in connection with truck design and methods of truck manufacture. He was one of the first to advocate an association of electric railway master mechanics. In 1904 Mr. Smith joined the Metropolitan Street Railways, now the Kansas City Railways, as superintendent of rolling stock and shops, which position he has held for the past sixteen years.

## O. B. Coldwell Promoted

### Now Vice-President Portland Railway, Light & Power Company in Charge of Light and Power Department

Under a reorganization of the operating personnel of the Portland Railway, Light & Power Company, Portland, Ore., Orin B. Coldwell, who for some time has acted as general superintendent, has been chosen second vice-president and has been placed in charge of the light and power departments. F. I. Fuller, first vice-president, has assumed charge of all railroad matters, which have heretofore been attended to by Mr. Coldwell. For operating purposes the railway department and the light and power department are again segregated.

Mr. Coldwell, the new vice-president, is one of the best-known operating men in the Northwest. He was born at Salem, Ore., in 1875. In 1892, while yet a student at the Portland High School, he entered the employ of the Willamette Falls Electric Company, a pioneer

one of the organizers of the Northwest Electric Light & Power Association, of which he served as president in 1914. He was also instrumental in bringing about its affiliation with the National Electric Light Association. He is a member of both organizations and, in addition, a fellow of the American Institute of Electrical Engineers.

A. G. Snell, superintendent of the Muncie division of the Union Traction Company of Indiana, Anderson, Ind., has resigned. Mr. Snell has accepted the position of cashier of the Farmers' State Bank of Muncie. He has been connected with the Union Traction Company for more than fifteen years. He was appointed superintendent of the Muncie division in 1917.

## Obituary

Frank E. Block, president of the Georgia Railway & Electric Company, Atlanta, Ga., whose lines are leased by the Georgia Railway & Power Company, is dead.

D. S. Robertson, purchasing agent of the Montreal (Que.) Tramways, died in Montreal from pneumonia on Feb. 27. Mr. Robertson was born in Glasgow, Scotland, sixty-nine years ago.

Andrew B. Bullock, superintendent of carhouses of the Kansas City (Mo.) Railways, died on Feb. 15. Mr. Bullock had been connected with the company for thirty-one years, beginning as a conductor.

R. L. Morley, electrical engineer of the Muskegon Traction & Lighting Company, Muskegon, Mich., died recently in Muskegon at the age of thirty-six years. Mr. Morley had been connected with the company for several years. He was graduated from the engineering department of Purdue University in 1909, and for three years thereafter served as electrical engineer of the Maine Short Line.

Henry B. Endicott, head of the Endicott-Johnson Company, and chairman of the Massachusetts Committee on Public Safety during the war, died in Boston on Feb. 12. During the war Mr. Endicott was called on to assist in the settlement of labor problems and in one year helped settle labor disputes involving 100,000 workers. He was not directly engaged in electric railway work, but filled offices in the Holyoke, Springfield and Boston Elevated railway settlements that drew the attention of the industry to him. He was a man of unusually broad sympathy and of fine understanding. He put public service above his own interests. The removal of the influence for good that he wielded in connection with labor matters makes his passing a distinct loss to Massachusetts and the nation at large.



O. B. COLDWELL

in the field of electric power transmission. During the next five years he was engaged in one capacity or another in practically every department of the Willamette Falls company.

### WIDE EXPERIENCE AS ENGINEER

Not content with a merely practical knowledge of electricity, Mr. Coldwell entered Leland Stanford University in 1897 as a special student in electrical engineering. Here he put in three years, spending his summer vacations in the employ of the Portland General Electric Company. In the fall of 1900 he entered Cornell University as a student in the electrical engineering course of Sibley College, and was graduated with the class of 1902. Returning to the West, he again joined the Portland General Electric Company, this time as assistant superintendent. He has since filled successively a number of positions with the company and its successor, the Portland Railway, Light & Power Company.

Mr. Coldwell has taken an active part in building up electrical engineering societies on the Pacific Coast. He was

# Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

## Heavy Coupler Orders Placed Deferred Maintenance and Buying of New Equipment Responsible for Large Volume of Business

Considerable activity is now being shown in the buying of couplers. The market is flooded with inquiries because of the large number of double-truck car orders pending. Deferred maintenance, however, also is responsible for a large volume of orders that are being placed.

Prices are firm, no advances having been made since Dec. 1, 1919, when a small increase, approximately 5 per cent, was announced. Owing to present market tendencies, another increase about April 1 would not be a great surprise.

In addition to the couplers ordered for new cars that are being built, many railways are in the market for maintenance needs. Among the large orders for this purpose noted is one by the Brooklyn Rapid Transit Company for enough coupler heads of the pin and link type to equip 475 cars. These included 400 type 1,250 couplers, 200 type 1,275, 250 type 18 and 100 type 4-A, all of which will be furnished by the Van Dorn Coupler Company. Also the Long Island R.R. electric division, has placed an order for a large number of couplers from a well known coupler manufacturer. In addition orders from some of the railways in the larger cities are now pending and may be closed at any time. The outlook is very good for a large volume of business within the next three months.

## President Names New Fuel Commission

Railroads' Coal Confiscation Claimed to  
Be Illegal By National Coal  
Association

President Wilson has issued executive orders effective until April 30 next, providing for continuation of the power of the Fuel Administration, but dividing them between the Director General of Railroads and a commission of four, composed of A. W. Howe, Rembrandt Peale, F. M. Whittaker and J. F. Fisher. It will function through the Tidewater Coal Exchange, which had been suspended before the resignation of Dr. Garfield as Fuel Administrator. Director-General Hines will retain jurisdiction over domestic distribution, while the commission will handle bunker and export coal matters. The order said the action was taken "because of the present emergency and in order to insure an adequate supply and equitable distribution, and to facilitate the movement, and to prevent,

locally or generally, scarcity of coal."

It directs specifically that the order issued by the U. S. Fuel Administration Nov. 6, 1917, relative to tidewater transshipment of coal at Hampton Roads, Baltimore, Philadelphia and New York, and for the employment of and co-operation with the Tidewater Coal Exchange, as a common agency to facilitate transshipment and to reduce delays in the use of coal cars and coal-carrying vessels," suspended by Dr. Garfield on Feb. 20, 1919, be reinstated.

Rush C. Butler, the general counsel of the National Coal Association, declares that all confiscations and diversions of coal by the Railroad Administration made subsequent to Dec. 13, 1919, the date of Dr. Garfield's resignation as Fuel Administrator, are invalid and unlawful, subjecting not only the Administration itself but the individuals to liability for any damage attendant on such action.

## Line Hardware Active

Spring Buying of Line Materials Opening  
Up Well—Railways Commence  
on Linework Within Six Weeks

To all appearances railways utilities are quite active in their preparations for line work this spring as orders for line hardware have been coming in in large amounts. Here and there, however, spots are found in the ordering where there is little or no work in course of preparation at this time. Throughout the South, West, and Middle West the buying has been more marked than in the East, although there has been considerable movement there too.

Shipments are of varying length of time, according to the class of material required. In the East flats may be ordered from stocks acquired before the embargoes shut down shipments from the steel regions, and deliveries are being made in two to three weeks. Many brackets are coming through in three to four weeks, while some cannot be shipped for four to six weeks.

It seems that the rolling mills are devoting much of their effort on heavy sections, and this is given as a reason for a rather limited quantity of the light sections such as angles, channels, ovals and flats.

The latter part of last week some manufacturers advanced their prices of line hardware 10 per cent, and it is expected that those who have not already done so will follow suit any day. The tendency of steel products is upward, and mills are booked to the limit for months to come. One of the main causes for the shortage is given as the insufficient number of cars to carry

coal to be coked, to carry raw materials to the mills and to remove finished products from the mill warehouses. Then, too, there is a shortage of labor not only in the steel mills but also at the coke ovens, so that it is improbable just now that a considerably greater amount of coal could be coked were there sufficient cars available to bring the coal in.

## Changes in Westinghouse Railway Department

Myles B. Lambert Becomes Manager  
and W. S. Rugg and Charles Robbins,  
Assistants to Vice-President

Announcement has been made by the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., of the appointment of W. S. Rugg, formerly manager of the railway and of the marine departments, and Charles Robbins, assistant sales manager, as assistants to vice-president. Myles B. Lambert, for many years actively connected with the work of the company, now becomes manager of the railway department.

Mr. Rugg comes from Michigan and is a Cornell graduate. Soon after his connection with the company, he was transferred from Pittsburgh to Chicago and, in 1901, was transferred to New York as special engineer. Eight years later he was made the manager of the office. In 1917, he was recalled to East Pittsburgh to take charge of the railway department where, in 1918, he was also made manager of the newly created marine department.

Mr. Robbins began his connection with the company in 1899 at its New York office. He was transferred in 1906 to the main offices at East Pittsburgh to become assistant to the manager and later manager of the industrial and power departments. In August, 1915, he was made assistant sales manager of the company.

Mr. Lambert joined the Westinghouse forces in 1901 and since that time he has occupied several positions in the railway department. The last one, previous to his promotion, was that of assistant to the manager. The larger part of Mr. Lambert's early life was spent in practical railway work. This has given him a thorough understanding of the class of work handled by his department. His earlier experiences were with the Long Island Railroad, then a steam operated road. Subsequently he entered the employ of the Kings-County Elevated Railroad of Brooklyn, where later he became division superintendent. Mr. Lambert's latest promotion will be gladly received



by those of his wide acquaintance among electric railway men. He has been particularly active in behalf of the American Electric Railway Association, serving on several of its committees.

### Sheet Products Advance

#### Headlights, Heaters With Pressed Covers and Devices Contained in Sheet Boxes Included

Owing to an increase in the price of sheets, similar increases in the price of headlights, heaters, covering boxes for electrical devices, etc., have been announced during the past few weeks. These increases range from 5 to 7½ per cent.

Manufacturers in the railway field are experiencing great difficulty in obtaining any sheet at all. Prices are high with large premiums the rule. Orders placed with the mills mean very little as the delivery situation is indefinite and hence manufacturers do not know what they will be able to produce. Some of the more fortunate ones who have a considerable amount of stock on hand will be enabled to quote good prices on a large amount of new business that is now being offered.

Sheet mills are operating at from 70 to 80 per cent of normal. This, however, has had little effect in relieving the sheet shortage among manufacturers in the railway field as manufacturers from every field are in the market for sheets and the demand is many times greater than the supply. The car shortage, also, is proving to be a heavy drawback and even when sheets are finished, it is almost impossible to get them moved. At the present time heavy stocks of finished sheets are piled

up in the sheet mills or warehouses of mills waiting for cars.

Although quotations for box annealed one-pass block sheets in from No. 17 to No. 30 gage range from \$4.20 to \$5.15 per 100 lb., manufacturers in the railway field have been forced to pay 8 cents to 9 cents per pound in order to continue production made necessary by the recent heavy ordering of equipment.

### Chicago Plans to Buy 300 Cars

The Chicago Surface Lines is contemplating the purchase of 300 new cars during the present year. The purchase of at least 200 additional cars is practically certain, since the Public Utilities Commission has asked that more cars be put in service.

### Rolling Stock

Lincoln (Neb.) Traction Company, has placed an order with the American Car Company for fifteen Birney safety cars.

Cumberland County Power & Light Company, Portland, Maine, lost two cars and a snowplow in a fire which destroyed its carhouse.

Indianapolis (Ind.) Street Railway, will be in the market shortly for from forty to fifty double-truck cars probably of the pay-as-you-enter type.

People's Gas & Electric Company, Burlington, Iowa, has ordered six safety cars from the National Safety Car & Equipment company.

New York & Stamford Railway, Port Chester, N. Y., is in the market for from five to seven safety cars.

Omaha & Council Bluffs Street Rail-

way, Omaha, Neb., has ordered five Birney safety cars for use on four of its outlying lines.

Grand Rapids (Mich.) Railway has placed an order for nineteen safety cars. The purchase has been approved by the special street car committee of the city commission.

Interstate Public Service Company, Indianapolis Ind., has purchased an electric locomotive for use on its line between Indianapolis and Louisville.

### Franchises

Hudson & Manhattan Railroad, New York, N. Y.—The application of the Hudson & Manhattan Railroad for another extension of time in which to begin building its line from Thirty-third Street and Broadway, its present terminus, to the Grand Central Terminal was denied on Feb. 28 by Acting Transit Construction Commissioner Ryan.

### Track and Roadway

Calgary (Alta.) Municipal Railway.—The Calgary City Commission is considering the purchase of 100 tons of steel for proposed improvements to the line of the Calgary Municipal Railway in Tuxedo Park.

British Columbia Electric Railway, Vancouver, B. C.—The British Columbia Electric Railway proposes to extend its Mount Tolmie line, Victoria, B. C., to Bay Road.

Boston (Mass.) Elevated Railway.—The Boston Elevated Railway has announced that it will pay the entire cost

### NEW YORK METAL MARKET PRICES

	Feb. 4, 1920	March 3, 1920
Copper, ingots, cents per lb.	19.00	18.37
Copper wire base, cents per lb.	22.25	22.25
Lead, cents per lb.	8.75	9.00
Nickel, cents per lb.	45.00	45.00
Spelter, cents per lb.	8.70	9.10
Tin, cents per lb.	58.00	61.50
Aluminum, 98 to 99 per cent, cents per lb.	32.50	33.00

### OLD METAL PRICES—NEW YORK

	Feb. 4, 1920	March 3, 1920
Heavy copper, cents per lb.	17.75 to 18.00	17.00 to 17.50
Light copper, cents per lb.	15.50 to 16.00	14.75 to 15.25
Heavy brass, cents per lb.	10.00 to 10.50	9.50 to 10.25
Zinc, cents per lb.	5.00 to 5.25	5.00 to 5.25
Yellow brass, cents per lb.	8.50 to 9.00	9.00 to 9.25
Lead, heavy, cents per lb.	6.75 to 7.00	7.50 to 7.75
Steel car axles, Chicago, per net ton.	\$33.00 to \$35.00	\$31.00 to \$32.00
Old carwheels, Chicago, per gross ton.	\$35.00 to \$36.00	\$41.00 to \$42.00
Steel rails (scrap), Chicago, per gross ton.	\$29.00 to \$30.00	\$30.50 to \$31.00
Steel rails (relaying), Chicago, gross ton.	\$34.00 to \$35.00	\$34.00 to \$35.00
Machine shop turnings, Chicago, net ton.	\$14.50 to \$15.00	\$17.50 to \$18.00

### ELECTRIC RAILWAY MATERIAL PRICES

Rubber-covered wire base, New York, cents per lb.	30.00	30.00
Waterproofed wire (100 lb. lots), cents per lb., New York	27.50	27.50
Weatherproof wire (100 lb. lots), cents per lb., Chicago	27.00	27.00
T rails (A. S. C. E. standard), per gross ton.	\$55.00 to \$57.00	\$55.00 to \$57.00
T rails (A. S. C. E. standard), 20 to 500 ton lots, per gross ton.	\$51.00 to \$53.00	\$55.00 to \$57.00
T rails (A. S. C. E. standard), 500 ton lots, per gross ton.	\$45.00 to \$47.00	\$45.00 to \$47.00
T rail, high (Shanghai), cents per lb.	3.00	3.00
Rails, girder (grooved), cents per lb.	3.00	3.00
Wire nails, Pittsburgh, cents per lb.	4.50	4.00 to 4.50
Railroad spikes, drive, Pittsburgh base, cents per lb.	3.35 to 3.85	3.35 to 3.85
Railroad spikes, screw, Pittsburgh base, cents per lb.	7.50 to 9.00	7.50 to 9.00
Tie plates (flat type), cents per lb.	3.00	3.00 to 4.00
Tie plates (brace type), cents per lb.	3.00	3.00 to 4.00

### ELECTRIC RAILWAY MATERIAL PRICES

	Feb. 4, 1920	March 3, 1920
Tie rods, Pittsburgh base, cents per lb.	7.00	3.50 to 4.25
Fish plates, cents per lb.	3.00	3.50 to 4.25
Angle plates, cents per lb.	3.90	2.75 to 4.00
Angle bars, cents per lb.	3.90	2.75 to 4.00
Rail bolts and nuts, Pittsburgh base, cents per lb.	4.50 to 6.50	4.50 to 6.50
Steel bars, Pittsburgh, cents per lb.	3.00 to 4.00	3.00 to 5.00
Sheet iron, black (24 gage), Pittsburgh, cents per lb.	4.35 to 4.60	4.50 to 7.00
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb.	5.75 to 5.95	6.00 to 8.00
Galvanized barbed wire, Pittsburgh, cents per lb.	4.10 to 4.45	4.60
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.70 to 3.95	4.20
Car window glass (single strength), first three brackets, A quality, New York, discount †	77%	77%
Car window glass (single strength), first three brackets, B quality, New York, discount	77%	77%
Car window glass (double strength, all sizes AA quality), New York, discount.	79%	79%
Waste, wool (according to grade), cents per lb.	20 to 23	29 to 32
Waste, cotton (100 lb. bale), cents per lb.	19 to 22	16 to 17
Asphalt, hot (150 tons minimum), per ton delivered		
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	\$25.00	\$25.00
Asphalt filler, per ton	\$30.00	\$30.00
Cement (carload lots), New York, per bbl.	\$2.90	\$2.90
Cement (carload lots), Chicago, per bbl.	\$2.00	\$2.00
Cement (carload lots), Seattle, per bbl.	\$2.68	\$2.68
Linseed oil (raw, 5 bbl. lots), New York, per gal.	\$1.93	\$1.80
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	\$1.95	\$1.82
White lead (100 lb. keg), New York, cents per lb.	14½	15½
Turpentine (bbl. lots), New York, cents per gal.	\$1.97	\$1.99

† These prices are f. o. b. works, with boxing charges extra.  
\* U. S. Steel Corp.

of the relocation of the tracks in the Belgrade Avenue extension. The company had previously contended that the Eastern Massachusetts Street Railway should pay part of the cost of the work.

**New York & Queens Traction Corporation, Brooklyn, N. Y.**—Action of the New York City Board of Estimate in ordering the Manhattan & Queens Traction Corporation to construct a surface line from Jamaica to the corporate limits of the city of New York has been validated by Judge Henry W. Rogers of the United States Circuit Court of Appeals in an opinion in which he reverses the recent decision of Judge Thomas I. Chatfield of the United States District Court sustaining an injunction against the Board of Estimate.

**Chickasha (Okla.) Traction Company.**—This company is building 3,000 feet of track.

**Toronto (Ont.) Civic Railway.**—Plans have been submitted to the Civic Administrative Commission by the Toronto Civic Railway of Toronto for the construction of an incline railway at a cost of \$180,000.

**Scranton (Pa.) Railway.**—The Scranton Railway plans to elevate its tracks at North Main Avenue and 100th Street.

**Grand Trunk Railroad, Montreal, Que.**—The Grand Trunk Railroad plans to electrify its St. Mary's, Ont., branch. Work will begin shortly.

**Milwaukee Electric Railway & Light Company, Milwaukee, Wis.**—Plans are being worked out for the construction of a car line from Kinnickinnic Avenue to the city limits.

### Power Houses, Shops and Buildings

**Pacific Electric Railway, Los Angeles, Cal.**—The Pacific Electric Railway has begun the construction of a \$75,000-dollar passenger station in San Pedro.

**Tri-City Railway of Illinois, Rock Island, Ill.**—The Tri-City Railway of Illinois and the Moline, Rock Island & Eastern Traction Company have filed a joint petition with the Illinois Public Utilities Commission asking for approval of the purchase by the first named company of the tracks and equipment of the latter.

**Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.**—This company is making plans for dismantling its power station at Lebanon, Ind. and substituting a high-tension line from another power house. There is also a general study being made looking toward a change from twenty-five to fifty cycles on part and perhaps all of the system, in order to be in better position to sell energy for commercial purposes.

**Cumberland County Power & Light Company, Portland, Me.**—A carhouse belonging to the Cumberland County Power & Light Company at Yarmouth

was destroyed by fire on Feb. 14. Two cars, a snow-plow and a rotary converter were also destroyed. The loss is estimated at \$50,000.

### Trade Notes

**American Steel & Wire Company, Worcester, Mass.,** has started work on a new Labor Bureau building to cost \$75,000.

**Charles A. Hirschberg,** advertising councillor, specializing in the technical field, announces that he is now located at 426-436 Sun Building, 150 Nassau Street, New York.

**Westinghouse Electric International Company, Pittsburgh, Pa.,** announces that G. L. Washington has left for Cuba to join the sales department of the Havana office of the company.

**Roth Brothers & Company, 14 W. Adams Street, Chicago, Ill.,** motor manufacturers, announce that H. E. Stocker for a number of years production manager of the Fort Wayne Works, General Electric Company, has become general manager of the company.

**American Steam Conveyor Corporation, Chicago, Ill.,** announces that Henry P. Thompson, Cincinnati district representative of the company has added to his sales engineering staff, Albert A. Casey, who will assist in handling American steam jet conveyors in that territory.

**Lindsley Brothers Company, Spokane, Wash.,** with offices in the Hudson Terminal Building, 50 Church Street, New York, N. Y., announces that R. D. Patterson formerly with the Northwestern Electric Equipment Company, New York City, has been appointed eastern representative of this company.

**Western Electric Company, New York, N. Y.,** announces that J. F. Davis who has been a supply salesman at Chicago for a number of years and has been with the company since 1911, has now been made sales manager at the Boston branch, the position recently held by W. F. Abely, who was promoted.

**American Institute of Electrical Engineers and the Association of Iron and Steel Electrical Engineers** held a joint technical session at the Hotel Chatham, Pittsburgh, Pa., on Saturday, February 21, at which time a paper was presented on the "Manufacture and Use of Graphic Recording Instruments" by Professor J. W. Esterline, of the Esterline Company, Indianapolis.

**Graton & Knight Manufacturing Company, Worcester, Mass.,** manufacturers of leather beltings, has purchased the leather belting plant of E. R. Ladew Inc., Glen Cove, New York. According to reports several millions was involved in the deal. The main factory at Glen Cove, N. Y., has been established since 1903.

**Anaconda Copper Mining Company, Chicago, Ill.,** rolling mills department, announces that Frank H. Freeman has

been appointed sales agent of the general office of the rolling mills department, Chicago. He was formerly connected with the Boston office of the American Electrical Works. H. Don Kersey, sales agent rolling mills department, has been transferred from the Chicago office to the New York office as sales agent to handle the company's business in the eastern territory.

### New Advertising Literature

**De Pere-Burton Company, Milwaukee, Wis.:** A thirty-two-page loose-leaf catalog on the Burton semi-sectional and De Pere improved cross-dam water tube boilers.

**National Tube Company, Pittsburgh, Pa.:** Bulletin 24A; 8½ x 11 in.; illustrated. Statistical data noting comparisons in the production of wrought and steel pipe.

**Griscom-Russell Company, 90 West Street, New York, N. Y.:** Bulletin No. 311 on Reilly Evaporators of the submerged type and a paper on "High Heat Level Evaporator Plant" for stationary power houses.

**Green Engineering Company, East Chicago, Ind.:** A thirty-two-page booklet "Securing Better Combustion of Midwest, Western and Southwestern Fuels" which consists of a compilation of articles which have appeared in McGraw-Hill publications during the past year.

**Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.:** A 36-page booklet, "Westinghouse Underfeed Stoker," on stoker operation, giving features of design, grate and tuyeres construction and also the arrangement of brackets, gears and fuel deflecting plates.

**Carrick Engineering Co., Chicago, Ill.:** A twelve-page catalog, letter size, describing the Carrick Combustion Control which automatically synchronizes fuel feed and damper position to correspond with the load, holding the proper relation for efficient results. A copy of the catalog will be sent upon written request.

**Coatesville Boiler Works, Coatesville, Pa.:** A sixteen-page booklet "Fuel Oil Applied to Power Boilers." It contains some valuable information as to the relative merits of different fuels for use under boilers of all types, as well as on the dimensions and capacity in gallons of horizontal and vertical storage tanks. A copy may be had free upon request.

**Baldwin Locomotive Works, Philadelphia, Pa.:** Record No. 95 on Internal Combustion Locomotives. A 36-page illustrated booklet describing this company's gasoline locomotives built in accordance with the Ehle patents. The general construction with details of the various parts are described and illustrated. A number of illustrations taken from locomotives in service including those made for the Government are shown. Data sheets for inquiry giving general requirements also are included.