

# Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

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## Will He Hoist? He Has

**N**ELLIE, the beautiful sewing machine girl, has indeed fallen upon evil days. Her habiliments cost more, a great deal more, than they formerly did. Her hallroom costs her more. The movies cost her more. And now her New York *Evening Journal* is going to cost her 3 cents. Willie Hoist, alias Hearst, says so. And Mr. Hoist knows. He is a law unto himself when it comes to fixing prices. No franchise provision or public service commission stands between him and the attainment of a profit. He is after all the traffic will bear. On one day's notice Nellie had to choose whether it were better to do without "Advice to the Lovelorn" and the great serial "When a Girl Marries" or pay 3 cents each evening where she formerly paid 2 to learn how to distinguish between a lounge lizard and a young man with honorable intentions. It was serious business for Nellie. We know now why Mr. Hearst fought to save Nellie from the robber traction barons of New York City. It turns out that he wanted Nellie for himself.

## Potential Competition Is Nature's Corrective of Excessive Fares

**I**N ALL this pother and turmoil concerning demands, or rather implorings, for higher rates of fare the communities which recklessly reject such application regardless of merit fail to consider the fact that the electric street and interurban railway of today is no longer a monopoly. Even a monopoly, as the old expression went, could not afford to "charge more than the traffic would bear." Today the electric railway cannot lightly afford to charge more than the competing jitney bus and private automobile do. We all know how easy it is in these times to extemporize a makeshift transportation service which, though far inferior to the railway, has served the politician as a club up to the day when the jitney drivers over-reach themselves. Not all railways have either the courage or the resources of a Doherty. They have so exaggerated a fear of subsidized, ragamuffin competition that it is hardly conceivable that they would ask for a fare high enough to induce such competition to become permanent. Another corrective is the private automobile. So much has been said about the automobile's advance in smaller cities that its fare-regulating force there calls for no argument. Such a large percentage of the population now possesses cars that it is only by making the service attractive that traffic will be held at its maximum, at least in pleasant weather. For these reasons the electric railway can no longer be considered a monopoly. Electric railways must therefore tread so warily in the matter of fare increases that their own common sense will keep them

from asking for more than they can reasonably expect to get from a public that can fall back upon the jitney, the automobile, the motorcycle and the still-vigorous bicycle.

## Organized Employees Must Live Up to Their Agreements

**L**AWLESS labor has again been rebuked. The occurrence was at Rochester, N. Y. There the men in the employ of the New York State Railways, taking things into their own hands, went out on strike in direct violation of the principle of arbitration. They were out three days. It was as raw an instance of its kind as has been witnessed recently. And that is saying a great deal. The people of Rochester, however, were in no mood to be trifled with. They reacted to the strike in a way similar to that of the general public in the recent outlaw railroad strike. President Mahon of the Amalgamated acted after the damage had been done. He threatened to revoke the local charter. In the outlaw railroad strike he was quick to issue a warning to the members of the organization of which he is the head. Of course, it may be that he was not sufficiently well in touch with affairs in Rochester to have appreciated the attitude which the men there took it upon themselves to assume. This attitude could hardly have been unknown, however, to the local president of the Amalgamated. Even this official had to threaten to resign before the men came to their senses. Syracuse and Utica men have also heeded the warning.

Out in Cleveland a situation existed somewhat similar to that in Rochester. The public there was becoming aroused. The *Plain Dealer* declared there should be no strike. A truce was apparently reached there on May 5, but all danger does not seem to be over. Mr. Mahon's opportunity has not been destroyed. He should act promptly. No doubt should be allowed to remain in the minds of union men anywhere that they can disregard agreements entered into solemnly without incurring the wrath of the parent labor body of which they are a part.

## Every Employee Should Be a Capitalist

**T**HE most satisfactory employees for a public service company, or for any other employer for that matter, are those who have invested some money in good securities, real estate or building and loan association shares. These employees realize that people are not divided into two classes, laborers and capitalists, but that the normal condition of the laborer is to have some capital accumulated, while the so-called "capitalist" is likely to be at least as diligent a laborer as those who are often referred to as such.

Much of the present unrest has been caused by false

conceptions of work. As was pointed out by James H. McGraw in his paper read before the Chamber of Commerce of the United States at Atlantic City last week, "We have come to believe that the men who provide the management ability, the men who provide the money and the men who provide the manual skill and the labor of production are different kinds of men." A little knowledge of economics would show the fallacy of this, for as soon as a manual worker begins to use his head and to practice thrift he finds himself a tripartite personality at once.

To the extent that it can be done without paternalism, an employer is warranted in encouraging his employees to save and invest. He can do this with good grace if he is paying equitably for the service which he receives. He should in fostering thrift, we think, be frank as to why he does it, explaining that employees who own their own homes or who have money working for them are more desirable than those who do not.

The average employer cannot tell his workers that, as capitalists, on however small a scale, they are also better citizens. They would resent this as "preaching," but it is true nevertheless. The irresponsible agitators in this country as elsewhere are those who have nothing to lose and everything to gain (they think) by stimulating unrest and unproductiveness. The countries in which bolshevism has not taken root are those in which the ratio of investors to population is high.

As is pointed out by a writer in the current *North American Review*, capital is the surplus of production over consumption. Obviously those who are consuming more than they produce are contributing to the destruction of capital, which in the last analysis is neither more nor less than the means for providing people with the opportunity to work. The only man who knows anything about capital, and what it can do to make life easier and pleasanter, is the one who has accumulated some and put it to work.

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### Lessons of the Switchmen's Strike for the Electric Railways

**P**ARTICULARLY in the Middle West the electric railways have been called upon to handle freight shipments in unprecedented quantities due to the outlaw strike of the railroad switchmen. This has given them an opportunity to demonstrate to hundreds of new customers the really fine service they are able to give. They have been placed in the favorable position of having their service sought after by many large shippers who have heretofore been little interested in the electric way. A permanent benefit will come from this emergency, for many of the new friends thus made will be retained. This is assured because, despite the suddenness with which this freight business has increased, the electric railways have been able, from all reports at hand, to maintain their practice of moving all merchandise offered the same day it is received.

Several lessons can be drawn from the experience of the electric railways during the switchmen's strike. One weakness, which was forcibly emphasized in Chicago, was the remoteness of location of the interurban receiving stations. The exceedingly long hauls thus made necessary for the shippers' trucks and the trucking companies whose service was largely used in this connection really formed the limiting feature in the amount of business which the electric railways handled. This

forms a lamentable commentary on the inability of the surface line companies and the interurban companies to develop an arrangement for moving merchandise shipments to these outlying terminals during the small hours of the night, when the street car service is infrequent. A determined and concerted action should now be undertaken to bring about this arrangement, for it would not only produce a good revenue for the city lines but would multiply several times the amount of merchandise dispatch business which the radiating interurban lines could secure. This is a condition not confined to Chicago, but Chicago offers one of the finest opportunities for this manner of developing the value of the electric lines to the community.

This trucking limitation has also pointed out the desirability and almost necessity of a pick-up and delivery service to be operated under the control of and in conjunction with the interurban companies. Britton I. Budd, president Chicago, North Shore & Milwaukee Railroad, has blazed the way in this connection in Chicago by placing an initial order a few days ago for three tractors and fifteen trailers to be used in feeding merchandise shipments to the electric lines. The inauguration of this pick-up and delivery service, coupled with receipt of the merchandise by the consignee almost invariably within twelve hours from time of shipping, will certainly give a most effective inducement to the shipper to route his merchandise the electric way. It means better than express service at freight rates.

One other phase of the electric freight service during the strike is worthy of comment. A great deal of freight was offered to the Detroit United Railway and Michigan Railway in various Michigan cities for shipment to points south, west and east and to the Chicago, Lake Shore & South Bend Railway in Chicago for shipment to points south and east. These shipments were accepted in large numbers and delivered to points as remote as Louisville on the south, Cleveland on the east and Chicago on the west. While such shipments were delivered with reasonable expedition, the transportation involved a most circuitous routing in many instances. For example, shipments from Chicago to Cleveland had to be routed over nine different roads from Chicago to South Bend, to Elkhart, Peru, Fort Wayne (Ind.), Lima, Findlay, Fostoria, Fremont and Cleveland—these towns marking the route and the interchange points between different lines. What it is desired to point out here is that the number of interchanges could be reduced to four, the mileage and time reduced by nearly one-half, and perhaps the shortest route from Chicago to Toledo, Detroit and Cleveland established by the building of only about 15 miles of new line between Angola, Ind., and Pioneer or Bryan, Ohio.

Moreover, the building of a link of less than 15 miles between Ridge Farm and Paris, Ill., or better, a 30-mile link from Danville, Ill., to La Fayette, Ind., would connect up the great Illinois Traction System with all of the network in Indiana, Ohio and Michigan.

The possibilities that this simple connecting up of systems would offer for through l.c.l. shipments in normal times as well as in an emergency are very great. To handle a through interchange of carload freight would of course involve many other considerations, but the through movement of l.c.l. shipments could be built up immensely by building this short gap and simplifying the interchange between lines. Even now the inter-

change arrangements at the termini of the various lines are the only barriers to the development of through shipments of l.c.l. freight from Bay City and Grand Rapids or Milwaukee on the north, Cincinnati and Louisville on the south, Aurora and Elgin on the west and Detroit, Toledo and Cleveland, and even Buffalo, on the east.

There are numerous limitations at present to the full realization of such a program, but are these not really small compared with the opportunity which their removal would open up for the development of the electric railways? What we need is an Insull of the electric railway field to preach the advantages and economies of the interconnection of electric railways—power systems and tracks—just as it is being talked and developed in the power and lighting industry.

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### Laying Bare the Facts a Good Omen

**I**N CHICAGO last week the Public Utilities Commission held the first of a series of public hearings for the purpose of receiving testimony as to the financial difficulties of the public utilities. These hearings were asked for by the utility companies after a careful consideration of what means might be effective in alleviating their inability to finance capital expenditures for much-needed extensions and betterments. A number of them are unable to float any securities at any rate of return; others, even those with the most satisfactory record of earnings, are able to float new permanent financing only at a rate considered prohibitive.

This hearing was characterized by an unusual degree of candor on the part of utility and bank executives in describing the situation. The difficulties were attributed chiefly to the general stringency in the money market resulting from an overextension of credit, to the political demagogues whose continual attack upon the utilities has brought grave distrust of their securities and to the fact that the net earnings of the majority of the utilities have been too meager to stimulate or even preserve interest in their securities as sane speculation or safe investment. These combined causes have brought all utility companies, weak and strong alike, into the same predicament as regards new financing. The only difference is a matter of degree.

Some question arises as to what good can come from such a hearing which brings into full public view the really serious conditions which surround utility stocks and bonds. The strong companies may not only not profit by such frank statements made by men who know but they may actually suffer as a result. These stronger companies could afford to pay temporarily the higher rates for new money. So the hearing was not called for their benefit. Nor was it with the idea of educating the commission, for its members know the situation.

Its real purpose then was based on the hope that, risking a possible detriment to the few sound utilities for the sake of the whole utility field, there would come out of the hearing a goodly amount of publicity tending to show the public the correctible causes for the present plight and convince it that higher rates must be approved to save these great services, thereby providing support rather than condemnation for the commissioners in their task of adjudicating adequate rates.

At the time of this writing, three days after the first day's hearing, it may be said that the hoped for result

has been realized to a gratifying degree. Fortunately, General Dawes, a prominent banker and highly esteemed citizen of Chicago, who has no favors to ask nor anything to lose, made a telling attack on the unscrupulous politicians in the City Hall who have continually made the utilities the issue on which to ride into office, saying they were directly responsible for the present financial and service weaknesses of the companies. He referred particularly to the transportation companies. This ingenuous and ardent flaying of the City Hall, coming from a man of broad reputation, gave just the "punch" needed for publicity, and all the newspapers gave front page space and large headlines to the General's statement and the testimony of the other witnesses. The news of the hearing has been followed up by a number of editorials in several of the Chicago papers. These have discussed the problems of the utilities in a very satisfactory way, showing that the editors have derived a new grasp of these problems and, incidentally, that it is very much worth while to get the bankers to discuss the public utility credit situation.

So it may be said that while, for the moment, such a hearing as the one in Chicago brings forth a lot of gloom about utility securities, the ultimate outcome will be beneficial. Certainly there is no better way to clear up the situation when it is controlled by the public than to go to the public with the facts, for nearly every one concedes that the great American public is fair. The problem is mainly that of getting the true situation before it.

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### Will the Curve Start Up Again?

**I**N LINE with this hopefulfulness for an ultimate beneficial outcome appears the discussion this week by O. B. Willcox, of Bonbright & Company, whose connection with the Investment Bankers' Association as chairman of its committee on public service securities has given him an especially good opportunity to judge conditions in the utility field.

We might say that Mr. Willcox describes or plots the curve of public utility financing up to the present, and from this and from his conception of the present fundamental public attitude he predicts the future trend. The situation as described in the Chicago hearing, a report of which is also published, might be said to represent a point on this curve, the last point which we have been able to plot, and this we would emphasize, that the two positions, conflicting as they might seem at the first glance, are really complementary.

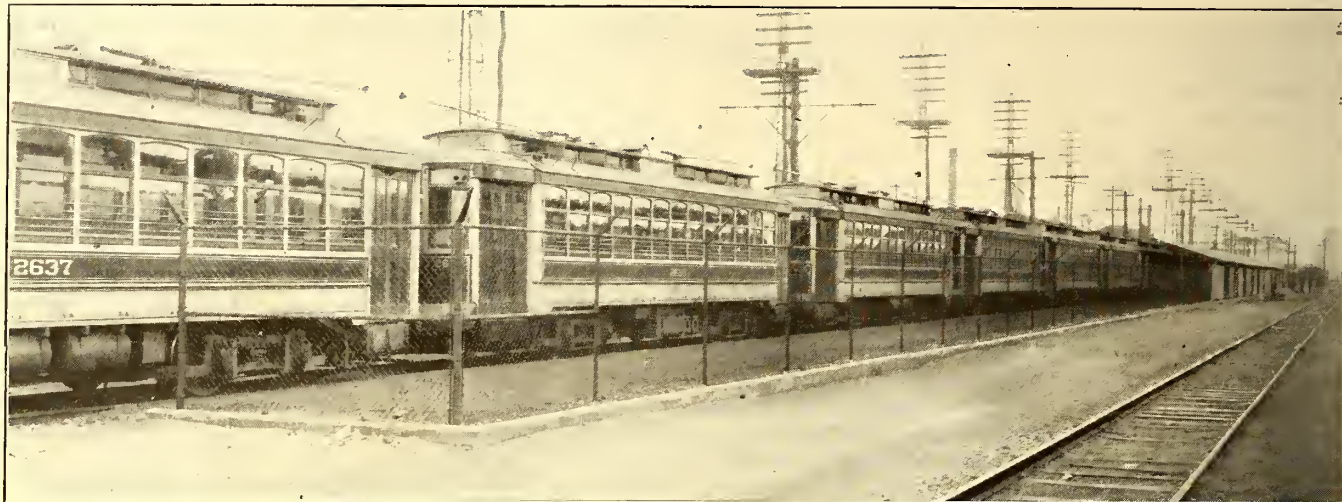
No curve of human events ever merely happens. The fact that an upward trend in this curve is predicted does not mean it will come of itself. Rather is there indicated necessity for that human endeavor, that intensive and fearless thinking which seems to have been present at the Chicago hearing. Mr. Willcox has indicated that there is now fertile ground from which satisfactory results may be obtained, and that there is a better conception on the part of the public than ever before of the dangers of low fares and confiscatory values and of the necessity from a purely selfish standpoint of fair treatment of utility enterprises. But this does not mean that hard work to confirm this situation is not necessary. We believe an outstanding effort to assist in this movement has been made by the Chicago hearing.

# Handling Shipyard Traffic at Sparrows Point

## How the United Railways & Electric Company of Batimore, Md., in Co-operation with the Government and the Bethlehem Steel Interests, Solved a Difficult Peak-Load Transportation Problem

By L. H. PALMER

Assistant to the president, United Railways & Electric Company

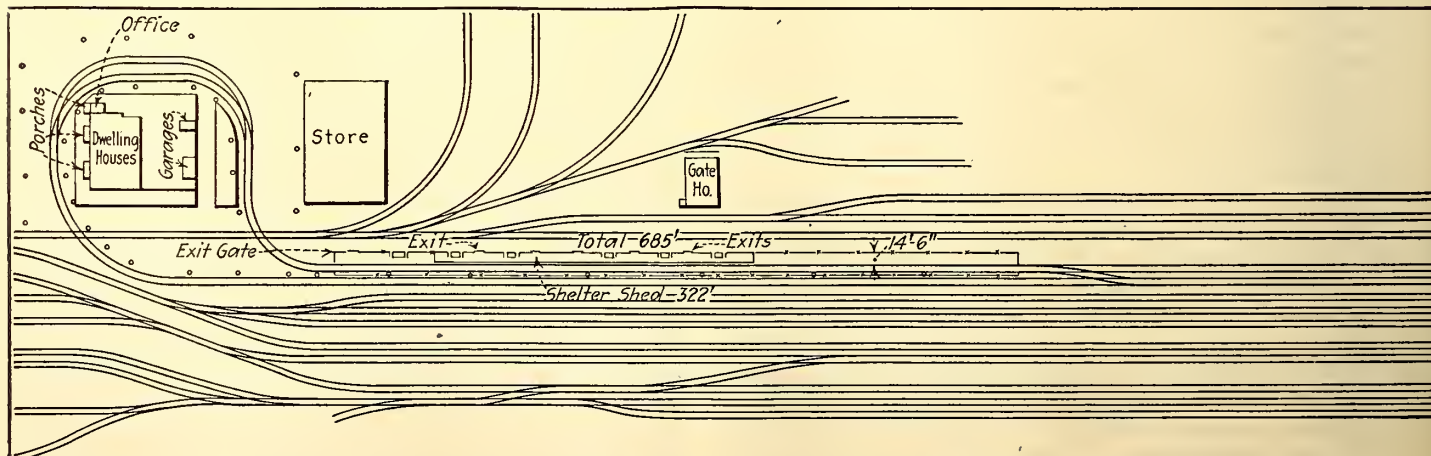


ENCLOSED AREA WITH ELECTRIC TRAINS IN PLACE AND ROW OF ENTRANCE GATES LEADING TO ENCLOSURE  
Note non-scalable fence. Cars are those purchased by Emergency Fleet Corporation

ONE of the effects of the war was a tremendous stimulation of the shipbuilding industry in many parts of the country. It was natural that Baltimore should participate in this development, partly because of its natural advantages as a manufacturing city through being on tidewater and near the coal and iron fields and partly because Sparrows Point, close to Baltimore, was already the site of large steel mills belonging to the Bethlehem Steel Company. The Bethlehem Shipbuilding Corporation, a subsidiary of the steel company, erected a great plant here. The transportation of the workers to it and the steel plant, the total being increased more than fourfold by the war activities, imposed a heavy transportation problem upon the

United Railways & Electric Company, whose line ran about one-half mile from the shipbuilding plant, and upon the Pennsylvania Railroad, whose track ran directly to the shipyard entrance. The Baltimore & Ohio Railroad also had a line to Sparrows Point, but it gave freight service only in this district.

Negotiations were initiated by the shipbuilding company looking to the construction of a branch of the electric railway to the gate of its plant, and in due course a contract to this end was signed by the Emergency Fleet Corporation, the Bethlehem Shipbuilding Corporation, the Bethlehem Steel Company and the United Railways & Electric Company for the construction of a double-track spur to the shipyard gates. This article



DETAILS OF ENCLOSED AREA AND ENTRANCE GATES SHOWN IN PICTURE ABOVE—ON OPPOSITE PAGE, TRACK AND SIGNAL LAYOUT AT STEAM ROAD CROSSINGS AND JUNCTION WITH UNITED RAILWAYS' MAIN LINE

deals with the layout and operation of this extension, including a rather elaborate prepayment station. I understand that the editors of this paper have arranged for a special article on the signal system to appear soon.

The Emergency Fleet Corporation had financed the purchase of fifty new cars for use in handling shipyard workers and assisted in the financing of this track extension to the yards on right-of-way furnished by the Bethlehem corporation.

As the sidings used by the Pennsylvania Railroad for

freight tracks of the Bethlehem Steel Company, all of which are protected by an electro-pneumatic signal and interlocking plant which governs the movement of trains on the electric tracks to and from the main line.

The main line of the electric railway at this point was equipped some time ago with continuous track circuit-controlled automatic block or spacing signals, and in order to handle safely, economically and without unnecessary delay the heavy traffic into and out of the new branch an interlocking plant, with suitable sig-



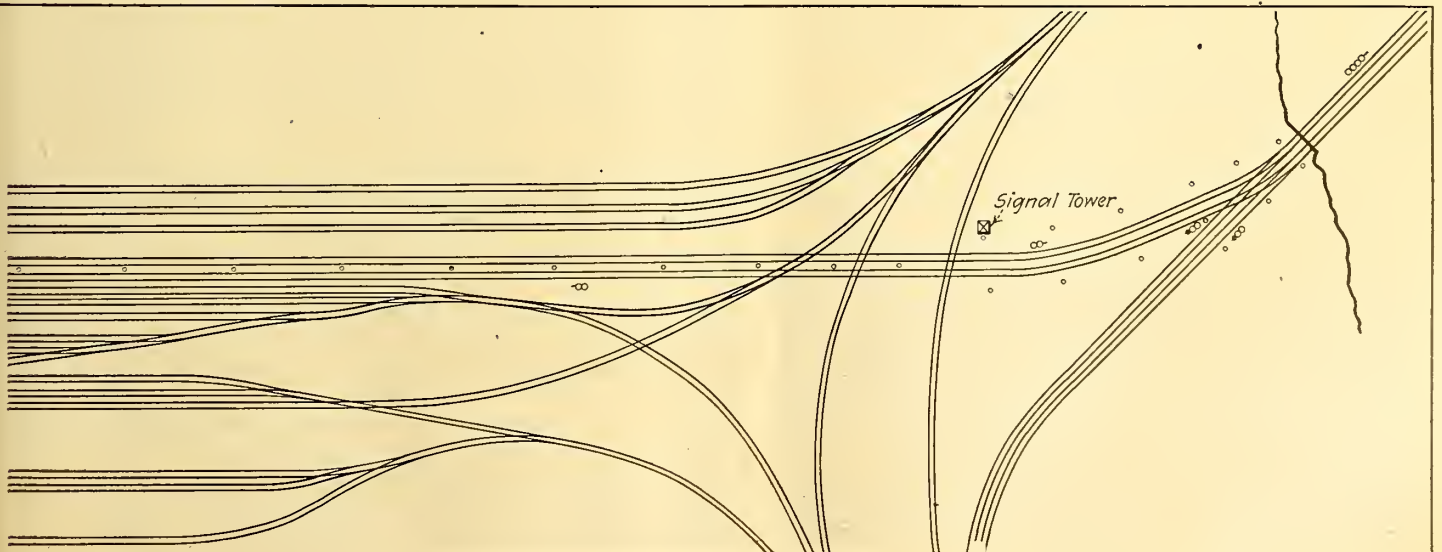
PARKED ELECTRIC AND STEAM TRAINS READY FOR THE 4 O'CLOCK CROWDS

passenger train service to the shipyard are located to the west of the electric railway tracks, in order to make room for the construction of this spur it was necessary to rearrange the yard tracks of the steel company and the shipbuilding corporation and to relocate the spur tracks used by the steam passenger trains. Involved in this relocation was the moving of brick sheds, approximately 1500 feet long, where furnace-lining bricks were stored. This one task itself was of no mean magnitude, particularly when performed under war conditions.

The electric railway spur consists of a double track, terminating in a loop at the main entrance to the yards, with an inner loop track. The track crosses the Pennsylvania main-line track to Sparrows Point and two

nals and derails, was required. After careful study the electro-pneumatic type of track circuit signal was selected as one which would provide safety with required speed of operation and a contract for the latest type material and its erection was awarded to the Union Switch & Signal Company of Swissvale, Pa., the same company which had equipped the main line with automatic signals.

This interlocking plant controls the two branch-off switches, two switches in the yard tracks, two Hayes derails on the U. R. & E., four Hayes derails on the yard tracks, seven color light-type signals on the U. R. & E., two high main-line-type position-light signals on the P. R. R. and four dwarf-type position-light signals on the yard tracks.



The signaling at the branch-off or junction is such that southbound cars are given either an indication to the main track (straight) or to the branch and northbound cars from the main line or from the branch, the signals being selected according to routes established by the position of the switch in advance.

These signals are also a part of the block system and as such are controlled by track circuit to the next sig-

R. & E. cars are blocked when traffic moves on the P. R. R. or yard tracks.

Further junction and crossing protection is furnished by track circuits which require cars to be clear of the junction or the crossing before opposing or conflicting movements can be made.

All switches and derails are controlled by track circuits and they cannot be moved when cars are standing upon them.

Approach locking is also provided to prevent the machine leverman from suddenly placing a proceed signal at stop and moving a switch in face of an approaching car.

Indicators of the electric-light type are provided to notify the leverman of the approach of cars on the main line of U. R. & E. and from the loop. Cars southbound on the U. R. & E. may go to main or branch, and properly to inform the leverman the approach light for this section is further controlled by a trolley contact which flashes the light if for the branch and does not flash if for the main line, this result being secured by the action of the car in taking power or not, according to the desired destination. Should the trolley contact be improperly operated, the motorman, on receiving the wrong signal, presses a key located near the junction signal L-12, giving in code information as to his destination.

The occupancy or non-occupancy of blocks on the main line leading away from the interlocking limits is also indicated by lights placed under the levers on the machine.

The installation of this branch-off or loop created a traffic that was too dense for the blocks on Bear Creek trestle north of the branch-off, with ruling time of eighty seconds on the northbound track and 100 seconds on the southbound track. Accordingly, two new blocks were added on each track and the ruling block between this interlocking and north end of draw is now forty-five seconds on the northbound track and forty-five seconds on the southbound track. During rush hours cars enter the main line every ninety seconds from the branch.

INTERLOCKING PLANT HAS ALL MODERN FEATURES

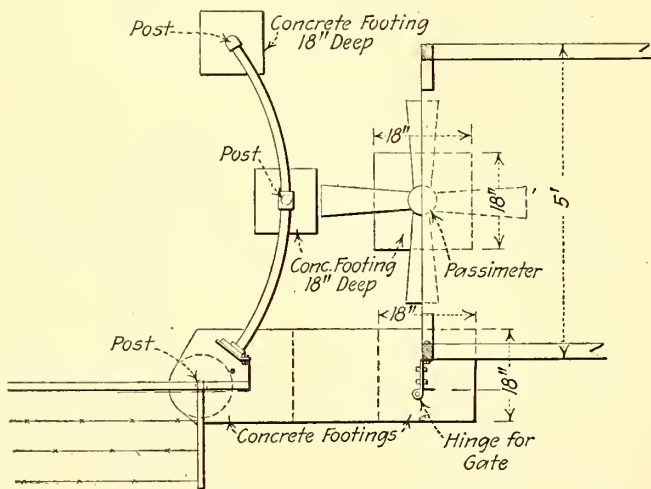
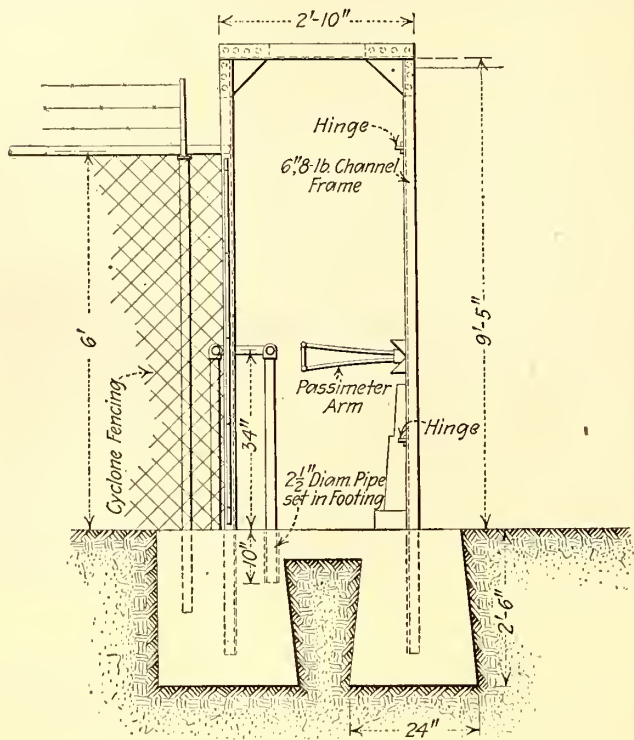
This signaling is invaluable, particularly during the heavy fogs which sometimes prevail due to the low-lying land and large area of water in the vicinity.

The interlocking machine is of the manufacturer's latest model, No. 14, electro-pneumatic type, with eleven working levers, four spare spaces and steel-case and light-type indicators under the levers to show the leverman when track sections controlling the switches are occupied or unoccupied.

In the same general location on the machine are placed the indicators which by red lights show when cars are approaching and receding on the U. R. & E. tracks.

The number of lever operations during the busiest fifteen minutes is thirty-seven, there being one "operation" each time a lever is moved to operate a switch or derail or to "clear" a signal. Lever movements placing a signal to stop are not counted. One lever may operate several switches and derails.

This machine is located in the second story of the tower building, in the first story of which are two 600-volt direct current, 25 cu.ft., car-type Westinghouse air compressors (one for emergency use), placed



DETAILS OF PREPAYMENT TURNSTILE AND TICKET BOOTH

nal in advance. To provide for closing in during congested periods, "permissive" signals, located on each junction signal, furnish an indication to proceed under control into an occupied block. These permissive signals are produced and controlled by the interlocking machine and can only be given if switch and interlocking conditions are proper for such display.

The signals at the crossing are so interlocked that when movements are made by United Railways & Electric Company cars all traffic on the Pennsylvania Railroad and yard tracks is blocked, and, vice versa, the U.

one above the other, and the relays in a steel cabinet with glass doors. The compressors are automatically controlled to hold the air pressure between 40 and 50 lb.

During rush hours the motor compressors operate only two out of thirty-seven minutes.

Suitable condensing pipes and tanks for collecting all moisture in the air are located on the outside of the building.

The compressed air is used to operate the switches and Hayes derails through the medium of cylinders and movements with electro-magnetic valves, which require air only when a movement is to be made.

The signals on the U. R. & E. are the manufacturer's style "N," electric light, with 6-in. lenses, which give a range of 1500 ft. under severe sunlight conditions, each lens being equipped with two 23-watt, 110-volt lamps burning in multiple. Yellow is used for "proceed," red for "stop" and red with small yellow underneath for "permissive" indications.

The position-light high signals on the P. R. R. tracks

intendent of power, United Railways & Electric Company.

After passing interlocking territory the electric cars proceed to the prepayment area, discharge their passengers and proceed around the loop. Most of the cars that run to the shipyards, after completing their morning work, are stored on the inbound track during the day, a shuttle car being operated on the outbound track from about 9:30 to 2 and a two-car train shuttle from 2 to 4.

The latter is necessary on account of the coming of the men to work for the afternoon shift. This shuttle connects at the interlocking tower with the main-line service. There is more or less casual travel between the shipyard office and the city, which makes it imperative to provide this shuttle service during the hours when the demands for traffic do not necessitate through service. A representative of the transportation department is located at the shipyard all day and has supervision of the operation and storing of cars. During the day a representative of the shops



AT LEFT, SIGNAL TOWER AT CROSSING OF MAIN TRACK OF P. R. R. AND DOUBLE TRACK OF U. R. & E. CO.  
AT RIGHT, INTERLOCKING MACHINE IN SIGNAL TOWER

display four lights of yellowish tinge in a horizontal line for stop and four in a vertical line for proceed. The position dwarf signals have two lights horizontal for stop and two at 45 deg. for proceed.

All track-circuit apparatus is of the Union Switch & Signal Company's manufacture, with latest model 15 vane-type relays.

Compressed air is distributed by 1-in. galvanized pipe and wires in grooved lumber, both mounted on same concrete foundations placed every 7 ft.

Power for the air compressors is supplied from the U. R. & E. Company's 600-volt feeders and the alternating current for signals, switch valves and track circuits is secured from the 2200-volt, 25-cycle mains used in the U. R. & E. Company's signal system, stepped down to 110 volts.

The plant was designed and installed by the Union Switch & Signal Company in accordance with specifications outlined by J. J. Coleman, engineer of the United States Emergency Fleet Corporation, and W. W. Wysor, chief engineer, and H. C. Bushnell, super-

department goes down to this location and gives the cars a running inspection, remedying any slight defects which the inspection may disclose or making such adjustments as are necessary.

In the afternoon, shortly before 4 o'clock (when the shipyards dismiss), the crews of the stored cars, who had been sent home in the morning, report back and are assigned to their places and prepare the cars for carrying the traffic back to the city. The cars are loaded in the prepayment area and as soon as they have received their passengers proceed around the loop and back to the city, without making a stop until they have crossed the Bear Creek trestle.

The shipyards dismiss from 6,500 to 7,000 employees in twelve to fourteen minutes, a recent check showing that 6,900 workers had left the premises in thirteen minutes, barring a few stragglers who remain behind for one reason or another. The releasing of such an army of workers in so short an interval of time illustrates the acuteness of the traffic conditions which the electric railway faced. Thus, in order prop-

erly to handle its portion of the traffic it was essential to provide a prepayment area, so that the loading of individual cars could be controlled. This has been successfully accomplished. Within four minutes after the 4 o'clock whistle blows the first of the trains of two and three cars begins to move, and by 4:25 thirty-five or forty cars have left the loop and are on their way back to Baltimore.

As will be seen from the accompanying illustrations, the prepayment station consists of a loading platform, which is 685 ft. long and 14½ ft. wide, enclosed by a non-scalable wire fence. For a distance of 322 ft. in the center of the station a shed has been erected to protect passengers during bad weather. The rear side of this is closed in, forming the fence for this portion of the prepayment station. The roof and sides consist of corrugated iron, supported in the metal framework of the building, which, with its fittings, is also galvanized.

The openings for the entrance and exit of the cars are guarded by watchmen. Entrance to the station is had through ten registering turnstiles arranged in pairs, each pair being operated from a small ticket booth housing two operators, one for each machine. The ticket takers receive cash, tickets or fare checks, as the case may be, making change when necessary. Tests show that each turnstile is capable of admitting, as a maximum, from forty-five to fifty passengers per minute. The speed with which the passengers go through the turnstile is accelerated by the use of tickets, which employees of the steel company can purchase at its office, or by the use of metal fare checks. To simplify fare collection, all passengers entering the cars through the prepayment area are required to pay two fares, which carry them to the eastern city limits. Passengers living in the single-fare zone board other cars on the inner loop and pay their fare in the usual way to the conductor.

Located at convenient intervals in the fence are sliding exit gates, 7 ft. wide, which are normally left open, so that passengers arriving at the shipyard can readily pass out to the yard entrances, the prepayment station being used as such only at the 4 o'clock rush hour. Just prior to this time the station is cleared of all persons, the exit gates are closed and locked, the watchmen station themselves at their appointed places and the ticket takers go to their respective booths.

The prepayment station can accommodate thirteen standard cars, and there is sufficient track space outside for thirty-seven additional. The cars are operated in units of two or three per train. Due to the track and road layout at the entrance to the shipyard, it was

not deemed feasible to locate the prepayment station at the outgoing track, so that the cars must go around the loop after they have been loaded. The cars are entirely enclosed, with door under the control of the crew, so that this plan has worked out without any hitch. When the station was opened, on June 26, 1919, 1,000 people were carried on the electric cars. For the first two weeks from 1,600 to 1,700 two-zone passengers were handled daily in normal weather, while now the average number of passengers handled on weekdays approximates 2,300 to 2,400.

#### OTHER SPECIAL SERVICE TO SHIPYARDS

In addition to the regular service handled from the carhouse serving the Sparrows Point line, twenty cars (made up into ten two-car trains) are operated from five different carhouses located at other points on the system. These cars leave their respective carhouses on schedule time in the morning and pick up passengers along their routes for the shipyards. In the evening on their last trip they return to their carhouses and carry passengers to the respective portions of the city reached. This method of operating through service from other sections of the city has proved advantageous to passengers and provides additional flexibility of service, so far as the railway company is concerned. It is, however, somewhat expensive, because after making one or two trips in the morning the cars lie over for the balance of the day, when they go back to their respective carhouses.

On one of the heaviest days approximately 2,700 people passed through the turnstiles in twenty minutes. Thirty-six cars operate into the shipyard siding in the morning and thirty-nine at night. The Pennsylvania Railroad operates four trains in and out of this location, hauling approximately fifty coaches. One of the impelling reasons for government assistance in the cost of construction of this new branch was that, due to the tunnel through which the Pennsylvania Railroad operates to reach the center of Baltimore, the railroad was up to its capacity and could not put on any more trains to handle the increasing number of employees at the shipyards and steel mill. Thus it was necessary for the United Railways to take care of a large part of the additional forces put on.

#### HOW THE TICKET-TAKING FORCE IS RECRUITED

The ticket takers who serve for short periods at the ten turnstiles are employed during the balance of the day by the shipbuilding corporation, the railway company paying them a small amount for about a half-hour's service each day and furnishing them with



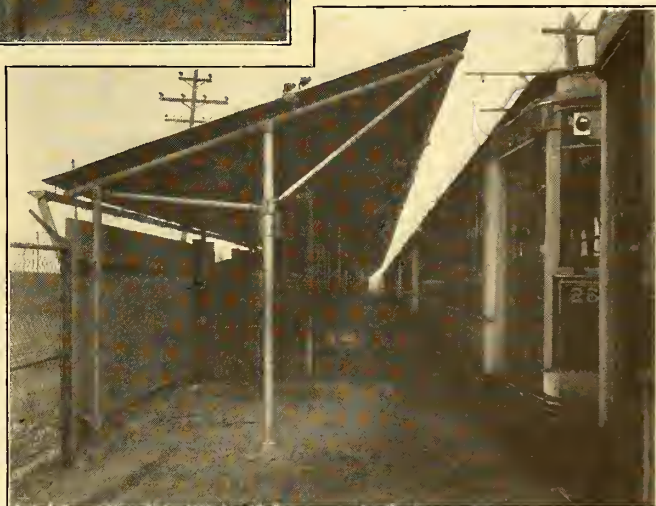
VIEW AT 4 P.M. ON APRIL 14 DURING THE RECENT RAILROAD STRIKE. THE ELECTRIC LINE HAULED SUCCESSFULLY THE WHOLE LOAD.



transportation. A dispatcher from the operating carhouse of this route goes down every afternoon, checks out the ticket takers and takes care of the collections. One man from the transportation department, located at this point, is in charge of the operations and handling of the situation. He is assisted at night by three or four special officers, and to help man the entrances and generally assist in the loading of cars he moves up the crews from the cars scheduled to go out last and has them aid him in this work. As the crowd dwindles away these men board their cars and take the last of the passengers away to the city. The United Railways Company has an alternative route for a part of the distance into Baltimore after passing over Bear Creek, and sixteen cars out of thirty-five or forty are routed over this other line. These cars run "express" for a considerable distance and are thus able to make practically as good time as those operating over the shorter route.

All the expenses of this improvement, including the moving and rearranging of steam railroad tracks and of the brick piles and the yard, are covered by the contract. Until the payments are completed the right and title to the easement is vested in the fleet corporation. The steel company can change the tracks, put in crossings, bridges, etc., in the future, if necessary, at its own expense.

No general overhead was charged against the cost, but only actual time spent upon the work, including supervision and engineering. The railway company pays 75 per cent of the cost in five equal annual instalments, the first instalment being due one year from the date of completion. Interest at the rate of 5 per cent on the balances is payable semi-annually. The railway company is reimbursed to the extent of 40 per cent of the total cost by the shipbuilding corporation in four annual payments. When the balances have been paid the title passes to the railway



ENTRANCE GATES, TURNSTILE, TICKET BOOTH AND PLATFORM AT SPARROWS POINT

The conductors on the cars that load up in the prepayment station do not ring up any fares on the register for passengers who pay as they go through the turnstiles, but collect and ring up all fares received from passengers picked up on their manifests each day a record of the number of passengers on their cars leaving the prepayment station.

Among the interesting features of the agreement made in November, 1918, between the Emergency Fleet Corporation and the three companies interested is that the railway receives an easement and a perpetual right-of-way for its double-track branch and terminal loop. The railway pays one-half the cost of operation and maintenance of the interlocking plant and the shipbuilding corporation the other half.

The steel company owns all of the property at Sparrows Point and the steam railroads and the electric railway company receive a lease on their right-of-way.

company, which is obligated to keep the branch in good repair. The fleet corporation was indemnified by the railway company, which is required to operate and to be responsible for operation.

This contract was approved by the Public Service Commission of Maryland and to date has operated satisfactorily and to the advantage of the parties concerned in their efforts to furnish adequate service under difficult operating conditions. During the recent "outlaw" strike on the steam railroads the Sparrows Point patrons ordinarily handled on steam trains were cared for successfully on the electric cars. The result is pictured in an accompanying illustration.

During construction and since completion of the work the Emergency Fleet Corporation, through its department of transportation, has co-operated with the officials of the Bethlehem companies and the United Railways in bringing the undertaking to a successful issue.

## Pulverized Coal for Boilers

**Expert for Well-Known Producer of Pulverizing Machinery Tells of Application to Power Plant Work**

AT A CONVENTION of the Association of Edison Illuminating Companies, held in New London, Conn., Sept. 18, 1919, Fred A. Scheffler, manager department of pulverized coal for steam power plants, Fuller Engineering Company, read a paper on the subject of pulverized coal for boilers, which has just been released for publication. He said that 6,000,000 tons is used annually in pulverized form in the manufacture of cement, 2,000,000 tons in the iron and steel industry, 1,500,000 tons in the production of copper and from 100,000 to 200,000 tons in the generation of power.

He listed a number of claims as to advantages of pulverized coal over lump coal firing by hand or stokers as follows: (1) Troubles due to poor coal are largely overcome. (2) The coal burning system is more flexible. (3) The combustion is smokeless. (4) There is great rapidity of combustion. (5) The system is applicable to any operation where heat is required, except those in which the ash of the coal might be detrimental to the material acted upon. (6) It solves the clinkering problem. (7) Standby losses are practically eliminated. (8) The firing operation can be stopped instantly. (9) The best efficiency and operating conditions obtain when the coal is fired dry. (10) A plant equipped to burn pulverized fuel is independent of coal producers and dealers and can operate with the cheapest grade of fuel available in its locality. (11) Less excess air is required for combustion. (12) Troubles of high temperature can be controlled by using proper gas velocity. (13) Its use is based on sound principles. (14) Practically all of the combustible in the coal is consumed.

Up to the date of the presentation of the paper there were more than 100 boilers in the United States and British Columbia operating with pulverized coal. The government nitrate plant at Muscle Shoals, Ala., was equipped with a pulverizing plant with a capacity of 384 tons per twenty-four hours.

As to cost of pulverizing coal, in one plant burning 36,682 tons per annum the cost, including labor, operating material, repairs to all machinery, power for operating the mills, conveyors, etc., and delivering the coal to the point at which it is to be fired, amounted to about 31½ cents per ton. In another plant, burning 63,016 tons, the cost was 27½ cents.

Mr. Scheffler stated that he had been asked a number of questions in regard to the use of pulverized coal under boilers and he repeated a number of these, giving answers to them. Some of the points brought out in these answers are as follows: With pulverized fuel the efficiency obtained is practically the same with fuels of all grades provided that the coal is properly prepared. Slag does not form on tubes when furnace capacities are not exceeded. The air pressure used in the Fuller plants is 2½ oz. for conveying the pulverized coal into the burner, and the air expands, before entering the furnace, to a pressure of ½ in. of water. The company has had no explosions in boiler furnaces; flarebacks are due to carelessness or ignorance when they occur. In starting a flame, a small wood fire can be used until the firebrick is sufficiently hot to support combustion. In a properly designed furnace all carbon and other combustible matter is consumed. When furnace capacity is not exceeded

dust or slag will not be formed in the boiler. If slag does develop it can be readily removed by having the furnace arranged with a hopper bottom, so that the slag can run down and accumulate at a point convenient for its removal. Only coals having an ash of low melting point will slag seriously. A boiler operated twenty-four hours a day and using per hour 1,200 lb. of inferior bituminous coal containing 10 per cent ash, and with a combustion chamber properly designed for the operating conditions, would need to be cleaned out approximately once in eight hours. About 30 to 50 per cent of the dust or ash passes out of the stack. Most of that going out of the stack is so fine that it does not descend, but objectionable dust can be removed by dust collectors. Boilers with vertical or nearly vertical tubes require no more frequent blowing with pulverized fuel than with hand or stoker firing. In other boilers more frequent blowing is necessary, but modern soot blowers simplify this operation. While the size of plant in which it is economical to install pulverized coal equipment cannot be definitely fixed, in general those using more than 100 tons daily could show a saving sufficient to warrant the investment. The equipment for pulverized coal can be installed on the second or third story in the power house where space around the plant is limited. In a pulverized coal plant properly installed and managed there is no danger from explosion. If pulverized coal in the storage bins becomes ignited nothing can happen except that coking may take place in the bin and it will be necessary to stop feeding pulverized coal into the storage bin. There is no danger of explosion from smoldering coal in the storage bin.

## Traffic Off in Kansas City During 1919

INSTEAD of a normal increase in traffic on the Kansas City (Mo.) Railways, there was a decrease of 20 per cent for the year ended June 30, 1919, as compared with the year ended June 30, 1917. This loss is attributed by the Committee of One Hundred of the local Chamber of Commerce, in a recent report on the street railway situation, to many causes. Some of these are private automobiles, jitneys and motor buses, poor service, increased fares, public disfavor and the epidemic and strikes in 1919. Losses due to private automobile competition amount to more than \$2,000 daily and are inevitable, but losses due to jitney and motor-bus competition can be prevented, if desired.

Jitney and motor-bus competition is held to be unfair in that it takes the short-haul business and is not subject to fixed schedules, twenty-four hour service or taxes and assessments, which in general are required of a street railway company. The report also points out that it is unfair in that there are numerous operators and owners, and service, routes and schedules are irregular.

The daily loss to the trolley car company is 60,000 passengers through this form of unfair competition and at a 7-cent fare the loss is estimated to be \$4,200 per day. This loss is one of the causes for increased fares and means that the relatively small number of passengers who rode in the jitneys actually penalized the many who rode on the street cars. At the present time the number of licensed jitneys is about 1,300. About 350 of these run regularly during the day, while 300 additional operate but two or three trips in the morning and evening rush hours. The balance make one trip each way per day or work irregularly.

# Status of Public Utility Securities

Present Basis of These Securities Far Stronger Than Ever Before—Outlook Good for Early Future Expansion in Central Station Industry—Financial and Investment Position of Electric Railways Should Constantly Advance

BY ORLANDO B. WILLCOX  
Vice-president Bonbright & Company, Inc., New York

**R**EGULATION of the rates which may be charged by public utilities for their service was established in response to the recognition of the universal need in every phase of modern life for the service provided by electric light and power, gas, street railway and telephone companies and the public interest in continuous service and in low rates.

The nickel fare for the usual street railway ride was well established. In other branches of public service the normal growth of the business, the construction of larger plants, with improvements in the art permitting economies of operation, and the adoption by the companies of the principle in operation that large turnover at reasonable rates made for safe and profitable business, led constantly to lower rates for service. The public utilities were in the formative stage and had not yet been standardized. Naturally, the economic principles involved in both adequate service to the public and adequate return to the investors were not fully worked out, and these principles, as well as full appreciation of the larger interests of the people which were to be protected and served through regulation, were only gradually developed. The public interest appeared to be primarily in low rates. The effect on the communities and on the industry of the country of cramped or poor service and their need for first-class and constantly expanding service were not yet fully apparent.

The public service commissions, during a period of low costs and increasing economies made possible by larger units of operation, were appealed to only to reduce rates, and while the reductions made voluntarily by the operators in efforts to increase gross earnings and spread overhead and fixed charges over a larger gross income probably exceeded those enforced by the public interest, nevertheless the duty of the commissions seemed to them in nearly all the early cases of regulation of rates to require the reduction of the net earnings of utilities through decrease in the rates charged for service. In some cases it might have been suspected that the purpose of regulation was the reduction in earnings of the operating companies rather than the reduction in rates for service.

The principle was adopted that rates should be fixed so that they should provide no more than a fair return on the property devoted to public use, and in working out the problem the value of the property involved was

considered and appraised, sometimes without recognition of elements of real value and substantial cost, thereby reducing the total amount on which the return through rates was to be fixed. The rates, on the other hand, were sometimes fixed so low as to permit only a bare interest return on the value of the property.

Even under these handicaps the growth in population and of the demand for utility service, the expansion of plants and systems, the improvements in the art and the economies effected afforded some protection to utility companies and the capital invested in their properties, and while the earnings on the equities were limited, the senior securities were usually protected and commanded a good market. The argument of the public utilities against appraisals and rates unduly low were that investors in such properties should be treated fairly, that private property, even if devoted to public use, could not be taken under our Constitution without just compensation, and that appraisals or rates might even escape the confiscatory level without giving that fair return to which capital so invested is entitled. These arguments did not always prevail. The public interest in low rates was assumed to be greater than the

public obligation to safeguard the owners of utility properties and securities.

The results were soon apparent and directly affected the public interest, not alone in losses sustained on the investments already made but also in the refusal of free investment capital to flow into public service in preference to more profitable opportunities in unregulated industries. The large amount of capital required for the expansion of public service to meet the demands of a rich and growing population could not be readily obtained from the investor, and the public service suffered in consequence. This condition was much emphasized during the war by the increased costs of operation as well as the increased requirements for all kinds of public utility service. The dependence of the public generally in all their activities and the dependence of industry stimulated by the war's demands on the common service of the public utility companies became apparent and was reflected in the declarations of officials, the comments of the press and in the insistent demands of the communities, the industries and the individuals unable to obtain the amount and character of utility service required for their comfort, convenience and effi-

*Mr. Willcox concludes as to electric railways:*

The street railway companies are sharing the improvement in public utility conditions; the fetish of the nickel fare is losing its hold on the public mind and has been overcome in hundreds of communities where more riders are paying higher fares. Many street railway companies are showing good earnings and a safe and increasing margin above charges, and the financial condition and investment position of street railways may be expected constantly to advance.

cient functioning. There was very general demand for more electric power and electric light, extended and more efficient wire communication, better and more satisfactory local transportation. The required expansion and improvements in the service could only be provided by additional capital expenditures and the investors of the country refused to provide the necessary funds by the purchase of utility securities.

This condition led rapidly to the recognition by the commissions, as well as by officials and the public generally, of these important principles: That the public required for its well being adequate and constantly expanding public utility service; that the real interest of the public was in good service, expanding rapidly enough to take care of increasing demands, rather than in cheap service and low rates; that such service could not be afforded by companies which were insolvent or threatened with bankruptcy; that the investors of the country would not provide the very large sums necessary to refund maturing obligations and to provide the expansion of utility service demanded by the growth of population and of industry unless their investments were both protected and assured an adequate return comparable with the profits offered in unregulated industries, and that, under public regulation, rates must be so fixed that they would provide a fair return on the capital invested and give the operating companies such surplus and such credit as would attract new capital into public service under private operation.

Those principles found their way into the decisions of the public utility commissions, not only in cases where applications had been made to reduce rates but also in those cases in which applications were made on behalf of the operating companies for an increase in rates on showing that such increases were required in the public interest to provide the required quantity and character of service, as well as for the protection of invested capital.

The responses of the public utility commissions throughout the country were more prompt and effective than might have been possible except for the compelling force of the conditions resulting from the war, which had so largely and so rapidly increased the costs of operations, as well as the demands for expanded service. The electrically equipped interurban and local transportation lines have not yet all fully worked out their problems, although reports indicate that street railway fares have been increased quite generally to meet higher costs and to assure continued service (New York City is a notorious exception); that notwithstanding higher fares more people are riding on street cars than ever before, and that many street railway companies are earning a fair margin over all charges. Other classes of utilities reflect, in their increased gross and net earnings, the recognition of their real importance as an essential part of the great American industrial system and as well the flexibility of public regulation in accommodating its functioning to changing industrial and economic conditions. These increased earnings of the utility companies mean more than protection to investments or inducements to new capital. They mean appreciation by the public and its official representatives that the public interests in provision for time and labor and money saving machinery through privately owned public utility enterprises can be served not by low rates, which will imperil invested capital and repulse new capital from these industries, but only by such

treatment in appraisals of the value of property devoted to public use and in the regulation of rates as will give these companies credit in financial markets and such measure of prosperity as will attract capital and encourage expansion.

The result to the power and light and similar utility companies is reflected in their increased earnings, which may be said now to have substantially overtaken the increased costs of operation due to high labor, coal and material costs, as is apparent in the rate of earnings applicable to interest and dividends.

#### CONFIDENCE NOW FELT IN FINANCIAL FUTURE

The peak of high operating costs seems to have been reached and is passing, if it has not already passed. The more favorable attitude of customers resulting from the shortage of service and the perils to the public of inadequate financing of utility companies is indicated in the acceptance of higher rates for service as part of the general advance in all commodities. The public has seen that utility rates must move up in times of higher costs, and not always down, and that the successful operation of public service companies with resulting good service requires a sufficient financial return on the investment and the payment of current rates for new money for expansion. The operators feel new confidence in their properties and their future. The money market provided more money for utilities in 1919 than in any year during the war. The credit of utilities is improving and, with a continuance of the rate of earnings indicated by the current reports, is in a fair way to be re-established, by a history of stability of market and gross receipts and adequate margins above charges, on a basis again commanding the confidence of the investors and permitting permanent financing at reasonable rates for the very large new capital required to keep up with the demands for growth of the industry.

#### STATEMENT OF CONCLUSIONS

Several conclusions may be drawn, then, from the history and present conditions of such utility companies:

1. The public and the officials have fairly recognized the essential character of such utilities in modern industry, the need of their expansion to meet the demand for their service and the necessity of fair earnings, predicated upon fair appraisals and fair rates, to establish the credit necessary to attract free capital for expansion. The dangers to the community of low rates and confiscatory values have been recognized and return is not probable because the public served would be the greatest sufferers and not the owners of public utility securities.

2. If, as competent authorities are pretty well agreed, the peak of commodity prices and other items of the costs of operations has been reached it may be expected that the present favorable showing of such utility companies will continue and that their operating costs will consequently, if gradually, decrease, with resulting increase in their net earnings and the margin above interest and dividend charges.

3. The recognition of these conditions by bankers and investors should undoubtedly lead to a substantial increase in the price level of the outstanding securities of those utility companies, especially the electric power and light and the gas and telephone companies, which have survived the disorders of the past few years; this

increase in the price level should, because of the factors involved, be more rapid than the increase in the price level of long term bonds generally, which should follow the approach of a normal ratio between commodities and the dollar.

4. The electric power and light companies particularly are not dependent upon large amounts of labor and are therefore relatively free from the effects of labor unrest and disorders.

5. The high costs of labor generally, which will undoubtedly prevail for some time, makes ever-increasing demand for time and labor saving machinery, which in modern industry is dependent upon electrical energy. Central station power can be provided cheaper than power from isolated manufacturing plants. Therefore, there must be a great expansion of the electrical business in the United States, with resulting offers of electrical utility securities.

6. Both commissions and operators have recognized depreciation and obsolescence of plants as proper charges as one of the costs of operation, and electrical securities will be increasingly protected by adequate reserves against these costs.

7. Many unregulated industries will be unfavorably affected by competitive production and falling prices, which on the other hand should act favorably upon electric companies.

8. The street railway companies are sharing the improvement in public utility conditions; the fetish of the nickel fare is losing its hold on the public mind and has been overcome in hundreds of communities where more riders are paying higher fares. Many street railway companies are showing good earnings and a safe and increasing margin above charges, and the financial condition and investment position of street railways may be expected constantly to advance.

## Difficulties in Utility Financing

### Leading Utility Men and Bankers Give Reasons Before Illinois Commission for Inability of Utilities to Secure Additional Capital

A BRIEF telegraphed report covering the financial difficulties faced by the public utilities as presented at a hearing called by the Illinois Public Utilities Commission April 29 was published in last week's *ELECTRIC RAILWAY JOURNAL*. Some of Chicago's leading bankers and public utility men appeared before the commission as witnesses on this occasion. The principal thoughts expressed in their testimony are given in what follows:

Samuel Insull, who is the controlling figure in a number of the public utility companies of the Middle West, was the first witness to be heard. He prefaced his testimony by stating that the gas, electric railways, electric light and telephone utilities of Chicago represent a combined investment of \$620,000,000, and it would cost from one to one and one-quarter billion dollars to duplicate their properties today. Their annual receipts total \$135,000,000, and they have 41,600 employees. Mr. Insull stated that at the present time, due in large part to the necessity to postpone all work requiring new capital during the war, the utilities of Chicago are in almost imperative need of \$100,000,000 for new capital expenditures. Of this amount the Chicago Surface Lines required \$25,000,000 and the elevated roads \$10,000,000 in order to bring their facilities up to what they would normally have been if they had not been forced to discontinue all new work.

How to finance these needed expenditures is the great question, Mr. Insull pointed out. He said that there has arisen a distrust of public utility securities in general which makes it practically impossible to sell them. This situation is felt by the strong companies as well as the weak ones, or those whose credit has been lost, because of a general disinclination on the part of the public to purchase any public utility securities whatever on account of the onus that has now come upon them. Mr. Insull gave two reasons as being fundamentally responsible for this situation. The first was that the constant agitation against first one utility and then another (he referred particularly to Chicago,

although it applies generally) has caused the people to be very skeptical about purchasing any securities which are constantly subjected to the turmoil of political harangue. He declared that this was the most serious problem which the commission has to meet in adjudicating the rates for public utility services. "When you can get a first class farm mortgage yielding 7 per cent, why would any one buy utility securities which are subject to continual attack, ostensibly for the good of the people, but usually for the good of the individual making the attack," said Mr. Insull.

The second reason for the inability to sell securities, Mr. Insull said, was that the market for the junior securities is very seriously affected by the low valuations established. These have been so low that the rate of the return allowed did not provide anything for payment of dividends, so that the market for junior securities has almost completely disappeared.

Mr. Insull then cited some instances to show the difficulty of securing new money at all, and when it is secured, the very high rate and unusual security provisions which must be met to get it. The 5 per cent bonds of the Commonwealth Edison Company have for years been floated with practically no discount, but are now bringing only 81, despite the fact that the company has unquestioned credit. Mr. Insull said he could not explain, or could not understand, why the securities of this company should be selling so low, for no bond interest or dividend has been passed and the earnings of the company are very satisfactory. The only way that this company can raise the four to five million dollars which it will have to have this year is to issue short-time securities with bonds as collateral and pay 8 or 9 per cent. He cited another case in the gas field, where a manufacturing company of excellent financial standing was able to finance a \$13,000,000 bond issue to cover a new gas plant installation only by backing this up with an equal amount of securities under conditions which specified that they should not be public utility securities.

Speaking of the Chicago Elevated Railways, Mr. Insull said that it was impossible to get new money. There are \$12,000,000 of notes overdue outstanding at this time, and he said if these notes were backed up by property rather than securities the roads would be in a receivership now.

In view of the great demand for capital and the severe competition with government securities and industrials which are selling on a big investment return, Mr. Insull pointed out that it is now impossible to float public utility securities, if at all, for less than 8 to 10 per cent, dependent on the credit and standing of the individual company. He advocated that the commission permit a rate of return for public utilities which would maintain their credit and give sufficient return to the junior security holders so that confidence in these might be restored. He explained that he did not mean by this that a rate of return on the property equal to the present cost of money should be permitted, but that there should be a rate of return high enough to provide for the high cost of money needed, whatever that cost may be.

B. E. Sunny, president Chicago Telephone Company, testified that his company had recently offered \$10,000,000 in 7 per cent notes secured by 5 per cent bonds, but had withdrawn this when it was found this money would cost 9 per cent. He told the commission that the only solution of the present financial situation for the utilities was a general increase of rates that would permit of the companies taking money at the existing high rates. He pointed out that it was not a matter of money but of service, and that it was entirely possible and practicable to make rates high enough to provide for this present high money cost. He advocated that the companies be given a free rein, a *carte blanche*, for a considerable period, as this would make it possible to work out of the present difficulties. He pointed out that the holders of public utility securities are frightened about their investments, and said that the difficulty was not a question of the credit of any individual company, but rather the result of a general feeling of apprehension in regard to all utility securities as a class. The problem then was to make all present security holders confident that their investment was sound, and then the market for them would come back and be able to take its place in competition with industrials.

Henry A. Blair, president Chicago Surface Lines, declared that his company could not sell bonds at any rate of return as long as the earnings of the company are where they are now. Capital expenditures exceeding \$150,000,000 are needed for this property within the next ten years and 300 to 400 new cars are required to meet the service requirements. Mr. Blair said that every effort had been made to finance the purchase of 200 new cars ordered by the commission, but that so far the cost of financing them had been so great that they could not be purchased. In this connection he called attention to the fact that whereas these cars could formerly be purchased for \$6,700 each, they now cost over \$15,000. Mr. Blair said that expenditures of between fifteen and twenty million dollars were needed this year, but that bankers who had supplied money to the surface lines heretofore had refused to finance any further until the earnings of the company were materially improved.

E. D. Hulbert, president of the Corn Exchange National Bank, the Illinois Trust & Savings Bank and

the Merchants Loan & Trust Company, all in Chicago, said there is at present a greater shortage of money and more difficulty in getting credit than there has been in fifteen years. He said there was a strong feeling among bankers that no new issues should be put out. He pointed out also that the time when a 6 per cent return on investment was adequate was gone, and that the price of money had gone up the same as everything else. He gave as one reason for the inability to market 6, 7 and 8 per cent securities the fact that the large investors who used to be depended upon do not buy these securities at all now because, with a 40 per cent income tax, they cannot afford to buy utility securities when they can buy government and municipal bonds which are tax-free.

Mr. Hulbert referred to short-term financing as being very unsound. He said that it could not be expected that utility securities could be sold unless they could show a satisfactory margin over their interest requirements. He said they should not be permitted to earn as large a margin as industrial enterprises because of their monopolistic character, but that they should be allowed to show at least a 10 per cent earning or no new expenditures could be financed. He gave as the principal reason for the unpopularity of utility securities the fact that people feel that the utility cannot readily pass on the increasing cost of its product, whereas the industrial company can.

Mr. Hulbert said there was a great feeling of anxiety among bankers as to the financial outlook next year and that one of the principal causes of this was the very large quantity of government securities held by the Federal Reserve Bank. He said this was largely responsible for the panic talk now going around.

Gen. Charles G. Dawes, president Central Trust Company of Illinois, made a scathing attack upon the politicians who are continually making a political football of the public utility enterprises. He said he did not know how it was to be done, but the utilities must be taken out of politics. He said that the only way there could be any hope for the re-establishment of public confidence in utilities so that their bonds could be sold for somewhere near what they were worth would be to do something to stop the political play upon the utility, which is done without regard for the ultimate results and without regard to the effect upon the people, who must suffer from any deterioration in the ability of the company to give service. "We need somehow to give assurance that the true interest of the people is being sought after and to have politicians who will stand up for what is really to the interests of the people. The difficulty is that the people do not have the arguments on the square," he declared.

Harold L. Stuart, of Halsey, Stuart & Company, made the broad statement that there was not a utility company in the United States the market price of whose securities is equal to the original cost of the property. Some of the commissioners took issue with him, but were unable to substantiate their objections. He advocated that the fair guaranteed minimum rate of return should be sufficient to cover the value of money at the time it was invested, and that in addition there should be a margin above the interest charges as an insurance to the investor that the interest would be paid. He thought that where 7 per cent securities were involved there should be earnings of at least 9 per cent.

Chester Cory, vice-president Harris Trust & Savings

Bank, brought out that in the four weeks beginning March 22, 1920, there had been floated of major issues of bonds and notes of utilities and industrials some \$245,890,000. These cost the companies issuing them from a minimum of 6.90 per cent to 10.75 per cent, with an average, he was sure, not far from 8.5 per cent. He said that borrowing money at such rates as these was merely a question of whether a management could afford it, assuming its credit was all right.

He pointed out that one vital difference between industrial bonds and public utility bonds was that, when due, the former are taken up, while the utility bonds are refunded, not necessarily because this is the best policy, but usually because the company cannot do otherwise. He gave this as one reason why industrial bonds have been popular the last few years. In other words the earnings of the industrial company are large enough so that it is possible to take up the debt, whereas a utility can earn barely enough to continue the debt. He declared that no utility can long enjoy credit if it has no other means of paying for extensions than with borrowed money. Such a company, he said, is destined for a financial graveyard sooner or later. To enjoy credit permanently there must be money for extensions made available from the proceeds from the sale of stock and from excess earnings. Unless a public utility can show earnings sufficient to cover all costs, interest charges and dividends, and a comfortable surplus, its credit is not good even though it can go out and borrow more money. The problem of a utility is not merely to get money now but to keep its house in order so that it can continue to get money. He pointed to the great danger of an undue preponderance of funded debt.

David R. Forgan, president National City Bank, said that there never had been so great a demand for permanent financing of both utilities and industrials and that as a result the credit facilities of the country had been extended to the limit. He said he thought when the Federal Reserve Bank was created that it would never reach its limit of liabilities, but that not only had the Federal Reserve Bank of Chicago reached

the 40 per cent limit but had been forced to borrow \$40,000,000 from another Federal Reserve Bank. He said that he would like to see the credit of his own bank reduced 25 per cent and felt certain that every other banker felt the same way.

He cited several instances of the very high rates being required for permanent financing and said that he did not believe this to be a temporary situation, for he could see no relief for many months ahead. If public utilities borrow money, he said, they will have to do it at a net cost of about 8.5 per cent. Speaking of public utility stocks, he said that any one who was not now a partner in a public utility and wanted to become one needed a guardian. Like one or two of the previous witnesses, he said that so long as utilities must compete in the money market with industrials they should be allowed to earn a margin over interest requirements, stating this should be at least twice the interest charges.

Charles H. Schweppe, of Lee, Higginson & Company, testified that \$450,000,000 of bonds and notes, industrial and public utility, have been issued since Feb. 1. He said that he thought many of these had not yet reached the ultimate consumer. He spoke of the fact that few companies have a sinking fund to protect their investors and emphasized the fact that a rate of return great enough to make possible the setting aside of a liberal sinking fund allowance must be allowed.

### Bus Routes Multiply About Los Angeles

THE accompanying table showing bus lines operating regular trips for long distances from Los Angeles, Cal., gives a good idea of how the bus transportation in southern California is extending.

Owing to the favorable climatic and topographical conditions in southern California, backed up by the extensive system of paved roads, it is possible for automobiles to operate every day in the year. The accompanying table is from an extended article on motor passenger and freight transportation in southern California by K. Q. Volk, which appeared in the *Engineering News-Record* for March 18, 1920.

TABLE SHOWING PRINCIPAL STAGE COMPANIES OPERATING OUT OF LOS ANGELES, EQUIPMENT, DISTANCES AND COMPARISON OF RATES

Los Angeles To	Company	Equipment		Destination	Mileage	By Stage			By Steam or Electric Road		
		No. Cars	Seating Capacity			Fare*	Mileage	Fare	Mileage	Fare	
Bakersfield and San Francisco	Eldorado Stage Co...	11	8	Bakersfield.....	125	5.40	None	171	5.56	None	
		6	12	Taft.....	162	6.48	None	216	7.61	None	
				San Francisco....	416	14.04	27.00	484	15.34	None	
Santa Barbara.....	Pickwick Stages....	2	12	Santa Barbara....	103	3.24	5.94	104	3.40	5.67	
San Francisco.....	Nor. Division.....	23	8	San Luis Obispo..	221	7.29	13.50	223	.....	.....	
				San Francisco....	458	14.04	27.00	475	15.34	None	
	United Stages.....	4	8	Santa Barbara....	103	3.24	5.94	171	5.56	None	
San Diego.....	Pickwick Stages....	12	8	San Diego.....	135	3.24	5.59	126	4.09	6.75	
	So. Division.....	..	..	San Diego.....	185†	4.32	8.10	.....	.....	.....	
	United Stages.....	10	8	San Diego.....	135	3.24	5.94	126	4.09	6.75	
	A. R. G. Bus Line...	23	8	San Diego.....	135	3.24	5.94	126	4.09	6.75	
Ontario.....	A. R. G. Bus Line...	19	20	Ontario.....	39	.92	1.35	40	1.09	1.85	
Riverside.....				San Bernardino..	59	1.35	2.16	60	1.74	2.92	
San Bernardino }				Riverside.....	56	1.35	2.54	63	1.89	3.16	
Redlands.....				Redlands.....	66	1.57	2.54	65	2.21	None	
Ontario.....				Ontario.....	39	.92	1.35	40	1.09	1.85	
San Bernardino.....	White Bus Co.....	14	16	San Bernardino..	59	1.35	2.16	58	1.74	2.92	
		2	25								
San Bernardino.....	Golden State Tours..	3	7	Gilman & Hot Spgs	112	3.24	5.40	95	3.51	None	
		12	16	Whittier.....	13	.30	.49	17.5	.41	.75	
Anaheim.....	White Bus Line.....	5	22	Anaheim.....	28	.81	1.35	27	.86	None	
		2	25								
	Valley Stage Line...	8	16	Same.....	Same	Same	Same	Same	Same	Same	
	A. R. G. Bus Line...	6	20	Same.....	Same	Same	Same	Same	Same	Same	
San Fernando.....	Original Stage Co....	7	15	San Fernando....	23	.54	.97	28	.78	1.32	
Santa Paula.....	United Stages.....	3	8	Santa Paula.....	68	2.00	None	65	2.21	None	
Lancaster.....	Golden State Tours	2	7	Lancaster.....	85	2.60	4.86	78	2.60	4.86	

\* All rates include war tax.  
† Inland route via Riverside.

# Making the Best Use of the Car Equipment

The Author Describes a Method for Studying Car Operation by Means of Which, with the Aid of a Few Curves, the Effects of Varying the Several Component Parts of the Schedule Can Be Determined Quickly

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AT THIS time, when the necessity for economy in electric railway operation is being impressed more forcibly than ever before on all operating companies, it is well to look into the adaptability to the service and the efficiency in use of the car equipment.

For any particular service to be performed, certain inter-related elements of operating costs exist, which, upon analysis, may be grouped under the headings of power costs and time costs. Outside these two groupings will remain other costs, such as fixed and overhead charges, and certain maintenance costs having no relation to the amount of service rendered. It is the purpose of this article to deal only with the former and to explain a method for determining the proper relation between service rendered, power costs and time costs.

Under power costs are included electric power for operating the cars and such maintenance and other costs as depend directly upon the mileage run. Time costs include platform expense, car heating and other costs determined by the hours in service of the car equipment. In the application of the results of this method certain limitations must be recognized, such as heating of the motors at various seasons, traction under various rail conditions, safety to passengers in starting and stopping, safety with regard to other traffic on the street, nervous strain on the trainmen and passengers as a result either of too fast or too slow a schedule.

The main factors governing the service which may be given and the costs resulting may be listed as follows: (1) Track conditions, (2) grades, (3) curves, (4) line voltage, (5) weather, (6) car equipment weight, (7) passenger load, (8) motor equipment, (9) gear ratio, (10) condition of equipment, (11) length of run, (12) accelerating rate, (13) braking rate, (14) coasting rate and time, (15) standing time, (16) traffic interference, (17) personal element—motorman, conductor, passenger, (18) supervision, (19) over-all economy.

The effect of all these factors may be satisfactorily analyzed by the method proposed, providing proper data and constants are applied, namely, resistance-speed

curves for factors (1), (2), (3), (5), (6), (7) and (10); motor-characteristic curves for (4), (8) and (9); traffic surveys of conditions and established practice.

The speed-time curve has been used satisfactorily for the solution of a simple, specific problem, but is inadequate for the general consideration of problems involving several factors. This method takes the idea of the speed-time curve, developing it through two additional stages and producing a form of chart showing the relative effects, throughout the practical operating range, of all factors considered.

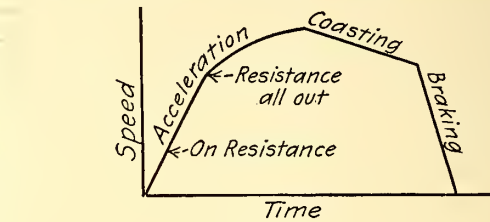


FIG. 1

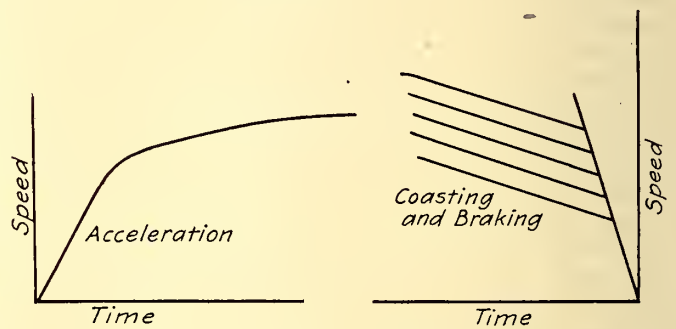


FIG. 2

FIG. 1. PARTS OF THE TIME-SPEED GRAPH. FIG. 2. DIAGRAM ILLUSTRATING COMBINATION OF ACCELERATION AND RETARDATION CURVES

qu Coast and time, (15) standing time, (16) traffic interference, (17) personal element—motorman, conductor, passenger, (18) supervision, (19) over-all economy.

The evolution of this method from the more cumbersome ones is briefly this: In its usual form the time-speed graph of the operation of a car is made up of three parts: one representing the accelerating period, the sec-

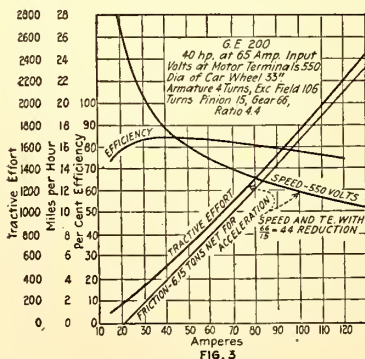


FIG. 3

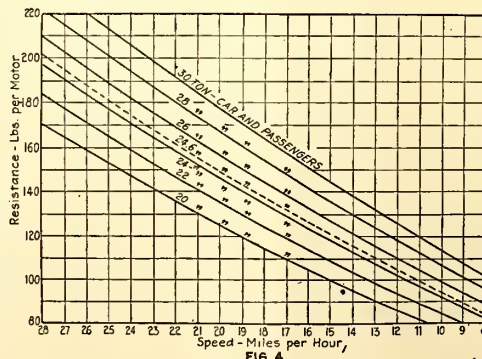


FIG. 4

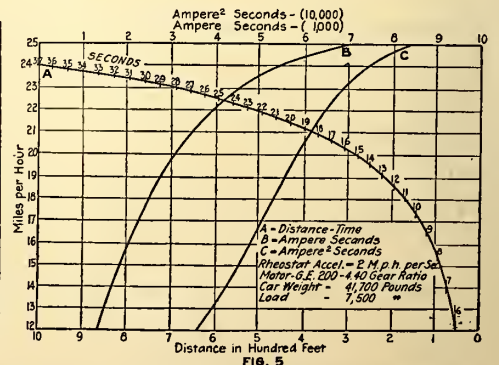


FIG. 5

FIG. 3. CHARACTERISTIC CURVES FOR GE-200 MOTOR. FIG. 4. FRICTION CURVES FOR ASSUMED CONDITION OF TRACK, ETC. FIG. 5. ACCELERATING CURVES SHOWING RELATION OF DISTANCE, TIME AND SPEED, AMPERE-SECONDS AND AMPERE-SQUARED-SECONDS



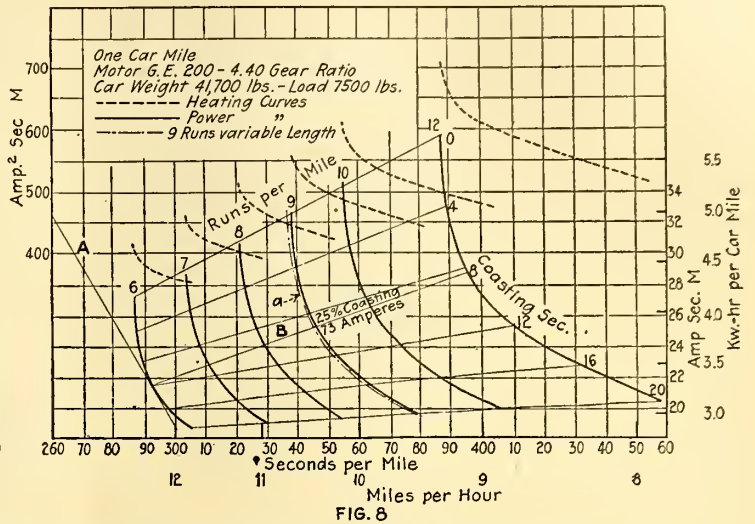
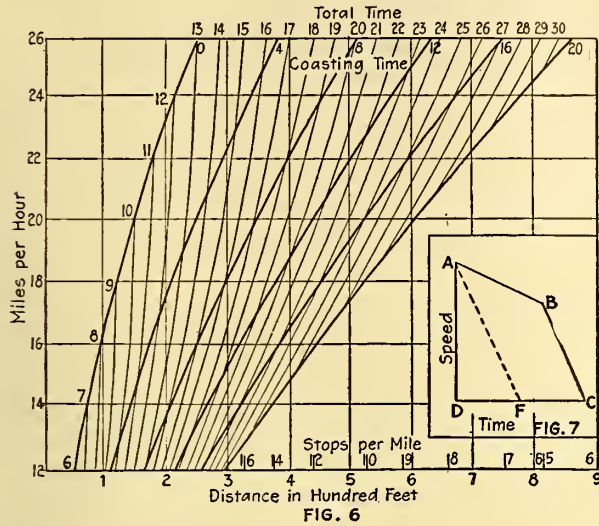


FIG. 6—RETARDATION CURVES SHOWING RELATION OF DISTANCE AND SPEED, TIME AND COASTING TIME. FIG. 7—DIAGRAM REPRESENTING COASTING-BRAKING PERIOD. FIG. 8—APPLICATION OF METHOD TO ONE MILE RUN

and the coasting period and the third the braking period. These are shown in Fig. 1. If now we have two independent graphs, one for acceleration showing the relation of time and speed, but indefinitely extended as shown in Fig. 2, and the other, also represented in Fig. 2, showing the relation of time and speed during the coasting-braking period, also indefinitely extended from the point of zero speed, then by combination of these the effect of lengthening or shortening the time of the cycle of operations can be determined graphically. The intersection of the two lines shows the maximum speed, the area under the combined graph is proportional to the distance covered, and other desired quantities can be calculated. This operation assumes that the braking period is fixed, but by assuming a number of different braking periods and plotting the corre-

is to be used and a set of friction or resistance curves. The former will include the effects of gear ratio, wheel diameter and line voltage. A sample set of such curves is shown in Fig. 3. The latter will provide for the condition of the track, the weather, the weight and condition of the equipment under consideration, with due allowance of tractive effort to compensate for grades and curves where these are present. Sample curves are given in Fig. 4.

From these primary data, by standard calculations presently to be taken up in the necessary detail, the acceleration distance-speed curve shown in Fig. 5 and the set of curves between maximum speed and the distance covered in coasting and braking as given in Fig. 6 are calculated. In Fig. 6 there are really two sets of curves, one calculated on the basis of several assumed values of coasting time, and the other calculated on the basis of an assumed series of total times. Obviously one or the other of these must be assumed, but both cannot be fixed.

With these two sets of curves in hand they can be combined by superposing one set on the other, times and distances being additive.

In Fig. 5 are plotted also a curve of ampere seconds and one of ampere-seconds squared, which are useful as a measure of the heating of the motors under a given schedule.

Having outlined the general principle of the method, it now remains to give first the detail of the calculations underlying the curves and then to show what can be done with the curves when they have been plotted.

All calculations for the tables and curves in this article are based upon the characteristic curves (Fig. 3) of a GE-200 motor with 4.4 gear ratio. A 4-motor equipment is mounted under a car loaded to 24.6 tons total weight. The resistance curves used are those of Fig. 4, in which the broken line curve gives the tractive effort per motor

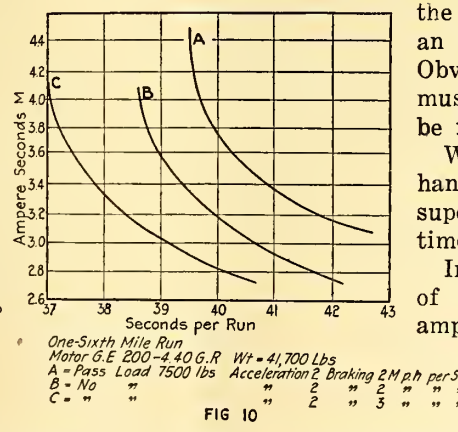
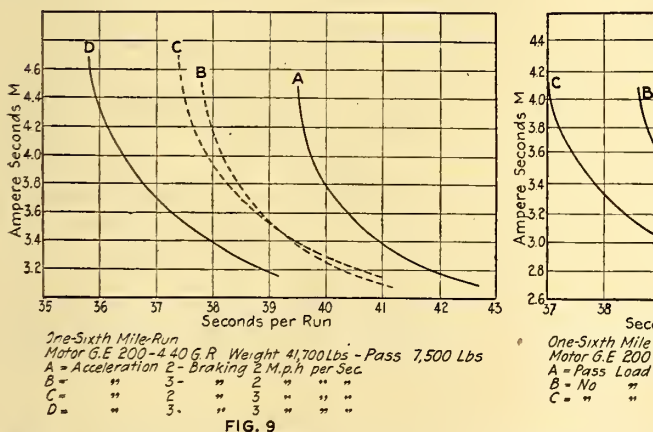


FIG. 9—SPECIAL APPLICATION SHOWING EFFECTS OF RATES OF ACCELERATION AND BRAKING ON TIME AND ENERGY CONSUMPTION. FIG. 10—WEIGHT EFFECT OF LIGHT LOAD

sponding coasting lines the solution is somewhat improved. However, the tediousness of calculations by this plan is obvious, and the same results can be accomplished much better by plotting sets of curves on a distance rather than a time base, and this is the plan which is followed here.

The fundamental or primary curves required for the calculations are the characteristics of the motor which

to overcome friction. Deducting this from the tractive effort curve of Fig. 3, by reference to the speed scales, a net tractive effort per motor for acceleration is obtained. From this there are tabulated in Table I, for each mile-per-hour differential, the average current and the average net tractive effort.

TABLE I—AVERAGE CURRENT AND AVERAGE NET TRACTIVE EFFORT FOR EACH MILE-PER-HOUR DIFFERENTIAL

NOTE—Equipment Data. Motor GE-200—4.40 Gear Ratio.  
Weight 41,700 + Load 7,500 = 24.6 Tons. Acceleration 2 m.p.h. p.s.

From Characteristic Curves for one Motor	Average Ampere	Average Net Tractive Effort	Time		Distance		Ampere Seconds		Amp-Squared-Seconds	
			Tons x 100 4 x T. E.	100 4xT.E.x 0.6821	Tons x 100 x m.p.h.	x m.p.h.	4xAve. Current x Time	Ave. Current Squared x Time	Differential	Int.
Speed, Miles per Hour			Differential	Int.	Differential	Int.	Differential	Int.	Differential	Int.
26	21.7	23	26.7	.....	.....	.....	.....	.....	.....	.....
25	23.0	50	12.30	48.39	442	1,408	6,448	81,005	.....	.....
24	24.4	80	7.70	36.09	265	966	5,318	74,505	6,500	.....
23	26.0	110	5.55	28.39	183	701	4,568	69,920	4,585	.....
22	27.9	150	4.10	22.84	129	518	3,991	66,170	3,750	.....
21	30.2	196	3.14	18.74	94	389	3,534	62,980	3,190	.....
20	33.0	252	2.44	15.60	70	295	3,154	60,110	2,870	.....
19	36.6	324	1.90	13.16	52	225	2,832	57,450	2,660	.....
18	41.5	425	1.45	11.26	37	173	2,554	54,910	2,540	.....
17	47.5	550	1.12	9.81	27	136	2,314	52,410	2,500	.....
16	55.0	710	0.866	8.69	20	109	2,102	49,890	2,520	.....
15	65.0	905	0.68	7.82	14	89	1,911	47,270	2,620	.....
14	75.5	1,130	0.544	7.14	11	75	1,735	44,400	2,870	.....
13.2	81.0	.....	.....	6.6	.....	64	1,571	41,300	3,100	.....
Mult.	80.0	1,230	3.3	.....	64	.....	1,055	21,100	.....	.....
.....	79.0	.....	.....	.....	.....	.....	516	20,200	.....	.....
Ser.	78.25	1,230	3.3	.....	.....	.....	.....	.....	.....	.....
Start.	77.5	.....	.....	.....	.....	.....	.....	.....	.....	.....

Using the mean values of speed, current and net tractive effort for the rheostat period and each 1 m.p.h. differential, or fractional period, differentials of time, distance, ampere-seconds per car and ampere-squared-seconds per motor are calculated by simple formulas. Adding these differentials from the starting point gives aggregate quantities for any range of operation. The values for rheostat period are determined by the assumed rate of acceleration during this period.

The formulas and their derivation for these calculations are as follows:

The accelerating force required per ton for an accelerating rate of 1 mile per hour per second is

$$F = \frac{2000}{32.16} \times \frac{5280}{3600} = 91.1 \text{ lb.} \tag{1}$$

To this add 10 per cent for acceleration of rotating parts.

$$F = 100 \text{ lb. per ton weight of car and load} \tag{2}$$

$$\text{Accel. rate} = \frac{\text{net tractive effort per motor}}{F \times \text{tons}} \tag{3}$$

$$\text{Dif. time} = \frac{\text{dif. speed}}{\text{accel. rate}} \tag{4}$$

Combining equations (2), (3) and (4) above we have

$$\text{Dif. time} = \frac{\text{dif. speed} \times 100 \times \text{tons}}{\text{net tractive effort} \times 4} \tag{5}$$

$$\text{Dif. time} = \frac{\text{tons} \times 100}{4 \times \text{net T. E.}} = \left( \frac{\text{sec. for speed dif.}}{\text{of 1 m.p.h.}} \right) \tag{6}$$

$$\text{Dif. distance} = \text{average speed} \times \text{dif. time} \tag{7}$$

Combining with equation (6) above we have

$$\begin{aligned} \text{Dif. dist.} &= \frac{\text{tons} \times 100 \times \text{ave. m.p.h.}}{4 \times \text{net T. E.} \times 0.6821} \\ &= \left( \frac{\text{ft. for speed dif.}}{\text{of 1 m.p.h.}} \right) \end{aligned} \tag{8}$$

$$\begin{aligned} \text{Dif. amp. sec.} &= \left( \frac{4 \times \text{ave. amp. per}}{\text{motor} \times \text{dif. time}} \right) \\ &= \left( \frac{\text{power demand}}{\text{per car}} \right) \end{aligned} \tag{9}$$

$$\begin{aligned} \text{Dif. amp. sec.} &= \frac{\text{ave. amp.}^2 \times \text{dif. time}}{4} \\ &= \left( \frac{\text{heating effect}}{\text{per motor}} \right) \end{aligned} \tag{10}$$

Integrating the differential quantities derived from equations (6), (8), (9) and (10) we have total amount from point of start to any point of accelerating run.

From this data are constructed the accelerating curves, Fig. 5, showing for any distance traveled the relation of time, speed, ampere-seconds and ampere-squared-seconds.

Retardation curves, Fig. 6, are constructed, showing for any distance traveled the relation of speed, time and coasting time. The data for these curves are calculated by formula, assuming values for braking and coasting rates. The curves of Fig. 6 are made on celluloid or other transparent material for the purpose of using them superposed on the curves of Fig. 5.

The formula for retardation curves is based on assumption and derived as follows (see diagram Fig. 7):

- ABC = Retardation time-speed curve
- AD = Speed co-ordinate in miles per hour
- DC = Time co-ordinate in seconds
- AB = Coasting curve = 1/2 m.p.h.p.s.
- BC = Braking curve = 2 m.p.h.p.s.

$$\text{Speed reduction by coasting} = \frac{\text{coasting time}}{4}$$

$$\text{Speed reduction by braking} = \text{braking time} \times 2$$

Total time in seconds from maximum speed to stop is:

$$T = \frac{\text{maximum speed}}{2} + \frac{2}{3} \text{ coasting time}$$

Total distance in feet run from maximum speed to stop (= Area ABCD) is

$$D = \left[ 1.466 \frac{\text{maximum speed}^2}{4} + \frac{2}{3} \text{ coasting time} \times (\text{maximum speed} - \frac{1}{3} \text{ coasting time}) \right]$$

By the use of these formulas, distances and times are calculated and tabulated for various ranges of speed and coasting time, and from these data the curves of Fig. 6 are constructed.

With Fig. 6 superposed on Fig. 5 at any lateral position, the distance and time scales become additive, for the reason that the coincidence of any point on the accelerating curve with any point on the retardation chart is at a common maximum speed, and the time and distance elements on both charts are calculated from this speed to no speed. A chart is thereby formed, for a certain length of run and any coasting time, showing the relative time—accelerating, coasting and braking; distance—accelerating and retarding; maximum speed attained; ampere-seconds used and ampere-squared-seconds heating effect. These data, for various lengths of runs, are entered in Table II and, being

multiplied by the number of runs per mile, show the performance per mile run, an allowance for standing or interference affecting time being added to the running time. Data from this table may be shown graphically on charts, and covers the full practicable operating range for any fixed set of conditions. By varying one or more factors other data may be obtained and the results directly compared on such charts.

ILLUSTRATION OF WHAT CAN BE DONE WITH THE CHARTS

Fig. 8 illustrates the application of this method to a one-mile run and by it certain general results may be observed. To a base scale of time (seconds per mile or miles per hour) are shown a measure of the energy (ampere-seconds or kilowatt-hours per car-mile) and the heating effect (ampere-squared-seconds), for a various number of stops per mile through a range of coasting from zero to twenty seconds per run. A 1-mile run made up of four  $\frac{1}{4}$ -mile runs, one  $\frac{1}{2}$ -mile and four  $\frac{1}{8}$ -mile runs, making up a mile of nine stops, see curve *a*, Fig. 8, is seen to have a slightly faster time for the same energy use than a mile of nine runs of uniform length.

Assuming values for energy and time costs (one cent variable per kilowatt-hour and \$1.90 variable per car-hour), a slope line *A* of constant over-all cost may be established. This line will have the same slope at all positions on the chart and its point of tangency to the various power curves is the point of highest operating economy in each case.

It is found that the points of highest economy on the several curves fall approximately on a straight line *B*; also that these points correspond approximately with a coasting of 25 per cent and a current demand of 73 amp. per car. This relation of approximately uniform coasting percentage and current demand for any number of stops per mile extends throughout the range from no coasting and 95 amp. to 40 per cent coasting and 60 amp., the variation being within 2 per cent. The relation of reduction of power to coasting is 0.8 per cent to 0.9 per cent kilowatt-hour per car-mile, or 0.9 per cent to 1 per cent current demand for each 1 per cent increase in coasting.

Referring to heating effect, it is found that for the same coasting percentage, the heating rate is approximately 25 per cent greater at twelve than at six stops per mile, although the heating amount per car-mile is 70 per cent greater.

A special application of the method is illustrated by Fig. 9, in which is shown the effect of rates of acceleration and braking on time and power.

- Curve *A* — 2 m.p.h.p.s. accelerating — 2 m.p.h.p.s. braking
  - Curve *B* — 3 m.p.h.p.s. accelerating — 2 m.p.h.p.s. braking
  - Curve *C* — 2 m.p.h.p.s. accelerating — 3 m.p.h.p.s. braking
  - Curve *D* — 3 m.p.h.p.s. accelerating — 3 m.p.h.p.s. braking
- Runs  $\frac{1}{4}$  mile in length.  
Three miles per hour per second for both acceleration

TABLE II—DATA OBTAINED BY SUPERPOSING FIG. 4 ON FIG. 3, THE DISTANCE AND TIME SCALES BECOMING ADDITIVE

NOTE—Equipment Data. GE-200—4.40 Gear Ratio—49,200 lb. Accelerating 2—Coasting  $\frac{1}{4}$ —Braking 2 m.p.h.p.s. In each case, upper number relates to one run and lower number to one mile.

Runs per mile, . . . . .	6.0	6.5	7.0	8.0	9.0	10.0	12.0
Stand per stop, second	8.3	8.1	7.9	7.5	7.2	7.0	6.7
Stand per mile, second	50.0	52.5	55.0	60.0	65.0	70.0	70.0
No coasting.....	Seconds	39.5	37.4	35.5	32.7	30.4	25.6
	Ampere Seconds, Thousands	287	295	303	321	338	387
	Ampere Square Seconds, Thousands	4.50	4.30	4.10	3.83	3.60	3.12
Four sec. coasting..	Seconds	27.0	28.0	28.7	30.6	32.5	37.4
	Ampere Seconds, Thousands	68.8	67.7	66.2	64.5	62.2	61.2
	Ampere Square Seconds, Thousands	413	440	464	516	560	59.0
Eight sec. coasting..	Seconds	39.6	37.5	35.6	32.8	30.5	25.7
	Ampere Seconds, Thousands	288	296	304	322	340	389
	Ampere Square Seconds, Thousands	4.15	3.97	3.80	3.50	3.25	2.75
Twelve sec. coasting	Seconds	24.9	25.8	26.6	28.0	29.2	33.0
	Ampere Seconds, Thousands	66.2	65.3	64.0	61.8	60.0	58.7
	Ampere Square Seconds, Thousands	397	424	448	494	540	56.0
Sixteen sec. coasting	Seconds	39.8	38.0	36.0	33.2	30.9	26.2
	Ampere Seconds, Thousands	289	299	307	326	343	394
	Ampere Square Seconds, Thousands	38.5	3.68	3.50	3.20	2.95	2.40
Twenty sec. coasting	Seconds	23.1	23.9	24.5	25.6	26.5	28.8
	Ampere Seconds, Thousands	64.3	63.3	61.5	59.5	57.5	55.5
	Ampere Square Seconds, Thousands	386	411	431	476	517	555
No coasting.....	Seconds	40.4	38.7	36.8	34.0	31.8	27.5
	Ampere Seconds, Thousands	292	304	312	332	351	410
	Ampere Square Seconds, Thousands	3.57	3.40	3.20	2.92	2.63	2.10
Four sec. coasting..	Seconds	21.4	22.1	22.4	23.3	23.7	25.2
	Ampere Seconds, Thousands	62.3	61.0	59.5	57.5	55.0	52.7
	Ampere Square Seconds, Thousands	374	396	416	460	495	49.0
Eight sec. coasting..	Seconds	41.2	39.7	37.8	35.3	33.2	29.4
	Ampere Seconds, Thousands	297	310	320	342	364	433
	Ampere Square Seconds, Thousands	3.33	3.13	2.95	2.60	2.40	1.88
Twelve sec. coasting	Seconds	20.0	20.4	20.6	20.8	21.6	22.6
	Ampere Seconds, Thousands	60.5	59.0	57.4	54.5	52.2	50.0
	Ampere Square Seconds, Thousands	363	383	402	436	470	45.8
Sixteen sec. coasting	Seconds	42.7	41.0	39.3	36.7	34.9	31.5
	Ampere Seconds, Thousands	306	319	330	354	379	458
	Ampere Square Seconds, Thousands	3.08	2.90	2.70	2.42	2.18	1.69
Twenty sec. coasting	Seconds	18.5	18.9	18.9	19.3	19.6	20.3
	Ampere Seconds, Thousands	58.6	57.0	55.5	52.5	49.8	47.5
	Ampere Square Seconds, Thousands	352	370	388	420	448	42.5

and braking is seen to give 8 per cent less time for the same power when compared with 2 m.p.h.p.s. for both. High rate of braking is slightly more effective than high rate of acceleration.

Fig. 10 shows the weight effect of light load; also the possibility of speeding up for light load by a higher rate of braking, 7 per cent being gained for the same power consumption. In a similar manner other comparisons may be made, showing effect of change in gear ratio, field control, grade, two motors versus four motors, line voltage, series running, various motor and car equipments.

While this method entails a large number of calculations, yet if a process such as outlined is followed and each step tabulated, the data for any modification of an equipment are easily deduced from the original data and a set of curves for any fixed conditions obtained by a few hours' work. While the author recognizes that certain steps in the calculations may be open to criticism, from an accurate mathematical standpoint it may be stated that the results are affected only in their absolute values and for all practical purposes and in their relative values they are within the range of observational error.

### Queue Loading in Cadillac Square, Detroit

THE queue loading practice which was started three years ago by the Detroit United Railway at the plant of the Ford Motor Company, with the co-operation of the automobile manufacturing officials, has recently been applied to Cadillac Square, in the heart of the city. The scheme was installed with the co-operation of the Police Department in connection with the looping back at Woodward Avenue of five east side car lines. The cars of these five lines stop for loading on the outbound trip along the two sides of Cadillac Square. There is



ORDERLY QUEUE LOADING IN CADILLAC SQUARE WITH WHICH DETROIT PEOPLE HAVE WILLINGLY COMPLIED

space along one side of the square for the simultaneous berthing of six cars. As the cars stop for loading collectors take up a position at the front end of each car and a line of passengers forms at the front and rear of each car. Passengers in the line entering the front end of the car pay the collector as they step aboard and those in the line at the rear end pay the conductor in the usual manner. This front end collection scheme and the orderly lining up of the passengers make the loading extremely rapid.

In installing the queue loading plan in Cadillac Square it was supervised at the beginning by the Police Department, but the passengers will soon be educated

and will take up this formation without police direction, unless the experience in this location is different from that at previous installations. In speaking of the queue loading plan, W. E. Cann said that the replacing of the rowdy rushing of the cars at the Ford plant with this orderly lining up of the passengers had spread into general use throughout the city. At heavy transfer points of Ford workers the passengers almost invariably line up. For example, at the Grand Belt and Woodward line transfer point a line 100 ft. long or more is often seen. The passengers often line up along Woodward Avenue also. Mr. Cann says that where this is seen it is a pretty safe bet that there are Ford workers in the line.

### How Automatic Train Control Works

IN A written discussion of a paper on "The Automatic Train Control Problem," by H. S. Balliet, delivered before a recent meeting of the New York Railroad Club and briefly abstracted in the March 27 issue of the ELECTRIC RAILWAY JOURNAL, page 640, Frank J. Sprague emphasized the importance of automatic train control and described the system developed by his company. The discussion by Mr. Sprague was illustrated by a diagram showing what happens with the use of this particular system of speed-brake control when trains entering a block adhere to or disregard the signals.

Briefly, the system includes the division of a block into two sections, permissive and controlled. Along the roadbed and clear of all equipment limitations there are provided certain protective track magnets under the full or partial control of the track circuit relays. In each block is a brake application magnet in the rear of the entrance, called the "distant" magnet; another at the beginning of the controlled section, called the "home" magnet, and a third, called the "reset" magnet, differentially positioned near the end of the block. On the locomotive are carried suitable receivers which register with the track magnets, and the necessary relays, air valves and means for initiating both service and emergency braking. The receivers and relays are sealed and free from interference by the engineer.

If a train enters the block, against a distant signal indication, at 60 m.p.h. the engineer will receive visible, audible and touch-responsive signals, which will clearly indicate to him the condition of the advance block. There will also be initiated a service brake application which in rate and amount of air reduction, if undisturbed, is that suited to the particular class of train the locomotive is hauling. The control of his valve is, however, immediately returned to the engineer before any actual braking takes place, and he can accept the automatic braking or increase or diminish it at will.

If the engineer proceeds at undiminished speed and the advance block is not cleared when he reaches the "home" magnet, entering the danger zone of the block at a reckless speed, an emergency brake application will take place. If on the other hand he accepts his initial warning and permits the automatic service brake to come on, or manually brakes his train down to a slower speed, meeting the requirements of the high limit of speed for which the train can be safely manually braked, there will be no emergency application of the brakes. If, however, he attempts to beat the operation while slowing down before reaching the control speed he will get an emergency brake application.

# Business Press and Increased Production\*

**Low Production Can Be Overcome by Correction of False Conceptions of Work, Increased Use of Automatic Machinery, Improved Methods of Manufacture and Distribution and Maximum Skill in Management—Business Press a Potent Factor in All These Lines**

By JAMES H. MCGRAW  
President McGraw-Hill Company, Inc.

LOW production per man is an accepted axiom in industry throughout the world today. The Great War shattered some fundamental conceptions of responsibility, which are having their reaction the world over in the minds of men. Low production today is a state of mind. To bring about increased production we must change the state of mind, as well as the physical elements.

No greater force for practical accomplishment exists at hand than the business press of America. Linked as it is with the heart of industry, in practical contact with what can be done and how it can be accomplished, it presents a great dynamic, educative force to raise the standard of thinking of men in industry.

Production, in fact, is not a matter of theory, but of the practical putting together of labor, of materials, of machinery and of management, to supply the economical wants of the work. This huge fabric of industry is threaded by more than 2,400 business papers, trade papers, engineering papers, technical journals and industrial papers. In practically every line of industry and every phase of industry there is a journal for the man who seeks to accomplish more in his particular line, no matter what his trade or calling or profession. Records available show that 819 of these publications of which check could be made have a total circulation of 6,351,059.

## HOW PROBLEM OF PRODUCTION IS MADE UP.

The one great problem of how to increase production which is facing the world today divides itself into several major problems. If the business men of America will intelligently consider these major problems, if they will recognize the slow, but sure, process of education in the solution of these problems, the business press stands ready as one all-embracing medium through which the vital and intimate needs of the separate trades or professions may be consistently and comprehensively developed.

## WORKMEN TODAY MANAGERS TOMORROW

Take the world-old problem of labor and capital. False conceptions of work have been developed until we popularly have come to believe that the men who provide the management ability and the men who provide the money and the men who provide the manual skill and the labor of production are different kinds of men.

As a matter of cold fact, if we may emphasize, as we can emphasize, through the business press that the majority of the industrial leaders of America were once workmen, that eleven out of the twenty-four railway presidents, for example, today were once messenger boys or clerks, that dozens of managers and superintendents and hundreds of capitalists and financial men were one time store clerks or farmer boys or mill men;

if we can only emphasize that the thing which separates them into a class is not a distinction in the kind of work they do, but in the kind of thinking they do, we will have at least gone part way toward the solution of the so-called labor problem. And no force exists today better able from a practical point of view to point out the difficulties as well as the opportunities of industry, to stand as a third party and admit the abuses of power on both sides, than the trade press.

America is still a land of opportunity in industry, and hundreds of business papers today are pointing out individual opportunities for men, literally acting as text books for the teaching of common-sense economics in industry and pointing out the practical plans that have been and are being worked out in individual plants for bringing men and management together. We can make rules and we can agree on fundamentals with regard to the relations between men and men, but no plan will succeed unless the "white-collared" workers in the office, who are responsible for carrying it out, have an actual working contact, either themselves or through others in sympathy with their ideas, with the overall-clad workmen in the factories.

## INFLUENCE OF INVENTION AND APPLICATION OF MACHINERY ON INCREASED PRODUCTION

Take the second great condition of increased production—the invention and the application of machinery to increased man power. Automatic machinery does not replace men, it multiplies the thinking of men and increases production. If this one thought could be developed among the men in industry there would be a more willing acceptance of automatic machinery as a basis of accomplishment by the great group of workmen known as "common labor" or "unskilled labor."

No nation in the world has set the standard for ingenuity in finding mechanical ways of increasing output more than the United States. No nation has been more ready to put its thoughts into type than the American inventor and the American manufacturer, and who shall say that this fluid interchange of thought between industry and between men in industry is not one of the potent factors in making our country the reservoir of ideas that it today is in mechanical invention and the mechanic arts?

Leonardo da Vinci left a personal literature of invention. You can go back in the writings of this man of fertile imagination and individual resourcefulness and find the suggestion or the actual prototype of many of our present day common-place machines. He thought of the airplane and devised a model that might fly, yet for five hundred years his inventions remained the inventions of the individual and remained buried in records. Who shall say that if there had been a technical press in his day, if he had contributed his imagination to a public technical press, instead of burying it in a

\*Abstract of address presented at meeting of Chamber of Commerce of the United States, Atlantic City, N. J., April 23, 1920.

diary, the airplane would have flown five hundred years ago, instead of in 1908? Today the mechanical and machinery papers carry pages of information that have to do with new means and methods. These are read by the men who can put the new ideas into operation.

I have pointed out certain fundamental factors in industry in connection with the relation of the business press to increased production. Just now all these problems are related to the one great problem of the present. We are in a period of credit deflation. Every careful business man in America today is making his plans with this as his major premise. The trade and business paper has a very definite relation in getting things accomplished under these conditions. There are, broadly, two huge classes of trade papers, one of those dealing with the problem of distributing and marketing goods, which are more correctly known as "trade" papers, and the other having to do with the engineering and technical problems of administration and production, which are exactly termed "technical" or "professional" papers.

As a nation we are today relatively efficient in making goods. We are relatively very inefficient in distributing them. The editors of the trade papers have the opportunity for leadership in pointing out and making generally understood better methods of distribution. They look upon the merchant and the dealer not as a slot machine for distributing merchandise for which there is an existing demand, but as a man who is also creating new demands locally. The editorial pages of a trade paper are used to teach the dealer how to capitalize his own position in creating more business for himself. The local merchant pays money for his subscription to a trade paper to get sales-building ideas, and every new idea he gets must tie up with some manufacturer's merchandise. In a similar manner, the technical papers bring to the engineer and the professional man the newest information with regard to progress in the art and science with which he is associated.

#### RAW MATERIALS MUST BE TREATED SCIENTIFICALLY AND RESEARCH ENCOURAGED

We are faced today with shortages in scores of raw materials that form the third great group in consideration of an increased production program for our nation. We must be better miners and be better users of by-products. We must find out how better to distribute, how to improve our transportation, how to improve utilization, to make ten parts go as far as a hundred did before. Our engineers and our technical experts, our chemists, our transportation men are at work on these problems today, and the technical and engineering press of the country is the great medium of exchange of ideas on how to get more done for less money, how to overcome wastes. Our patent laws protect the business interests of our nation, but one of the problems facing this country today is the need of better understanding of the value of engineering thinking and the analytical approach to the problem which the engineer contributes to industry. Only by making the individual industries conscious of their professional relation, only as a practical matter of seeing the opportunity through the columns of the technical and engineering press for molding and leading thought and opinion, can these things be accomplished quickly.

Our nation today is short of research men. Business men must establish more laboratories. They must see that opportunities are offered to the technical man, the

trained investigator, so that it is worth the while of serious-minded young men to enter these branches of industry. It is for this sort of thing that the technical and business press of the country stands, and it is this sort of thinking that will ultimately solve our raw materials problem and the technical problems of extraction, of transportation and of utilization.

#### SKILLED MANAGEMENT AS ESSENTIAL AS SKILLED LABOR

I have said that increased production and the possibilities of increased production is a state of mind. No body of men is more responsible for this state of mind than the management, which is the fourth great factor in production. There is just as much opportunity for the development of the intelligent application of management to industry as for the intelligent application of machinery to the processing of materials. Human engineering and business engineering are two new terms in our dictionaries which have come out of a new kind of thinking in industry. We shall never have maximum production until we have maximum skill in labor, minimum use of materials and maximum skill in management. The business press sees men and machinery and material and capital put together and made a co-ordinated whole by management.

It does no good to arouse the nation to action, or to arouse the individual to action, unless there is also suggested how some one has turned that action into practice. This is an educational process. This is a function, and a vital function, of the business press. It is one of the reasons for a business press, and in forwarding such movements and in explaining and interpreting them in the practical language of the particular industry, the press has an opportunity for increasing production which is second to none in any of the great educational mediums of the nations.

#### LEADERSHIP OF BUSINESS PRESS IN NATIONAL PROBLEMS

In all this work the business press has a double relation. It is evident from what has been said that one of its values is based on the vitality of its editorial relation to the industry which it serves. It must draw, and in worth-while business does draw, its editors from the industry. They may be and are men of knowledge of their particular lines.

But of more importance possibly than the relation of the business press as a recorder and a clearing house of ideas is its professional relation to its industry or trade. The editors of the business press have the opportunity to be both a part of an industry and to stand on the side lines looking out over industry. They can see, because of their exceptional opportunities for investigation and association with leaders of their particular fields, the general trend of an industry. They can help and do help point out and chart the way of the industry, and they have a sense of responsibility toward the public which that particular industry may serve, which is one of the fundamental values of the business paper.

Two concessions for the installation of electric street car lines in the city of Guatemala are said to be now before the government of that country, with indications that they will be favorably acted upon. At present there are no electric roads in the country, although it has vast water power resources.

# Railway Census Figures Issued

**Report Shows a Growth of 9.2 Per Cent in Mileage and 22.7 Per Cent in Rolling Stock from 1912 to 1917—During This Period Traffic Increased 19.5 Per Cent—Operating Expenses Fail to Reflect Present High Costs**

STATISTICS of the electric railways in the country for the fourth quinquennial census report, which were obtained by the Department of Commerce, Bureau of the Census, in 1917, have just been published in book form by the bureau. The report analyzes the conditions existing in the industry in the usual complete manner and gives comparative data in all tables covering the conditions of 1912, 1907, 1902 and in some cases 1890.

Some preliminary statistics have already been published in the columns of the ELECTRIC RAILWAY JOURNAL for April 26 and May 3, 1919.

The report for 1917 covers 943 operating and 364 lessor companies which operate 32,548 miles of line, involving in all a total of 44,835 miles of single track, 94.8 per cent of which is operated by overhead trolley, 3.8 per cent by third rail and 0.7 per cent by conduit or underground trolley. The miles of line and miles of single track show an increase of 6.9 and 9.2 per cent respectively over the 1912 census.

The rolling stock owned, however, increased 22.7 per cent over 1912. The total number of cars of all types reported was 102,603, 77.9 per cent of which were passenger cars, 11.2 per cent were classified as "express, freight, baggage and mail cars" and 10.9 per cent as service cars. The number of cars equipped with motors was 74.5 per cent of the total and represented a growth of 20.4 per cent in the last five years.

## CAPITALIZATION

The capitalization of the operating and lessor electric railways was found to include a considerable

investment in non-railway properties, such as power installations for light and power purposes and other auxiliary operations. In computing the net capitalization per mile of track, the investments in stocks and bonds of other companies, in treasury securities and in other permanent investments have been deducted from the outstanding capital stock and funded debt securities. Table I presents the statistics for 1917 compared to 1912 and 1907.

TABLE II—Income of Operating Companies, by Source

ACCOUNT	1917	1912	Per Cent of Increase <sup>1</sup>
Income from all sources.....	\$730,108,040	\$585,930,517	24.6
Operating revenues.....	709,825,092	567,511,704	25.1
Railway operations.....	650,149,806	535,996,122	21.3
Passenger.....	603,129,620	502,651,637	20.0
Baggage, express, and milk.....	4,965,566	3,687,947	34.6
Parlor, sleeping, dining, and special car.....	957,966	1,036,520	-7.6
Mail.....	614,678	723,640	-15.1
Freight.....	18,546,504	10,165,616	82.4
Miscellaneous transportation revenue.....	1,066,138	1,919,413	-44.5
Power revenue.....	6,710,099	5,515,475	21.7
Rent of tracks, equipment, and other railway property and facilities.....	7,413,335		
Other railway operating revenue.....	6,745,900	10,295,874	37.5
Auxiliary operations.....	59,675,286	31,515,582	89.4
Non-operating income.....	20,282,948	18,418,813	10.1
PER CENT OF INCOME FROM ALL SOURCES			
Operating revenues.....	97.2	96.9	
Railway operations.....	89.0	91.5	
Passenger.....	82.6	85.8	
Parlor, sleeping, dining, and special car.....	0.1	0.2	
Freight, mail, baggage, express, and milk.....	3.3	2.5	
Other railway operating revenues.....	3.0	3.0	
Auxiliary operations.....	8.2	5.4	
Non-operating income.....	2.8	3.1	

<sup>1</sup> A minus sign (—) denotes decrease.

TABLE I—Capitalization, Including Floating Debt

	(4) 1917	(4) 1912	(4) 1907	Per Cent of Increase <sup>1</sup>		
				1907-1917	1912-1917	1907-1912
Capital stock.....	\$2,473,847	\$2,379,346	\$2,097,709	17.9	4.0	13.4
Common.....	2,012,190	1,970,385	1,776,920	13.2	2.1	10.9
Preferred.....	461,659	408,961	320,789	43.9	12.9	27.5
Funded debt.....	3,051,179	2,329,222	1,677,064	81.9	31.0	38.9
Real estate mortgages.....	7,198	6,097	4,060	77.3	18.1	50.2
Floating debt.....	166,593	296,162	278,927	-40.3	-43.7	6.2
Total.....	5,698,816	5,010,823	4,057,759	40.4	13.7	23.5
Stocks and bonds of other electric railway companies and treasury securities.....	390,489	360,105	237,896	64.1	8.4	51.4
Net capitalization.....	5,308,327	4,650,718	3,819,863	39.0	14.1	21.8
Investments in other securities and non-railway properties.....	251,773	105,145	136,768	84.1	139.5	-23.1
Net capitalization based on electric railways:						
Inclusive of floating debt <sup>2</sup> .....	5,056,554	4,545,573	3,683,095	37.3	11.2	23.4
Per mile of track.....	115	112	108			
Exclusive of floating debt <sup>2</sup> .....	4,889,962	4,249,415	3,404,168	43.6	15.1	24.8
Per mile of line <sup>3</sup> .....	153	141				
Per mile of track.....	111	105	101			

<sup>1</sup> A minus sign (—) denotes decrease. <sup>2</sup> Includes real estate mortgages.  
<sup>3</sup> Miles of line represented: 1917, 31,968.95; 1912, 29,991.42.  
<sup>4</sup> All totals in thousands of dollars—last 000's omitted.

The gross capital liabilities, exclusive of floating debt, which approximates \$166,500,000, averaged \$126,021 per mile of track in 1917, \$116,435 in 1912 and \$111,569 in 1907.

## FINANCIAL OPERATIONS

The reports of the financial transactions of the electric railways conformed in practically every case to the standard system of accounts adopted by the I. C. C. All income from railway operations is shown, therefore, as originating with the operating companies, while the income of the lessor companies (rentals) is reported as an expense by the operating companies.

The income from all sources of the 943 operating companies according to source and the percentage that each bears to the total is shown in Table II. Notable factors are the relatively large increase in auxiliary operations, chiefly in light and power business, and the decrease in mail and special car revenues.

Table III illustrates the differences in the relative importance of the several classes of operating revenues for electric railways and steam railroads.

The classification of companies as to size is based upon income from railway operations, hence income from auxiliary operations, of which the chief is light

and power service, and other non-transportation revenues do not affect the classification, however large they may be. Table IV shows what percentage of the operating revenue is received from various sources, depending upon the size of the company.

OPERATING EXPENSES

Because of the many and varied factors involved in operating expense, such as the differences in character of the systems, in power and the source of power, in character of roadbed, rolling stock and the territory served, comparisons of the costs of maintenance and operation are only of value as illustrating general conditions. Tables V and VI give comparative figures for the last three census years of the five general or main expense accounts, together with changes and per cent distribution of the accounts. Auxiliary operations,

chiefly light and power business, constitute an important factor. Considering railway operating expenses, the expenses for conducting transportation constituted 41.5 per cent in 1917, 40.5 per cent in 1912 and 39.6 per cent in 1907. Power expenses amounted to 18.3 per cent of the same total in 1917, 16.8 per cent in 1912 and 17.9 per cent in 1917.

A classification of companies by income, as in Tables VII and VIII, shows that considering railway operating expenses solely, the expenses for conducting transportation constitute a greater proportion of the total for the larger companies than for the smaller companies and power expense is a greater proportion of the total railway operating expenses for the smaller than for the larger companies.

TAXES AND OTHER DEDUCTIONS

At prior censuses taxes were treated as a deduction from income, together with rentals for leased lines, interest, charges for sinking funds and other deductions, but in accordance with the system of ac-

TABLE III—Per Cent Distribution of Operating Revenues by Source

CLASS OF SERVICE	Electric Railways			Steam Railways		
	1917	1912	1907	1917	1912	1907
Operating revenues.....	100.0	100.0	100.0	100.0	100.0	100.0
Passenger.....	92.8	88.8	91.5	20.6	23.2	21.8
Freight.....	2.8	1.8	1.3	70.3	69.3	70.4
Mail.....	0.1	0.1	0.2	1.5	1.8	1.9
Express.....	0.8	0.6	0.4	2.7	2.6	2.2
All other.....	3.5	8.7	6.7	4.9	3.2	3.6

TABLE IV—Per Cent Distribution of Operating Revenues, by Source, of Companies Classified According to Income from Railway Operations

ACCOUNT.	Class A— Over \$1,000,000		Class B— Over \$250,000 to \$1,000,000		Class C— \$250,000 and Less	
	1917	1912	1917	1912	1917	1912
PER CENT DISTRIBUTION OF OPERATING REVENUES						
Operating revenues.....	100.0	100.0	100.0	100.0	100.0	100.0
Railway operating revenues.....	94.1	96.7	85.0	89.9	80.4	84.9
Passenger.....	88.4	91.7	74.8	81.2	71.2	76.5
Baggage, express, and milk.....	0.5	0.4	1.2	1.3	1.3	1.1
Parlor, sleeping, dining, and special car.....	0.1	0.2	0.2	0.3	0.1	0.2
Mail.....	0.1	0.1	0.1	0.1	0.2	0.2
Freight.....	2.0	1.2	5.1	3.4	4.3	4.0
Miscellaneous transportation.....	0.1	0.3	0.2	0.5	0.6	0.5
From other railway operations.....	2.9	2.8	3.4	3.1	2.7	2.4
Auxiliary operating revenues.....	5.9	3.3	15.0	10.1	19.6	15.1

TABLE V—Operating Expenses, by Accounts

ACCOUNT	(3)	(3)	(3)	Per Cent of Increase <sup>1</sup>		
	1917	1912	1907	1907-1917	1912-1917	1907-1912
Number of companies.....	943	975	939			
Operating expenses, total.....	\$452,595	\$332,896	\$251,309	80.1	36.0	32.5
Railway operating expenses.....	421,251	318,700	245,140	71.8	32.2	30.0
Way and structures.....	55,470	44,271	28,521	94.5	25.3	55.2
Equipment.....	48,981	38,717	31,486	55.6	26.5	23.0
Power.....	76,958	53,599	43,973	75.0	43.6	21.9
Conducting transportation.....	174,973	129,204	97,122	80.2	35.4	33.0
Traffic.....	2,302	2,606	1,731	33.0	-11.7	50.6
General and miscellaneous.....	62,738	50,303	42,307	48.3	24.7	18.9
Transportation for investment—credit.....	172					
Auxiliary operations—expenses.....	31,344	14,196	6,169	403.1	120.8	130.1

<sup>1</sup> A minus sign (—) denotes decrease. <sup>2</sup> Includes superintendence of power. <sup>3</sup> All in table in thousands of dollars—last 000's omitted.

TABLE VI—Per Cent Distribution of Operating Expenses, by Accounts (Based on Table V)

ACCOUNT	1917	1912	1907
Operating expenses, total.....	100.0	100.0	100.0
Railway operating expenses.....	93.1	95.7	97.5
Way and structures.....	12.2	13.3	11.3
Equipment.....	10.8	11.6	12.5
Power.....	17.0	16.1	17.5
Conducting transportation.....	38.7	38.8	38.7
Traffic.....	0.5	0.8	0.7
General and miscellaneous.....	13.9	15.1	16.3
Transportation for investment—credit.....	(1)		
Auxiliary operations—expenses.....	6.9	4.3	2.5

<sup>1</sup> Less than one-tenth of 1 per cent.

TABLE VII—Operating Expenses, by Accounts—Companies Classified According to Income From Railway Operations: 1917.

ACCOUNT	Total	Class A— Over \$1,000,000	Class B— Over \$250,000 to \$1,000,000	Class C— \$250,000 and Less
Number of companies.....	943	114	179	650
Operating expenses, total.....	\$452,594,654	\$340,055,035	\$70,304,757	\$42,234,862
Railway operating expenses.....	421,250,838	322,769,195	62,528,547	35,953,096
Way and structures.....	55,470,419	41,882,192	8,619,811	4,968,416
Equipment.....	48,981,554	37,894,165	6,836,922	4,250,467
Power.....	76,958,461	56,201,555	12,652,775	8,104,131
Conducting transportation.....	174,972,645	139,964,660	23,046,724	11,961,261
Traffic.....	2,301,817	1,265,200	725,877	310,580
General and miscellaneous.....	62,738,265	45,727,954	10,650,757	6,359,554
Transportation for investment—credit.....	172,333	166,621	4,319	1,333
Auxiliary operations—expenses.....	31,343,816	17,285,840	7,776,210	6,281,766

TABLE VIII—Per Cent Distribution of Operating Expenses of Companies Classified According to Income from Railway Operations: 1917 (Based on Table VII)

ACCOUNT	By Classes			By Accounts			
	Class A	Class B	Class C	All Companies	Class A	Class B	Class C
Operating expenses, total.....	75.1	15.5	9.4	100.0	100.0	100.0	100.0
Railway operating expenses.....	76.6	14.9	8.5	93.1	94.9	88.9	85.1
Way and structures.....	75.5	15.5	9.0	12.2	12.3	12.3	11.8
Equipment.....	77.4	13.9	8.7	10.8	11.1	9.7	10.1
Power.....	73.0	16.5	10.5	17.0	16.5	18.0	19.2
Conducting transportation.....	80.0	13.2	6.8	38.7	41.2	32.8	28.3
Traffic.....	55.0	31.5	13.5	0.5	0.4	1.0	0.7
General and miscellaneous.....	72.9	17.0	10.1	13.9	13.4	15.1	15.0
Transportation for investment—credit.....	96.7	2.5	0.8	(1)	(1)	(1)	(1)
Auxiliary operations—expenses.....	55.1	24.8	20.1	6.9	5.1	11.1	14.9

<sup>1</sup> Less than one-tenth of 1 per cent.



TABLE IX—Taxes and Other Deductions—Operating Companies

	(1) 1917	(2) 1912	(3) 1907	Per Cent of Increase		
				1907-1917	1912-1917	1907-1912
Taxes assignable to railway operations	\$45,757	(1) \$35,028	\$19,756	131.8	30.6	77.0
On real and personal property	21,805					
On earnings, capital and other	23,952					
Deductions from gross income	\$175,306	149,866	\$118,339	48.1	17.0	26.6
Rent for leased roads (lines and terminals)	48,303	44,785	48,023	0.6	7.9	-6.7
Interest on funded debt	110,507	98,025	63,741	86.9	21.5	53.8
Interest on unfunded debt	8,606					
Miscellaneous rents	1,775					
Income transferred to other companies	900	7,056	(2) 6,576			
Miscellaneous debits, not elsewhere specified	5,215					

<sup>1</sup> Includes \$603,226 rental of subways and tunnels (Boston Elevated Ry. Co.).  
<sup>2</sup> Includes "Charges for sinking fund."  
<sup>3</sup> All totals in thousands of dollars—last 000's omitted.

TABLE X—Taxes

	1917	1912	1907	Per Cent of Increase		
				1907-1917	1912-1917	1907-1912
Total	\$45,756,695	\$34,424,739	\$19,755,602	131.6	32.9	74.3
Class A	37,157,324	28,098,949	15,524,362	139.3	32.2	81.0
Class B	5,902,953	3,935,021	2,479,106	138.1	50.0	58.7
Class C	2,696,418	2,390,769	1,752,134	53.9	12.8	36.5

<sup>1</sup> Not including \$603,226 rental of subways and tunnels (Boston Elevated Railway Co.).

counting in vogue "taxes assignable to railway operations" are a charge against net operating revenue and charges for sinking fund are handled as a profit and loss account.

The ratio of taxes to income from all sources less operating expenses increased from 11.1 per cent in 1907 to 13.6 per cent in 1912 and to 16.5 per cent in 1917. The aggregate of operating expenses and taxes was \$498,351,349 in 1917, of which amount taxes form 9.2 per cent, or taking operating revenues as a basis taxes absorbed 6.4 per cent.

Taxes, when classified according to the size of the company, as shown in Table X, indicate the greater increases are for the larger companies.

The interest charges of the 943 operating companies on funded and unfunded debt amounted to \$119,113,018 in 1917, an amount 21.5 per cent greater than the

TABLE XII—Employees, by Classes of Occupation

CLASS	1917	1912	1907	Per Cent of Increase <sup>1</sup>		
				1907-1917	1912-1917	1907-1912
Number of companies	943	975	939			
Persons employed						
Number	294,826	282,461	221,429	33.1	4.4	27.6
Salaries and wages <sup>2</sup>	\$267,240	\$200,391	\$150,991	77.0	33.0	33.0
Salaried employees—						
Number	27,151	23,271	11,700	132.1	16.7	98.9
Salaries <sup>2</sup>	\$33,910	\$26,129	\$12,909	162.7	29.8	102.4
Salaried officers of corporation—						
Number	1,883	1,927	1,518	24.0	-2.3	26.9
Salaries <sup>2</sup>	\$6,786	\$5,709	\$3,852	76.2	18.9	48.2
Managers and superintendents—						
Number	2,889	2,882	2,094	38.0	0.2	37.6
Salaries <sup>2</sup>	\$6,205	\$5,376	\$3,580	73.3	15.4	50.2
Clerks, stenographers, and other salaried employees—						
Number	22,379	18,462	8,088	176.7	21.2	128.3
Salaries <sup>2</sup>	\$20,918	\$15,044	\$5,477	281.9	39.0	174.7
Wage earners—						
Number <sup>3</sup>	267,675	259,190	209,729	27.6	3.3	23.6
Wages <sup>2</sup>	\$233,331	\$174,762	\$138,082	69.0	33.5	26.6
Conductors and motormen—						
Number	136,184	131,321	115,518	17.9	3.7	13.7
Wages <sup>2</sup>	\$127,222	\$95,452	\$75,705	68.0	33.3	26.1
Conductors—						
Number	68,352	65,726	60,032	13.9	4.0	9.5
Wages <sup>2</sup>	\$62,997	\$47,102	\$38,234	64.8	33.7	23.2
Motormen—						
Number	67,832	65,595	55,486	22.3	3.4	18.2
Wages <sup>2</sup>	\$64,230	\$48,350	\$37,471	71.4	32.8	29.0
All other employees—						
Number	131,491	127,869	94,211	39.6	2.8	35.7
Wages <sup>2</sup>	\$106,109	\$79,311	\$62,377	70.1	33.8	27.1

<sup>1</sup> A minus sign (—) denotes decrease.  
<sup>2</sup> Exclusive of 6 companies which failed to furnish this information.  
<sup>3</sup> For 1917 as of date Sept. 29; for 1912, Sept. 16; for 1907, average number for the year.  
<sup>4</sup> Totals for salaries and wages are in thousands of dollars—last 000's omitted.

interest charges in 1912, the increase for 1907 to 1912 being 53.8 per cent. In the case of the 364 lessor companies the interest on funded debt in 1917 amounted to \$16,147,380, as compared with \$15,234,132 in 1912. "Deductions from gross income" when classified by companies according to income indicate a 57.1 per cent increase over 1912 for the Class A companies. Class B companies increased but 44.6 per cent, while Class C showed a decrease of 4.9 per cent. The cause for these variations is due entirely to the increased interest charges on funded debt.

GENERAL RESULTS OF OPERATIONS

The report gives tables for the several standard units of comparison and Table XI shows the result of operation of all operating companies classified according to income from railway operation.

The number of persons employed in 1917 was 4.4

TABLE XI—GENERAL RESULTS OF OPERATION OF ALL COMPANIES AND OF COMPANIES CLASSIFIED ACCORDING TO INCOME FROM RAILWAY OPERATIONS

UNIT	All Companies			Class A—Over \$1,000,000			Class B—Over \$250,000 to \$1,000,000			Class C—\$250,000 and Less		
	1917	1912	1907	1917	1912	1907	1917	1912	1907	1917	1912	1907
Number of companies	943	975	939	114	91	76	179	155	130	650	729	733
Operating ratio (per cent)	63.8	58.7	60.1	62.3	56.7	58.4	66.4	61.7	61.9	72.5	68.3	67.4
Per mile of track:												
Operating revenues	\$15,832	\$13,820	\$12,268	\$20,940	\$19,844	\$19,287	\$10,314	\$8,937	\$8,009	\$6,839	\$5,784	\$5,251
Operating expenses	10,095	8,107	7,373	13,046	11,252	11,256	6,853	5,517	4,956	4,962	3,949	3,539
Net operating revenues	5,737	5,713	4,895	7,894	8,592	8,032	3,461	3,420	3,053	1,877	1,835	1,712
Per car-mile:												
Operating revenues	Cents 33.17	Cents 29.53	Cents 25.97	Cents 32.80	Cents 29.49	Cents 26.25	Cents 36.04	Cents 30.63	Cents 25.71	Cents 31.99	Cents 28.32	Cents 24.84
Operating expenses	21.15	17.32	15.61	20.43	16.72	15.32	23.95	18.91	15.91	23.21	19.33	16.74
Net operating revenue	12.02	12.21	10.36	12.37	12.77	10.93	12.09	11.72	9.80	8.78	8.99	8.10
Per revenue passenger:												
Operating revenue	6.28	5.95	5.63	5.84	5.54	5.28	8.51	7.51	6.53	8.22	7.68	6.99
Operating expenses	4.00	3.49	3.39	3.64	3.14	3.08	5.66	4.64	4.04	5.96	5.24	4.71
Net operating revenue	2.28	2.46	2.25	2.20	2.40	2.20	2.85	2.87	2.49	2.26	2.44	2.28

per cent more than in 1912, but the salaries and wages paid increased 33 per cent. The greatest increase in wages was to clerks, stenographers and other salaried employees. This increase was 39 per cent. The 267,675 wage earners in 1917 is an increase of 3.3 per cent compared with 1912, but the amount paid in wages, \$233,330,688, is an increase of 33.5 per cent. Expressed in terms of an average unit wage, the conductors and motormen received an annual average wage of \$934 in 1917, as compared with \$727 in 1912, and all other classes of wage earners an average of \$807 in 1917 and but \$620 in 1912.

Table XII gives a comparative summary for the last three censuses of employees' salaries and wages for the year by classes of occupation.

### Problems of the Super-Power Plant

AT A meeting of the Washington Section of A. I. E. E. held on April 13 Harold Goodwin, Jr., of the General Electric Company gave the principles and procedure followed in the design of a 200,000-kw. power plant to be built in Paris, France. It is intended to supersede all present generating stations in that city. The plant will be near the city on the Seine River and the main generating equipment will consist of seven 35,000-kw. generators. The plant will feed ten 60,000-volt underground lines and two 60,000-volt overhead lines. The turbines driving the generators will operate at 325 lb. pressure and 320 deg. F. superheat.

With such large concentration of power, special attention was given to feeder protection. It was decided that the maximum allowable concentration at any point under the city is 500,000 kva., in case of a "dead" short circuit, as 580,000 kva. is the breakdown capacity of the oil switches. As 200,000 kva. could be supplied to any feeder from a single generator and transformer, special reactors were needed. The necessary flexibility and protection were provided by connecting each generator and transformer to a high-tension bus and connecting each of these buses through reactors to a synchronizing bus.

The boiler plant will contain four boilers of novel construction for each turbine. They are to be equipped with superheater coils set between the lower and upper banks of tubes, in order to produce the high degree of superheat specified.

The plant is intended to operate on a 50-cycle basis, replacing the several frequencies now in use, namely, 16 $\frac{2}{3}$ , 40 and 42 cycles. It is estimated that the plant as designed would have cost approximately \$45 per kilowatt at pre-war prices, but the exact present cost has not yet been estimated. It will, however, be between two and three times the pre-war cost.

### Rail Hardening Experience in England

AMONG items reported to the London County Council by the highways committee at the meeting held on March 30 information was given as to the result of the Sandberg rail-hardening process, which is used to a considerable extent in Great Britain. It was stated that the effect of the treatment is to raise the elastic limit of the surface of the rail from about 25 tons to more than 100 tons per square inch. Measurements which have been made indicate that the life of rails can be extended more than three years by this process. An absence of corrugation on the treated rails has been noted.

## Lack of Public Policy Deplored

### National Municipal League Committee Presents Report Outlining a Suggested Correct Public Policy Toward Street Railways

AS A supplement to its April issue the *National Municipal Review*, published by the National Municipal League, Concord, N. H., publishes a report of the league's committee on public utilities, in which all previous reports of this committee are summarized and the unsolved elements of the problem analyzed. Dr. Delos F. Wilcox is chairman of the committee, whose membership includes seven other men from different parts of the country.

That there is a recognized crisis in local transportation, due largely to the fact that the policy of private management under partial public control has broken down, is the starting point of the report. The necessity for street railway service is recognized, yet the various cities have not prepared themselves to assume responsibility for it. The present condition is a public menace on account of the financial condition of so large a business, on account of the breakdown of such an essential service, on account of the loosening of control of public authority over the street railway and on account of the danger of an unprecedented series of conflicts between the companies and labor. There are several points of view on these questions and the fact that the public lacks a definite policy merely delays the final solution of the problem. The problem is made more complex by the forty-eight separate jurisdictions, aside from the national one under which railways have to operate.

The report then goes on to review the league's efforts to outline and develop a public policy during the last twenty years and reviews the previous reports made by the committee. Its original program that "every city . . . shall be vested with power to perform and render all public services" is still maintained. In other words, ultimate authority of a municipality to own and operate its street railway system, if the people of the city desire it, is a part of the policy of the league.

The report closes with a listing of the unsolved problems that demand immediate attention, which are outlined as follows:

1. A location of authority between states and local bodies.
2. Formation of definite policy for consummation of municipal or state ownership and successful public operation of utilities. Under this heading several sub-problems are outlined, such as (a) preparation of specific constitutional amendments; (b) preparation of condemnation laws with all the various corollary questions; (c) preparation of legislation to enable cities to secure funds on advantageous terms (involving the question of debt limit); (d) preparation of satisfactory plans for public operation; (e) preparation of plans for adjustment of disputes between municipalities and employees; (f) preparation of a policy of extension and of rates.

The committee then reaches its conclusions that street railway transportation is a public function and that it cannot be put upon a permanently sound basis until the organized community has prepared itself to perform the function.

As an appendix is given the public utility section of the National Municipal League's model city charter.

## Centrifugal-Electric Tie Tampers

**A Three-Phase Motor Operated from a Motor-Generator Set Is Used on Account of Its Rugged Construction**

**A**N exceedingly simple and yet apparently effective electric tie tamper has been brought out by the Kalamazoo Railway Supply Company, Kalamazoo, Mich., under the name of the "Jackson tie tamper." It comprises simply a three-phase, 60-cycle, 110-volt squirrel-cage induction motor with an unbalanced weight



THE ROTOR AND UNBALANCED WEIGHT ON THE TAMPER MOTOR SHAFT

mounted on the end of the shaft at which the tamping tool is bolted to the motor housing. By rotation of the motor at a speed of 3,600 r.p.m. the centrifugal force of the unbalanced weight on the shaft produces a tamping impulse of some 400 lb. 3,600 times a minute.

The well-known ruggedness and simplicity of the squirrel-cage motor is taken advantage of by making use of a motor-generator set for supplying the necessary alternating current, the advantages of this type



CENTRIFUGAL-ELECTRIC TIE TAMPER IN OPERATION

of motor being considered so important as to offset the investment necessary in the motor-generator set, as compared with use of the direct-current motor in the tamping tool. The rotor of the tamping motor is mounted upon a heavy nickel-steel shaft which runs on two heavy ball bearings. The motor housing is made extra heavy and is claimed to be rain, dust and dirt proof. The tamping tool is bolted to this housing at one end and the operator's handle at the other end. This handle is also of unique design since it is constructed of flat spring steel and provided with leather hand strips. This spring handle relieves the operator of vibration and permits the tamping bar to take any working angle without the necessity of the operator bending his back or assuming a cramped, unnatural position. The tamping bar can be quickly attached to the motor and it is supplied in various widths and thicknesses, to conform to the requirements of the ballast.

Each tamper requires approximately  $\frac{1}{3}$  hp. for its operation, it is claimed, and the generator supplying the energy is designed for a capacity of four tampers. No operating switch is provided on the tamping tool, since this is considered to be a source of trouble which the manufacturers have considered could be very largely eliminated by making use simply of a plug and socket-type switch in the power lead. The weight of the tamper, exclusive of the tamping bar, is 40 lb.

## Arkansas Association Meets at Hot Springs

**A Three-Day Meeting Packed Full of Instructive Discussion, Particularly with Relation to Managerial Problems**

**T**HE Arkansas Utilities Association met at Hot Springs, April 26 to 28 inclusive. At the opening of the convention the Hon. Charles H. Brough, Governor of the State, said that the 200 leading utilities in the State represent an investment of \$150,000,000, and that the tax commission reports show them to be reporting their investments fairly. J. S. Wharton, president of the association, in responding, said that the records show that the utilities are paying, on a basis of assessment, double the average of the other industries of the State.

Next a paper on "Lightning Protection" was read by J. L. Buchanan, president Wescos Supply Company, St. Louis, Mo., followed by one on "Underfeed Stokers," by O. P. Barnell, Westinghouse Electric & Manufacturing Company, St. Louis. P. W. Thomas, mechanical superintendent Arkansas Light & Power Company, discussed the three fuels readily available in the State, namely, coal, oil and natural gas, with special reference to labor supply, first cost, reliability, economy and overload requirements. The discussion was merged with that of an address by W. G. Schmauder, Texas Power & Light Company, Dallas, on "Present Operating Problems," the important points in which were the cost of money, the open shop and power-plant efficiencies.

Mr. Schmauder advocated firing so as to produce a gray haze at the stack rather than black smoke or no smoke at all, and banking by intermediate firing. He also urged investigation of turbine performance and condenser conditions.

The association voted to affiliate with the South-

western Geographic Section of the N. E. L. A. and to meet again at Hot Springs next year. The result of the election was as follows: President, C. J. Griffith, Little Rock; first vice-president, J. F. Christy, Jonesboro; second vice-president, J. A. Whitlow, Pine Bluff; third vice-president, Judge R. M. Foster, Helena; secretary-treasurer, S. E. Dillon, Hot Springs.

On the closing day Judge Thomas E. Wood, member Arkansas Corporation Commission, discussed primarily the indeterminate franchise feature of the corporation commission act. He commented on the commission's responsibility in preserving service for the public and avoiding receiverships at this time. He decried the bitter hostility of some cities that had depended upon paid propagandists instead of the orderly processes of law.

## Sample Car Tried in Milwaukee

Use of New Cars, Together With Remodeling of Old Rolling Stock, Planned to Help Out General Shortage

THE sample car after which the 100 new cars which the Milwaukee Electric Railway & Light Company is about to purchase are to be patterned has been completed in the shops of the company and is being operated in regular schedule for trial purposes. This car embodies several new ideas in design. It is 45 ft. long, seats forty-eight people in winter and fifty in summer within the car body, with a few additional seats on the platforms, and weighs only 31,480 lb. It is

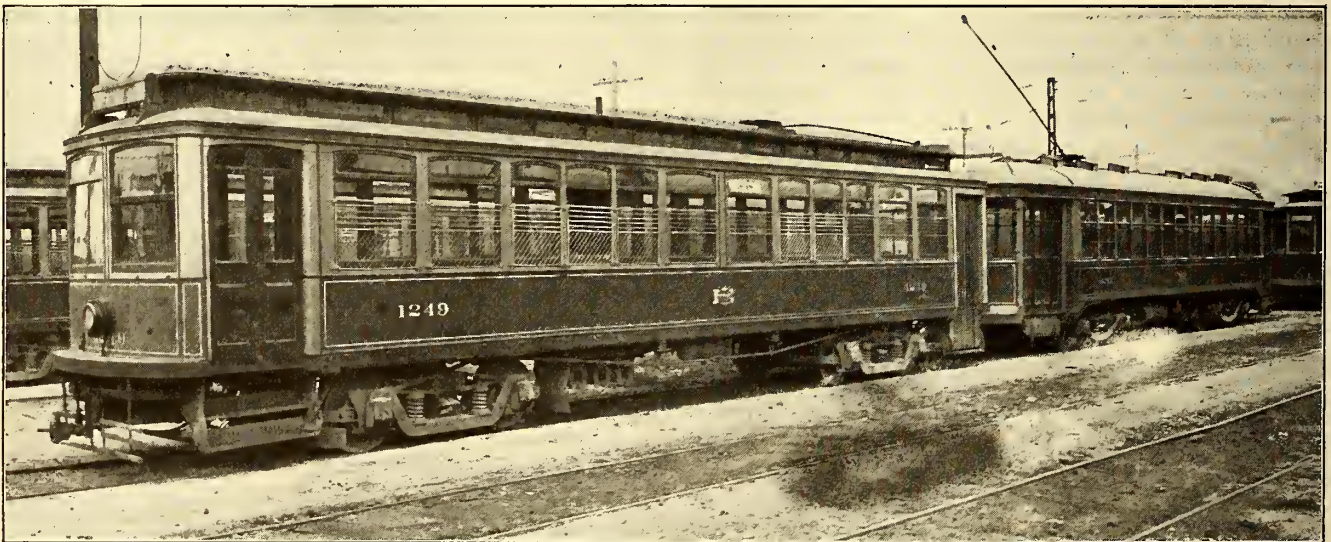
fifty-three passengers. In addition to the control at one end, the trailers were equipped with air-operated doors and safety devices. The two cars, having control equipment on opposite ends, are thus operated as a single unit and consequently they may be run anywhere in the same manner as a single-car unit. As these two-car trains are used only in the rush hour, the rather heavy weight of the trailer is not considered of importance and the scheme provides the dual advantage to the company mentioned above.

## First Annual Meeting of American Welding Society

THE American Welding Society held its first annual meeting in New York on April 22. Morning and afternoon sessions were devoted to business matters, including the election of J. H. Deppeler as president, J. W. Owens as vice-president to serve for two years and D. B. Rushmore as vice-president to serve for one year.

The retiring president, Comfort A. Adams, spoke briefly regarding the work being done by the American Bureau of Welding. He said that the bureau's activities had been devoted principally to determining how a good weld can be assured. Methods will be sought for testing the quality of a weld after it is made and for determining the best way to eliminate "locked-up" stresses in long welds.

The evening session was devoted to the presentation and discussion of three papers. The first was on "The



MILWAUKEE TWO-CAR TRAIN, UTILIZING INTERURBAN T RAILER (LEFT) IN CITY SERVICE IN WINTER

equipped with double trucks designed by the company, which are of very light construction with no springs except the long elliptics in the bolster. The trucks are equipped with 26-in. wheels and four baby motors. The car is also equipped with complete safety devices.

During the past winter the Milwaukee company has developed a plan for providing additional equipment to help out against the general shortage, without making new purchases, and at the same time to put into use equipment which ordinarily stands idle in the winter. This has been accomplished by equipping a number of interurban trailer cars with control equipment on one end, through power cables and one trolley, and coupling these permanently to some of the larger four-motor city cars. These trailers weigh 39,000 lb. and seat about

Speed of Metal Arc Welding," read by William Spragen of the University of Washington. He said that it is desirable to be able to compute the rate at which arc welding could be accomplished, but there are so many elements entering into the calculation that it is difficult. For inside work 1.8 lb. of metal deposited per hour is considered a reasonable rate, but when the work is performed out of doors the average appears to be about 1.2 lb. This decrease is no doubt due to the cooling action of air currents.

The other papers were: "Automatic Arc Welding Machines" by H. L. Unland, power and mining engineering department General Electric Company, and "Recent Developments in Gas Cutting" by Stuart Plumley, the Davis-Bournonville Company.

## When Appraisals Were Forgotten

SANDERSON & PORTER of New York have just issued in pamphlet form an address entitled "Appraisals and Rate Making," by Cecil F. Elmes of the engineering staff of the firm, which was presented before the fifteenth annual convention of the Illinois Gas Association, March 20, 1919, at Chicago, Ill. The paper is an able argument for the appreciation of the public utility business as based economically upon the same laws as privately conducted business.

Mr. Elmes opens his address by calling attention to the automatic rate regulation of commodities by public opinion during the war and immediately thereafter, but says that during this time there was no mention of the word "appraisal" of a milk company's plant even though public sentiment, assisted by newspaper advertisement, forced the price of milk in a given community to 22 cents for grade "A" and 17 cents for grade "B." He notes that when we, the American people, started to drop non-essentials one of the first to go overboard was the appraisal, and it was dropped while we were making rates on commodities vital to the national life. And in general the work was well done and done with justice.

The rest of the address is devoted to an analysis of rate making, the worth of service and the determination of value and rate of return. The general purpose of the address seems to be to show the similarity of the public utility business to private business, and conversely the similarity of so-called private business or commercial ventures to public utilities. Basic commission and court decisions are called upon to substantiate this analysis, and at the end Mr. Elmes indicates that there is real progress in the comprehension of the economics of public utility business.

To support some of his statements and arguments with reference to questions of value Mr. Elmes gives some very interesting data on the average cost of wheat, iron, lead, cattle and sheep and the wages of carpenters and masons, all in England, between the years 1260 and 1918 inclusive.

## Engineers to Hold Organizing Conference

THE joint conference committee of the national societies of civil, mining and metallurgical, mechanical and electrical engineers has issued a call for a conference to be held in Washington June 3 and 4 for the purpose of forming an organization of engineering and allied technical associations. The purpose of such organization will be to further the public welfare wherever technical knowledge and engineering training are involved and to consider matters of common concern to the professions represented.

The plan of organization has been formulated by the joint conference committee upon the following principles: (1) Non-interference with the inter-relations with respect to technical matters, and the maintenance of the autonomy, functions and operations of individual organizations; (2) local affiliations of existing groups of engineers in order to facilitate united action in local questions of public welfare and other matters of common interest; (3) national association of engineering organizations by means of a national council composed of representatives widely chosen by local affiliations or organizations and by national organizations, meeting

annually and acting through an executive board; (4) financial support of such association by contributions from all participating organizations on the basis of membership; (5) a form of organization which will permit expansion and development.

A large number of societies have indicated their willingness to co-operate with the "founder societies" in this movement.

## Purchasing Coal on Specification

THE Western Society of Engineers devoted a recent meeting to the subject of coal purchase by specification, with particular reference to the objections which are made to this practice. Among many interesting things brought out, the following are of particular interest:

In preparing specifications for coal to be purchased on the B.t.u. test basis a maximum limit of the percentage of ash should be named on account of the deleterious effects of the ash on the coal. A penalty for the ash content in the coal over the maximum should be provided, heavy enough so that very little such coal would be furnished. The penalty should be on a scale that increases rapidly as the percentage of ash increases. If the ash content is lower than the limit named in the specifications the contractor should obtain an increased price per ton, corresponding to the increased value of the coal.

In writing proposals for coal to be purchased on a B.t.u. basis, limits for the B.t.u. per pound should be named far enough apart so there will be plenty of opportunity for competitive bidding and yet the coal will still be limited to the general quality desired.

Operators in general are not in favor of selling their coal on the B.t.u. basis on account of their fear of the deleterious effects of the ash on the coal. A penalty for the samples for analysis is the most difficult part of the entire operation. The fundamental principle governing in this matter is that samples shall be so taken as to be fairly representative of the entire lot of coal. The latest bulletin on this subject is technical paper No. 133 published by the United States Bureau of Mines, Washington, D. C.

Taking up in more detail the objections of the coal operators to the purchase of coal on a B.t.u. basis, the following objections were noted:

1. That the contracts as drawn are not mutual.
2. That the terms of settlement are based on the assumption that all samples taken are truly representative of the quality of the coal delivered, while the operators do not consider this to be true.
3. That the contract so operates that the deductions made for the delivery of coal below contract grade is greater than the loss actually sustained, making such deductions, therefore, a penalty instead of liquidated damages.
4. That the plan offers an opportunity for graft and "shake-downs" on the part of the buyer's representative, and the same opportunity for bribery and trickery on the part of the contractor.
5. That the plan promotes and fosters unfair competition, which works to the detriment of both the buyer and the contractor.

The above objections were taken up in detail and discussed at the meeting, but space limitation prevents more than the listing of the objections here.

## Association News

### Hearing Before I. C. C.

#### Mr. Henry Urges That Status of Electric Railways Under Transportation Act Be Determined— Questionnaire to Be Sent Out

BEFORE attempting to interpret Section 422 of the transportation act the Interstate Commerce Commission feels that it must have more data with regard to the freight carried by interurban electric lines. In order to secure those data a questionnaire will be sent to all companies. The committee on national relations of the American Electric Railway Association has been asked to prepare a draft of a questionnaire which will give the commission full information on the subject.

The interpretation of the transportation act so far as it applies to electric railways is a matter to which the American Electric Railway Association, through its Washington office, has been giving a great deal of attention. On March 22 Charles L. Henry, chairman of the committee on national affairs of the association, requested an interpretation of the clause in the bill which excludes from the operation of the law such interurban electric railways as are "not engaged in the general transportation of freight." A report of the first hearing on this question was published on page 659 of the issue of this paper for March 27. On May 6 another hearing was granted to the committee by the commission. At this hearing the committee's views, as expressed by Mr. Henry, may be summarized as follows:

"The clause 'engaged in the general transportation of freight' includes only such roads as have either direct or indirect physical connection, interchange arrangements and joint rates with connecting steam railroads and are actually handling general freight traffic.

"It is to be understood, of course, that this definition will not only include those that now are thus situated but also those that may hereafter be thus situated and qualified.

"This committee respectfully suggests that if the commission will promulgate such a definition of the clause 'engaged in the general transportation of freight' as above outlined, or in such other words as the commission deems best, the whole situation will be so clarified that most of the interurban electric railways of the country will be able to determine for themselves whether or not they are amenable to the provisions of amended Section 15 of the interstate commerce act.

"If there are a few companies that cannot so determine, they can make application to the commission for a definition as covering their status, or the commission may call upon them for facts that will enable the commission to determine their specific case."

The commission did not feel justified in accepting the interpretation suggested by the committee, and after Mr. Henry had been questioned nearly an hour, it was decided that it would be best to send out the questionnaire. The suggestion of the committee for the questionnaire will be drafted at once and submitted to the commission.

In addition to Mr. Henry, Edwin C. Faber of the Aurora, Elgin & Chicago Railway and C. D. Cass of the

Waterloo, Cedar Falls & Northern Railway, members of Mr. Henry's committee, assisted on May 6 in the presentation of the electric railway companies' case.

### Experience with Equipment During the Severe Winter

SECRETARY E. B. Burritt, on behalf of the committee on equipment of the Engineering Association, has sent out a questionnaire to electric railway companies in the Northern States asking for information regarding their experience during the recent severe winter. It is desired especially to collect data for the purpose of recommending improvements. The topics covered by the questions include snow conditions and removal, tracks and roadway, equipment for snow removal, and equipment troubles with motors, armatures, fields, gears, pinions, gear cases, axles and wheels. There are also two questions on equipment tests.

## Letter to the Editors

### Infringement of Contactor Patents

NACHOD SIGNAL COMPANY, INC.

LOUISVILLE, KY., April 24, 1920.

To the Editors:

IN A recent issue of your paper you published an article describing an overhead trolley contactor made by an electric railway for its own use in connection with the operation of a highway crossing signal. The contactor described is substantially like the contactor made by the Nachod Signal Company and covered by United States patents, dated May 18, 1909, and May 9, 1911.

Electric railway managers should know that the manufacture of a patented article by the railway itself, even for its own use, is illegal and constitutes infringement. In some cases manufacturers hesitate to institute suits on account of the good will of the customer and because the amounts involved are not large, but the duplication of patented articles is manifestly unfair to those who put their time, energy and resources into the development of such devices, and it will retard their design and manufacture. CARL P. NACHOD, President.

### Auto Traffic Increases

THE number of privately owned automobiles in Kansas City, Mo., has increased from 10,000 in 1915 to over 30,000 in 1919. Approximately 75 per cent of these are passenger cars, all of which at some time or other during the day carry people about the city at the expense of the street cars. In a check made by the Committee of One Hundred of the Chamber of Commerce on ten different heavily traveled streets leading to the business section 4,677 private cars, carrying 9,336 passengers, were counted coming in between the hours of 7 and 9 a.m. and 6,231 carrying 13,265 passengers were counted outbound between 4:30 and 7 p.m. The estimated loss from such competition during the rush hours on these streets alone is estimated at \$1,700 per day. The total loss due to all the private automobiles for twenty-four hours per day would exceed this figure by more than 300 per day.

# News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION  
PERSONAL MENTION

## Employees Reaffirm Plan

Kansas City Men Heartily in Favor of Representative Plan of Co-operation Installed a Year Ago

The "representation plan" of co-operation by employees in the operation of the Kansas City (Mo.) Railways was readopted, with slight modifications, by the employees, on April 5. This plan had been put into effect April 1, 1919. It provides for committees of employees in each department, and a central committee of representatives from the department groups, chiefly to handle matters affecting relations of employer and employee. The members of the committees are elected on May 1.

An important element in the operation of the "representation plan" is that the various committees are not arbitrators, but advocates of the employee with a grievance. The committee investigates the case; and if such case has merit, the committee appears before the officials of the company, or before higher committees, to urge the cause of the complainant, and to assist him in gathering his evidence and testimony.

Matters which cannot be adjusted by the division or department committee, or by the central committee, get finally into a board of arbitration, composed as follows: One man selected by the employees' branch of the central committee, one man selected by the employer's branch of the central committee, and three men so far as possible representing the public interest, selected by these two.

In cases of discipline or discharge, the committees function as follows:

1. Employee applies to the employee members of his division committee.
2. Division committee confers with division superintendent or general foreman.
3. Division committee may appeal to superintendent of transportation or department head.
4. Division committee may then appeal to the general manager.
5. An appeal may be taken from the general manager to the president of the company.
6. The case may then be referred to the general committee.
7. The next appeal rests with the central committee.
8. The board of arbitration is the court of last resort.

On all other matters, the functioning is as follows:

1. Division committee takes up case.
2. Appeal taken to general committee.
3. Appeal taken to central committee.
4. Arbitration.

## Company Would Terminate Labor Agreement

The employees of the Portland Railway, Light & Power Company, Portland, Ore., have asked an increase to 66 cents an hour, in reply to formal

notification of Franklin T. Griffith, president, recently that the company desired that the present wage scale be terminated on April 30. The new pay would mean an increase of 8 cents an hour for motormen and conductors.

According to Mr. Griffith, the company cannot consider any increase in wages. Mr. Griffith states that the present wage scale in Portland is one of the highest in any city of the country. Under it the company is running behind more than \$1,000,000 a year.

The existing scale was arrived at last

fall, after a prolonged hearing before an arbitration board, the employees securing a slight increase at that time. When the agreement was entered into, however, it was provided that either side could negotiate to change the agreement at the end of any six-month period by filing notification of such desire thirty days before such date. About a month ago Mr. Griffith took advantage of this clause, and announced the desire of the company of which he is the operating head to terminate the agreement.

## \$10,000,000 Expenditures Being Held Up

Inability of City and Company to Get Together Becoming Very Serious at Pittsburgh

A. W. Thompson, president of the Philadelphia Company, the holding company for the Pittsburgh Railways, said in an interview with the resident correspondent of the *ELECTRIC RAILWAY JOURNAL* in Pittsburgh that all that has been accomplished after more than a year's work and the expenditure of \$500,000 in valuing the local railway under the direction of the Public Service Commission bids fair to be lost or of no avail unless good judgment is used now. As far as Pittsburgh itself is concerned Mr. Thompson said it was well to keep before the people, more particularly the business men, the real question in connection with the railway problem and what is to the best interests of the public. Mr. Thompson regards the public as the people who ride on the cars, the employees who operate the cars and every one who invests in traction securities. Mr. Thompson said:

WHAT the "car rider" wants is good service for a reasonable fare; if he gets that he is satisfied. The employee desires and should have a fair rate of wage commensurate with the work he does and the time required to perform that work. The investor desires and should be assured of a reasonable return on the money he has invested.

### INVESTORS DRIVEN AWAY

If the security holder, after investing his money, finds that because of mismanagement, unfair legislation and other reasons which reduce the value of his security, he has individually suffered an unfair loss, having suffered that loss he is not likely to invest again in such securities; and if this number is large the result is the destruction of the company's credit.

Much has been said by the city and the traction company in regard to the matter of valuation of the Pittsburgh Railways properties. Valuation means little to the car rider except as it is reflected in the fare he must pay. Valuation means much to the investor because of the recognized amount of property behind his investment. The difficulty of serving the people and at the same time paying a reasonable return to the investor is more imaginary than real, as it is to the advantage of both to have a well-operated and prosperous property of any kind.

### \$4,200,000 FOR FIXED CHARGES

The present fixed charges are \$4,200,000, nearly \$1,000,000 more than has been publicly stated by a representative of the city. If the valuation as handed down helps the credit of the railways and makes possible financing estimated to be \$10,000,000, to be applied to rehabilitating the railway, then such a decision undoubtedly works to the advantage of Pittsburgh. Based on the value of the nickel today, the 7½-cent fare has less purchasing power than the 5-cent fare had six or seven years ago.

Past experience indicates to every one that only through co-operation and confidence between the various interests, particularly between the city officials and the traction company officials, will the best results be

got, and that controversies resulting in hearings, suits, etc., too frequently involving a discussion of technicalities of the law and a demand for each point by both sides, with no spirit of give and take, terminate in long-drawn-out arguments, during which time the public suffers. Is it not reasonable to expect that, having gone through a procedure of valuation and arguments before the Public Service Commission, and that body having come to a decision, it is time to make a start toward bringing about something constructive and not have the situation turn into one of appeals, arguments, etc.?

More than \$500,000 has been expended for the purpose of finding out the fair value of the traction properties, and now with the decision of the Public Service Commission at hand, is there to be further delay and discussion, some of which it seems fair to prophesy will be idle? Had it been possible for all interests to have agreed in the beginning, \$500,000 spent for hire of engineers and statisticians could have been invested in new cars.

### REORGANIZATION IMPERATIVE

If it is possible to bring about a reorganization of the finances, working out a return on investment which will cover a period of years, bringing about improvements which are sadly needed and stabilizing the industry, then and only then can Pittsburgh look forward to a greater development, greater industrial activity, which can only result to the highest degree from efficient and sufficient transportation.

Controversies in court and out have continued to the extent that the people are tired of hearing about the traction problem.

The credit of the traction company is becoming more impaired each day, if it is not already wholly destroyed.

Expenditures are necessary for improvements, and money cannot be borrowed for these improvements until this problem is settled. It seems to me that the broad question of what is best for Pittsburgh should be immediately determined, so that the proper service may be rendered by the traction lines to the best interests of the public, the city and the railway.

## Legislative Session Fairly Productive

### Some Important New York Measures Failed, but Many Stabilizing Bills Were Enacted

While the New York State Legislature of 1920, recently adjourned, has received its usual annual baptism of criticism for the things it has omitted to do, for its usual and to-be-expected shortcomings and for some spectacular stunts, and while the defeat of the electric railway relief bills was indefensible, much important general legislation of a permanent structural nature was enacted. Sensible and desirable amendments were passed to the insurance, banking and tax laws and measures were put through calculated to relieve existing conditions of stress during the reconstruction period.

**I**N the matter of legislation affecting electrical interests it was particularly liberal in the consideration of measures reflecting every angle of the situation. The Jenks measures providing relief for street surface lines and the permissible establishment of a service-at-cost-plus plan were defeated, in the opinion of some observers, more on account of the lateness of the time at which they were introduced than on account of the desire of the Legislature not to afford remedial legislation.

#### OFFICE CREATED, BUT NO APPROPRIATION

The Senate bill providing for the appointment by the Public Service Commission of the First District of at least one and by the Public Service Commission of the Second District of at least two accident inspectors at salaries to be fixed by the commission passed both houses and is in the hands of the Governor. The Legislature, however, failed to provide any appropriation to pay the said accident inspectors, so that in the event of their appointment they will be obliged to work for nothing until another Legislature can appropriate for their salaries.

Senate bill No. 1352 passed the Senate but died in the Assembly. It amended the public service commissions law by providing that if after a hearing on complaint alleging violation of Section 26, relating to safe and adequate service and just and reasonable charges by street railway companies, or upon consideration of facts admitted in writing by a carrier the Public Service Commission shall determine that any party complainant is entitled to reparation the commission shall make an order directing the carrier to pay such sum.

#### RATE SUSPENSION MEASURE KILLED

The Senate bill which allowed the Public Service Commission to suspend rates of steam, telegraph or telephone corporations for not to exceed 120 days pending a hearing passed the Senate, but died in the Assembly. The effectiveness of this measure was killed by the subtle amendments made at the request of the telephone people against whom the bill was originally directed who against their will dragged in the telegraph and steam corporations. Had the measure prevailed it would have formed an opening wedge to similar amendments to the law in

reference to the suspension of street railway rates under similar conditions.

The Legislature passed and the Governor signed Senate Print No. 357 (chapter 275 of the laws of 1920) providing for compulsory arbitration of civil agreements. Much confusion has arisen in reference to the application of this measure, there having also been before the Legislature Assembly Print No. 1662, which provided for compulsory contracts between public service corporations and their employees. This measure, modeled somewhat after the Kansas statute, never had a chance of passage, but the press and many members of the Legislature were of the opinion that the latter was the bill which was passed. The measure which was enacted is of vital interest to corporations and business people in general. It is intended to afford a short cut in the legal procedure necessary to bring about the settlement of all agreements that are in dispute.

Senate Print No. 761 amended the civil code providing that in an action wherein the validity of a rate or charge made by a public service corporation is involved the municipality granting the franchise shall be a necessary party to the action, except where a corporation furnishes service throughout the state or in more than two municipalities. This measure passed the Senate but died in the Assembly.

#### RAILWAY INVESTIGATION BILL DEAD

Assembly Print No. 303, appropriating \$50,000 to investigate the condition of traction companies of the State and determine whether or not the fare now authorized is sufficient, just and reasonable, died in the ways and means committee of the Assembly.

Senate Print No. 434 and Assembly Print No. 458, two different measures introduced by Senator Walker and Assemblyman Donohue, Democratic minority leaders in the Senate and Assembly, respectively, providing for municipal ownership of public utilities, both died in committee. There was no politics in their death, however, as Senate Print No. 1305, the Republican public utilities measure, met with a similar fate.

Senate Print No. 426 (Mayor Hylan's municipal bus line measure) after being given the honor of a public hearing at which the Senate cities committee was subjected to the same stereotyped tirade the Mayor had pre-

viously delivered to the Assembly judiciary committee on the Jenks electric railway measures, was never reported for a vote.

A most important measure, Senate Print No. 1019, introduced by George F. Thompson of Niagara County and public service commission investigation fame, was calculated to relieve street railway corporations from keeping in repair any portion of the street except a space 6 in. on each side of each rail instead of the space between the rails and 2 ft. outside as at present. The railways asserted that the present law is a relic of the days of the horse-drawn vehicles; that they were never consulted when a municipality wished to repave a street, and that if relieved from the present burden many new cars could be bought and the service materially improved. The measure was opposed by Corporation Counsel Andrews of the city of Albany and the Mayors' Conference. It was never reported out of committee.

The Legislature has been exceedingly fair in its amendments to existing tax laws clarifying conflicting sections and relieving corporations from the payment of double income and other taxes and passing a measure which is before the Governor repealing the tax on intangible assets.

### Council Directs Preparation of Service-at-Cost Grant

The Mayor and the Corporation Counsel of Rochester, N. Y., were directed by a unanimous vote of the Common Council on the evening of May 4 to negotiate and prepare a service-at-cost contract with the New York State Railways. The Council specified that the contract be drawn as outlined by the Mayor in his communication of April 27 and then submitted to the Council and executed by the Mayor when directed by that body to do so. The report of the law committee on which the Council's action was based is particular to call attention to the fact that the cost is to include as one item a fair return on property actually used and useful in giving service. This fair return is to have no reference to the company's capitalization, to the amount of money taken in or to the amount of money spent for other items of the cost of operation. Compensation for the use of the property involved in giving service is to be just as much an item of cost as compensation for the labor used.

### Preparing Bill to Create Chicago Transportation District

At a meeting on April 23 of the Chicago Traction Commission, which is considering the Thompson plan for transportation, announcement was made of the synopsis of the proposed bill for establishment of the Chicago Transportation District. This matter will be taken up by the State Legislature next year, and it is intended to



ask for the establishment of a special taxing district comprising the city of Chicago and possibly some outlying territory where local transportation is to be furnished for a 5-cent fare. The bill would exempt this district from control of the State Utilities Commission and give the five trustees power to purchase, condemn, build, maintain and operate surface lines, elevated railways, subways and monorail systems.

## May Assist in Track Renewal

New Ohio Law Provides That City Can Do Work and Railway Repay in Ten Installments

Through an amendment to the general code known as Senate Bill No. 211, the General Assembly of the State of Ohio has made it possible for a municipality to finance the renewal, repair or reconstruction of the track of an electric railway at the time the street is paved, the cost being subsequently assessed against the company in ten equal annual installments plus 6 per cent interest. It is understood that the Pennsylvania-Ohio Electric Company, Youngstown, will reconstruct about \$500,000 of track this year on this plan.

The bill recently signed by Governor Cox provides that a City Council may by ordinance order a railway to renew, replace or reconstruct its track and roadbed at the time the street is torn up for paving or resurfacing. If the company is dissatisfied with the ordinance, provision is made that within ten days after its passage the company may file a complaint or appeal to the Public Utilities Commission. The commission is thereafter charged with the duty of hearing and determining the case within thirty days, either approving, modifying or reversing the action of the local Council. If the railway then fails to notify the local council in writing that it will do the indicated construction work directed by the commission, or if without appeal, by the City Council, then it is provided that the Council may by ordinance authorize the receiving of bids and a contract for furnishing the necessary material and labor to make such renewal or reconstruction of the track and roadbed itself. In this case it is understood the company may bid and get the contract on a competitive basis.

Having done this work, the code provides that the Council shall by ordinance assess the entire cost of the labor and material required for the work against the railway, and upon failure of the latter to pay the assessment in cash it becomes a lien upon all of the property of the company located within the city. This assessing ordinance must provide for the payment of the assessments in ten equal annual installments with interest until paid and not to exceed 6 per cent per annum; provided, however, that the company shall not be liable for any installment of the assessment falling due after the expiration of the company's franchise unless the use of the track is continued.

## Detroit Scene Shifted

Court Called Upon to Fix Company's Rights—Trustee Seeks to Prevent Municipal Bond Issue

The City Council of Detroit, Mich., has indicated its willingness to stand back of the Mayor and the Street Railway Commission in their program for street railway extensions, and if the Mayor's policy is carried out, no more lines will be built in the city by the Detroit United Railway. The Council's attitude in the matter became evident when a majority of the Councilmen voted to instruct the Street Railway Commission to construct a line on Harper Avenue, from Gratiot Avenue to Van Dyke Avenue, disregarding the fact that the Detroit United Railway had previously been granted permission to build the same line.

A PRIVATE right-of-way on the north side of Harper Avenue is owned by the Detroit United Railway and about two years ago the company was authorized to construct a double-track line in the center of the street, and the company in turn agreed to pave between the tracks when the city was ready to pave the remainder of the street. The company now claims a right-of-way in the center of the street. The Mayor also proposes to build one of the municipal extensions authorized by the voters on April 5, when the \$15,000,000 bond issue was approved, along the Harper Avenue route.

### MAYOR WOULD END COMPANY'S PRIVILEGE

Mayor Couzens will ask the Council to rescind the Council resolutions which give the Detroit United Railway permission to build extensions, except in the case of the Twelfth Street line, where all preparations have been made for laying the tracks. These lines, including the Harper, St. Jean, Shoemaker, West Warren and McGraw extensions, will probably be built by the city.

This present plan was favored by several of the councilmen last year, but at that time did not receive the Mayor's support. The Council wanted to construct the new lines and make replacements on the existing lines with the ultimate result that all lines would belong to the city.

Opposition to the city activities on the Harper and other lines where agreements have been made with the Detroit United Railway will be made by the company. The plan on the part of the city to stop work on extensions where the Detroit United Railway has already started work will probably result in delay from controversy over compensation to be allowed the company for work already done.

### INJUNCTION HOLDING BOND ISSUE

Bonds for financing the proposed city car lines are being held up by the injunction proceedings in the federal court instituted by the Detroit United Railway and the New York Trust Company, but the Street Railway Commission is proceeding with the plans for the work. Corporation Counsel Clarence E. Wilcox has made a motion before Federal Judge Tuttle to dismiss the company's suit for an injunction, and May 10 has been set as the date for hearing on the motion. Mr. Wilcox

maintains that the case should not be heard in the federal court, as no federal question is involved. He also pointed out that the Supreme Court has ruled on similar cases that a municipality had the right to order the railway off the streets upon the expiration of controlling franchises.

The Detroit United Railway and the city are now involved in four suits in the courts. The two cases in the federal court, one by the Detroit United Railway and the other by the New York Trust Company, involve practically the same points. It is asked that the municipal street railway ordinance be declared void and invalid, and that the city be enjoined from proceeding under its authority. The third case filed in the Circuit Court by E. J. Burdick, general manager of the railway, involves the legality of the form of ballots used in the election on the city street car ordinance. The fourth suit was instigated by the Corporation Counsel to commence ouster proceedings against lines on which the franchises have expired.

### Staten Island Strike Settled

The strike of trainmen employed by the Richmond Light & Railroad Company on Staten Island was settled on the evening of May 5 and arrangements made to resume service on the morning of May 6. Public Service Commissioner Lewis Nixon drew an order permitting 8 cents to be charged as a single fare, and decreeing that the company shall place on sale tickets in strips of ten to be sold to passengers at 75 cents for ten. Fares for school children were reduced from 4 to 3 cents by the order of Mr. Nixon.

The strike was declared on April 27. Under the settlement the men will get 50, 55 and 60 cents an hour, dependent upon length of service, instead of 40, 42½ and 45 cents. Their original demands were for from 65 to 70 cents. The settlement of the strike came after conferences between representatives of the men and Captain Kuhn, who was appointed receiver by Federal Judge E. L. Garvin, and between Captain Kuhn and Commissioner Nixon. Judge Thomas I. Chatfield concurred in the terms of the settlement, it was stated, and authorized the receiver to resume operation of the road. An order has also been issued by the court permitting the receiver to proceed unmolested in the discharge of his duties and in the operation of the road.

## Legislative Session Apparently Disastrous

### Opinion Prevails That Rhode Island Company Cannot Be Reorganized Under Legislative Relief Extended

Two of the acts most desired by the underlying traction interests in Rhode Island were strangled by the Senate judiciary committee in the final hours of the legislative session on April 28. The five other measures passed by the General Assembly were signed and became laws May 5. Two acts, one declaring jitneys and buses common carriers after July 1, and placing them under the control and regulation of the Public Utilities Commission, and the other authorizing towns to contribute to the cost of service, passed the House, but were held up by the Senate judiciary committee, which refused to report them after one of the most bitter fights ever waged in the Rhode Island Legislature.

**T**HE traction people and the street car men's union were opposed by the jitney and bus interests, and the latter won their fight on the jitney act. The same fight was made on the act permitting towns to subsidize the electric railways for service rendered, with the additional influence of their respective Senators, who were opposed to allowing this burden to fall upon their constituents.

#### RAILWAY CHARTER AMENDED

An act passed by the Assembly and signed by the Governor amends the charter of the United Electric Railways which places the government of the corporation in the hands of a board of directors of nine; five elected by the stockholders, one appointed by the trustee under any general or refunding mortgage, two appointed by the Governor with the advice and consent of the Senate, and one appointed by the Mayor of the city of Providence. It also requires that the United Electric Railways shall be required to take over and operate all of the properties of the Rhode Island Company, unless otherwise agreed by the Attorney-General of the State. It is also provided that the company shall first pay in \$1,000,000 in cash to be used in rehabilitating the properties. The act limits the indebtedness of the United Electric to \$22,000,000 and provides that all stock or bond issues must first be approved by the Public Utilities Commission. Dividends under the act are limited to 6 per cent on the common stock in any one year, but in the case of a lower dividend in one year the deficiency may be paid the following or subsequent years.

#### COMPANY HAS NOT ACTED

Another act passed and signed places the primary control of the United Electric in the City Councils of the cities and the Town Councils in the towns, but gives the company the right of appeal to the Utilities Commission for modification of any ordinances claimed to be unjust or unreasonable. Other acts relieve the company from franchise taxes and paving obligations, and provide an increased appropriation of \$10,000 for the utilities board for clerical assistance to handle the additional work under the jitney act, which did not become a law.

Up to the present time nothing has been done to take advantage of the electric railway legislation passed, and

doubts are expressed in some quarters as to whether or not the United Traction and the Rhode Island Suburban stockholders and bondholders will avail themselves of the new laws.

It has been said by men in close touch with the situation that it appeared improbable that the Rhode Island Company could be reorganized under the relief given, and that the lopping off of several of the non-paying lines seemed a certainty. It is known that the receivers of the Rhode Island Company, at the present time, have under serious consideration the cutting off of certain non-paying suburban lines.

Representatives of the stockholders say that it is impossible to keep the present trolley system intact with the jitneys and buses allowed to run un-

restricted except for such regulations as the cities and towns are empowered to impose.

Definite action with regard to the future of the traction properties is expected at a meeting to be held in the near future. There is said to be a possibility that the United Electric Railways will not accept its charter as amended because of the provision which requires it to take over all of the properties. If any plan of reorganization is decided upon, it will be only upon the condition that the lines held by the New York, New Haven & Hartford Railroad be left out.

There is talk of a special session of the Legislature to take up again the question of jitney and bus regulation. The realization of such a move is only problematical at the best, in view of the present temperament of the Senate.

There is another hitch that has not yet been discovered, or if it has nothing has been said about it. The Governor is required to appoint two members of the board of directors of the United Electric Railways, under its amended charter, "with the advice and consent of the Senate." This the Governor did not do and the Assembly has ended its session. No provision is made in the act to allow him to appoint these two members when the Senate is not in session. Consequently, he cannot act.

## Three New York Cities Tied Up by Strike

### Men in Rochester, Syracuse and Utica Return Under Pressure from Union Officers and a Thoroughly Aroused Public

After having repudiated its agreement with the New York State Railways to arbitrate all differences by walking out on a strike which lasted three days, Division 282 of the Amalgamated Association at Rochester, N. Y., finally voted, on Monday evening, May 3, to return to work on the morning of May 4. This ended a strike which had been opposed by the international union and which violated the principle of arbitration, a plank of the international. By their action, the railway employees incurred the disfavor of public opinion and the suspicion of their international officers. The probabilities are they will receive not one cent more than the offer the railway first made to them.

**A**CLAUSE in the agreement between the employees and the company calls for arbitration of all differences. On this account it was not expected there would be a strike. The new agreement was to go into effect on May 1. The company had offered an advance of 10 cents an hour. This would mean 55 cents an hour, the former scale having been 45 cents. The employees, however, demanded a flat increase amounting to a new scale of 85 cents an hour and an eight-hour day.

At a meeting early Saturday morning, before dawn, the employees not only refused the company's offer, but, despite the pleadings of their local union officers and international officers, refused to arbitrate and voted to walk out immediately.

The meeting, it is said, was dominated by a radical minority; President James F. Hamilton, of the New York State Railways, also expressed that belief, and James Largay, Utica, the international vice-president, believed that that was the cause for the three-day

strike. Nevertheless, no employee, nor group of employees, attempted to defeat the attempts of the "radical minority." It was not until William D. Mahon, international president of the Amalgamated Association, told the men, on the night of May 3, that unless they voted to return to work immediately they would have their charter taken away that the employees voted to return to work. David Archbald, president of the local division, also declared that unless the men returned he would resign.

During the three days of the strike, industrial operations were considerably hampered and the public was greatly inconvenienced and had to rely on the "jitney," which reaped a harvest. Nevertheless, it is doubtful if any other labor situation in this city has brought about more bitter public opinion against the employees. Newspapers and individuals are almost unanimous in denouncing the action of the Amalgamated Association in violating the principle of arbitration.

About 1,460 members of the Amalgamated Association, employees of the New York State Railways, in Syracuse and in Utica also declared a strike at meetings on the morning of May 2. Owen Lynch, president, and John Drohan, business agent of the Syracuse local, pleaded with the men to avoid a walkout, but they would not heed their advice. When Business Agent P. T. Noon, Utica, announced before the Utica meeting that the Syracuse men had left their jobs, the Utica employees immediately voted to join them without a dissenting voice.

#### OFFER OF SETTLEMENT MADE

James F. Hamilton, president, and B. E. Tilton, vice-president of the New York State Railways, made an offer to the Syracuse and Utica strikers the same as that made in Rochester. The men had a choice of the following propositions:

Motormen and conductors to receive 5 cents an hour increase, effective May 1, 1920, and arbitrate hours and wages.

Hour clause to read: Working day to be on a basis of nine hours, with leeway of one-half hour to complete schedules, with 5 cents an hour increase, effective May 1, 1920, and arbitrate wages.

Wages of motormen and conductors effective May 1, 1920, to be 51 cents an hour first three months, 53 cents an hour next nine months, and 55 cents thereafter on city lines; 57 cents flat an hour on inter-urban lines and 60½ cents an hour on the Oneida lines between Syracuse and Utica. Men to accept whatever hours they wish in the different localities (thus an increase of pay of 10 cents an hour or 22 per cent).

The wages of the men previous to the strike were 41 cents for the first three months, 43 cents for the next nine and 45 cents thereafter.

The Utica men insist on an eight-hour day and a six-day week. The Syracuse men met Monday night following the settlement of the Rochester strike, but failed to reach an agreement and adjourned the meeting until the morning of May 5.

#### SYRACUSE AND UTICA SERVICE RESTORED

Service in Syracuse was resumed on the morning of May 5 and in Utica on May 6. The men there will also abide by arbitration. Mr. Mahon addressed the meeting in Utica on May 5. He warned the strikers that the organization charter would be taken away if they did not live up to their contract with the company made two years ago to arbitrate differences. Mr. Mahon also addressed the Syracuse men the same day, but they contended that arbitration would do no good as the fare in Syracuse must be raised to afford the company sufficient revenue to meet the wage demands. They were inclined to the belief that a strike was perhaps the best means of provoking a boost in fares. Mr. Mahon's second attempt was successful. A board of nine arbitrators will be chosen, three each representing the Amalgamated locals, the company and distinterested parties.

There are 610 men in the Utica local and 850 in the Syracuse branch. No cars were operated by the company in either city during the strike.

## Pittsburgh Strike Postponed

### Problem Up to City of Making Good on Promises to Employees— Early Statement of City Plan Expected

Acting upon the recommendations of their wage scale committee, the 3,000 trainmen of the Pittsburgh (Pa.) Railways have decided to postpone their contemplated strike action for at least thirty days. Mayor E. V. Babcock and the City Council entered into the negotiations between the trainmen and the receivers for the Pittsburgh Railways on April 27. The Mayor promised the men that if they would postpone their strike action he would evolve a plan which would enable the receivers to give them a material wage increase. The men are demanding a 75 per cent advance, or a maximum hourly pay of 91 cents.

#### MAY DISCARD PREVIOUS STUDIES

The issue that is before the Mayor and the City Council is whether the municipal authorities of Pittsburgh will now discard the results of more than three years of intensive studies of the city's railway transportation system and compromise for the sake of political expediency the issues of increased wages. To do this would result in forfeiting the benefits of the valuation recently concluded, in preventing the building up of credit which is absolutely necessary to rehabilitate the traction companies, and in a repudiation of the reports and findings of the city's own experts.

Following the prosecution of a series of complaints filed by the city of Pittsburgh, the Public Service Commission rendered a decision in March, based upon a report of a valuation board composed of representatives of the city, company and the commission. This report was unanimous with respect to the fixing of an operating budget for the years 1920, 1921, 1922, 1923 and 1924, including a definite rehabilitation program for such period, and an agreement that the value of the property was not less than \$48,000,000, on which a 7 per cent return was reasonable.

The receivers of the company thereupon prepared their 1920 budget to conform with the Public Service Commission's findings. This program was such as more than to exhaust any balance remaining after meeting bare operating costs, taxes and the 7 per cent return on the agreed to value of "not less than \$48,000,000."

#### DEMANDS MADE LAST MONTH

In April the motormen and conductors presented demands for an eight-hour day, revised working conditions and a wage rate of 91 cents an hour as a maximum, the total increased labor costs from which would aggregate about \$7,000,000 a year.

The receivers of the company notified the wage committee of the men and later the municipal authorities that they had granted a 10 per cent increase in wages, effective on April 1, 1920, but that it was impossible to meet

the new demands for further increases.

The Mayor and the Councilmen then met with the employees and stated they would endeavor to secure an increase in wages if possible without a fare increase, or, if found necessary, with such an increase.

The problem is thus squarely up to the city. Through its complaint proceedings, it brought forward the budget, the rehabilitation program and the least amount as a fair valuation. Now with that determined and with a lack of funds to carry out the requirements of the same for 1920, the city cannot evade the issue of recommending what it considers an appropriate wage and at the same time approving a rate of fare and the elimination of municipal charges to secure the revenue to meet the budget deficit.

For the purpose of putting into effect its pledge to find a way to increase wages, in return for which pledge the members of Division 85, Amalgamated Association, deferred for thirty days the taking of a strike vote, the city through C. K. Robinson, special city counsel, in charge of traction litigation for the city, asked Receivers C. A. Fagan, W. D. George and S. L. Tone of the Pittsburgh Railways for a detailed financial statement of the company. This, it is expected, will include the annual budget the receivers made up, with detailed explanations of proposed expenditures. The receivers agreed to furnish this. Means of providing the wage increase without increasing street car fares, mentioned May 5, are:

To reduce the volume of track repair and other maintenance provided for in the budget and pay the money to the men.

To abandon the plan of the receivers to purchase 150 new cars (expected to cost between \$1,500,000 and \$1,750,000), and meaning no increase in fares for Pittsburgh.

To make the entire city a 7½-cent fare zone, and increase the fares to those living outside the city.

After a study of the receivers' statement of the financial condition of the company, the Mayor and the Council are expected, probably early next week, to meet with the receivers and outline the city's plan. In preparation of this plan, the Mayor and the members of the Council were to meet on May 7 in the Mayor's office.

Sidetracked by the crisis over the carmen's wages, plans of the city to work out with the receivers a service-at-cost plan for operating the Pittsburgh Railways will be taken up later. At the same time an effort will be made to reach an agreement on a fair valuation of the railways company, to supersede the valuation placed on the properties by the Public Service Commission.

Following instructions of the Mayor and the Council to protect the city's interests, in case a valuation cannot be agreed upon, counsel for the city on May 5 filed in the Superior Court an appeal from the Public Service Com-

mission's refusal to grant it a rehearing on the valuation decision. The appeal to the Superior Court, even if set ahead, cannot be argued before fall.

The city authorities proved themselves unequal to the occasion last year, when during the rioting attending the railway strike the property of the Pittsburgh Railways suffered damages to the extent of \$250,000, not to speak of the great loss in revenue. Mayor Babcock was severely censured by the citizens for his inability to prevent the rioting.

Postponement of the strike for a period of thirty days does not mean that all danger of one is over. There are those who believe a strike on June 1 is probable, because by the scheme that Mayor Babcock contemplates he will be unable to realize sufficient money to give the men more than a 10 per cent wage increase. The men say they will not be satisfied with that.

## Good Service Paramount

Mayor Peters of Boston Opposes Increased Wages to Carmen on Elevated System

Mayor Peters has urged the Boston (Mass.) Elevated Railway to refuse the demands of the men for increased wages. His appeal is very unusual. It was made to the general counsel for the company, who is one of the arbiters in the present wage dispute. The Mayor said in part:

Any deficit in operation must be met by the taxpayers of the cities and towns served. The demands of the carmen must be treated as a part of the whole situation. Increases in wages of trainmen now will certainly react most unfavorably on the industrial situation in Boston and on the citizens as a unit. I feel it my duty to impress upon the board the fact that the interest of the public is paramount and if this interest is served, that of the carmen cannot suffer.

In comparing wages and working conditions of city employees with those of the trainmen the Mayor says that to give the trainmen a higher salary than the police and firemen is not only unwarranted but would work an injustice to certain municipal employees. He holds that the men should not receive any additional compensation until they have shown themselves worth more by causing the elevated to show an increased earning capacity. They have it in their power to do this through improved service to the public.

According to the Mayor it is no longer possible to shut our eyes to the fact that public service employees should enforce their rights only as far as they do not conflict with or encroach upon the greater rights of the public.

James H. Vahey, the arbiter of the men on the board, issued on his own account a summons to compel the attendance of Mayor Peters and to submit to cross-examination before the arbitration board. Instead, the Mayor sent his corporation counsel, who questioned the legality of the summons when signed only by a single member. Mr. Doherty, the presiding arbiter, ruled that there was no necessity for summoning the Mayor. If needed later, he could be asked to appear.

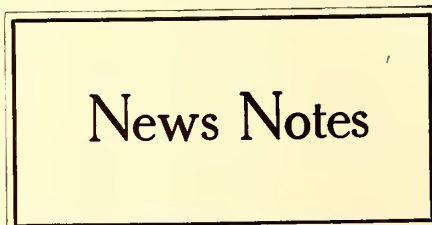
## Tension Lessened in Cleveland

At a conference between Mayor Fitzgerald of Cleveland, Ohio, and officers of the local branch of the Amalgamated, during a special meeting of the City Council on May 5, an agreement was reached to submit the demand of the employees of the Cleveland Railway for an eight-hour day to a special committee of Council. At the same time the officers stated they would call off the strike, scheduled for the following day, and ask the men to vote again on the offer of J. J. Stanley, president of the company.

Under this offer the wage scale would be as follows: 70 cents an hour for the first three months; 73 cents for the next nine months and 75 cents for all who have been in the service more than one year. This amounts to an increase of 25 per cent over the old scale; 50 per cent over what the men were receiving a year ago and 140 per cent over the figures of five years ago. According to late estimates made by the United States Department of Labor, the cost of living in Cleveland has increased 95.05 per cent during the past five years.

Mr. Stanley said he had probably offered the men more than he had a right to, in view of the fact that the rate of fare under the service-at-cost grant will probably have to be raised in order to cover the additional wage payment. The increase will aggregate \$1,500,000 annually.

It was stated that Mr. Stanley at once began to commit to writing the matters he feels that the committee should take into consideration. The special committee will consist of Councilmen Dittrick, Michell, Reynolds, Hichcliffe, Finkle, Damm, Kadleck and Potter. With the exception of the last three, the committee is composed of members of the Council street railway committee.



## News Notes

**Successful Municipal Ownership Vote.**—An ordinance providing for the purchase by the city of the property of the Ashtabula (Ohio) Rapid Transit Company for \$296,000 was carried on referendum vote on April 27 by a majority of twenty-one votes. The property consists of 5.5 miles of line all in Ashtabula.

**Men at Trenton Want More.**—The employees of the Trenton & Mercer County Traction Corporation, Trenton, N. J., have petitioned the company for an increase in wages. The operators of the two-man cars are now being paid 46, 48 and 50 cents an hour, while the operators of the one-man cars receive 55 cents an hour. The company

is asked to grant whatever increase it can afford. Union officials say that many men will probably quit their positions and seek work elsewhere unless wages are advanced.

## Preparing for Scranton Arbitration.

—T. Frank Penman, Scranton, Pa., and John F. Reynolds, Carbondale, will represent the Scranton Railway as arbitrators in deciding a new agreement with the employees, and Patrick McLane, Scranton, and James H. Vahey, Boston, will represent the men. These four men will endeavor to decide the issue and in event it is necessary to select a fifth man the latter will be selected by W. D. Mahon, international president of the union, and Van Horn Ely, head of the American Railways. The final disposition of the matter is to be handed down within fifteen days from the time the board convenes.

## Trenton Suburban Strike Unsettled.

—The New Jersey & Pennsylvania Traction Company, Trenton, N. J., has announced that employees who were responsible for the strike will not be reinstated to their former positions when the strike is settled. Deputy sheriffs of Mercer County are guarding the Princeton division, where only one car has been run during the strike. Members of the State Constabulary of Pennsylvania are patrolling the lines in that State. The railway has refused the offer of Princeton students to operate cars. Joseph R. Buchanan, of the United States Department of Labor; Sydney L. Wright, president of the railway; Charles J. Fury, a government mediator, and P. J. Shea, representing the strikers, conferred on May 3, but no settlement was reached.

**City Ownership Recommended.**—The Miami (Fla.) Traction Company is willing to dispose of its holdings, including tracks, etc., to the city of Miami. It is reported that the company has set a price of \$150,000 on the property. Some time ago Mayor Smith appointed a committee to decide under what franchise the company would resume operations. The committee held several meetings, and a resolution was passed advising that the city purchase the tracks. At the present time jitneys and buses are the public conveyances that operate in the city. The City Council has so far failed to pass a jitney ordinance that safeguards the people. Two attempts have been made along this line, but the courts decided that the ordinance was unconstitutional, so the jitney business is flourishing. It is reported that the 5-cent jitney will pass out and a 10-cent jitney take its place.

## Program of Meeting

Central Electric Railway Association

The summer meeting of the Central Electric Railway Association will be held at the Hotel Ottawa, Ottawa Beach, Mich., on July 7, 8 and 9.

# Financial and Corporate

## "Watered Stock" Claim False Vice-President of Brooklyn City Railroad Denies Charge Made by City Accountant

H. Hobart Porter, vice-president and general manager of the Brooklyn (N. Y.) City Railroad, has characterized as "wholly false" the recent statement made at the traction investigation of the Board of Estimate by Deputy Commissioner of Accounts Wood D. Loudoun, which was referred to briefly in the issue of May 1. Mr. Porter also declared that there was not a dollar of "water" in the capitalization of the company. In discussing Mr. Loudoun's testimony, he said:

Mr. Loudoun's testimony must be mistakenly reported, for the accountants of the city were allowed access to the books of the railroad and had opportunity for a full examination. These books show that the Brooklyn City Company is capitalized at \$18,000,000, divided into \$6,000,000 of bonds and \$12,000,000 of stock. The books show further that all of this except a stock dividend of \$750,000 in 1865 was paid for by the bondholders and shareholders, dollar for dollar, at par. In 1894 \$6,000,000 was paid in cash.

There is not one dollar "water" in the capitalization of the company. In addition to this property, the company is operating 469 cars which belong to the Brooklyn Rapid Transit Company and which it is claimed cost that company more than \$3,000,000 and for which the Brooklyn City Railroad will pay the receiver of the Rapid Transit Company a rental. The receiver of the Brooklyn Rapid Transit Company further claims that the Brooklyn City Company is indebted to the Rapid Transit Company for additions and betterments which cost more than \$10,000,000.

### LOUDOUN STATEMENT FALSE

Mr. Loudoun swore that the Brooklyn City Railroad has accumulated more than \$300,000 for the purpose of paying a dividend for the first quarter of 1920. This is wholly false. The Brooklyn City Railroad earned and paid large dividends prior to 1893 when its properties were leased to the Brooklyn Heights Railroad. From 1893 to July, 1919, dividends were paid by the Brooklyn City Company out of a rental of its properties paid by the Brooklyn Heights Railroad. The lessee surrendered the property and terminated the lease last October. No dividend was paid for the quarter ended Oct. 15, 1919, and no dividend has been paid since and no dividend will be paid during 1920 or for years to come unless the company is relieved of its present situation. The company is not paying interest on its full bonded debt of \$6,000,000. A little less than \$2,000,000 of its first mortgage bonds are in a guarantee fund claimed by the Brooklyn City Company and on these bonds it is not paying interest. It will pay interest on a little more than \$4,000,000 of bonded debt, say \$200,000 a year, a fraction over 1 per cent upon the money actually paid into the company by its stockholders and bondholders, less than two-thirds of 1 per cent upon the appraised value of its own property. The stock of the company which a year ago sold at \$16 for a share of the par value of \$10 sold within the last few days at \$4 per share.

The first mortgage bonds which were sold above par are now offered at 60 cents on the dollar. This means that the securities of the Brooklyn City Railroad show a shrinkage of more than \$16,000,000 in market values. To a mind of very ordinary intelligence these market values would have disproved earning capacity or the possibility of dividends.

At the hearing Mr. Loudoun testified that the Brooklyn City Railroad had

received \$35,968,314 in dividends in corporate life and that in 1894 when it increased its capital from \$9,000,000 to \$12,000,000 it paid dividends at par to all stockholders, although a number of them have not paid in full for the increased shares. If the company had distributed dividends on a 6 per cent basis there would now be a surplus of \$14,069,314.

## Record Franchise Taxes

Increase in New Jersey Over Last Year Nearly \$1,000,000—Largest Collections Ever

The largest amount of money ever collected by the municipalities of New Jersey for franchise taxes of public

an increase over last year of \$934,410 or 31.2 per cent.

The nineteen electric railways of the State are assessed to pay \$1,064,303 or 27 per cent of the total tax. Last year the electric railways paid a tax of \$960,910, or 32 per cent of the total.

This is the first levy to be made at the maximum rate of 5 per cent of the gross receipts as a result of the passage of the 1917 law. Previous to that year the assessment was at the rate of 2 per cent of the gross receipts, but in 1917 the Legislature enacted a law by which the rate was increased by 1 per cent annually until a maximum of 5 per cent was reached. Utility companies whose gross receipts are less than \$50,000 are not affected by this law and still taxed 2 per cent of their gross. Another reason for the increased tax is the fact that in nearly all cases the rates for services have been changed with the result that the gross earnings of the companies have also been materially increased. The tax just levied is based on the gross receipts for the year ended Dec. 31, 1919.

	Number of Companies	1919 Tax	Number of Companies	1920 Tax	Per Cent Increase in Tax Over 1919
Total	254	\$3,925,744	294	\$2,991,334	31.2
Street railways	19	1,064,303	29	960,910	10.8
Water companies	110	224,924	114	168,974	32.8
Gas and electric companies	75	1,970,813	100	1,416,029	39.0
Telegraph and telephone companies	33	625,572	35	429,249	45.5
District tel. messenger	3	4,632	3	3,495	32.4
Sewer and pipe lines	17	35,500	16	12,674	180.0

utility corporations and others for the use of the highways will be paid this year as the result of the assessment just concluded by the State Board of Taxes and Assessments. The tax to be paid by 254 corporations and three individuals using the streets totals \$3,925,744,

## California Companies Report

The accompanying table shows the number of companies and taxes paid, together with the percentage increase over the previous year for the classes of public utilities utilizing the streets.

### INCOME STATEMENTS OF CALIFORNIA ELECTRIC RAILWAYS YEAR ENDED DEC. 31, 1919.

	Petaluma & Santa Rosa R. R. Co.	San Francisco Napa & Calistoga Ry.	Sacramento Northern R. R.	San Francisco-Oakland Terminal Rys.	Los Angeles Ry. Corp.
Year ended Dec. 31, 1919:					
Miles of line	37.02	41.66		144.37	184.50
Miles of single track	43.41	44.52	212.00	262.00	389.00
Operating revenue	\$ 369,301	\$ 334,020	\$1,506,734	\$ 5,793,501	\$ 7,336,550
Operating expenses	249,573	173,470	1,210,767	4,788,902	6,097,776
Net revenue railway operations	\$ 119,728	\$ 160,550	\$ 295,967	\$ 1,004,599	\$ 1,238,774
Auxiliary operations (net)	2,657		12,244	81,499	
Net operating revenue	\$ 122,385	\$ 160,550	\$ 308,211	\$ 1,086,098	\$ 1,238,774
Non-operating income	1,033	4,684	29,980	21,804	67,040
Gross income	\$ 123,418	\$ 165,234	\$ 338,191	\$ 1,107,902	\$ 1,305,814
Deductions:					
Taxes on railway operations	15,971	32,796	61,531	298,264	373,800
Rentals				4,103	294,066
Interest on funded debt	38,412	63,678	117,610	783,065	992,525
Miscellaneous deductions	1,523	1,745	52,218	334,941	12,253
Total deductions	\$ 55,906	\$ 98,219	\$ 231,359	\$ 1,420,373	\$ 1,672,644
Net income for year	67,512	67,015	106,832	*312,471	*266,830
Credit balance from previous year	22,561	*3,224		*751,127	*368,999
Miscellaneous additions—1919		301	2,996	92,839	5,332
Total credits	\$ 90,073	\$ 63,791	\$ 109,828	*\$ 970,759	
Miscellaneous deductions—1919	561	96	109,828	162,332	21,934
Dividends	18,123				
Appropriations to reserves	13,383	8,861			185,414
Total debits	\$ 32,063	\$ 8,957	\$ 109,828	\$ 162,332	\$ 207,348
Surplus at end of year	58,006	55,134		*1,133,091	*937,845
Road and equipment account	\$1,670,775	\$2,016,929	\$9,651,320	\$46,072,168	\$44,812,997
Miscellaneous physical property	77,850		154,904	1,592,064	
Total value of property	\$1,548,625	\$2,016,929	\$9,805,224	\$47,664,232	\$44,812,997
Capital stock	944,300	731,700	4,469,023	28,175,000	20,000,000
Funded debt	698,400	1,155,100	5,225,360	18,769,500	18,753,000
Total securities outstanding	\$1,642,700	\$1,886,800	\$9,694,383	\$46,944,500	\$38,753,000
* Deficit.					

## Conditions in Boston Are Better

### Elevated Railway Earns Enough with 10-Cent Fare to Pay Cost of Service and Reduce Part of Accumulated Deficit

The second annual report of the public trustees of the Boston (Mass.) Elevated Railway shows that the deficit for the year ended Dec. 31, 1919, was \$978,130. Passenger revenue increased 41.2 per cent and operating expenses 31.8 per cent over the previous year. This was further reflected in a 91.5 per cent increase in net operating revenue, and the net loss for the year was 67.3 per cent, or \$2,008,576 less than in 1918. These gains in revenue are due to the several fare changes that have been made since the trustees took over the operation of the property on July 1, 1918.

**I**N AUGUST, 1918, the unit rate of fare was changed from 5 to 7 cents, which in the following December gave way to an 8-cent flat fare. The receipts from the 8-cent fare, after a trial of seven months, also proved in-

improvement which can be completed only in a series of years. The changes thus far made are featured in the purchase of modern cars, in the replacement and addition to former equipment, the completion of certain through lines,

improvements have been authorized that will cost \$5,700,000. Part of these, however, will be from the depreciation fund, as full provision is now being made for maintenance and depreciation.

The sale of the Cambridge subway makes available for further capital expenditures the sum of \$7,868,000. The trustees hold that only a prudent use of this money, which at present affords their only source of capital, would be justified. Such use should secure important improvements, with resulting economies, and tend to re-establish the credit so vital to the development of railway facilities.

The trustees also reiterate their belief that car riders ought not to be subject to a special tax for using public highways, either through payment of subway rentals or assessment for street improvements. The question is between the car rider and the tax payer and is one for legislative decision—determining what is proper service at cost.

The accompanying table gives details as to revenues, expenses and traffic handled for 1919 as compared to 1918, together with the percentage change in each item.

INCOME STATEMENT—BOSTON ELEVATED RAILWAY

Year Ended Dec. 31	1919	1918	Percentage Change + Inc. - Dec.
Revenue from transportation	\$28,860,271	\$20,462,781	+ 41.2
Revenue from other railway operations	544,320	514,184	+ 5.8
<b>Total railway revenue</b>	<b>\$29,404,591</b>	<b>\$20,976,965</b>	<b>+ 40.2</b>
Way and structures	\$3,783,715	\$2,372,932	+ 59.6
Equipment	4,290,040	3,142,369	+ 36.6
Power	2,980,659	2,604,366	+ 14.7
Conducting transportation	10,530,882	7,772,434	+ 35.7
Traffic	4,758	9,167	- 48.2
General miscellaneous	2,110,285	2,094,829	+ 0.7
<b>Total railway operating expenses</b>	<b>\$23,700,339</b>	<b>\$17,996,097</b>	<b>+ 31.8</b>
<b>Net operating revenue</b>	<b>\$5,704,252</b>	<b>\$2,980,868</b>	<b>+ 91.5</b>
Taxes assignable to railway operations	1,045,502	917,515	+ 13.9
<b>Operating income</b>	<b>\$4,658,750</b>	<b>\$2,063,352</b>	<b>+125.5</b>
Non-operating income	93,991	85,728	+ 9.7
<b>Gross income</b>	<b>\$4,752,741</b>	<b>\$2,149,080</b>	<b>+121.0</b>
<b>Deductions from gross income:</b>			
Rent for leased roads, including rent for Tremont subway	2,775,232	2,752,214	+ 0.7
Miscellaneous rents, including all other subways and tunnels	1,339,502	1,059,072	+ 26.4
Net loss on physical property purchased from W. E. St. Ry.	7,986	9,136	- 12.6
Interest on funded debt (B.E.)	1,309,477	1,120,787	+ 16.8
Interest on unfunded debt (B.E.)	246,313	181,370	+ 35.8
Amortization of discount on funded debt	44,291	7,818	.....
Miscellaneous debits	8,070	5,389	+ 49.8
<b>Total deductions from gross income</b>	<b>\$5,730,871</b>	<b>\$5,135,786</b>	<b>+ 11.6</b>
<b>Net income transferred to profit and loss</b>	<b>*\$978,130</b>	<b>*\$2,986,706</b>	<b>+ 67.3</b>

\* Deficit.

adequate to meet the cost of service as defined under the statutes, and on July 10, 1919, the unit flat fare was increased to 10 cents. Owing to strikes and other extraordinary conditions, operating losses continued until the middle of September. Since that time the 10-cent fare has produced revenues in excess of expenditures. This surplus on Dec. 31, 1919, had reduced the deficits incurred in July, August and September, aggregating \$928,695, to \$459,008, including the back pay due to employees on account of an arbitration agreement. The trustees believe that by June 30, 1920, all losses will have been absorbed and no deficit will exist to be assessed upon the cities and towns served. In the previous year a deficit of nearly \$4,000,000 had to be met by city and town assessment even after the \$1,000,000 reserve fund of the company had been used. As the law now stands there can be no lower fare until the cities and towns have been reimbursed for the amount paid to meet past deficits and this reserve fund has been restored.

The trustees during the year have made a beginning under a program of

the lengthening of tunnel trains and with the introduction of two and three-car trains on surface lines.

In the 1920 budget additional im-

### New Jersey Valuation Bill Vetoed

Governor Edwards of New Jersey has vetoed the bill of Senator Allen providing for a valuation of the property of the Public Service Railway. The Governor in his veto points out that the Allen bill is much weaker than the bills which the Governor caused to be prepared and which Assemblyman Gaede introduced, but which the Republican Legislature rejected. In his veto the Governor said:

I am forced to return this bill unapproved, for these reasons:

1. The bill is limited in its application to the valuation of street railway property. Therefore the properties of the Public Service Gas Company, the Public Service Electric Company, and other similar utilities would escape valuation.

2. The scope of the investigation and valuation under the bill in question is limited to the physical property. If that is

STATISTICAL INFORMATION—BOSTON ELEVATED RAILWAY

Year Ended Dec. 31	1919	1918	Per Cent Change + Inc. - Dec.
Mileage—first main track	248.42	248.98	- 0.2
Second main track	214.14	214.32	- 0.1
Total—all track (incl. car-houses, cross-overs, yards, etc.)	535.33	534.86	+ 0.1
Car-miles—In passenger service	53,533,522	52,762,285	+ 1.6
By express and freight cars	175,020	239,283	- 26.9
By sprinkler cars	12,707	20,248	- 38.2
<b>Total revenue mileage run</b>	<b>53,721,249</b>	<b>53,021,816</b>	<b>+ 1.3</b>
Car-hours—In passenger service	4,749,318	4,641,730	+ 2.3
By express and freight cars	16,765	23,675	- 29.2
By sprinkler cars	1,017	1,873	- 45.7
<b>Total revenue car-hours run</b>	<b>4,767,100</b>	<b>4,667,278</b>	<b>+ 2.1</b>
Ratio CM to CH (speed m.p.h.)	11.28	11.32	- 0.3
Revenue passengers total	324,758,685	348,664,700	- 6.86
Gross passenger revenue	\$28,767,544	\$20,352,412	+ 41.2
Average fare per passenger (cents)	8.85	5.84	+ 51.5
Passenger rev. per mile of line	\$115,700	\$81,800	+ 41.3
Passenger rev. per mile of single track	53,700	38,170	+ 40.8
<b>Car-mile statistics:</b>			
Operating revenue (cents)	54.70	39.60	+ 38.2
Operating expenses (cents)	44.10	34.00	+ 29.8
Net income (cents)	1.82	5.64	- 67.8
Passenger traffic (revenue)	6.05	6.57	- 7.9
Car-miles per rev. passenger	0.165	0.152	+ 8.59
<b>Car-hour statistics:</b>			
Operating revenue	\$6.18	\$4.50	+ 37.5
Operating expenses	\$4.97	\$3.86	+ 28.9
Net income	\$0.20	\$0.64	- 68.7
Passenger traffic (revenue)	68.10	74.90	- 9.1
Operating ratio—per cent	80.6	85.9	- 6.17

not so the best that can be said for the language defining the scope of the investigation is that it is vague and indefinite.

3. This bill, instead of creating an independent board, as the Gaede bill does, provides for a commission, consisting of the Governor, the State Treasurer and the State Comptroller.

Contrast the definite, specific direction contained in the Gaede bill with respect to the extent and scope of the inquiry to be made, with litigation-creating language of the bill now returned, and you will understand why I cannot approve this measure. Instead of authorizing an investigation into the issuance or alleged issuance of stocks and bonds without consideration, this bill limits the investigation to the valuation of the utility property. Just what is meant by the phrase, "including every proper and lawful element thereof," I do not know, but it is an invitation to litigation.

### St. Louis Valuation Figures by July 1

J. L. Harrop, chief engineer of the Missouri Public Service Commission, who is in charge of the valuation which is being made of the properties of the United Railways, St. Louis, says that two months will be required to complete the engineers' work and prepare the report.

Company engineers are also making a valuation.

The value of the property of the company has been variously estimated between \$38,000,000 and \$60,000,000. The latter figure was fixed by the city as a basis for determining rates under the compromise franchise settlement ordinance rejected by the company after the measure had been passed by the city.

The Public Service Commission's tentative valuation of the property for the establishment of the 8-cent cash fare and the 7-cent token fare, recently abrogated, was \$58,000,000.

The valuation was undertaken by the commission as a basis for the determination of reasonable fares to be charged by the company.

## Financial News Notes

### New Director for Portland Company.

—Harry M. Verrill has been elected a director of the Cumberland County Power & Light Company, Portland, Me. Mr. Verrill was recently chosen president of the company.

**Equipment Notes Approved.**—The Public Utilities Department of Massachusetts has approved the petition of the Berkshire Street Railway, Pittsfield, Mass., for an issue of notes to the amount of \$64,000, to pay for twelve one-man cars.

**Annual Tax Paid in Lump Sum.**—The Boston (Mass.) Elevated Railway departed from its usual custom of paying annual taxes in installments and presented to the State of Massachusetts a check for \$375,000, the amount

of tax assessed on the property of the company for the year of 1919.

**Hearing on Abandonment.**—The Easton (Pa.) Transit Company threatened to abandon the line from the Country Club Junction at Easton to Nazareth, Pa. Judge Stewart has fixed June 7 as the time for a hearing on the application of the company to discontinue the line.

**Plans to Reclaim Abilene Road.**—The American Public Service Company, Dallas, Tex., has agreed to take over and operate the railway in Abilene, Tex. The Public Service Company has agreed to spend \$60,000 in repairs to track and equipment. It will operate the lines under supervision of the city.

**Massachusetts Pays for Cambridge Subway.**—The State of Massachusetts has obtained title to the Cambridge Subway in paying, by means of a certified check, the amount of \$7,868,000 to the Boston Elevated Railway. It is estimated that the rental payments to the State from the subway will amortize the indebtedness in about fifty years.

**Long Island Road Suspends Again.**—The New York & North Shore Traction Company, Roslyn, Long Island, which operates in Queens and Nassau Counties, has suspended service. In a letter to the Public Service Commission, President George A. Stanley of the company asserted the powerhouse lacks coal. He added that competition by municipal buses has caused heavy losses of revenue.

**Plan to Lift Receivership.**—Thomas J. Keenan, of Curtis, Keenan, Brink & Harrison, attorney for William G. Phelps, receiver of the Binghamton (N. Y.) Railway, has secured an order from United States Judge George W. Ray, in which full approval is given to the proposed agreement by which the receivership will be relinquished within the next six months and the property returned to the Binghamton Railway.

**Ohio Lease Abrogated.**—The Dayton & Western Traction Company, Dayton, Ohio, took over its property at 12:01 a.m. on April 25. This comprises the road from Dayton, Ohio, to Richmond, Ind., about 40 miles. For the last fourteen years the property has been leased to the Ohio Electric Railway and operated by it as the Dayton-Richmond division. In the future it will be operated separately under the organization noted elsewhere in this issue.

**Weymouth Votes \$28,000 to Railway.**—At a special town meeting held in Weymouth, Mass., it was voted that the sum of \$28,000 be appropriated for aiding the Eastern Massachusetts Street Railway in operating within the town boundaries. At two previous meetings held for the purpose of considering the matter of extending aid the vote had been against any contribution. Lacking the necessary revenue for operation the Eastern Massachusetts Street Railway closed the lines. Under the

new arrangement the lines will be opened up shortly.

**Natchez Line Offered for Sale.**—The 6 miles of single-track electric railway in Natchez, Miss., owned by the Southern Railway & Light Company, are being dismantled as the operation of the railway has recently been discontinued, due to the high cost of operation, and the small earnings, due to the large number of privately owned automobiles. The entire equipment is offered for sale as there seems to be no chance to resume operation of the railway. A modern auto bus has been tried for two months, but the results are not satisfactory. The cost of operation of the bus has been high and the earnings are small, even though the fare is 10 cents. The company will continue to operate its gas and electric plants.

**Fort Wayne Property Transferred.**—The Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., which went into the hands of a receiver last year, has ceased to exist and the Indiana Service Corporation became an operating reality when on April 28 the recording of the deeds and the transfers of property was completed in the local courts. The Indiana Service Corporation now controls the interurban lines from Fort Wayne to Bluffton and Lafayette and the city lines in Fort Wayne, in Wabash, Peru, Logansport and Lafayette. The officers of the company are the following who are actively engaged in operating the company's property: President, Robert M. Fuestel; vice-president and general manager, S. W. Greenland, and secretary and treasurer, Harry E. Vordermark.

**Notes Offered on 8 Per Cent Basis.**—The Guaranty Trust Company, New York, N. Y., and Stone & Webster, Boston, Mass., are offering \$1,500,000 Eastern Texas Electric Company five-year 7 per cent convertible gold notes dated May 1, 1920, and maturing May 1, 1925. These notes, which are redeemable as a whole or in part at any time on forty-five days' notice at rates varying from 103 per cent and accrued interest before May 1, 1921, to 100 per cent and interest between May 1, 1924, and maturity, are being offered at 96 and interest to yield about 8 per cent. The notes are direct obligations of the company issued under provisions which secure the holders against any increase in the funded debt unless earnings have equaled at least twice the interest on the entire funded debt for eighteen consecutive months out of the preceding two years. The Eastern Texas Electric Company owns and operates the entire electric light, power and street railway business in Beaumont, Tex., and the entire electric light and power business in Port Arthur, Tex., as well as the interurban electric railway between these two centers. The company has outstanding an issue of \$750,000 of three-year 7 per cent notes due Aug. 1, 1921, which are to be called for redemption.

# Traffic and Transportation

## Buses Start in Milwaukee

Railway Establishes Feeder Bus Route to Learn if Territory Served Will Support Transportation Service

Another electric railway company, namely, the Milwaukee Electric Railway & Light Company, has gone into the bus business to determine if the public will give its support to a route over which there has long been a clamor for service. The line begins at a point about 3½ miles from the terminal building and is virtually a 1¼-mile extension of the Mitchell Street trolley line. As the electric cars are now routed the patrons have had a maximum walk of not more than 1,500 ft.

During the war the Mitchell Street merchants petitioned the Wisconsin Railroad Commission to order a trolley extension over the route now used by the buses. The request was refused on the ground that the costs at that time were excessive and that the possible new traffic did not warrant the extension. The city of Milwaukee appealed the case to the State Supreme Court, but the court upheld the commission.

After the armistice, the so-called Mitchell Street Advancement Association again urged that the company extend transportation facilities through this territory on the grounds that it would greatly benefit trade conditions. The bus line is the result. The line connects at both ends with existing trolley lines. Service was started on April 17, 1920, with three Reo "speed-wagon" chassis mounting home-made bodies which seat sixteen passengers. The buses have the entrance and exit at the front, with door under the control of the operator. They are equipped with pneumatic tires.

### TEN-MINUTE HEADWAY ESTABLISHED

The present hours of operation are from 6 a. m. to 11 p. m. Between 6 a. m. and 7 p. m. the buses are run on a ten-minute headway, whereas after 7 p. m. service is cut to a fifteen-minute headway until 11 p. m., when all bus service is withdrawn. Two buses are required to maintain the ten-minute schedule, which leaves one bus in reserve at all times for inspection and repairs. The fare is the same as on the trolleys, and transfers are exchanged between both classes of service. The method of fare collection is according to the payer plan. All fares are deposited in a lock fare box, which is mounted just back of the dashboard. The bus is in charge of a single operator, who also acts in the capacity of fare collector.

In Wisconsin buses operated for the transportation of passengers for hire are classed as common carriers and come under the jurisdiction of the State

Railroad Commission. Under the commission's regulation it is necessary for an operator of buses to obtain a permit before he can start operations. These permits, however, are free. Such licenses as are required are issued by the State and cover only the ordinary registration and drivers' licenses.

The Mitchell Street merchants who formed the association are enthusiastic over the company's willingness to try the bus experiment and hope that the earnings will uphold their previous claims that the extension was warranted.

## Three Cents a Mile Asked

Indiana Interurbans Apply for Increase from 2½-Cent Basis—Material and Labor Costs Higher

Petitions were filed with the Public Service Commission of Indiana on April 28 by the Terre Haute, Indianapolis & Eastern Traction Company and the Indianapolis & Cincinnati Traction Company, Indianapolis, requesting an increase in basic interurban passenger fare from 2½ cents a mile to 3 cents a mile. A similar petition will probably be filed by the Union Traction Company of Indiana and by other traction lines operating within the State. Increased cost of operation resulting from a prospective increase of \$1 a ton on coal, a 25-per cent increase in coal freight rates, a 25-per cent increase in material and supply costs since Jan. 1, 1920, and increases in labor costs are given as the reason for the advance in fares.

The petition of the Indianapolis & Cincinnati Traction Company states that with the increased fare the company contemplates the continued use of interchangeable penny coupon books whereby \$20 worth of transportation is sold for \$17.50. Commutation books also would be sold on the present basis of forty trips for twenty-five times the one-way fare with a minimum fare of 10 cents. The Terre Haute, Indianapolis & Eastern Traction Company proposes that commutation fares be on a basis of five-eighths of the regular passenger rate with a minimum of \$3.25 for forty trips.

The Indianapolis & Cincinnati Traction Company estimates that operating expenses will increase \$81,214 for the twelve months from May 1, 1920, and that the increase in fare would increase the gross receipts \$38,496. Substantial increases in passenger receipts for the first three months of this year, if continued for the year beginning May 1, will increase the gross revenue \$98,037 over 1919 figures. The net income asked, the petition says, will yield little over one-third of the amount the company is entitled to earn on the value of the property.

## Portland Planning Relief

Election Called for May 21 to Vote on Proposal to Rescind Franchise Requirements

The City Council of Portland, Ore., has ordered a special city election on May 21 for the purpose of submitting to the voters three measures, each offering financial relief to the Portland Railway, Light & Power Company, with a view to keeping to a minimum any increase in fares which may be granted by the Public Service Commission.

The first of the three measures to be voted upon provides for relieving the company of license and franchise taxes and a portion of the bridge tolls, and also provides that the company shall not carry city employees without payment of the prevailing fares. This measure further provides that five-tenths of one mill be levied for 1920 to cover the costs of such relief, and that the Council be authorized to levy not in excess of three-tenths of a mill for the same purpose each year thereafter.

The second measure covers the cost of new pavement, relieving the company of payments on work which would have to be done if the tracks were not at present in the streets. All costs for excess work will be charged to the company. A tax levy of three-sixteenths of one mill for 1920 is provided, and three-tenths of one mill for each year thereafter.

### RELIEF FROM PAVING CHARGES

The third measure proposes to relieve the company of pavement reconstruction and repair costs when such repairs and reconstruction have not resulted because of the trackage in the street. The plan for relief in this connection is on the same basis as new pavement, and a tax levy of 1½ mills for the first year and 1 mill thereafter is provided. The proposals were worked out by a special transportation committee of the Council, and approved for submission to the voters by unanimous vote of the Council.

It is estimated that even with the relief provided in the plans to be submitted to the people, an increase of 1 cent in fare will be necessary, making a 7-cent fare in Portland. Failure of the passage of the measure will be followed by a 2-cent fare increase, it is believed.

The former plan to float a \$5,500,000 bond issue to bring relief to the company was discarded.

## Traffic Survey for Memphis

Ross W. Harris, traffic expert, who represented the city of Memphis, Tenn., in the recent appraisal of the property of the Memphis Street Railway, has been engaged by the city and the company to make a survey of traffic conditions in Memphis. The expense of the work will be borne jointly by the city and the company.



## Ten-Cent Fare Asked in Toledo

### Railway Appeals to Court to Enjoin City from Interfering with Collection of New Rate

The Toledo Railways & Light Company has applied to Federal Judge John M. Killits at Toledo, Ohio, for an order allowing it to collect a 10-cent cash fare and charge 2 cents for transfers. This action was taken on April 30 so as to protect the rights of the company before the ouster ordinance, passed last summer, became effective on May 1, under the terms of an extension by Council which allowed the cars to be brought back from Michigan under the protection of the court. The company also asks that the city be enjoined from interference with the collection of the higher fares. If not granted, the company asks such modification of present orders as to allow it to stop service and remove its property from the city streets.

**T**HE cross-bill seeks to obtain a compensatory return for the company's investment, to establish the rights and status of the company on the streets of Toledo, and also to settle several moot questions which remain unsolved after several weeks of negotiations between the members of a commission drafting a cost-of-service ordinance and Henry L. Doherty, the principal owner of the railway.

The bill first recites the history of the case, beginning with the expiration of franchises from 1906 to 1914. It bases the rights of the company on the so-called "Three-Cent Fare Ordinance" of Nov. 24, 1914, which resulted in litigation in the federal court establishing the day-to-day privileges of the company, and also upon various paving ordinances.

Under all present orders of the federal court issued since the ouster ordinance a permanent settlement was supposed to have been submitted to the people for ratification at the election on April 27, but due to disagreement between the commission and Mr. Doherty no measures were ready for a vote at that time. Therefore, the company asserts its right to ask for a compensatory return or the privilege of withdrawing service when it desires.

The company now is operating under an order which fixes the fare at 7 cents with 2-cent transfers. Henry L. Doherty claims this does not provide a fair return.

#### \$15,000,000 VALUATION

In the cross-bill the valuation of the property is said to be \$15,000,000 and the present fare provides barely 3 per cent on this investment. Eight per cent is cited as a compensatory return. This rate will have the backing of the city and cost-of-service commissioners who have already agreed to this return on the stock of the company formed by the new ordinance. Allowance for amortization of the property is also asked for in the cross-bill.

It is doubtful whether there will be a hearing on the matter before thirty days. Mr. Doherty agreed with the city officials that he would give them that much notice, but filed before May 1 to safeguard the rights of the company. Judge Killits will fix a date for hearing when he returns to Toledo. The City Council will be asked to furnish a fund of \$20,000 to secure special counsel and technical advice in the

fight against the establishment of 10-cent fares.

It is a question of whether or not Council will ask the Public Utilities Commission of Ohio to order the company to take up its tracks and remove its property. A minority of Council which opposed the return of the cars to the streets during the recent strike may attempt to balk the company by taking advantage of the provisions of the Miller public utilities abandonment law and giving the company thirty days' notice to vacate.

In the latest petition filed by the company, however, the Miller law is claimed to be inapplicable to the Toledo railway case. Judge Killits has held it applicable thus far in the proceedings. The company claims its right to withdraw from the streets is preserved in a decision of the Circuit Court of Appeals in the same case in which the present action is filed.

#### MILLER LAW ATTACKED

If held applicable, the company declares that the Miller law is unconstitutional in that it would take property "without due process of law," violate contract rights, violate the "home rule" provisions of the Ohio constitution, and also of the city charter of Toledo.

Mr. Doherty seeks by this new cross-bill to clear up all the various loose-ends of the controversy. The officials believe they can prove a much higher valuation than what Mr. Doherty has said he would accept for the property, and also that they will clear the air of false charges regarding the price charged for current used by the railway department. The initial fare to be charged under a cost-of-service plan could also be obtained after valuation and return were approved by the court.

In negotiations for the approval of the cost-of-service ordinance in process of being completed, Mr. Doherty won several important contentions recently. The maximum rate of fare has been eliminated, the premium for performance clauses have been stricken out, and the provision governing interurbans has been modified. Interurbans using city streets will now contract with the company and points contested by the city will be arbitrated in the usual manner by representatives chosen by the city, company and federal court.

What Mr. Doherty termed "evolutionary rather than revolutionary mu-

nicipal ownership" has been injected into the plans for the cost-of-service measure. The union of the ideas of cost-of-service and municipal ownership were suggested at a meeting at which both Mr. Doherty and Mayor Cornell Schreiber were present. General plans were formed and will be presented in written form by Mr. Doherty.

Under the new plan the city will begin to acquire an equity in the railway immediately upon the new ordinance going into effect. Mr. Doherty has said that this plan is both legal and feasible as far as he is able to determine.

When the new cost-of-service ordinance becomes effective money will begin to accrue in both the sinking and amortization funds. As these funds grow it would be invested to retire outstanding bonds of the company. Then the bonds would be retired through the issue of common stock which would be held and owned by the city, the company debt being reduced through retirement of the bonds and the city ownership growing through the exchange for the common stock, until ultimately the entire property might become city owned.

It is thought that this new plan will bring the agreed ordinance down to the place where the important differences remaining to be settled will be the one of valuation. And the new court angle may settle this matter.

## Transportation News Notes

**Rate Reduced in Fall River.**—The Eastern Massachusetts Street Railway has installed a reduced ticket rate on its lines in Fall River. A ticket good for sixteen rides is sold for \$1.

**Asks More on Ohio Interurban.**—The Columbus, Delaware & Marion Railway, Columbus, Ohio, has applied to the State Public Utilities Commission for an increase of 5 cents in the rate between Columbus and Worthington. The present fare is 15 cents.

**Sunday Cars Authorized.**—The Ontario Legislature has amended the railway act so as to permit of the operation of electric cars on Sundays in cities of 15,000 population. The present minimum population is 50,000. St. Thomas, with a population of about 20,000, is expected to be the first municipality to take advantage of the amended act.

**Fares Up on Ottawa Line.**—The Ottawa (Que.) Electric Railway has been authorized by the Railway Commission to increase the rates charged on its Britannia line. An advance of 5 cents is granted from Holland Avenue to Britannia. A similar increase is allowed on the eastern extension from

Cloverdale Avenue to Rockcliffe Rifle Range.

**Seven Cents Asked in Rutland.**—Application has been made to the Vermont Public Service Commission by the Rutland Railway, Light & Power Company, Rutland, for an increase in cash fare from 6 cents to 7 cents in each zone. The company proposes to install the new rates on May 20. It is planned to sell fifty tickets for \$3.15 and fifty school tickets for \$1.50.

**Seven-Cent Fare Made Permanent.**—The Massachusetts Department of Public Utilities has issued an order making permanent the 7-cent zone fare now being charged by the Worcester Consolidated Street Railway. The fare on the company's suburban lines remains at 6 cents for each zone. The 7-cent fare was authorized by the board temporarily on March 7 last.

**Asks Six-Cent Fare.**—A tariff providing for a 6-cent fare within the cities of Aberdeen and Hoquiam and the town of Cosmopolis and between Cosmopolis and Aberdeen, with a 12-cent fare between Cosmopolis and Hoquiam, has been filed with the Washington Public Service Commission by the Grays Harbor Railway & Light company, Aberdeen. The company recently applied to the commission for a 7-cent local rate.

**Fares Raised in Macon.**—Fares on the lines of the Macon Railway & Light Company, Macon, Ga., were raised from 6 cents to 7 cents on May 2. The increase was sanctioned by unanimous vote of the City Council. The ordinance passed by the Council provides for a 7-cent fare for a period of two years, after which the grant may be abrogated by the city upon sixty days' notice. Two years ago the company was granted a 6-cent fare.

**Seven-Cent Fare in Augusta.**—A 7-cent fare will go into effect on May 9 on the lines of the Augusta-Aiken Railway & Electric Corporation of South Carolina, Augusta, Ga. The increase will be made in accordance with the terms of an order issued by the State Railroad Commission on May 1. The company had applied to the commission for a 10-cent fare. The commission granted the company's request for a general readjustment of lighting and power rates.

**Would Foster Riding Habit.**—Promotion of the riding habit offers the best hope of relieving the financial condition of the Eastern Wisconsin Electric Company, Sheboygan, Wis. This is the conclusion reached by the management of the company, which has asked the Sheboygan municipal authorities to cooperate with it in securing a fare revision from the State Railroad Commission. The company proposes to install a 5-cent fare for the habitual rider through the sale of fifty tickets for \$2.50. It is also proposed to sell six tickets for 35 cents. The cash fare is to be 7 cents.

**May Raise Rush-Hour Fares.**—An increase in fare during morning and

evening rush hours was suggested by witnesses for the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., at a recent hearing before the State Board of Conciliation. Representatives of the company declared that, if the demands of the carmen for higher pay were granted, the company would be forced to secure additional revenue. It was intimated that in this event the State Railroad Commission would be asked to allow an increase in fare during the rush-hour period. The carmen are asking a wage advance of 6 cents an hour. They also seek changes in working conditions.

**Would Raise Philadelphia Suburban Rates.**—The Philadelphia (Pa.) Rapid Transit Company has filed with the State Public Service Commission a revised rate schedule which it proposes to place in effect on its Willow Grove line on May 28. Under the proposed plan there is an increase in the number of fare zones between Philadelphia and Willow Grove, Doylestown, Chester and Media. The 5-cent fare in each zone will be continued. Between Philadelphia and Willow Grove there will be three zones instead of two as at present. The proposed new schedules also call for an extra charge for chartered or special cars.

**Eight Cents Asked in Grand Rapids.**—An 8-cent cash fare with five tickets for 35 cents is asked in an application filed recently with the City Commission of Grand Rapids, Mich., by the Grand Rapids Railway. The company also requests authority to install a loop system in the downtown section of the city and to make other changes in routing to accommodate the one-man safety cars which will shortly be placed in service. In seeking a fare increase, L. J. De Lamarter, general manager of the railway, stated that during the coming year the system would be called upon to expend \$288,950 for replacements and betterments. At the present rate of fare the company's revenue will, it is estimated, fall short by \$255,965 of providing for operating expenditures and those already authorized for replacements and improvements.

**Six-Cent Fare Extended.**—The 6-cent fare on the Chicago (Ill.) Surface Lines will continue in force at least until July 1. This extension of time was allowed by the Illinois Public Utilities Commission on April 26, the date of expiration having been set originally for May 1. Counsel for the city contended that a 5-cent fare should again be made effective, on the ground that even at this rate the March traffic would have produced \$150,000 after payment of operating expenses. The commission held that this rate would not be sufficient and that there was no reason for disturbing the present tariff until the conclusion of the valuation hearings. The city has been ordered to close its case by May 20 and the company by June 10. The report of the surface lines showed an increase in revenue of \$751,632 for February over the same month for 1919.

**Fare Ordinance Modified.**—The ordinance to be referred to the voters of Duluth, Minn., in the referendum election on June 21, at the request of the Duluth Street Railway, will make a 6-cent fare mandatory for a period of one year. The ordinance provides that after one year's trial the Council may order a change to any "reasonable rate of fare not higher than 6 cents." The original ordinance submitted by the company to the Council to be referred to the voters was one which provided that the Council should have the power to fix the fare at a figure not to exceed 6 cents. A new angle to the railway's campaign for a higher fare and increase in revenue was furnished when the Federated Trades Labor Assembly wrote to the City Council urging the purchase of the railway without condemnation proceedings, if a "reasonable price can be obtained."

**Rejects Fare Ordinance.**—A franchise ordinance providing for an increase in fare from 5 cents to 6 cents has been rejected by the Little Rock Railway & Electric Company, Little Rock, Ark. The ordinance was passed by the City Council in March. In declining to accept the grant the company stated that it would be unable to comply with conditions contained therein with regard to the making of improvements and the furnishing of additional service. It stated further that, without a flexible adjustment of fares, it would be unable to make an adequate return on the investment. The railway department of the system was operated at a loss of \$85,000 in 1919. Since receiving its present franchise in 1901, the company has expended approximately \$1,000,000 on street paving and has paid to the city on account of percentage of its gross receipts about \$160,000.

**Salt Lake Lines in Need.**—A 7-cent fare is required by Utah Light & Traction Company, Salt Lake City, Utah, to enable it to meet operating costs and to make an adequate return on the capital invested in the property. This fact was brought out at recent hearings before the commission on the company's application for an increase in rates. The company some time ago filed a petition for a 7-cent fare with a 1-cent transfer charge and a 4-cent school ticket. For the past five years the system has earned annually not more than a 3.79 per cent return on the valuation of \$8,468,000 fixed by the commission. During 1919 each passenger car paid on an average 5.37 cents for a ride which cost the company 6.51 cents. Witnesses for the company contended that \$286,000 should be set aside each year for depreciation. The company asks a return of 8 per cent. The commission has taken the application under advisement. In December, 1917, the commission authorized the company to charge a straight 5-cent fare. The company subsequently received permission to raise the cash rate to 6 cents and to sell twenty tickets for \$1.

## Legal Notes

**ILLINOIS**—*The Rulings of Public Service Commissions Must Be Reasonable.*

The Public Utilities Commission has received no arbitrary powers by statute, and its orders and decisions are subject to review and must be reasonable and lawful. [State Public Utilities Commission vs. Bartonville Bus Line, 125 Northeastern Rep., 374.]

**ILLINOIS**—*Paving Assessments Upheld on Street Railway Property.*

Where a city ordinance provided that a street railway company shall at its own expense pave and repair that portion of the street occupied by its tracks, the city is not prevented from assessing for paving improvements, property owned by the street railway company and used as material yards on the theory that the property will be benefited by the proposed improvement, while devoted to street railway purposes. [City of Chicago vs. Chicago Railways, 125 Northwest Rep., 327.]

**MASSACHUSETTS**—*Reserved Space for Car Tracks in Center of Street Is Not Available for General Public Use.*

In a special reservation in the center of the street where the electric railway company had received a grant to lay tracks and operate cars, the company owed a duty to trespassers that it was liable only for wanton conduct. [Crowell vs. Boston Elevated Railway, 125 Northeast Rep., 607.]

**MISSOURI**—*Construction of Ordinance Giving Right of Way to Fire Apparatus Going to Fire.*

Under a city ordinance giving fire apparatus right-of-way when going to a fire, a motorman need not know that it is going to a fire and is not excused from colliding therewith, unless he did not know, or did not have any reason to believe, that it was approaching until too late to prevent collision. [Haekelman vs. Kansas City, 217 Southwestern Rep., 618.]

**MISSOURI**—*Payment of Fare Not Necessary to Make a Person Become a Passenger.*

Where one boards a street car, intending to become a passenger, the conductor making no objection, and thus impliedly accepting him as a passenger, it is immaterial whether he paid his fare. Hence, when he was injured while attempting to alight after being told the car was going to the carhouse it was a question for the jury whether the company was negligent. [Chapman vs. Kansas City Railways, 217 Southwestern Rep., 290.]

**MISSOURI**—*If Car Exceeds Speed Limit, Person Injured Is Not Necessarily Freed from Consequences of Contributory Negligence.*

An automobilist, who passed behind a street car at an intersection so closely as not to see a car approaching on the other track, was held to be guilty of contributory negligence although the car with which he collided was exceeding the speed limit, and there was a municipal ordinance giving him the right of way, known as the "Vigilant Watch Ordinance." [Zeis vs. United Railways of St. Louis, 217 Southwestern Rep., 324.]

**NEW JERSEY**—*Student Conductor Is Not an Employee.*

Applicant for position as conductor, who was injured before he had received an appointment and while being instructed in the duties of a conductor under an arrangement whereby he was to receive no compensation during such time except a bonus in case he was ultimately accepted, was not an employee of the railroad at time of injury within the workmen's compensation act. [Fineberg vs. Public Service Railway Co., 108 Atlantic Rep., 311.]

**NEW YORK**—*Workmen's Compensation Act Protects Employee Waiting Ten Minutes to Take Train From Employer's Premises After Work.*

Ten minutes was not an unreasonable time for a railroad employee to stay on the premises of his employer while waiting to take the next train home, on which train he had a right to ride free of charge, and if injured during such time he was entitled to compensation under the workmen's compensation act. [Kowalek vs. New York Consolidated Railway, 179 New York Supp., 637.]

**NEW YORK**—*Power to Regulate Fares Includes Power to Increase Them.*

The Milburn Agreement, between city of Buffalo and certain street railways, abolishing transfers but providing it should not prevent the Legislature from regulating fares, etc., does not preclude the Public Service Commission from authorizing increased fares, since the regulating power reserved to the State includes the power to increase inadequate rates as well as reduce excessive fares. [International Ry. vs. Public Service Commission, Second District, 124 Northeastern Rep., 123.]

**UTAH**—*Company Not Liable for Injuries Due to Obstruction Caused by Order of the County Road Commission.*

A traction company, which pursuant to an order of county officials removed dirt and rock from its track on a county road and dumped this material at a place designated by the county officials, was held not liable for injuries to a traveler due to the obstruction. [Shepard vs. Utah Light & Traction Co., 184 Pacific Rep., 542. See also a similar case, Bagwell vs. Georgia Ry. & Power Co., 99 Southeastern Rep., 712.]

## New Publications

### Boiler and Furnace Testing

This is a reprint of Engineering Bulletin No. 1 of the United States Fuel Administration. It is a simple, practical treatise suitable for putting into the hands of the men in the boiler room.

### Corona Discharge

By E. H. Warner and Jakob Kunz, Bulletin No. 114, Engineering Experiment Station, University of Illinois, Urbana, Ill.

This bulletin will be of interest to power transmission engineers who are following the progress in high-voltage transmission.

### Exhaust Systems

No. 32 in Series of Safe Practices Pamphlets of National Safety Council, Chicago, Ill.

This circular, which is well illustrated, gives details of plans for exhausting the dust, fumes, etc., which are produced by machines.

### Report to the President of the United States Bituminous Coal Commission

From Henry M. Robinson, chairman, and John C. White and Rembrandt Peale, commissioners. Government Printing Office, Washington, D. C.

This contains the majority and minority reports of the commission which was appointed to adjust matters of controversy between the bituminous coal miners and the operators of the country. The report covers the history of the controversy and gives valuable data relating to the coal industry.

### Reports of Investigations

Bulletin No. 1 of School of Engineering Research, University of Toronto, Toronto, Ont. 243 pages. Published by the University.

The first publication of the University of Toronto's School of Engineering Research contains the results of tests of properties of girderless concrete floors, of a single-stage turbine pump, of the strength of cast iron in bending and of many other investigations. There is also a paper of a mathematical nature on the calculation of transmission line networks.

### Modern Practice in the Construction and Maintenance of Rail Joints and Bonds in Electric Railways

Technologic Paper No. 62 of the Bureau of Standards, by E. R. Shepard, associate electrical engineer, Bureau of Standards. Government Printing Office, Washington, D. C., 131 pages.

This is a second edition of the bulletin originally issued in 1915. It includes an appendix describing recent developments and improvements. The publication as a whole constitutes an excellent treatise on the subject and should be in the hands of every electric railway man who has anything to do with bonding directly or indirectly. It is well illustrated and covers practice up to within a few months.

## Personal Mention

### Mr. Beggs Again Active in Milwaukee

John I. Beggs has assumed control of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. The new position of chairman of the board of directors was created with the understanding that he would accept the place and thereby acquire a controlling direction of the company's affairs, including its relations with the public. No president will be appointed for the time being and no changes in the present personnel of the organization are contemplated.

In speaking on the subject to a representative of the *ELECTRIC RAILWAY JOURNAL* Mr. Beggs said that he would maintain the company's present organization as it is and would apply himself particularly to the solution of the company's public policy problems and to finding ways and means of raising the \$10,000,000 which the company needs this year. He also said that for the present street railway extensions will be built only when the factory or community directly benefited will buy enough of the company's securities to finance the track extension and additional equipment required.

Mr. Beggs has for many years been a dominant figure in traction circles, particularly in Wisconsin. He built most of the interurban lines radiating from Milwaukee and was closely associated with the development of the city lines of the Milwaukee system. He took charge of the Milwaukee lines in 1897. The company had just emerged from bankruptcy, but Mr. Beggs built it up into one of the most prominent and successful combined central station and electric railway properties in the country.

### F. L. Francisco, Traction Engineer, Resigns

F. LeRoy Francisco, city member of the Board of Supervising Engineers, Chicago Traction, has tendered his resignation to Mayor William H. Thompson of Chicago. Mr. Francisco was appointed to this position on May 15, 1916, and since that time has been a very constructive force on the board. His service has been characterized by a devotion to engineering principles and an utter disregard of the political aspects of his position.

The *Chicago Daily News* attributed his resignation to the fact that "he could not stand for the tactics of the Lundin political machine and its conduct of city affairs." It is believed that Mr. Francisco was influenced to resign from the board because of the pressure of his consulting engineering practice in this country and in South America.

He is a member of the firm of Francisco & Jacobus of Chicago and New York. It is reported that Mr. Francisco will be succeeded by Joseph Strauss, president of the Strauss Bascule Bridge Company.

### R. P. Woods at New Post

Will Operate Interurban Line—Resigns from Kansas City Railways Board of Control

Robert P. Woods has resigned as a member of the board of control of the Kansas City (Mo.) Railways to accept the position of vice-president and general manager of the Kansas City, Clay County & St. Joseph Railway. As



R. P. WOODS

operating head of the latter road Mr. Woods succeeds the late J. R. Harrigan. A brief announcement of Mr. Woods' election was published in the *ELECTRIC RAILWAY JOURNAL* for May 1.

Mr. Woods has been the city representative of the Kansas City Railways board of control since 1914. In this capacity he has had supervision over many of the improvements made by the company. Because of his thorough knowledge of these phases of the system's activities, it is understood that he will act temporarily as consulting engineer to the board. He will thus be in a position to direct the carrying out of the extensive traffic improvements which are being made at the direction of John A. Beeler.

For several years Mr. Woods has taken an active part in the civic life of Kansas City. He has also been prominently identified with the movement for the formation of an association of municipal representatives of public utilities. A group of such officials met at Atlantic City during the convention of the American Electric Railway Association last October,

and organized the American Association of City Representatives of Electric Railways. Mr. Woods was at that time chosen president of the new body.

Mr. Woods was born in Buffalo, N. Y., on March 4, 1870. At the age of twenty-one years he entered engineering work, and for the following ten years was engaged on a number of bridge, waterworks and sewer projects for various corporations. In 1901 he was made chief engineer in charge of construction of the Wabash River traction line. One year later he was appointed to a similar position with the Indianapolis - Shelbyville interurban. From 1902 to 1904 he served the Indianapolis & Northwestern Traction Company as chief engineer.

In the latter year he became consulting engineer in charge of design and construction of the Lebanon-Thorntown Electric Railway, Lebanon, Ind. Upon the completion of the line Mr. Woods was made vice-president and general manager. He subsequently became president of the company. From 1911 to 1913 he had charge of the building of the 80-mile line of the Kansas City, Clay County & St. Joseph Railway. His connection with the road terminated automatically with the completion of the system.

V. M. Loudon, general manager of the Cleveland, Alliance & Mahoning Valley Railroad, Ravenna, Ohio, has resigned.

H. Albright has been appointed master mechanic of the Cleveland Alliance & Mahoning Valley Railroad, Ravenna, Ohio.

Frank D. True has been elected vice-president of the Cumberland County Power & Light Company, Portland, Me., to succeed A. H. Ford, who resigned several months ago.

Mark A. Williams has been appointed manager of the railroad department of the Cumberland County Power & Light Company, Portland, Me. Mr. Williams has had supervisory charge of the railroad department for some time.

W. E. Riddle, superintendent of transportation of the Cleveland, Alliance & Mahoning Valley Railroad, Ravenna, Ohio, has been made general manager of the company. Mr. Riddle succeeds V. M. Loudon, resigned.

H. M. Verrill, general counsel of the Cumberland County Power & Light Company, Portland, Me., has been elected president of the company. Mr. Verrill succeeds William M. Bradley, who resigned more than a year ago because of ill health.

Percy Priestly has been appointed general manager of the Liverpool Corporation Tramways in succession to C. W. Mallins, resigned. Mr. Priestly, who has had a varied experience as an engineer and a manager, held a double office for Oldham Corporation Tramways before he went to Liverpool in April, 1918. He then took up the position of deputy general manager under Mr. Mallins.

## Dayton & Western Personnel Announced

Independent operation of the lines of the Dayton & Western Traction Company, Dayton, Ohio, was resumed on April 25. For fourteen years the road had been operated as the Dayton-Richmond division of the Ohio Electric Railway, Springfield, Ohio. The Dayton & Western connects Dayton and Richmond, Ind., forty miles apart.

The following operating staff has been named:

Valentine Winters, president.

Henry Gebhart, general manager.

W. A. Coleman, superintendent.

P. A. Hommel, general auditor.

F. L. Boyer, general passenger and freight agent.

Valentine Winters, now president of the road, occupied that position up to the time when the system was taken over by the Ohio Electric Railway. He is the second vice-president of the City Railway, Dayton.

Henry Gebhart, appointed general manager, is vice-president and general manager of the Oakwood Street Railway, Dayton. Mr. Gebhart will continue his connection with the latter company. For two years following his graduation from the University of Pennsylvania with the degree of electrical engineer, Mr. Gebhart served as an instructor in engineering at that institution. He then joined the Westinghouse Electric & Manufacturing Company, but resigned in 1907 to become superintendent and purchasing agent of the Oakwood Street Railway. Four years later he was advanced to the position of general manager.

W. A. Coleman, superintendent, was formerly connected with the Dayton & Western. When the system was taken over by the Ohio Electric Railway, he continued with the latter company as assistant superintendent of the Dayton-Richmond division. He resigned his position with the Ohio Electric Railway several months ago.

P. A. Hommel, general auditor, and F. L. Boyer, general passenger and freight agent, were formerly employed by the Ohio Electric Railway.

Edward I. Blair, assistant to the president of the Chicago (Ill.) Elevated Railways, has been selected by President Britton I. Budd to have direct charge of the operation of the lines of the Chicago & Interurban Traction Company.

J. R. Cooper has been appointed assistant superintendent of the lines of the Connecticut Company, New Haven, Conn., formerly known as the Shore Line Electric Railway. These lines recently reverted to the Connecticut Company under court order.

Edward J. Glennon, Deputy Public Service Commissioner for the First District of New York, has been appointed a Justice of the State Supreme Court by Gov. Alfred E. Smith of New York. Mr. Glennon was formerly assistant district attorney of Bronx County.

Edwin H. Reed has been appointed auditor of the Brooklyn (N. Y.) City Railroad. For the past five years Mr. Reed has held the position of general accountant of the American Public Utilities Company, Grand Rapids, Mich., resigning recently to join the Brooklyn City lines. He was formerly special accountant for the Indiana Public Service Commission.

Ralph W. E. Donges, Camden, N. J., former president of the Board of Public Utilities Commissioners of New Jersey, has been appointed a Circuit Court Judge to succeed Howard Carrow. His territory will comprise the southern section of the State. Mr. Donges resigned from the utility body in 1918 to accept a position in one of the military departments of the Federal Government.

Thomas F. Glynn has been made superintendent of the Lynn (Mass.) division of the Eastern Massachusetts Street Railway. Mr. Glynn, who was formerly a car starter, was recently advanced to the position of assistant superintendent of the Lynn division. His promotion to the superintendency followed shortly thereafter. He succeeds Benjamin B. Foss, who has resigned.

L. J. Davis has been appointed engineering assistant to C. E. Morgan, assistant general manager of the Brooklyn (N. Y.) City Railroad. Mr. Davis was formerly sales engineer for the Westinghouse Electric & Manufacturing Company, with headquarters at Detroit, Mich. He was born at Vandalia, Ill., in 1880. Shortly after his graduation from the University of California in 1905, he entered the employ of the Westinghouse Company as an apprentice. He spent several years in the erection department, where he perfected his knowledge of the equipment and maintenance of cars and locomotives. He was later put in charge of the inspection of the railway and central station apparatus turned out at the company's East Pittsburgh plant. He was then transferred to Detroit as sales engineer.

H. T. Ely, who for the past nine years has been in the employ of the Eastern Pennsylvania Railways, Pottsville, Pa., has been promoted from dispatcher to division superintendent of that company, with jurisdiction over that portion of the system between Middleport and Mauch Chunk, Pa. Mr. Ely's headquarters will be at Lansford, Pa. He entered the electric railway field in 1899, with the St. Louis (Mo.) Transit Company, since which date he has been connected at one time or another with the United Railroads of San Francisco, the Interborough Rapid Transit Company, the Boston Elevated Railway, and the Public Service Railway of New Jersey. Prior to his connection with the Eastern Pennsylvania Railways he held the position of superintendent of the Beaumont (Tex.) Traction Company, a subsidiary of the Eastern Texas Electric Company.

## Obituary

### A. T. Potter, Traction Pioneer

Albert T. Potter, vice-president and formerly general manager of the Rhode Island Company, Providence, R. I., died at his home in Edgewood, R. I., on April 23. Mr. Potter had been ill since July, 1917. He retired from active connection with the Rhode Island Company two years ago.

Mr. Potter's name has been identified with the Providence traction system for more than half a century. Starting as a switch boy and hostler shortly after the opening of the first Providence horse-car line, he literally grew up with the system. He superintended its development from small beginnings into one of the most important electric railways in the East. Respected and loved both by the company's employees and by the public at large, Mr. Potter did much to promote a feeling of co-operation between the railway and its patrons. The title, "A. T.," by which he was generally known, illustrates the universal good will with which he was regarded.

Mr. Potter was born on Jan. 20, 1851. At fifteen years of age he entered the employ of the 'old Union Railroad. Soon thereafter he was promoted to foreman of the Cranston carhouse. In 1875 he was transferred to Providence as assistant to the superintendent. He became general manager of the company in 1888. Four years later, when the Union Traction & Electric Company took over the lines of the Union Railroad, Mr. Potter was made general manager of the entire system. In 1902 he was elected general manager of the Rhode Island Company, and in the following year he became its vice-president. He was subsequently succeeded as general manager by his son, Albert E. Potter, now president of the company.

David T. Davis, first vice-president of the Havana Electric Railway, Light & Power Company, Havana, Cuba, died at his home in New York City on April 25. Mr. Davis was a member of the New York law firm of Davis, Symmes & Schriber.

Oliver P. Covell, aged seventy-three, known as "Old Dad Covell" by hundreds of Toledo people, and the oldest motor-man in the service of the Toledo Railways & Light Company, died at his home in Toledo recently. Mr. Covell had been in the employ of the Rail-Light and its predecessors for more than forty-five years. At one time he drove a horsecar in Toledo. Except for short vacations, "Dad" Covell had worked as a platform employee since Sept. 5, 1875. He held badge No. 1 and had the distinction of operating the first electric car in Toledo.

# Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

## Paulista Railway Contracts

**Westinghouse International Electric Company Receives Orders for Locomotives and Equipment**

Since the announcement of the Paulista Railway electrification in Brazil was made in the April 24 issue of the *ELECTRIC RAILWAY JOURNAL* it has been learned that the Westinghouse Electric International Company has obtained contracts for a portion of the equipment therefor. Two of the four locomotives to be built by this company are for passenger service and two are for freight service.

The passenger locomotives have a one-hour rating of 2,000 hp. and weigh 121 tons. They will be operated from a 3,000-volt direct-current overhead trolley system and will be complete with regenerative control. They are designed for a maximum speed of 65 miles per hour and have a track gage of 5 ft. 3 in. The freight locomotives have a one-hour rating of 1,500 hp. and will weigh 87 tons. They also are operated from a 3,000-volt, direct-current overhead trolley system and will be complete with regenerative control. The maximum speed will be 40 miles per hour and the gage 5 ft. 3 in.

## Metal Market Situation

**Copper Market Quiet, with Deliveries Held Up—Lead Stocks Low**

There has been virtually no change in the copper market within the past few weeks. Prices in the producers' market during the past month have increased one-quarter cent and have held almost the entire month at 19.25 cents. That price still holds for May and second-quarter delivery. Third quarter is marked at 19.50 cents. In the outside market, on the other hand, 18.50 cents is being asked for nearby deliveries, which is three-quarters of a cent below prices asked a month ago. This market is even a little less strong, as a rather large sale was reported this week at 18.37½ cents New York.

Demand in both markets is light. A few sales for near delivery are going through, but sales for futures are quiet. Unrest in four brass mills in New York State and in New England is helping to put a damper on buying for futures as the course of labor is so uncertain. Traffic, too, is still hindering deliveries to refineries, and walkouts in Buffalo railroad yards add uncertainty to the future. Sheet copper is in heavy demand.

Lead stocks in the East are low. Labor shortage and poor transportation

are serious adverse conditions which make production of the metal unsatisfactory. Nearby demand is better at from 8.75 to 9 cents in the outside market in New York. The leading producer's price is still 9.25 cents. Zinc shows little change over last week. There are sufficient stocks available for the small volume of sales going through.

## Electrical Materials Booked at New High Record

**Heavy Ordering of Cars and Equipment Indicate Railway Field Is Contributing Its Share**

From the looks of things, manufacturers of electrical apparatus and supplies are moving on to new high records for the year 1920. According to last week's issue of the *ELECTRIC RAILWAY JOURNAL*, orders placed for rolling stock alone will total more than \$4,000,000, and for the previous week, April 24, orders reported will total \$1,500,000 for rolling stock, in addition to \$2,000,000 for an electrification, which is the amount of the contract of one manufacturer. In this issue orders which will amount to more than \$1,000,000 are noted. Hardly a week passes but that contracts are placed in the electric railway field for equipment that calls for a large expenditure in electrical apparatus.

Bookings for the first four months are at an unprecedented rate and are well in excess of the amount that manufacturing capacity can turn out. Several manufacturers have admitted this to be the case. The one great drawback, besides that of the inability to get sufficient labor to man the machines and handle raw materials, in the manufacturing problem today is the shortage of rolling stock and poor transportation conditions, which are holding up the movement of both raw and finished materials. This condition is backing up shipping schedules in the plants and making it increasingly more difficult to close up the gap between booking and billing.

Noticeable increases in orders taken are found in generating apparatus and supplies. Orders on General Electric during the first quarter of 1920 were at the rate of \$375,000,000 for the year, and during the month of April even this rate was increased. This brings bookings at a rate of \$1,250,000 a day. Orders on Westinghouse during this first three months were at a rate of \$180,000,000 for the calendar year, which is \$600,000 a day. Shipping dates on a large part of the big apparatus will not be consummated during the present year.

## Pole-Line Stocks Low

**Deliveries Lengthened By Transportation Delays—Difficulty in Getting Lumber Out of Woods**

Supplies of virtually all pole-line equipment are short in the market. It has been almost impossible to secure delivery on poles, cross-arms and wood pins for some time, and stocks in the East and in the Middle West are swept clean. In the South conditions are better. Inquiries and orders in the Mid-West are off a bit, possibly because buyers feel it useless to place orders with deliveries as uncertain as they are. Cross-arms are reported in plentiful supply at the mills, but they cannot be moved to jobbers' yards. In some cases producers have been compelled to curtail operations because of congested shipping docks. Several carloads of arms are enroute to Eastern markets but are held up by embargoes.

Wood poles, too, are short, especially in the 30-ft. and 35-ft. lengths. The 40-ft. and 45-ft. poles are in slightly better supply. Red cedar is reported particularly hard to get and is said to be sold up for the year. Lack of snow in certain parts of the Northwest was responsible for fewer poles getting out of the woods last winter because of difficult sledding conditions.

Wood pins are so short in some East and Mid-West markets that Western Union steel pins are being substituted in places. Chicago and New York stocks are virtually exhausted, but several cars are in transit. In New York territory wood-pin prices are very uncertain, while in the Chicago market a recent advance has set lots of 2,000 to 3,000 at \$52.94 per 1,000.

Line hardware is in better condition and stocks are in fair shape. Buying is good, in fact better than heretofore.

## Foreign Trade Convention on Pacific Coast

During the past few years the relation of the United States to foreign trade has undergone a marked change, leaving this country in the creditor class of nations, and it is the effect of such a situation that has been taken as the theme of the seventh national foreign trade convention, to be held next week, May 12-15, in San Francisco.

The general sessions, which will be held each morning and Wednesday afternoon, will take up in order the following topics: Fundamentals of Our Foreign Trade; Exports and Imports; Foreign Trade Policies; The Merchant Marine; National Program of Foreign Trade. Group sessions will also be held at which many topics will be discussed.

## Heavy Demand for Power-Saving Devices

One Manufacturer Advances Prices 10 Per Cent—Good Deliveries Being Made

Pressure upon electric railways to reduce operating costs is reflected in the present healthy market for devices designed to facilitate the saving of energy by motormen. After much pioneer work, manufacturers have succeeded in developing equipment which not only stimulates the car operator to make a good showing in negotiating stated schedules, but which stands up faithfully under the arduous conditions of railway service. The natural result is a growing demand for this class of apparatus, particularly under present conditions of coal cost and in view of the price levels of energy even when purchased by electric railways from central stations and hydro-electric companies.

Power-saving devices for car service have not suffered in general from adverse conditions surrounding the manufacturer as much as apparatus of heavier types, according to the statement of one of the makers of this type of equipment whose manufacturing conditions are discussed in the following paragraphs. While it has not been possible to build up large factory stocks and maintain them against orders for extremely prompt shipment, deliveries are in fairly good shape. In one line, shipments can be made in from six to eight weeks after receipt of order, notwithstanding increased sales compared with last year and rapidly growing foreign inquiries.

Raw material stocks are in pretty fair shape, so that in a representative factory work is under way to build up a stock of 5,000 equipments. Owing to protracted labor troubles in the wire mills, a serious shortage of small sizes of wire used in instrument coils is being sustained by purchasers. The outlook for improved conditions is better, however, for in one notable case involving one of the largest wire-drawing plants in the country, a strike of unskilled labor for a wage of 75 cents per hour has completely failed after four weeks of idleness, and work has been resumed on nearly a normal scale.

No serious difficulty is reported in the securing of castings for car types of instruments designed to save power, and while some uncertainty exists as to the continuance of tool makers in steady production the outlook is for an excellent business year in this line.

Express shipments have been utilized, even on some large orders.

Prices trend upward, but no immediate advance is expected in one representative product, which was obliged recently to be marked up about 10 per cent.

The spreading acceptance of efficiency equipment as a legitimate investment for the operating company is unquestionably a factor making for stability in costs.

## Recording Meter Business Good

A fair demand for recording voltmeters and other chart-using instruments exists at present in the electric railway field. Factory stocks are low, the lighter sizes of wire are hard to obtain, but deliveries can be made in about four weeks in a representative case. Efforts are being made to hold prices against further advancement. One well-known line went up in January—the first increase for three years—but no immediate prospect of higher quotations exists, it is believed. Shipments by express have solved the problem of transportation reasonably well. Development work interrupted by the war is going forward acceptably.

## Gear Association Meets in Detroit

At a meeting of the executive committee of the American Gear Manufacturers' Association, held at the close of the Detroit convention May 1, the present officers were re-elected. The incumbents are as follows: President, F. W. Sinram; vice-president, H. E. Eberhardt, and secretary-treasurer, Frank D. Hamlin.

Messrs. Sinram and Hamlin have served the A. G. M. A. as president and secretary, respectively, since its organization three years ago. During this time the association has grown from eight to eighty member companies and during this period not one company has withdrawn.

One of the chief features of the convention just closed was the devoting of an entire day to the discussion of standardization as it affects gears.

## Air Brake Association at Chicago

The Air Brake Association held its annual meeting May 4-7 at the Hotel Sherman, Chicago, with a good attendance. The most important change in officers at the convention was the advancement of L. P. Streeter, of the Illinois Central, formerly first vice-president, to the presidency, succeeding T. F. Lyons, of the New York Central, as the post of secretary and treasurer is permanently filled. Frank Purcell, of the Northern Pacific, was elected first vice-president, and George H. Woods, of the Santa Fé, second vice-president. These changes automatically upward have made a place for C. M. Kidd, of the Norfolk & Western as third vice-president after having headed the executive board.

F. M. Nellis, of the Westinghouse Traction Brake Company, is secretary of the association.

## Batteries on Deferred Payments

Rather a new departure in the method of payment for storage batteries has been inaugurated by the Edison Storage Battery Company. Edison batteries for all services can now be bought on the deferred-payment plan, which divides payments over a period of twenty months. It is understood that a trade acceptance is taken with the original payment when the sale is made.

## Rolling Stock

New York Municipal Railway, New York, N. Y., is expected to close a contract this week for 100 steel subway cars similar to the ones now in operation. The cars are being ordered for the new extensions which are expected to be placed in operation during the year.

Pennsylvania-Ohio Electric Company, Youngstown, Ohio, formerly the Mahoning & Shenango Railway & Light Company, through the Republic Engineers, Inc., of 60 Broadway, New York City, has placed an order for ten double-truck cars with the G. C. Kuhlman Car Company. Delivery is expected to commence in October.

New York Central Railroad, New York N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Feb. 23 as being in the market for thirty steel passenger cars fully equipped with multiple-unit control for its electric division, has placed an order with the Standard Steel Car Company for fifteen cars of this type. The cars will be similar to those purchased several years ago for the electric division and will be two-motor cars equipped with General Electric B. C. control and B 260 motors. Owing to the increased price of the cars, which has about tripled since the last order, only one-half of the intended order was placed. Delivery is expected to be made in about six months.

Tacoma Railway & Power Company, Tacoma, Wash., noted in the Feb. 21 issue of the ELECTRIC RAILWAY JOURNAL as having placed an order for six safety cars, has specified the following details on this equipment:

Builders	.....The J. G. Brill Co.
Type	.....Birney safety
Total capacity	.....70
Length over all	.....28 ft. 3/4 in.
Truck wheelbase	.....8 ft.
Rail to trolley base	.....12 ft. 6 in.
Width over all	.....8 ft.
Body	.....Semi-steel
Interior trim	.....Mahogany, light
Roof	.....Arch
Air brakes	.....Safety Car Devices Co.
Armature bearings	.....Ball
Axles, diameter	.....3 3/4 in.
Car signal system	.....Faraday
Car trimmings	.....Bronze
Conduits and junction boxes	.....National code
Control	.....K-63, double end
Compressor	.....West D H 16
Couplers, 1 1/2 in. x 36 in. flat end for 1 1/2 in. rim	.....
Curtain fixtures	.....Side windows and vestibule
Material	.....Fabrikoid or Pantasote
Designation signs	.....Hunter
Door operating mechanism	.....
	.....Safety Car Service Co.
Fare boxes	.....Center platform
Wheelguards	.....Six bar, H B. lifeguard
Gears and pinions	.....Pressed steel
Governor hand brakes	.....
	.....West S 6 A Norway iron
Heater equipment, not specified	.....
Headlight	.....Golden Glow S. M-95
Motors	.....2-West, 506-AM-2
Paint	.....Varnish, light mahogany
Registers	.....Stone & Webster standard
Sanders	.....Air, furnished by builder
Sash fixtures, not specified	.....
Seats	.....Heywood Bros., 57-SF steel mahogany
Seating material	.....Rattan, 16 in. x 32 in. cushions
Slack adjuster, not specified	.....
Step treads	.....3/4 in. x 10 in.
Trolley catchers or retrievers	.....Ideal
Trolley base	.....1 1/2 in. x 16 in. x 16 in.
*Trolley wheels or shoes	.....
Trucks	.....Brill 29-E-1
Ventilators	.....Utility standard
Wheels	.....Southern Wheel Co., standard

### Franchises

**Northern Light Railways, Elk Lake, Ont.**—The Northern Light Railways has been granted a charter to build a narrow-gage line between Elk Lake and Gowganda.

**Los Angeles (Cal.) Railway.**—The Los Angeles Railway has applied to the Los Angeles City Council for a franchise to extend its Western Avenue line from Melrose Avenue to Santa Monica Boulevard.

### Recent Incorporations

**Oneida-Sherrill Railway, Oneida, N. Y.**, has been organized to build an electric railway line between Oneida and Sherrill, N. Y., a distance of 3 miles. Preliminary surveys have already been completed. It is planned eventually to extend the line to Durhamville. The names of the promoters of the enterprise have not yet been announced.

### Track and Roadway

**Public Service Railway, Newark, N. J.**—The Public Service Railway plans to build connecting tracks in South Warren Street, Trenton.

**Pacific Electric Railway, Los Angeles, Cal.**—The Pacific Electric Railway is laying new rails on its line in East Colorado Street, Pasadena.

**Pacific Electric Railway, Los Angeles, Cal.**—The Pacific Electric Railway proposes to construct a spur track at Fourteenth Street and Daisy Avenue, Long Beach.

**North Carolina Public Service Company, Greensboro, N. C.**—The North Carolina Public Service Company plans to double-track its line in Elm Street, Greensboro.

**British Columbia Electric Railway, Vancouver, B. C.**—The British Columbia Electric Railway will double-track a part of its Victoria Road line. The cost of this work is estimated at \$25,000.

**San Diego (Cal.) Electric Railway.**—The San Diego Electric Railway has under way a comprehensive program of track repair on its San Diego city lines. The work is being done in accordance with the terms of an agreement between the company and the city.

**Philadelphia (Pa.) Rapid Transit Company.**—An ordinance has been introduced in the Philadelphia City Council to permit the Philadelphia Rapid Transit Company to build an electric railway line in Adams Avenue, Roosevelt Boulevard and Wyoming Avenue.

**Interborough Rapid Transit Company, New York, N. Y.**—Detail studies have been completed for the construction of the proposed rapid transit extension in Queens Borough from the present terminus at Roosevelt and Al-

burtis Avenues, Corona, to Main and Amity Streets, Corona. The line will be a little more than one mile in length.

**Springfield (Mass.) Street Railway.**—The Springfield Street Railway proposes to build a double-track extension in St. James Avenue and a single-track extension through Carew Street and Page Boulevard to connect with the Indian Orchard line in Berkshire Avenue. The rights-of-way are now being surveyed. The improvements, which will be financed through the issuance of 6 per cent bonds, will cost \$300,000.

### Professional Note

**Edward B. Richardson**, formerly of Richardson & Hale, consulting engineers, and **Harry Gay**, who for the past nine years has been in the construction and engineering division of the Boston office of Stone & Webster, have formed the partnership of Richardson and Gay, consulting engineers. The firm will be located at 220 Devonshire Street, Boston, Mass., and will specialize on steam, hydraulic and electrical power plants, mechanical equipment and handling, heating and ventilation, appraisals, purchasing and industrial developments.

### Trade Notes

**Boston Woven Wire Brush Company, Lynn, Mass.**, has moved its offices and works to Reading, Mass.

**Brooklyn (N. Y.) Rapid Transit Company**, is reported as inquiring for a 7½-ton overhead traveling crane.

**Railway Audit & Inspection Company, Inc., Philadelphia, Pa.**, has opened an office in the Perry-Payne Building, Cleveland, Ohio.

**Phillips Insulated Wire Company, Pawtucket, R. I.**, has awarded a contract for the erection of an addition, 45 ft. x 81 ft., to its plant.

**American Bridge Company, Trenton, N. J.**, is planning to make two additions to its works on Federal Street, estimated to cost \$500,000.

**Prest-O-Lite Company, Indianapolis, Ind.**, will build a number of reinforced concrete buildings at Baltimore, Md., to cost approximately \$100,000.

**American Steel & Wire Company, New York, N. Y.**, has planned an addition and improvements to its works at Bessemer, Mich., to cost about \$500,000.

**American Car & Foundry Company, Buffalo, N. Y.**, is planning the erection of a one-story brick and steel car shop at a cost of about \$200,000, including equipment.

**Ingersoll-Rand Company, 11 Broadway, New York, N. Y.**, will construct a three-story brick addition to its plant at Painted Post, N. Y., to be used as a foundry. With equipment it is estimated to cost about \$500,000.

**Page Steel & Wire Company, New York, N. Y.**, has appointed Charles L.

Bennett special representative in charge of the combined offices of its Cleveland and Detroit territories, with headquarters at 818 Guardian Building, Cleveland, Ohio.

**American Brake Shoe & Foundry Company, New York, N. Y.**, will construct a foundry at Newark, N. J. The cost of the plant will amount to about \$400,000, with equipment, and will consist of a one-story main building 120 x 240 ft. with two wings approximately 116 x 200 ft. each.

**General Electric Company, Schenectady, N. Y.**, is reported to have purchased a plant from the Bartlett-Hayward Company at Baltimore, Md., formerly used for the manufacture of munitions. No announcement has been made as to what products will be manufactured in the new plant.

**R. & W. Construction Company, Chicago, Ill.**, has been formed by E. C. Rutz and P. E. Widsteen, formerly of the Woodmansee - Engineering Company. The new concern will specialize in power plant and transmission line work. Offices have been opened at 35 South Desplaines St., Chicago, Ill.

**Bound Brook Oil-Less Bearing Company, Bound Brook, N. J.**, through its general manager and treasurer, George O. Smalley, announces the appointment of George A. Shoemaker as works manager of the company. Mr. Shoemaker was formerly connected in a similar position with David Lupton & Sons Companies, Philadelphia, Pa.

### New Advertising Literature

**Delta-Star Electric Company, Chicago, Ill.**: Publication No. 92, describing a few forms of its unit-type high-tension outdoor substations.

**Heald Machine Company, Worcester, Mass.**: Bulletin No. 20-22A, describing the Heald grinding machines and magnetic chucks, and a booklet entitled "Heald Machines in Operation."

**Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.**: Circular 1,608, in which it describes and illustrates the control of electric motors in industrial applications.

**American Steam Conveyor Corporation, New York, N. Y.**: A twenty-four page booklet, "The American Trolley Carrier," describing a one-man method of handling fuel by this company's apparatus.

**Automatic Reclosing Circuit Breaker Company, Columbus, Ohio**: Bulletin No. 300 and 301 on Automatic Reclosing Circuit Breakers, giving theory of operation, adjustments, general descriptions and applications.

**Sprague Electric Works of the General Electric Company, New York, N. Y.**: Booklet B-3552, giving price lists on its direct-current and alternating-current oscillating and non-oscillating fans and ventilating outfits.