

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 55

New York, Saturday, February 14, 1920

Number 7

Electric Cars Clear the Streets for Other Vehicles

THIS is the time of the year when schedules are slow because the track is the only part of the street which is kept clear from snow, and the vehicles on the track block the progress of the cars. We are not referring to the conditions caused in the eastern part of the country during the past week by the blizzard of Feb. 5. That simply accentuated a condition which exists in practically every city, and every time that there is much snow on the streets. The electric railway company clears the way for its cars, and other vehicles use that part of the street because it is the only one free from snow.

We are referring to this fact not because it is new, but because we believe that a company can well emphasize in some of its publicity matter at this time for the year that it is the only user of the highways which makes any contribution toward the cleaning of the streets. Few people realize what this means to the rest of the community. They would, however, if they lived in New York, where in Manhattan Borough the streets remained impassable for a number of days after the big storm, coincidentally with the stoppage of the underground conduit lines, while in Brooklyn, where the overhead trolley is used, the cars kept in operation and kept open their part of the streets. This service is often entirely forgotten in summer, but in winter it is a very real contribution to the good of the community.

Why the Self-Propelled Vehicle Stays

SOME three or four years ago we were discussing with a railway manager the inroads of the gasoline vehicle in all its forms from Ford to motor truck. The contention of our friend was that once the public realized what a great portion of their taxes were going into the rebuilding of ruined roads, they would tax gasoline vehicles to a point that would greatly impair their growth. Had he realized the variety of powerful interests behind the good-roads movement even then, he would not have been so sanguine. Back of this movement are not merely the makers of automobiles, motor trucks and their accessories, but also the millions of people who own and ride in automobiles or who operate commercial vehicles. All of these interests are willing to see almost any amount spent for the improvement of highways, although they are not equally willing to pay for them directly out of their own pockets in the form of gasoline, mileage, tonnage taxes, etc.

Indeed, it is fatuous business to sit around and hope for such things as an uprising against the cost of concrete roadways, the exhaustion of the gasoline supply or other acts of Providence. The investment behind the self-propelled vehicle will find the power and the brains to keep on growing. That does not preclude the electric railway from growing, too, if it will search its

own bosom and make a friend and partner of the gas vehicle where it can be used to advantage, instead of seeing it only as an interloper. The fact that motor buses and motor trucks usually come to the electric railway man's attention through unfair competitors does not mean that there is no place for the bus in city transportation service. There is no danger that it will supplant the trolley under similar conditions of fare, length of haul and operating requirements, but for feeders to existing lines, at additional and perhaps higher fare, there is often a field. Certainly, the interests of the public will be better served if any bus lines in a city are operated by the existing railway company rather than by an independent corporation, because the railway company has the organization and the necessary knowledge of local traffic conditions.

Take a Chance a La Terre Haute!

CASES in the electric railway desert are so few and far between that we may be pardoned for lingering at the pleasant caravansary of Terre Haute, Ind. To change the figure of speech, Terre Haute was revealed at the 1919 Atlantic City convention as one of the brightest stars in the safety car constellation. Its record answers so cheerfully some of the most difficult questions relating to the electric railway's future that we cannot help setting forth some of the facts again for the well-being of the many who are still trudging across the desert of high operating expenses and declining patronage.

First, the management was bold enough to believe that the automobile simply has created the taste for better street railway service and not produced an aversion for street railways as such. Therefore, it managed to secure up-to-date cars which are operated at up-to-date speeds and at up-to-date headways. Answer from the public: A 43 per cent increase in travel. This means that more people are being carried in Terre Haute on street cars than before the automobile became a factor.

Second, the improvement in service, speed and safety was so obvious to the city administration that it promulgated an ordinance in which the type of car used is distinctly specified as the only type that will be satisfactory to the municipality hereafter. Selfish agitation is thus cut off a-bornin'.

Third, and most important, is the fact that the Terre Haute, Indianapolis & Eastern Traction Company did not have to go beyond its own home district to get the money to make it the first city of its size to have 100 per cent safety car service. Bankers have a painfully suspicious way of scanning electric railway securities these days, being rather inclined to consider them "in-securities." Yet, the most cautious banker must be convinced by a saving of some 8 cents per car-mile;

especially when the cars themselves are running past his door every day bearing load after load of clearly contented riders.

Thus has Terre Haute answered for us the two biggest questions: Can the electric railway survive competition and can it get the money for modernization?

Electric Freight Haulage Will Reduce the H. C. of L.

WE HEARTILY indorse the plea of Mr. Bibbins in this issue for greater development of electric freight traffic. It is of benefit not only to the electric lines but to the public. The steam railroads of the country confessedly cannot handle all of the business offered to them because the demands for freight haulage have grown so much more rapidly during the past five years than the railroad facilities. On the other hand, the electric roads, although they also have not expanded, have considerable unused capacity for handling freight at times when it would not interfere with their passenger business, and they are particularly well equipped for caring for short hauls and city distribution of freight.

America has a reputation for wastefulness of its resources, and conservation is being urged as a national duty. An opportunity for national economy exists in the use of electric railway tracks for transporting freight to the extent of their useful capacity. The investment in these tracks is estimated by Mr. Bibbins at some \$3,000,000,000, yet they are almost idle as regards this necessary service, while more expensive methods are being used. The plan suggested by Mr. Bibbins should appeal particularly to local organizations interested in the development of individual communities, such as merchants' associations and boards of trade, because the benefits thereby obtained should be directly reflected in lessened expenses of manufacturing and reduced costs of living in those communities introducing this reform.

Engineering Association Plans Comprehensively for 1920 Program

THERE are many signs to indicate that the American Electric Railway Engineering Association is aware of the unusual needs of its members for information and inspiration this year. Elsewhere in this issue is a list of committee assignments in addition to that issued at the beginning of the association year. This later list can be considered as an outline of what the engineers believe to be the high spots in the several fields of engineering endeavor, and the complete list may well furnish a basis for the thought and study of progressive engineers this year.

By a coincidence we print this week also a digest of the 1919 convention discussion on track spirals. The report of the sub-committee on standard track spirals of the committee on way matters was presented informally at the convention, and the printers' strike in New York prevented the inclusion of more than a mere outline of the discussion in our regular report issue. With the co-operation of E. M. T. Ryder, chairman of the sub-committee, and J. W. Welsh, special engineer of the association, we are now able to give a comprehensive digest. From this it will be noted that substantial progress has been made in the direction of getting out some standards that will be used, as these appear to commend themselves to users and manufacturers. There is no

reason for further delay in putting these spirals into use, and the sooner this is done the sooner will the effect be appreciable in track special-work cost reduction. This subject is referred to in more detail in the following editorial.

Another evidence of activity was the meeting of the committee on standards held in New York last Monday. This might be termed the "balance-wheel" committee of the association, as its function is to insure steady progress for the technical work. As will be noted in the report printed on the "Association News" page this week the committee set its seal of approval upon a revised report of the committee on power distribution with reference to a specification for overhead crossings of electric circuits with steam and electric railways. It also made a number of constructive suggestions regarding the coming few months' work. In many ways the committee on standards has the most responsible work of the entire group of engineering committees, for it both reviews much of the work of the others and also initiates important work on its own account. The committee is sometimes criticized as ultra-conservative, but the critics should take into account the "balance-wheel" function mentioned before. There certainly is no committee more conscientious in the performance of its duties or more solicitous for the good name and efficiency of the association.

Standardization of Track Spirals Now Open for Discussion

THE preliminary report of the committee on way matters of the American Electric Railway Engineering Association, which was distributed prior to the 1919 convention at Atlantic City, did not include the report of the sub-committee on uniform spirals. The report was presented orally, as a statement of progress, at the convention. At the same time, data were quoted and diagrams were shown covering a proposed uniform system of spirals which had been prepared by the sub-committee. In its report the sub-committee indicated that it had dropped the tentative spiral at first proposed for discussion.

In its place a new system was proposed which, for novelty, simplicity and convenience in use, seems to meet practically every objection which so far has been raised against the idea of uniform spirals. Even the difficulty of substituting the new spiral in replacements when several existing spirals abound seems to have been overcome to such an extent that the instances where the new spiral cannot be used should prove to be a negligible number.

From the discussion at the convention it appears that the way out of what seemed to be an insurmountable difficulty has been found. If this proves to be true, we have made a very important advance in the science of special track work design.

The report of the 1920 committee on way matters will be awaited with a great deal of interest in view of this advance, and in the meantime it is desirable that the subject be given the fullest possible consideration by all engineers who have had practical experience in using or producing special track work.

To start the ball rolling we have prepared the abstract of the Atlantic City discussion. In a short time the proceedings of the Engineering Association will be in the hands of the members. This week's abstract will serve to stimulate thought on the subject, and we shall be glad to open the columns of the paper to the

fullest extent for the purpose of printing contributions to the discussion. The ELECTRIC RAILWAY JOURNAL has on several occasions expressed its belief that the standardization of spirals is not only desirable but is also practicable, and this belief seems now about to be substantiated.

Valuation By Headlines

IN ITS FAMOUS case of *Smyth vs. Ames*, now quoted as a precedent in most valuation cases, the Supreme Court names as items which must be considered and given weight "original cost * * * amount expended in * * * improvements, the amount and market value of bonds and stock, the present * * * cost of construction, the probable earning capacity * * * and the sum to meet operating expenses." The court says further "We do not say that there may not be other matters to be regarded in estimating the value of the property." But we doubt if the Supreme Court ever anticipated, in this latter statement, a new method of valuation such as appears operative just now in New York newspapers, namely, what might be called valuation by headlines and their consequent molding of public opinion. By its statement, the court does not, of course, exclude such an idea, but it is certainly not included. It is a new sort of valuation method. It is not treated in the standard books on public utility finance, but it is being developed so intensely in the Interborough hearings now being held that it may become historic.

The case in question is a hearing to inquire into the financial status of the Interborough Rapid Transit Company, conducted by the Board of Estimate of New York, to consider the justice of its claim to a higher fare. The mayor, a member of the board, has an apparent taste for getting his ideas into print but has heretofore used the letter form. He has, in the present case, developed a new means—that of epigrammatic comment or question—and he has secured thereby headline space in many newspapers. What matters it as to the actual facts? The average reader enjoys these little bits of repartee which he sees so prominently displayed but shuns the mental effort of interpreting whatever real details and figures may be under discussion. He may thus be led to get a distorted conception of the real situation. This, of course, will make it all the more difficult for the board to announce any finding which may differ from the public opinion thus formed.

We do not mean here to enter into discussion of the controversial questions, to defend or condemn the acts and expenditures of the Interborough which have been brought into the limelight in this hearing. Most of this information was previously brought out by the legislative committee of which Senator Thompson was chairman or is of public record. If the board really wants to review the case on its merits, there is, of course, good reason for it to review the facts with the Interborough officials who are most familiar with them, but a more dignified hearing would engender increased confidence in the final decision of the board. It is to be hoped that, when the board considers all the testimony, it will make a decision which is worthy of a representative body of the nation's metropolis. The future stability of New York's local transportation system and, consequently, the prosperity of the city itself, quite possibly depends on this decision. Both the public and the company are entitled to a solution which will result in uninterrupted service on a basis fair to all concerned.

Traffic Studies Pay in Kansas City

“THE average speed of cars was increased from 5.52 miles per hour to 8.33 miles per hour. Sixty-one cars were put through the section (2.36 miles) instead of the former thirty-eight.” This means that some good engineering was done in traffic studies. It happened in Kansas City on a busy line through a congested section in the rush hour. Moreover, this record was made on the first day that the new regulations on Eighth Street were in force and probably does not represent the ultimate gain which will be realized from the modified operating methods. The traffic study paid well in this case:

Kansas City, like many other cities, found some bothersome sore spots in the transportation system. Particular trouble was felt in the two east and west, heavily loaded lines through the congested retail district. These arteries were being pinched more and more and the traffic streams were growing more and more sluggish. Drastic treatment seemed necessary, and a doctor was called. Apparently Dr. Beeler's medicine is reviving the patient.

Intensive traffic studies, directed toward speeding up service in congested districts, have of course been made in many cases, and each one emphasizes the benefit of the practice and adds some new point or points to assist in the general problem. The present instance is an excellent example of painstaking investigation leading to clear, simple remedies which involve no radical departures from tested practice. On another page in this issue we are printing abstracts of the first two sections of Mr. Beeler's report to the Kansas City Railways Company in the hope that the troubles found and remedies suggested may assist other companies in analyzing similar difficulties.

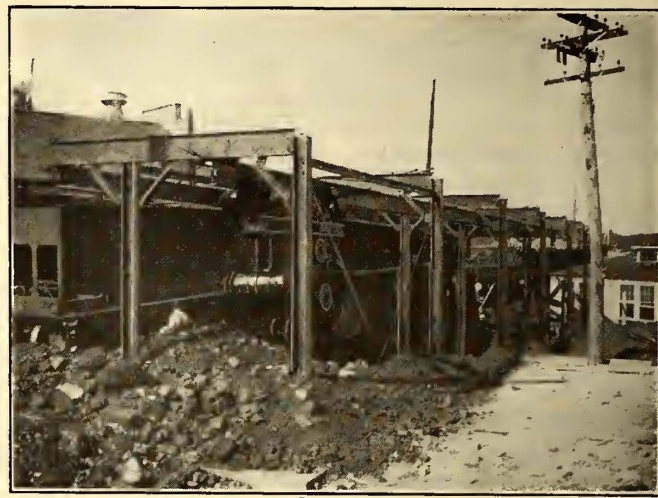
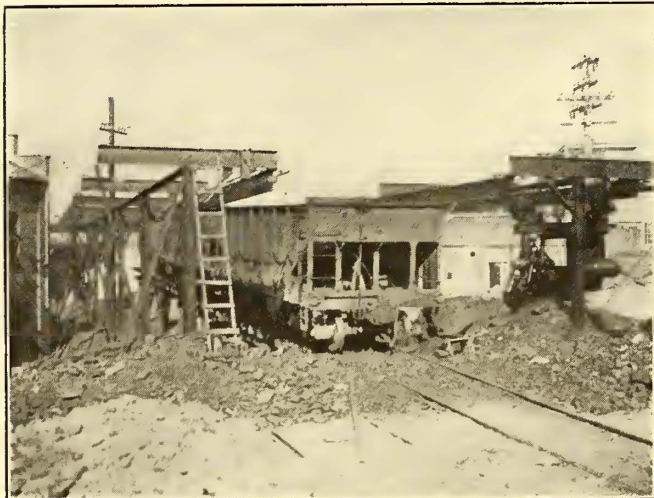
We would call particular attention to one point in these reports—and that is that a large number of the remedies suggested call for action and co-operation by the city authorities. Keeping auto traffic off the tracks, giving street cars precedence and other factors to increase efficiency of crossings, double berthing and other features cannot be put into effect by the company alone, but only with the consent of, or even by the sole action of the authorities. This emphasizes the community interest of the transportation problem and the benefits to be gained through co-operation.

So, is there not a double benefit to be derived from an organized, determined effort to solve such problems? The company, of course, benefits from increased earnings per car hour. The passenger is, in general, in a better frame of mind if he can get through the congested district with reasonable speed. But, in addition, the attitude of the general public is, it appears to us, very likely to be changed from criticism to sympathy and understanding at least, if it is allowed to see the careful analysis that is undertaken, and is made to feel that there is nothing more that can feasibly be done than is being done to provide the best possible service. We believe this to be the case in Kansas City, judging from local newspaper reports. The same remedies that solve the problem, if put in one at a time, do not attract attention, do not accentuate their effect. Publicity causes co-operation of the public and public officials, so necessary to successful traffic regulation.

We bespeak serious attention to problems of this sort and intensive effort toward the application of such clean analysis as has proven worth while in Kansas City.

Handling 50 Per Cent Greater Power Station Load With Nine Men Less

Simple Addition of Facilities at Wilmington, N. C., Which Greatly Enhance Efficiency of Plant Operation—This Installation Is Typical of Labor-Saving Practices Now Becoming General



THE MONORAIL HOIST COAL-HANDLING SYSTEM AS SEEN FROM OPPOSITE SIDES OF THE UNLOADING TRESTLE

WHEN the small power plant becomes loaded to the point that its material expansion is imperative, the transition from the older hand-fired type to the first step in what will ultimately be a modern plant with stokers and coal and ash-handling and storage facilities usually begins. This characterizes the recent improvements made in the generating station of the Tidewater Power Company which supplies energy and street car service to Wilmington, N. C. Like most of the seaport cities, and particularly the Southern ones, Wilmington has grown abnormally during the war and since. The electric light and street railway service grew correspondingly so that the load on the local steam generating plant was greatly magnified.

There was space in the turbine room to install a new Westinghouse-Parsons 2,500-kw. turbo-generator unit in addition to the one 2,000-kw. and one 1,000-kw. turbine units and two old 400-kw. machines already there. But the boiler room, equipped with six 254-hp. and one 520-hp. Babcock & Wilcox boilers, was completely occupied so that an extension of 23 ft. on the end was necessary to house two new 600-hp. boilers of the same type. The old boilers were built for hand firing, and the company burned a great deal of sawdust and wood from local mills taken in exchange for power supplied to them, as well as dirty coke and breese from a gas plant,

and slack coal. The use of wood was gradually being discontinued in favor of coal, as the contracts with the mills expired, because the wood was becoming too expensive. The coal that was used was handled into the plant in wheelbarrows and the ashes were removed in the same manner. This work and the actual firing and tending of the boilers required the services of eight men in three shifts respectively of four, two and two men.

The two new boilers were equipped with Westinghouse stokers and made to do the twenty-four-hour service, thus carrying the principal portion of the load. This large addition of capacity to the boiler plant meant a big increase in the amount of coal to be handled. To take care of that under the old methods meant more labor, but with labor costs continually

mounting, the desire was to decrease rather than increase the amount of labor needed. So a coal and ash-handling plant was installed as described below, which, together with the stokers on the big boilers, made it possible to release nine men from the force required in the boiler room and to handle coal and ashes—six from the coal and ash-handling and three from the boiler room. The interesting part of this is that this reduction in labor was done despite a more than 50 per cent increase in load on the plant.



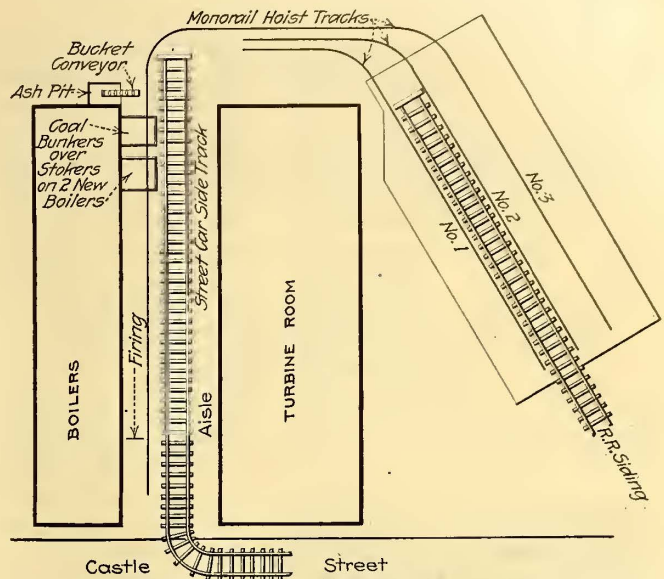
LOOKING TOWARD THE STREET FROM THE REAR END OF THE COAL STORAGE AREA

Before the expansion of the plant, there was provision for only a small reserve supply of coal. This of course had to be remedied for the larger plant, and it was done in conjunction with the arrangement for receiving coal and handling it into the plant. A small area of ground along one side of the power station was available for this purpose. To utilize it, the area was excavated down to the ground level at the rear of the station, which is about 15 ft. below that of the street in front of the area. A wood trestle was then built for the railroad side track, extending through the center of the area and long enough to receive simultaneously three cars of coal. Coal is received in side or bottom-dump cars and unloaded down through and on either side of the trestle. The excavated area provides a storage capacity of 2,500 tons, which gives a fairly good insurance of service continuity considering that the average daily consumption of the plant is 60 tons.

To get the coal into the plant from the storage pile, a Shepard Electric Crane & Hoist Company monorail hoist system was installed at a cost of approximately \$18,000. The layout of this monorail system comprises a single track extending through the boiler room, passing over the bunkers directly above the stokers of the new boilers and out the rear end of the boiler room, thence curving around and branching into three tracks which extend across the length of the storage area. There is one of these tracks on either side of the unloading trestle and an extra track on one side of the trestle which is used for putting coal into and taking it from a reserve pile.

The hoist car may be operated over any of the three tracks by the operator simply throwing the switch, which is plainly seen in an accompanying illustration. Automatic stops are provided so that the car cannot run off the open end of the monorail if the switch is not properly set. The general layout is shown in the rough sketch reproduced herewith.

The hoist is equipped with a $\frac{3}{4}$ -yd. clamshell bucket and three driving motors which operate on the 600-volt railway current supplied by means of two trolleys, one either side of the monorail. One motor drives the car along the system, another raises and lowers the hoist, and the third opens and closes the bucket. This equipment renders practically unnecessary the manual handling of coal. Some coal must be shoveled from

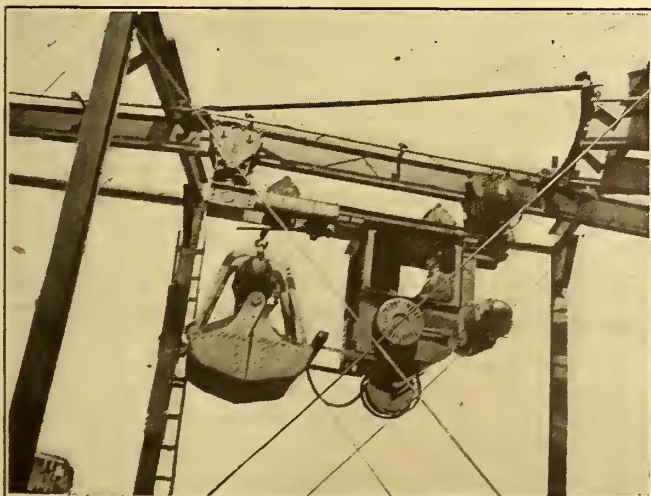


ROUGH SKETCH SHOWING THE LAYOUT OF FACILITIES AT THE WILMINGTON POWER PLANT

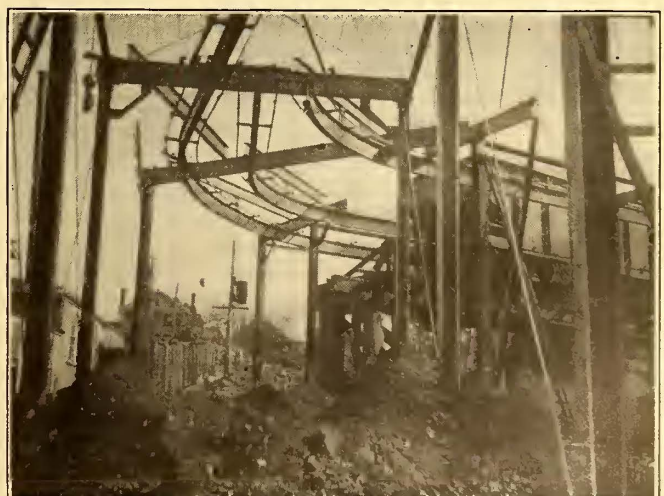
underneath the trestle to make room for new shipments, particularly when it has been received much faster than used. But this condition is minimized by taking coal from underneath monorail tracks 1 and 2, with the hoist, and dumping it under track 3, provided there is storage space for it.

Since the monorail was extended all the way through the firing aisle in the boiler room, it is now used for bringing coal to the hand-fired boilers as well as to the new stoker-fired boilers, by simply lowering the bucket and dumping the coal on the floor in front of each boiler. As the hoist car enters the boiler room, it runs upon a Fairbanks scale balanced against the weight of the empty hoist and operator. The operator stops the hoist here and balances the scale against the loaded hoist. He inserts a card in a slot in the scale and squeezes two levers, and the weight of the coal is impressed or cut into the card. Totaling the readings on these cards at the end of the day gives the amount of coal burned in the plant. The amount burned in any one boiler can, of course, be kept separate for test purposes if desired.

The ashes from the hand-fired boilers are raked out onto the floor in the firing aisle from whence they are



THE HOIST CAR PROCEEDING TO THE BOILER ROOM WITH ITS BUCKET OF COAL—THE THREE OPERATING MOTORS ARE CLEARLY SHOWN

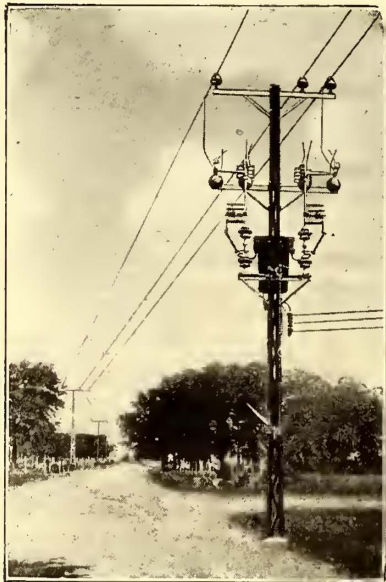


THE MONORAIL SWITCH AT THE REAR OF THE POWER PLANT WHERE THE SINGLE RAIL BRANCHES INTO THREE DISTRIBUTING RAILS

picked up with the monorail hoist and dumped in a car on the street car side track which extends through the boiler room firing aisle. The ashes from the stoker-fired boilers drop into ash cars in a tunnel beneath the furnaces, from whence they are removed to a pit just outside the building and from thence elevated by a bucket conveyor and dumped into a car standing on the track just mentioned, for hauling out on the roadbed for filling purposes somewhere on the railway system.

Farm Service From Interurban Lines Should Be Profitable

ELECTRIC interurban lines having an alternating-current transmission system can develop considerable farm business throughout the territory they serve



POLE EQUIPMENT FOR PRIVATE POWER SUPPLY

in the same manner followed by transmission companies. At each farmhouse is installed a transformer with a complete switching, choke coil and lightning arrester equipment, as illustrated. The switch is preferably of an interlocked type, operated from ground level, the fuses being so located that they can be replaced by the farmer. In this manner the growing demand for electric service on farms can be used as an additional source of revenue to the rail-

way companies. There has been a steady development during the past few years in apparatus for taking care of small consumers in this field, and this apparatus is reliable in every way.

Having Infrequently-Used Snow Scraper Always Ready

The Newport News & Hampton Railway, Gas & Electric Co., Hampton, Va., has little use for a snow scraper. But on the rare occasions when a snow storm causes trouble, a three or four-hour delay in installing a large scraper on a car is serious. Consequently, E. C. Kelly, overhaul shop foreman, endeavored to make a permanent installation of the scraper on a car which would involve an investment small enough to warrant tying it up continuously. The idea was of course advanced for the sake of having the scraper all ready on these rare occasions when needed.

A Root spring scraper was installed at a 45-degree angle across the track on the bottom of a small four-wheel flat car, and the car was loaded with eight old car wheels to weight it down. The scraper is connected to a raising and lowering mechanism consisting of a chain, attached to a wheel mounted in a frame above the flat-car floor, which is turned upon its axis by means of a 3½-ft. lever.

Airplane Gives New Data on Air Resistance

Experience and Tests Show Only About One-third the Air Friction Assumed to Be Met by Electric Cars

AIR friction and the part it plays in increasing the duty required of a railway motor has always been an interesting subject to those engaged in railway motor application work. But while air friction does resist car motion it is only one of several forces that do this. It is therefore a matter of fundamental importance in the aeronautical field where it constitutes the sole resisting force to the forward motion of aircraft. During the war thousands of trained scientific workers all over the world studied the problems of aerodynamics and many millions of dollars were spent in airplane experimentation and development. It would seem, therefore, that some of the fund of information thus accumulated relative to air friction might be of value to the electric railway industry.

That air friction is an important component of train resistance particularly at high speeds has long been known. A very considerable amount of experimental work has been done in an effort to determine its exact amount for cars of different designs and a number of formulas for calculating it have been proposed. Possibly the most noteworthy work done along this line in the United States was that by the Electric Railway Test Commission at the St. Louis Exposition in 1904. The Berlin-Zossen tests made in Germany at about the same time also yielded valuable results. But in none of the work done on railway cars has there been available the test facilities, the money or the personnel available in the airplane experimental work.

Air friction, in the usual train resistance formula, is accounted for by a term involving the product of a constant based on test results and the square of the car speed. A comparison of six well known train resistance formulas shows that for a 40-ton car with a front end area of 100 sq.ft. running at the speed of 50 m.p.h. the air resistance terms in the formulas give results varying from 4.6 to 12.0 lb. per square foot. The average value for the six formulas was 7.36 lb. per square foot.

Data covering the air resistances of a large number of different types of fuselages, or the bodies of airplanes were published in a recent issue of *Mechanical Engineering*. These data reduced to a 50 m.p.h. basis give resistances ranging from 0.95 to 3.93 lb. per square foot with an average value of 2.24 lb. These figures are only about one-third of those given above for railway cars. As might be expected the shape of the fuselage, the projections from it and the openings into it have a marked effect on the air resistance. For instance the resistance on a certain stream line body with a pilot's seat is about one-third more than the same body without the seat and its opening into the body. Fuselages with round section stream lines give the lowest resistance.

The discrepancy between the resistances of airplane fuselages and car bodies is quite large and would seem to be worth investigating. It would be absurd of course to subordinate to air friction other important factors in car design, but it is an open question whether all of the attention has been given this factor that it deserves, particularly in cars which have been designed for high-speed service.

Neglected Opportunities In Electric Railway Transportation

Lower Cost of Passenger Fares and Distribution of Necessities Possible Through Electric Package Freight Transport, City Merchant Delivery and Line and Terminal Interchange with Steam Roads

Wanted—a New Outlook and a New Deal

BY J. R. BIBBINS

Engineer, The Arnold Company, Chicago

PERHAPS the most pressing question before the electric railway industry today is to devise ways and means for increasing its revenue producing business by all justifiable means and this promptly. If the widely heralded present day policy of "coordination," as applied to transportation, has definite meaning, it will not overlook the great possibilities of the established electric lines as a factor in the movement of fast and perishable freight, express and other commodities in which rapid dispatch is urgent, and in a more intensive use of electric railway mileage, particularly in terminal districts and through interchange with steam roads.

Up to the present time, the electric roads have been largely neglected in the public mind as other than passenger carriers. Probably the majority have been located and built primarily for such passenger travel. However, there exists in this country a large mileage of interurban electric roads constituting a valuable carrier network which could be utilized far more than at present, as secondary carriers supplementing rather than competing with the steam roads. A few have developed freight handling business extensively, notably the Pacific Electric System.

The logical use of the electric roads to their fullest extent involves the following:

1. A public policy which recognizes the duty of all railway operators to utilize the investment to the best advantage, thus ultimately reducing the unit cost of all service.

2. A railroad policy which recognizes that electric lines have a very large service capacity for supplementing steam road service, with investment already made and at a cost of service probably far below that which would be necessary for the steam roads to secure equivalent facilities.

3. The organizations of electric railway systems with-

in large cities for the purpose of conducting during light hours of traffic a transfer or local package business, especially between the downtown wholesale and retail districts and outlying residential points of distribution.

4. The organization of the city terminal systems, including interurban terminals for the purpose of developing a less concentrated terminal distribution therein than is possible with steam terminals without prohibitive development expense.

5. Interchange with steam roads at strategic points where the electric lines can become feeders to or connecting carriers for the steam lines and can thus secure for local merchandise a more convenient and efficient city entrance already possessed by the electric lines.

6. Incorporation of electric lines into a universal Terminal Belt Line service, together with strategic parts of steam lines, in order to promote the most efficient means of internal city development, freight interchange and dispatch and possibly the ultimate electrical operation of all such service within the city.

7. Electric roadbeds and equipment suitable for this class of service, so as to avoid the objection of being a highway nuisance.

8. A sufficient quota of electric lines to enable electric lines to take their proper place in this carrier equipment pool, or else an equivalent contribution to such quota on a proper rental basis.

9. Express stations so located within the various city and district centers as to be accessible and operated on the "union freight station" plan, thus simplifying the responsibilities and operations of the shipper, and encouraging his trade.

10. Schedules so arranged as to concentrate the electric delivery and express business during the light hours of city passenger travel, thus avoiding the prin-

THE electric railway industry, only about twenty-five years old, comprises throughout the United States a trackage of nearly 50,000 miles and a capital investment estimated in excess of \$4,000,000,000. This mileage is nearly equal to the entire steam railroad mileage of the southern district of the United States and not far from that at the densely settled eastern district. Its revenue passenger traffic is over ten times that of all railroads of the United States today. In passenger miles (passengers carried one mile), its traffic is equal to that of the entire United States railroad traffic of ten years ago and is 80 per cent of the railroad traffic today based on an average journey of 2.5 miles for electric and 33 miles for steam passengers. It is variously estimated that a total of \$200,000,000 to \$600,000,000 new capital is required per year for normal progress of the industry. While the electric rate is probably 2 cents or under per mile, the steam rate is 2 to 3 cents per mile. On the steam roads the freight earnings are nearly three times passenger earnings; on the electric railways, but a small fraction or negligible. But the cost per mile of electric line exceeds that of steam on account of expensive city construction. In 1916 the property account of the United States railroads averaged about \$2.80 per \$1 of annual gross revenue; the electric railways require about \$3 from passenger business alone, although capable of adaptation to freight transport also.

J. R. BIBBINS.

cial source of opposition of public authorities in the use of thoroughfares where this is necessary.

FIRST—RECOGNITION OF THE NECESSITY

Perhaps the most essential need in this program is the encouragement of the proper frame of mind and the necessary co-operation of city authorities and steam railroad executives and with the electric railways as the intermediate link. It is a matter of common knowledge that the general attitude of hostility of city governments and well-meaning but often misguided citizens toward the electric railways has taken the definite form of open opposition to any plan enabling electric railways to depart in the least from the specific purpose expressed in the original ordinances. This has practically restricted the railways to a passenger carrying business. In most cases, however, when these franchises were assumed, the usefulness of the electric lines as agencies for rapid transport of packages, freight and perishables was not generally understood by either party to the bargain.

In the interim, the cost and difficulty of internal city transport by trucks and motors has increased tremendously. Also, with the growing traffic upon the steam railroads, and the checking of growth in facilities due to impaired financial credit, the problem of l. c. l. or package freight transport adequate for the needs of the rapidly growing cities, has been increasingly difficult of solution. In a number of cities, car-load "clearing systems" have been organized (notably the Belt Railway Clearing Yard in Chicago, with capacity of 10,000 cars per diem), but the problem of clearing l. c. l. business, and especially of handling perishable food produce, rapidly and conveniently, as needed by our large cities, has grown without commensurate improvements taking place in more rapid methods of distribution within the cities, both with respect to tracks and numerous distributing substations.

It is pertinent for every student of economics to ask the question—how long can this expensive and burdensome system of intra-city transport and distribution of dispatch freight continue under the present plan? This is one phase of the problem to which this inquiry is directed.

Obviously, an "entente cordiale" must be established among the three parties—city, electric railways and steam railroads—with a full understanding of the basic necessities and possibilities before any decisive improvement can take place. Given such an understanding and a consequent desire to utilize to the fullest extent all transport agencies, in the effort to simplify and put to the best use all existing investment in standard gage tracks and facilities throughout the terminal districts, whether steam or electric, then we may form some comprehension of the future.

Electric Railway Mileage: Chicago has over 1,250 miles of standard gage electric tracks (nearly 200 miles of which are elevated), extending radially and laterally throughout the entire area of some 200 square miles; Brooklyn and Boston have each about 600 miles, surface, elevated and subway; Pittsburgh has 600 miles, and San Francisco about 350 miles. The rapid transit mileage is especially important, being upon private right-of-way and strategically located.

In general, the city tracks extend from the retail, wholesale and railroad freight house districts into all parts of the city, with a radius of haul of from 10 to

15 miles. In many of these cities also, interurban lines radiate in all directions into and through the producing suburbs and countryside upon which the city should be dependent for its main consumption of farm products. This extremely effective system of local transport is superimposed upon a large system of railroad terminal lines, freight stations, substations and belt railways, the latter having developed along exclusive lines of frequent and convenient interchange, but between steam roads only.

On the other hand, the electric railway system is practically isolated as regards its utility in this general scheme of city freight transport, which applies not only to the city railways, but also to the interurbans. In fact, both the cities and the steam railroads have heretofore generally pursued a policy of deliberate and rigid exclusion of the electric railways from fast freight carriage, the former by restricting the city lines exclusively to passenger service, the latter by refusing to interchange freight with the electric interurbans except in isolated cases and where both steam and electric lines were jointly owned or controlled.

Interurban Development: Only the long distance interurbans have measurably succeeded in utilizing their investment to some extent for freight carriage when their contracts with the cities have been broad enough to permit it. In the Middle West, particularly, this was foreseen and, as a result, some of the large interurban systems, such as those radiating from Detroit, Cleveland, Columbus, Minneapolis, etc., actually have developed a considerable fast freight business within and between cities served by their lines. Detroit and Indianapolis are conspicuous examples of the possibilities in this section, and express business is now being conducted over these lines from large well equipped city freight stations, with regular schedules, in suitable enclosed equipment, operated during non-rush hours in and out of the city. This fast freight service extends in many cases within a radius of 100 to 300 miles, under operating agreements with connecting electric lines.

As a specific example, in one of the cities above named, the electric interurban lines actually developed this fast freight service to such an extent as to handle over 80 per cent of the milk business in a large section of the city, with a large saving in time of transit and expense in local distribution by the merchandizing companies, not to mention the saving to the city in the wear and tear on pavements by long trucking hauls from downtown railroad freight stations and the important saving in this particular product through more rapid transit and delivery.

In striking contrast, the Northwest Chicago suburbs, containing vast truck gardens, daily send their hundreds of tons of food produce by vehicle 15 miles to the congested downtown wholesale market, from which it is again hauled out by the retailers located from 10 to 15 miles distant, throughout the city.

SECOND—POSSIBILITIES OF CO-OPERATION

If the electric railways of the country, with their capital investment of over \$4,000,000,000, of which possibly three-fourths represent investment in tracks and facilities practically unused during non-business hours, could be utilized as a supplemental distributing agency in the general transportation plan, it is difficult to form a modest conception of the benefits to be derived jointly by the public, the cities and by the

carriers themselves, both steam and electric, in resulting economies over the present wasteful and complicated system of city distribution. For the electric lines, there would result new revenue, utterly unattainable under the present operating system of passenger transport, at no additional cost to the city or to the public, and little to the carriers. The economy would be clean-cut. For the city there would result a very large decrease in wear and tear on city streets by vehicles and in the inevitable congestion which results from concentrating within very limited hours the enormous vehicle traffic in the streets of the busy districts. For it is a fact that trucking traffic actually superimposes upon the rush hour peaks of passenger travel, resulting in the appalling conditions which are daily encountered in the outskirts of the business district of Chicago and elsewhere.

This situation, as time goes on, must become worse rather than improve, as no effective methods have yet been discovered or put into effect either by cities or the carriers, to radically improve the situation. In fact, the consistent opposition of the teaming and trucking interests themselves to any such improvements, is an important factor.

Merchant Delivery: One great advantage in using electric lines for internal city transport may be mentioned in the case of such hilly cities as Pittsburgh, where practically all of the wholesale and retail business as well, is conducted in a small congested triangle in the bottom lands at the intersection of the Alleghany and Monongahela rivers. From this triangle, all of this merchandise is daily trucked uphill to the residential districts, which are located principally upon the highlands (300 to 500 ft. elevation and with hauls of 5 or 10 miles). Even in large flat cities like Chicago, the same conditions exist, except that in place of the steep grades, the hauls are longer—running as high as 15 to 25 miles.

In Pittsburgh, several logical sub-centers or delivery points are already established in the form of little cities within the big city, such as "East Liberty," which fact increases the opportuneness of the proposed plan. But in all of these cities, delivery substations could readily be established at the outlying carhouses or along the electric lines from which local deliveries could be made quickly and at much lower expense than with the present haul from "downtown."

This initial cost of transportation under the existing plan of course is borne by the ultimate consumer, which is the public, and finds its ultimate expression in the so-called "high cost of living." It should be re-labeled "high cost of doing business."

Industrial Service: In the industrial field, another great opportunity for increased usefulness exists for the electric lines by delivering during non-rush hours express consignments to various industries throughout the city, perhaps isolated from railroad service, such for example as spare parts for automobiles. In fact, a large business of this nature is now being done by some systems in and between towns and cities reached by interurban lines. But this business could be greatly expanded by the further co-operation of the interurban and urban railway systems, which of course would only be permissible through assent of the city authorities to this general plan.

As an example of extraordinary co-operation between steam and electric lines in electric freight service, the city of Syracuse may be mentioned, in which the West

Shore steam main line is practically given over to the third-rail electric, which operates regular passenger and freight schedules to the east, including three classes of service at different rates, viz: (1) terminus to terminus, consignee doing his own trucking; (2) station receipt and trucking delivery; (3) receipt and delivery by truck at both termini.

THIRD—PUBLIC POLICY

In order to bring this system of electric distribution about on an efficient operating plan, the city authorities should recognize the values in this idle investment in tracks, power stations, and other facilities, which could be used to produce additional railway revenue and thereby relieve the passenger transportation of a very considerable part of the investment burden. It is evident that in no simpler way would it be possible for the railways to keep down to a moderate price level the passenger fare which is now so perplexing a problem.

The public should be informed concerning the basic costs of transportation not only for its daily street car rides, but also for its household commodities, and that such a plan is not designed to guarantee a longer lease of franchise life (to a supposedly selfish monopoly), or undue return on its investment, without compensating return to the public.

To the steam railroads it should be demonstrated that a system of local express distribution is already available for reasonable use, far more extensive in character than they could develop as along present independent lines.

And the electric railways should co-operate in a campaign of education in a broad-minded public spirited way, endeavoring so to arrange schedules as to interfere as little as possible with normal passenger transportation and without such use of the city streets as to incur the opposition of the public.

It will be necessary to design a complete system of routes and delivery points with suitable substations and to serve them on schedules reasonably suited to the needs of the public, not only for food produce but for retail merchandise. It will be necessary to provide equipment suitable for this freight carriage, which will not be unsightly or noisy, and to maintain the roadbed in an efficient way. It may also be necessary as traffic intensifies, to provide independent rights-of-way for delivery trunk lines. This could well be worked out in connection with existing elevated and subway lines or possibly with steam railroad trunks in some instances, assuming that a spirit of co-operation exists.

The electric railways cannot, of course, expect to utilize the city streets for freight transport, except under reasonable restrictions and schedules. But in the great majority of cases, the existing investment can be so used without serious disadvantage to the public or the city, supplemented, as business grows, by more independent trunk routes. It is believed that with reasonable co-operation and publicity, the permission of the city authorities can be secured as a part of the general problem of modern city planning or zoning, which is now under active discussion in many cities.

FOURTH—STEAM ROAD INTERCHANGE

Possibly half of the electric railway interchange of the United States is interurban. A study of the district maps indicates a very extensive network of these

interurbans connecting the various centers of population, especially in the Middle West. This network represents investment originally made largely for passenger service. But it is a fact that the use of automobiles in the countryside has so reduced the revenues of the interurbans as to render it difficult if not impossible for them to live except for the through business from city to city. Many of the interurbans were built to develop the countryside, with perhaps only one large terminus. As a result of this automobile invasion, the principal support anticipated from the countryside has gradually waned and net revenues have diminished to the vanishing point. This has made necessary a reduction of service schedules, which unfortunately but necessarily has further encouraged the use of automobiles. Looking into the future, the "good roads" program of the various states spells further diminution of revenue and increase of private automobile transportation in the countryside. There is now one automobile to every five families and to every nineteen persons in the United States—a total of 5,300,000 motors.

It is therefore obvious that this interurban investment, if it is to be conserved, must look to other lines of business. The interurban network intersects the steam railroad network at numberless points and the interurbans have in the majority of cases been projected into territory which the railroads have not and could not economically develop. But, assuming a more friendly policy between steam and electric lines, should it not be possible for these interurbans to be used as supplemental traffic lines or branch line connections to the steam roads? This will require a new "open door" policy of freight interchange between steam and electric lines at convenient designated points, possibly with a reciprocal "right-of-user," according to location, on a reasonable mileage or traffic basis.

And it would seem an eminently proper policy for the United States Railroad Administration, in the interests of conservation, to authorize a survey, at least of this interurban network in the effort to solidify the general transportation system, promote short-routing and reduce the delays in both main lines and terminals with which the steam roads are now grappling. If the roads are, in fact, to be organized into regional groups, there is no reason why interurbans should not receive the same consideration instead of being permitted to decline into a state of disuse or complete abandonment.

Railroad Policy: It has been the obvious policy of most steam railroads to ignore the electric interurbans entirely as an element in transportation. They have uniformly refused interchange connections except where the electric line had the courage and persistence to take their cases to the courts for redress. However, even with these interchange connections established by judicial decrees, there has not existed that cordial business relationship necessary for the full usefulness of the facility.

The principal argument advanced by the steam railroads is that the electric lines do not provide roadbed or equipment suitable for such reasonable interchange traffic and that the railroads are obliged to carry the entire investment in rolling stock which the interurbans would thereby be enabled to use without compensation, in other words, that the electric lines are a "parasite" of the railroad business. Consequently, the steam railroads have proceeded with their

independent development, the acquisition of enormously expensive terminals and have in many cases, loaded themselves down with branch lines which never have paid and cannot pay a reasonable return on the investment.

Railroad Branch Lines: In fact, many railroads are now confronted with the "branch line problem," and owing to the necessary standardization of equipment, they cannot operate their expensive trains by a sufficiently frequent schedule to realize on their investment. In numerous cases, the steam railroads have developed branch lines into territories which have so changed in character that the original traffic has disappeared, for example, lumber, oil and mining districts, which are now completely exhausted, leaving only a small local freight business for which, alone, the lines would never have been built.

Thus both steam roads and electric roads are confronted with a situation of non-paying lines, particularly branch lines, which operate as a serious drain upon the revenues of the established main lines, and which cannot be abandoned because of the injustice to the people of the regions affected. The electric roads cannot finance their pro rata share of rolling stock because of the arbitrary attitude of the steam roads, and the whole situation is involved in the existing system of car rentals, which is of course based upon the theory that each road contributes a reasonable pro rata share to the rolling stock pool of the country according to its mileage and traffic.

Fair Basis of Usage: However, it would seem that an impartial analysis of cost-of-service in regard to rolling stock and terminal switching would reveal some reasonable basis of rental whereby the existing differences as between the electric and steam roads could be adjusted, at least temporarily, and until the electric roads could develop their traffic and terminal facilities and, with their added revenue credit, finance their necessities in new rolling stock. In fact, some of the stronger interurbans stand ready to take this step. The principal difficulty lies in adjusting and harmonizing the points of view and in correcting the arbitrary attitude of railroad and rate policy.

A Concrete Case: The possibilities of joint action are well illustrated in the extraordinary development of an automobile manufacturing city of the Middle West, which, within the present century has grown from a small country town to a city of 100,000 inhabitants and has doubled its commercial activities within about eight years, i. e., at the same rate as Cleveland, Ohio. The city authorities are bending every effort toward the establishment of an industrial belt line around the city, which will not only serve to by-pass through freights but also to develop a new industrial city of a capacity equal to the existing one.

This city is served today by two steam lines and two fast electric interurban lines. The steam road situation has reached a point of complexity and shortage of service at critical times which requires that the roads must now depart from the previous "way station" plan of operation to a co-operative terminal system with adequate clearing and interchange facilities. The electric roads handle some intra-city fast express, but both interurbans could enter such an enlarged terminal system to great advantage and also could operate as connecting links to other existing railroads which now have no terminal facilities in the city.

The steam railroads naturally desire to retain their strategic advantage as regards freight transportation, but the city authorities cannot afford to promote further development on this "way station" plan, which would unquestionably mean a restricted development. But, by using the electric lines as a connecting link, the city could secure a large increase in its pro-rata share of special automobile cars from one of the largest trans-continental railroad systems, with which the electric lines would interchange. This special automobile equipment is essential to the industry. However, under the existing plan of railroad operation the city is practically restricted to being only an "industry" on the lines of the two existing roads now serving the city, and the industries are restricted to the pro rata equipment of these two roads.

Here is a typical development situation and a contrast of conflicting interests which is probably duplicated in most cities. For the electric roads to take their specific grievances to the courts and commissions will not solve the problem in time. In fact, in this case the electric lines have already won a decision establishing a steam road interchange, but without results.

WANTED—A NEW DEAL IN CONSERVATION

It therefore appears to the unbiased observer that a new policy is urgently needed in American railway development. In no phase of our national activity is there greater need for "conservation" than in conserving jointly the existing investments in railroads and railways. At recent national conferences in Washington for the consideration of the welfare of both the steam railroads and the electric railways, no definite proposals have appeared urging co-operative effort and development as proposed in this argument. Each group of interests has seemingly neglected this proper source of economy and additional revenue with existing investment, which seems to offer such great possibilities. In the meantime, both interests are seriously handicapped in their necessary growth, and terminal operation in the large cities yearly increases in difficulty and complexity. Even under the coordinating influence of the United States Railroad Administration, only minor improvements and perhaps a beginning along major lines have been possible within the short period of its control.

For the Associations: It would therefore seem an eminently wise and prudent policy for the principal railroad and railway associations to join hands in the further study of this problem of co-operation, and,

through joint sub-committees, to conduct a searching investigation of the essential factors involved in carrying out such a program as herein discussed, possibly along the following lines:

A SUGGESTIVE PROGRAM

1. The physical plan of railroad and railway network and the possibilities of more intimate co-operation through interchange, short routing, etc.
2. The physical plan of the respective terminal systems and the possibilities of co-operative use to expedite terminal movements by interchange, belt lines, transfers, etc.

3. The physical plan of the electric urban distributing lines and the possibilities of developing them for expediting internal transport during proper hours of the day.

4. The franchise relations with the cities and the legal and practical modifications in utility and public policy required to bring about the more intensive use of the urban lines for city transport under proper public regulation.

5. An educational policy designed to apprise the public of the opportunities for further service and development of the railways based upon a proper allocation of the costs of this additional service and the possibilities of continuing by this means, a moderate level of passenger fares so as to avoid the distressing necessity of establishing a fare so high as to discourage travel, interfere with proper city development, destroy outlying property values in the large cities through zone fares and encourage automobile competition with the serious problem of downtown traffic congestion.

6. And finally, the basis of a reasonable co-operative

agreement between steam and electric roads for a less restricted interchange and usage of existing strategic investment in line and terminal facilities, fair to both parties, so as to prevent the unnecessary wastage of existing investment, uneconomic extensions along competitive lines and the needless restriction of general growth.

While this program may appear to some too broad in scope and too radical in character to draw serious attention, it is nevertheless patent that half-way measures in the past have failed of achievement. With a new deal, broad enough in vision to challenge and hold public attention, with a possibility of definite relief by lower fares and lower transport costs of city necessities, the foundation will have been laid.

In the panel is a definite legislative recommendation somewhat along the lines of policy advocated.

Recommendation of Street Railway Investigation Commission of Massachusetts, 1918

3. Trolley Freight:

This Commission recommends that the authority to grant permits to street railways to become common carriers of newspapers, baggage, express matter and freight, now vested in the local authorities, shall be transferred to the Public Service Commission. Proposed legislation will be found in Appendix A, 3.

Be It Enacted as Follows:

Section 1. A street railway company upon the petition of any interested party may be authorized to become a common carrier of newspapers, baggage, express matter and freight in such cases, upon such parts of its railways, and to such extent as the public service commission after public notice and a hearing shall determine that the public interests and convenience require. Any street railway acting under authority so granted shall be subject to such regulations and restrictions as said commission from time to time may make, and shall be subject to the provisions of all laws now or hereafter in force relating to common carriers in so far as they shall be consistent herewith. The authority conferred upon any street railway company by virtue of the provisions of this act may be modified or revoked at any time by said commission if it shall determine upon investigation and after public hearing that the public interests so require.

Section 2. This act shall take effect upon its passage.

Spacing of Car Stops

Reasonable Average Spacing of Traffic Stops and Fare Stages Is Not Precluded in Attracting Short Rider at Short Fare

THE matter of stop spacing and location necessarily is extremely important in a system of graduated fares which is based upon securing a large proportion of riders who have less than 1 to 1½ miles to go. We cannot reasonably expect a person to ride if one-fourth of his total journey along the route of the railway must be traversed on foot. How then has this problem been solved on British short-ride tramways where the cars seat up to seventy-eight passengers?

The gratifying answer is that in respect to stop spacing, the British tramway is frequently better off than the American street railway. Compulsory stops for safety purposes are comparatively rare, while the now-absurd firehouse stop is apparently unknown. Usually, the compulsory stops have been fixed by the Board of Trade or the railway itself and not by local bodies. Traffic stops are generally of two sorts: Stops at fare stages which are made regularly because they are natural

The reason why British tramways are no worse off, when not better off, than ourselves in the spacing of stops does not lie wholly in their greater freedom from obsolete regulations. It lies largely in the fact that they have always had to examine the matter of stop location from the vital standpoint of effect on the attraction or repulsion of the short rider. Thus arose the basic policy of locating fare stages at traffic-gathering points rather than adhering to mathematical equality. In one city, for example, a very short but effective fare stage was made between the base and a point just beyond the crown of a hill! To a lesser degree the same policy of traffic building is followed in setting the permissive stops.

SHORT-RIDE FARES REDUCE RIDING HABIT

Where short-ride fares are in vogue, as in the United Kingdom, it is known that people will walk a certain distance to save part of the fare. Hence a considerably longer stop spacing is allowable just preceding and just following the fare stage inasmuch as most prospects would ignore these in any event. On the other hand, this spreading can be wisely offset by closer stops in the business district where every merchant is jealous of his vested (?) rights in car stops. The length of walk which people will take to avoid paying higher fare will depend upon the distance between the fare stages which range from ⅓ to ¼ mile, upon the increments (½d. or 1 d.) to the base fare, upon topography, upon weather, upon the prominence of car-stop signs and, not the least, upon the psychological impulse to ride, *ride*, RIDE created by the passage of cars at frequent intervals. From American experience, we know that in order to save a second 5-cent fare many people will walk distances of more than a mile.

The provision of a waiting room at fare stages or even at some prominent intervening stop is often good policy. People like to sit down in an attractive place for a minute or two. Even if they stop only for a newspaper, tobacco or candy, they are better prospects for riding. Glasgow, despite its marvelously frequent service and extremely low fares, has not disdained the installation of a couple of waiting rooms. One of these is illustrated. In Continental cities glazed waiting rooms are quite an attractive feature of this form of traffic creation.

One may say with confidence that skip-stop operation would have remained a permanent feature in more American cities on its sheer benefit to the rider had the spacing of stops been tempered by the need for attracting the short rider. As it proved, the skip stop has had the greatest success and permanence in those cities where the stops were located only after a study of on-and-off traffic instead of the use of a slide rule in an office. An average spacing of 600 to 660 ft. between stops does not preclude variations from 300 to 900 ft., provided it is clear that such variations will mean the greatest good to the greatest number.



WAITING ROOM AT CATHART AND BATTLEFIELD ROADS, GLASGOW TRAMWAYS

traffic-gathering points, and stops between stages, which are optional or permissive. There will also be found, of course, certain points, as at large stores, where stops are made regularly during business hours.

An examination of the average spacing between the points at which cars will stop for passengers proves that the British combination of short-ride fare and large car has not had any worse results than in the United States and Canada. In truth, the following table shows that the spacing in the larger cities like London, Glasgow and Leeds is just what we would like to have to meet the suggestions of the recent Fuel Administrator:

SPACING BETWEEN STOPPING PLACES IN BRITISH CITIES	
Aberdeen.....	390 to 633 ft. Average, 471 ft.
Glasgow.....	Under 600 ft. to 900 ft. with average of 600 ft.
Belfast.....	Average spacing, 600 ft.
Dublin.....	Average spacing, 600 ft.
London.....	Average spacing, 660 ft.
Leeds.....	Pre-war, 540 to 750 ft.; war, 660 to 900 ft.
Reading.....	450 ft. to 600 ft.

In the case of the London district, we must not forget that a third cause making for the establishment of more stopping places is the competition of the motor bus.

Trolley Car Accidents in New Jersey

The trend of the times in accidents is shown by the following table prepared by the Public Service Railway:

	Autos	Wagons	Pedestrians
1917.....	4,815	2,341	769
1918.....	6,048	1,985	730
1919.....	7,297	1,438	645

Kansas City Studies Congested Lines

Analysis and Report Is Made by John A. Beeler—Remedies Suggested Are Directed Toward Speeding Up Traffic on Heavily Loaded Lines

KANSAS CITY has a serious problem in its surface transportation in the retail district. In the first place, the retail business and office buildings are concentrated within a comparatively small area, bounded approximately by Seventh and Thirteenth, Wyandotte and McGee Streets. The situation is further aggravated by the rugged topography of this very district. Heavy traffic must be carried through this district, and, while there are several available north and south lines, there are only two east and west lines, Twelfth Street and Eighth Street. Both of these, moreover, penetrate to the large wholesale district on the west side, the Eighth Street line going to Kansas City, Kan., and they carry much through traffic from the large residential districts in east and southeast Kansas City, Mo. All of the streets are narrow, except Grand Avenue, a north and south street, and traffic in the whole district has been growing sluggish. An extended analysis to search for remedies was decided upon, and the Kansas City Railways called in John A. Beeler, a con-

Street between McGee and Wyandotte. It varies from a maximum of 4.08 m.p.h. westbound, down to as low as 1.58 m.p.h. eastbound in the same period, between 5:00 and 5:15 p.m. The slowest speed was recorded when the smallest number of cars passed eastbound, while some of the highest speeds are obtained with the largest number of cars passing, showing that the congestion cannot be due to the large number of cars put through. The difficulty is, however, caused by slow loading, and unloading of passengers, vehicular interference and excessive car stops. On Twelfth Street between Washington and Oak there are now ten passenger stops and one safety stop eastbound, and ten passenger stops westbound. This is an average of 15.8 stops per mile, which is twice the number desirable for a street of this character.

Counts of passengers boarding Twelfth Street cars in the downtown district show that the average number boarding eastbound cars at each stop runs as high as eighteen passengers per car in the evening rush.

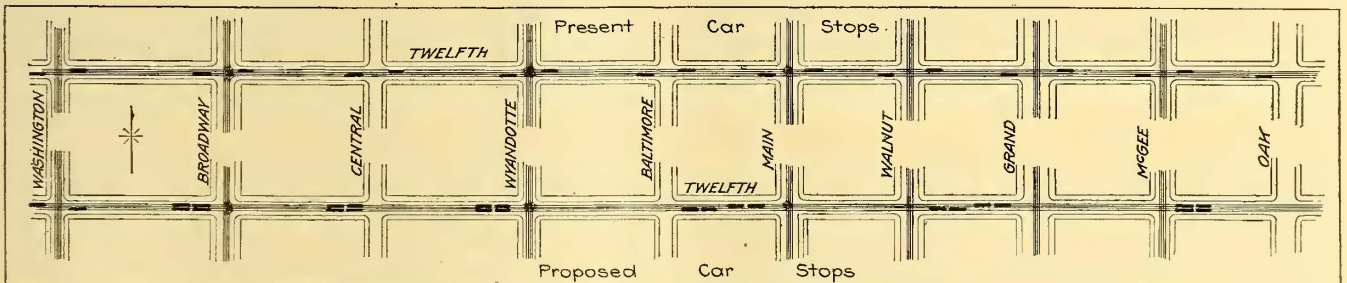


DIAGRAM SHOWING OLD AND NEW PASSENGER STOPS ON TWELFTH STREET

sulting engineer of New York, to solve the problem. He divided the work into parts and has recently made the first two sections of his report, those dealing with the most serious problems of (1) Twelfth Street and (2) Eighth Street. That which follows is largely an abstract of these reports.

CAUSES OF CONGESTION

A cause which contributes much to the congestion is the slow movement of all traffic due to the large number of vehicles, both parked and moving, and the slow loading of street cars and jitneys. There is also considerable delay in getting the cars and jitneys moving when they should proceed, caused by one or more passengers attempting to squeeze into an already overcrowded conveyance and preventing the doors from closing. Meanwhile traffic is blocked.

The practice of running vehicles on the car tracks and stopping them immediately behind cars at loading zones is another factor of importance in slowing down the movements. This prevents the car following from coming up close behind the leader, and absolutely prohibits it from loading or unloading behind the first.

From tests made of street car speeds in the business district the slowest movement is found to be on Twelfth

The total for the four principal stops shows that the average eastbound car in the evening takes on over 48 passengers in this district.

The heavy loading is accompanied with excessive delay and is to a considerable extent responsible for the slow speed mentioned above. One difficulty is fare collection. The present 7-cent fare is slower to collect than a 5-cent fare, and steps to rectify this should be taken. The movement of passengers in boarding the cars is slow because but a single stream is loaded at each end. Then the numbers getting on at the two ends are seldom equal, so that one door is generally open long after the other is closed. Usually the crowd at the rear door is the larger, as this is the entrance habitually used throughout the day. There is no collector at this end, and the conductor is inside the car several feet from the door where his view is obstructed when the platform is crowded, so that he is not always certain when the step is clear. Therefore he does not close the door and give the signal to proceed promptly.

Another difficulty is from patrons who are admitted after the door has been closed. Observations show the rear door has been opened as many as four times to admit passengers at one stop. Due to this uncertainty the traffic officer cannot know when the car is ready to

proceed. It ends in his giving the right-of-way to the opposing direction, frequently holding the car long after it is ready to go.

To ascertain how much of the time in the rush hour the intersections are actually in use, a count was made at Twelfth and Main in the afternoon rush. Cars running east and west used the intersection but 15 per cent of the time, and the north-and-south cars used it but 20 per cent of the time. The total time during which cars were in the intersection was 35 per cent of the hour. A striking feature of this exhibit is that there were only eight times that east-and-west cars passed in the intersection, and only six times did north-and-south cars pass. Out of a total of 120 cars passing in the hour observed only four times did cars follow each other without the officer signalling traffic from the opposing direction.

These figures indicate that without any change in the methods and with no attempt to pass two cars at once, over twice as many cars could be moved across the intersection, leaving ample leeway for the inevitable loss of time when directions are changed. If cars move in both directions at the same time this figure could again be doubled. With cars passing in pairs as recommended below there would be a further gain, so that from four to five times as many cars can be put through this intersection as actually passed.

MEASURES FOR RELIEF

To relieve the serious congestion on Twelfth Street, the first thing to do is to get the cars moving faster through the business district. This can be accomplished by the adoption of a number of measures of relief, as follows:

1. Stopping places in the congested zone must be relocated and combined.
2. Double-berthing must be resorted to at all stops on this street in the business district.
3. Vehicles must keep off the car tracks and must move in the path between the right side of the car and the curb.
4. Street cars must be given precedence by traffic officers. They must be passed across the intersections in pairs and simultaneously in both directions whenever possible.
5. Automobile parking must be limited during the day and prohibited in the rush hours.
6. Additional street collectors must be employed so as to load a double stream of passengers at the rear ends of cars.
7. Street collectors must see that car doors are closed promptly when proper loads are on the cars.
8. Cars must stop but once at each passenger stopping place, and after the doors are once closed and the car ready to proceed the doors must not be opened again.
9. Car riders must assist by using street car tickets or having exact change ready, and by presenting transfers right side up and unfolded.
10. So far as possible cars should be operated on regular headway. Railroad crossing delays must be avoided or their effects minimized as far as possible.
11. The front doors of the street cars must be remodeled so as to permit two streams of passengers entering or leaving simultaneously.

RELOCATION OF PASSENGER STOPS

The present and proposed passenger stops at each intersecting street are illustrated in the diagram. In this way the stopping places will be combined for greatest efficiency. It will be necessary for some patrons to walk a few feet farther, others will walk a shorter distance, but all will be benefitted by the increased speed of the cars. Patrons will be concentrated at a smaller number of points, and while each stop made may take slightly longer there will be a material reduction in the total length of time required to ride through the business district.

Reference to the diagram shows that the stop locations recommended have been chosen in general so that the cars will stop before reaching street intersections. No passengers should be taken on except at the prescribed stops. Then when a car approaches the intersection the traffic officer, knowing it is ready to proceed immediately, can stop the opposing traffic, thereby permitting the car to cross the intersection without delay. This will obviate the necessity of bringing the car to a full stop as at present. Double berthing has been provided for all stops within the congested section.

The exact points at which the cars will stop should be indicated by distinctive signs placed along the curbs or overhead. These should be placed so that the car riders will know exactly where to stand while waiting, so that the minimum time will be taken in getting on the cars when they arrive.

REGULATION OF VEHICLE TRAFFIC

The practice of allowing vehicles to run on the car tracks is a cause of much of the congestion now existing. This prevents cars from double-berthing and in consequence makes the additional wasteful stops and slower movements of all traffic. It has already been pointed out that this practice rarely helps the vehicle driver himself, as he is likely to be stopped behind a car when he might have proceeded along side. Strict adherence to this rule will be of distinct benefit to everyone.

The street cars, owing to the necessity for loading, are likely to be hampered in getting away quickly from the intersections, unless some means is adopted of having the car always ready to move. The locations of car stops recommended provides for this by making the loading at such a point that when the car approaches the traffic officer he knows that it can move across the intersection immediately on his signal. To get the greatest traffic through the intersection he should, therefore, be prepared to give precedence to the street cars, allowing parallel vehicle traffic along with them but holding the cross traffic until cars are clear of the intersection.

By thus co-ordinating the movements of the vehicles with those of the street cars the maximum use of the intersection will be made.

It has already been indicated that so far as possible cars should be passed across the intersection in pairs in both directions, so that four cars can be passed at one signal of the officer. When cars or vehicles are passed singly much time is lost while the stream from one direction is ceasing and that coming from the other direction is starting.

While the use of Twelfth Street for parking purposes has not reached the point it has on some of the other streets, due to the narrowness of the roadway, this very condition makes it essential that the use of the street be retained for moving vehicles instead of standing ones. No parking would be allowed on this street in the rush hours, and in the non-rush the standing time allowable should be only sufficient to load and unload passengers and freight. Leaving unattended vehicles standing along the curb should be prohibited at all times. Vehicles should not be allowed to stop at the loading places.

The present street collectors who receive fares from patrons as they may board at the front end are a

great help in expediting the movement of the cars. But the car loading can be done even more quickly if additional collectors receive fares at the rear ends of the cars. Practically all of the cars now running in the congested district have double doors at the rear and single doors at the front. The practice generally is for passengers to enter at the rear in single file so that they may pay their fares to the conductor. In some instances the conductor allows a second stream of passengers to enter, but as they must pass behind him it is difficult to insure collection and inspection of all the fares.

Additional collectors on the street to take fares at the rear end would permit a second stream of passengers to enter through the little-used exit door, making three streams of passengers entering at the same time. Since there are comparatively few passengers leaving the cars where the street collectors are used, and those who do leave go out the front door, the time of loading can be reduced materially by the use of these additional collectors.

An additional advantage will be that these street collectors can close the doors, enabling the car to pro-

be obviated by the purchase of tickets, and much of this can be overcome by the use of the exact change, although this latter method has the objection that it is more difficult for the conductor to inspect the coins in the box than the tickets. If a passenger has to have 50 cents or \$1 broken to get change, he should step aside until the conductor has collected from the others.

Transfers should never be presented folded but should be handed to the conductor face up. Passengers on entering should pass into the car away from the door. When desiring to alight they should go to the door before the car stops, and as far as possible enter by the rear and leave by the front door.

The company should provide much more convenient packages of tickets and better channels of distribution than are now in use.

THE EIGHTH-STREET REPORT

The second section of the report deals with Eighth Street where many difficulties similar to those on Twelfth Street were found and similar remedies suggested. The conditions on Eighth Street differ from

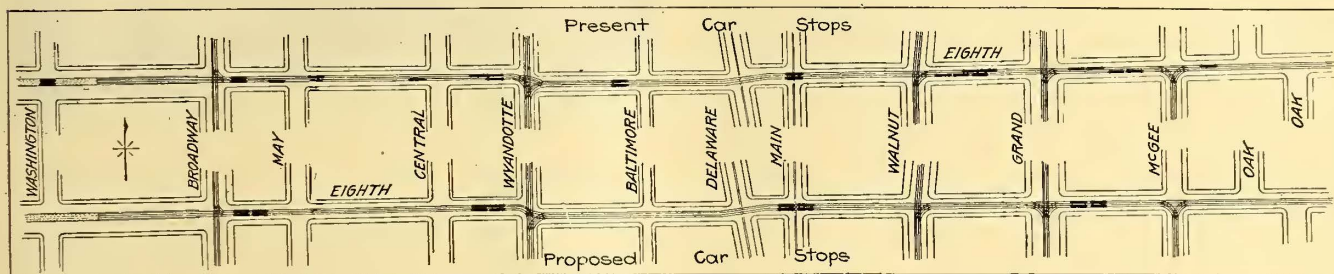


DIAGRAM SHOWING OLD AND NEW PASSENGER STOPS ON EIGHTH STREET

ceed without unnecessary delay. This will save time for all the car riders. When the doors are closed they should not be opened again, as the traffic officer must know that the approaching car is ready to proceed immediately on getting his signal.

REGULARITY OF HEADWAY ESSENTIAL

The street railway should also use every means possible to keep the cars on schedule time. When cars are delayed, they should make every effort to get back on schedule. Certain cars should be turned back when late. When a late car is followed closely by a second car the first should proceed as rapidly as possible, and should not accept passengers until it has at least partially equalized the spacing.

The platforms have sufficient width to provide for two doors, but with the type of sliding door in use one-half the platform space is always closed by the door. Double folding doors would make it practicable to load or unload two streams of passengers at one time from the front end of the car. An air-operated door control, or a hand control that is easy to operate, would speed up closing.

HOW THE PUBLIC CAN HELP

The use of car tickets or exact change will do much to speed the car loading. If a passenger tenders a dime for fare the conductor now must count out a nickel and five pennies. The passenger will then count his change from which he will select the exact fare, and place it in the fare box. This takes from one to five seconds additional for each passenger. All this can

those on Twelfth Street in two particulars: first, at Baltimore Avenue, in order partially to overcome the severe grade, the tracks have been elevated on a viaduct passing completely over Delaware and Main, reaching the surface again at Walnut; second, in addition to the through service, Eighth Street is used by a number of other important lines turning around in the business district which turn on and off at Eighth Street in the congested intersections at Walnut, Grand and McGee Streets.

PEAK-LOAD CONDITIONS AT BUSY INTERSECTIONS

The number of through cars is not abnormally large. There are 31 cars scheduled eastbound and 29 westbound in the maximum hour; including the others however, the total between Walnut and Grand shows 56 scheduled eastbound and 73 westbound in the same period.

In order to afford some idea of the relative number of street cars scheduled to go through the busy intersection during the maximum rush, the following comparison between Twelfth and Eighth Streets is shown:

Intersection	Maximum Rate Cars Per Hour	
	Twelfth St.	Eighth St.
Wyandotte	104	121
Main	183	0*
Walnut	203	240
Grand	196	241
McGee	123	131
Total	809	733

*Eighth Street crosses Main on an overhead viaduct.

At all of the corresponding Twelfth Street intersections, except Wyandotte, only straight crossings are

made, while on Eighth Street many left-hand turns are required at Walnut and McGee, and right-hand turns at McGee and Grand. These turns present a problem not encountered on Twelfth Street. The right-hand and left-hand turns prevent many cars from passing which otherwise would be able to do so. Especially is this true of the left-hand turns, as it not only prevents cars from passing in the opposite direction but ties up everything. With the number of cars turning reduced the capacity of the intersection would be greatly increased. The foregoing in combination with the numerous stops and poor loading facilities afforded is responsible for cars scheduled not arriving on time.

The viaduct from Baltimore Avenue to Walnut Street, carrying the Eighth Street lines, eliminates grade crossings at Main and Delaware, thus not only assisting traffic movements on Eighth but also on Main and Delaware. It is apparent that the viaduct is of great importance to Eighth Street, and were it not for this structure the street car traffic probably would be slower here than it is on Twelfth.

During the evening rush hour the east-bound cars are averaging but 2.02 m.p.h. between Walnut and McGee Streets. The westbound cars average still less, as they are moving at the rate of only 1.32 m.p.h. These two blocks represent the point of maximum congestion on Eighth Street, and speeds as low as 0.8 m.p.h. for a full fifteen minute period have been observed. From 5 to 6 p.m. between Walnut and Wyandotte, even with the assistance of the viaduct, the average car speed is 6.52 m.p.h. westbound and only 2.26 m.p.h. eastbound. Between Wyandotte and Broadway on the street surface it is 4.72 m.p.h. westbound and 2.47 eastbound.

MEASURES FOR RELIEF

In addition to employing all the measures recommended in the Twelfth Street report, such as restricting the number of stops, giving precedence to street cars, double-berthing, limited parking, and keeping vehicles off the car tracks, the following must be done:

1. Use the prepayment method of fare collection at the Main Street elevated station during periods of heavy loading.
2. Lengthen the elevated platform at Main Street, to enable four cars, two in each direction, to load simultaneously when necessary.
3. Reroute the cars to reduce the number turning into and out of Eighth Street.

A survey of the passenger counts and the local conditions indicates that the passenger stopping places on Eighth Street should be rearranged as shown in the diagram on page 333, which shows also the present stops.

The recommended locations will place the stops where there will be a minimum of interference, and therefore, the best conditions. The present stop on the east side of Walnut caused a great deal of congestion on Eighth Street, and the use of this location is alone responsible for much delay. This is especially true in connection with those cars that turn from Walnut to Eighth. First they stop on Walnut, and, while waiting for a chance to proceed and turn the corner onto Eighth, block other northbound cars. Then when the opportunity is presented they turn the corner and stop on Eighth Street. Here they are likely to be delayed by cars going up the hill which are not able to clear the corner at Grand. This condition is serious in the rush hours and can be remedied only by omitting the stops on Eighth Street at this point.

Positive stops should be eliminated as far as possible.

The present stop westbound at Grand Avenue should be discontinued. There are very few cars turning at this point and the Eighth Street cars should be given the right of way. The positive stop at Walnut Street should be done away with and a slow sign substituted.

North Shore Loop Station

AN ARTICLE appeared on page 234 of the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 31 describing the new station recently opened in the Chicago business district by the Chicago North Shore & Mil-



EXTERIOR VIEW OF THE CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD STATION IN CHICAGO

waukee Railroad. At that time a picture of the exterior of this station was not available. One has since been obtained, however, and the station is so attractive that the accompanying illustration appears as a supplement to the previous article.

Quick Restoration of Telephone Service After a Fire

ON A RECENT date at about 2 o'clock in the afternoon a fire started in the Chamber of Commerce Building, New Haven, Conn. This building houses the general offices of the Connecticut Company and a private branch telephone exchange carrying all dispatching lines of that company. The fire in the basement immediately severed the telephone cable which carried all lines into the building, and left the railway company without communication. The Southern New England Telephone Company, impressed with the seriousness of the situation, cut in the principal dispatching lines to its own testboard at the main exchange, and at 2.30 placed the Connecticut Company's dispatcher at the testboard operating these lines.

By 4 o'clock a sixty-line private branch exchange board which the telephone company had in stock had been moved to the terminal room and temporary connections had been made, so that the Connecticut Company's own operator was operating the board with practically all of the dispatch lines connected. By evening, in addition to the dispatch lines, all commercial lines connected with the Connecticut Company's telephone system were restored to normal operating condition. Meanwhile, as soon as telephone workmen could get into the smoke-filled building, the night and day forces were put on, and by the next morning complete telephone service was restored to the company's offices.

Present Status of Standard Track Spirals

Report of Sub-Committee and Discussion at Atlantic City Emphasize Value of Standards and Indicate That Partial Renewal With Standards Is Feasible

AT THE Atlantic City convention of the American Electric Railway Engineering Association in October, 1919, an informal report was presented by the sub-committee on standard spirals of the committee on way matters. On account of conditions in the printing industry that time it was impracticable to abstract this report in the report issue of the ELECTRIC RAILWAY JOURNAL. However, as the work of the committee on way matters for the current year is now being started, it is desirable to have before way engineers a summary of the remarks made by E. M. T. Ryder, engineer maintenance of way, Third Avenue Railway System, New York City, and others who participated in the discussion.

In introducing the subject Mr. Ryder said that at present there are many different spirals used by manufacturers, and quite a number of railroads have their own spirals. In comparing the various spirals one finds

to the Lorain 2-A spiral, and is the one that will probably be used in 90 per cent of all cases. Similarly the No. 8.5 spiral is the shortest one in this series which will permit the insertion of the association's 200-ft. radius switch. Spiral No. 4.0 will take care of the 75-ft. radius switch to be used in places where it is impossible to use the 100-ft. radius switch. The No. 4.5 spiral very closely approximates all the manufacturers' spirals that were in common use with the 12-ft. long 100-ft. radius switch. That switch is no longer the association's standard, and while it seems desirable to figure out a spiral that will take care of it, there is some question as to whether the association should adopt it as one of its standards. The purpose in adopting it, if this seems desirable, is to provide for renewals which must be made for many years to come.

The other spirals shown on the drawing are somewhat larger ones which can be used when it is necessary to

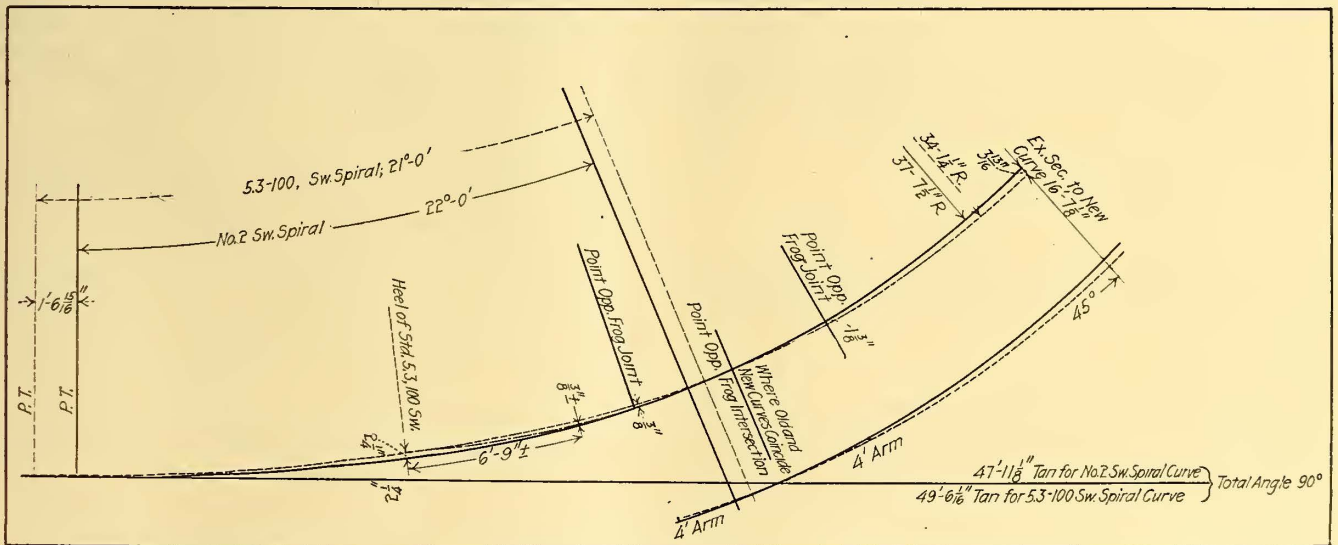


FIG. 1—ILLUSTRATING PARTIAL RENEWALS OF OLD LAYOUT USING STANDARD SWITCH PIECES AND PROPOSED UNIFORM SPIRALS

that they are quite similar. Nearly all of the existing systems are based on the Searles spiral, in which the rate of curvature is uniform. While the calculations may be made in different ways, all of the spirals are based on the same fundamental principle. A comparison of different typical spirals is given in an accompanying figure.

The fundamental principle referred to is that all of the angular functions are constant, and only the lineal functions, such as arc and radii, vary. Thus any one spiral can be obtained from any other, practically by simple multiplication, and the spirals are convenient to calculate and use.

The sub-committee has prepared a number of recommended spirals, as shown herewith. The most important one, No. 5.3, was picked out as the shortest Searles spiral into which could be inserted the association's standard 100-ft. radius switch. It practically conforms

obtain clearness from obstruction on the street or on account of unusual conditions. These give more flexibility to the standards but probably would not be used except in a few cases.

In answer to a question as to the significance of the numbers on the uniform-spiral drawing (p. 337), e.g., 4, 4.5, 5.3, etc., Mr. Ryder explained that these indicate the length of arcs, of which the spiral is made up. In all cases the angular rate of change per arc is 1 deg. Mr. Ryder also said in this connection that in the opinion of manufacturers it would simplify their work if the arc length were as great as possible. Where the radii are comparatively long, it is permissible to use a long arc. With the proposed system, in the base spiral from which the lengths are figured the arcs are all 10 ft. long, while in the shorter spirals they are of varying lengths. Thus where the curvature is sharpest, the arcs are shortest.

R. B. Fisher, the Buda Company, said that his company would be pleased to use any spiral that is adopted by the association. The expense of doing this would not be great, as it would simply be a matter of carrying a different set of spiral boards until the old ones were used up. Sooner or later the company would be able to discontinue the use of the old templates.

Charles A. Alden, Bethlehem Steel Company, said that the purpose of a spiral curve is to reduce the shock of a change in direction from tangent to circular arc. The proper form of such a curve is one in which the radius of curvature is inversely proportional to the distance from the beginning of the curve. Any curve of the Searles type meets this requirement, provided the arcs are of reasonably short lengths.

To meet the varying conditions, it is necessary to have spirals of different lengths. These can be secured either by using constant angles and varying the lengths of

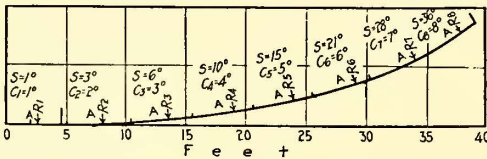


FIG. 2.—PRINCIPLES OF DESIGN OF PROPOSED UNIFORM SPIRALS

NOTE—All spirals are similar to Searles spirals and consist of compound curves composed of a series of circular arcs of equal length. Rate of change of central angles of arcs is uniformly one degree.

Corresponding angles and angular functions of all spirals are the same.

Corresponding lineal dimensions of all spirals are proportional to their respective arc length. For convenience the base spiral has arc lengths of 100 ft.

The number of any spiral is the length in feet and tenths of its individual circular arcs, measured on the center line of standard gage track.

S = Total central angle of spiral.

C = Central angle for any arc.

A = Arc lengths.

$$R = \text{Radius for any arc. } R = \frac{360A}{2\pi C} = 57.2958 \frac{A}{C}$$

C & S are the same for corresponding arcs of all spirals.

A is constant for each spiral, and its center line length in feet and tenths is the same as the spiral number. The proposed standard spirals are: Nos. 4.0—4.5—5.3—6.5—8.5—10.0.

arcs and radii, or by using constant arcs and varying angles and radii, or by using constant radii and varying arcs and angles. The spirals formed in any one of these three ways would be of practically equal value, provided the angles of the spirals and their lengths on the center line were the same.

PROPOSED SPIRALS USE CONSTANT ANGLES WITH VARYING LENGTHS OF ARCS AND RADII.

The committee has decided that the first method is the most convenient in practical use, and their report covers a series formed in this manner. The base of this series is the spiral of 10 ft. arc with successive central angles of 1, 2, 3, 4, 5, 6, 7, and 8 deg. From this base the two chord lengths of 5.3 and 8.5 ft. are deduced in order to provide spirals suitable for "cutting in" the association's 100-ft. radius and 200-ft. radius switches respectively. The 6.5 spiral is provided as an intermediate length. The 4.5 and 4.0 spirals are provided as the commercial equivalents of the usual practice for curves of radii to which such a spiral is suitable.

The spirals are extended to 12.4, 15.0 and 20.0 ft. arcs to cover radii intermediate between those covered by the above series and those for which steam railroad practice and field books are available.

Mr. Alden thought that the work of the committee

should be extended to cover a specification defining the conditions under which each spiral should be used. Any one of the last mentioned three spirals could be used with a 40-ft. radius center curve. It would be possible, for instance, supposing the proposed standards were adopted and no such specification was in force for the buyer to specify that he was to get a 40-ft. radius spiral curve, and under that specification he could be furnished a curve of 80, 90 or 100 ft. long at a corresponding cost.

The discussion was continued by Victor Angerer, William Wharton, Jr., & Company, who said that it is no doubt feasible and not only advisable, but desirable for the manufacturers to have a uniform system of spirals. It is awkward for the manufacturers to have to work with different spirals. While the Wharton Company has its own special set of spirals, its customers may require it to use the Lorain or Pennsylvania Steel spirals, or in some case the special system of the railway company. As a result templates and tabulations for all sets of spirals must be kept up. It is too much to expect that the matter can be reduced to one system, although this would be a great advantage, but if at least the spirals of the several manufacturers can be eliminated the recommended spiral could be used for those customers who did not specify their own.

There is one point, however, that must not be overlooked, and that is whether a new set of spirals could be worked into partial renewals of layouts made according to the present system. In most cases this can be done with some little "fudging." Then when the remainder of a layout thus treated is renewed, the whole will conform to the new system.

Mr. Angerer felt that the system suggested by Mr. Ryder is the best that has been developed so far, and is probably the best that can be developed to cover the various phases that must be considered. One of his objections to former spirals was that they were too complicated and the arcs were too short. In the system now proposed the arc lengths increase with the length of the spiral and the various elements can be worked out from the basic 10-ft. spiral by simple proportion or multiplication. It is possible in this system to very closely approach existing spirals. For example, the 5.3 spiral corresponds very closely to at least two of the spirals now in large use by manufacturers, and the 4.5 spiral will cover a number of those that are in use with a 12-ft. switch.

Mr. Angerer said that there are some points which might still be worth studying. Without changing the general idea of the system it might be applied to the inside rail. This question has been raised by men who have discussed this subject, and also in articles appearing in the ELECTRIC RAILWAY JOURNAL. The selection of the arc lengths as they appear in this set of six spirals seems to be a happy one, even if it does not appear scientific to have odd arc lengths like 5.3 ft. There is a good reason for this, as has been explained. This system of spirals does not involve more material or greater length than most existing spirals, therefore the spirals will not cost any more than the old ones, and it is to be hoped that later on as the new spirals come into more general use economy in manufacture will work to the advantage of both manufacturer and user.

C. H. Clark pointed out an advantage to the purchaser in being able to specify a standard spiral in that if the cost of a 6.5 spiral were desired all bidders would be quoting on exactly the same length of rail. On the other

hand, without the standards, if the cost of a spiral to meet certain conditions were desired, one manufacturer might bid on a 5.3 and another on a 6.5.

NO QUESTION ABOUT DESIRABILITY OF STANDARD IF ADOPTED

Charles Rufus Harte emphasized the fact that there can be no question about the desirability of having all manufacturers make only one type of spiral. That feature hinges on the possibility of inducing a general adoption of the standard. If this can be accomplished, the manufacturers using other types of spirals can, in a comparatively short time, afford to scrap the old templates. A question raised by Mr. Harte concerned the practical application of the spirals to special conditions. It not infrequently happens that special work has to be carried on special supports, and it becomes desirable to fix the exact position of the rails. In case it becomes necessary to calculate some of the points, will the recommended spiral lend itself to such purpose or does it require higher mathematics to obtain sub-chord points?

matics which may have been studied in college but long since forgotten.

Mr. Harte was assured by Mr. Clark that there will be no greater trouble in laying out this system of spirals from the manufacturer's drawings than has been the case with any other system. L. C. Datz explained that most of the field work is done by getting the point of intersection of the two tangents, bisecting it and getting the middle of the curve. The steel companies can easily figure out two or three more points to assist in the field work of laying out the curve. To these explanations, Mr. Harte replied that with this information the field man is all right, but in many instances the information is not at hand when wanted. With every one of these spirals it is a more or less complicated proposition to determine points not given by the standard chord but some require much more complicated calculations than others. This point should be carefully considered before a decision is reached.

In reference to the question of Mr. Harte, C. S. Kimball said that the proposed spirals are simple com-

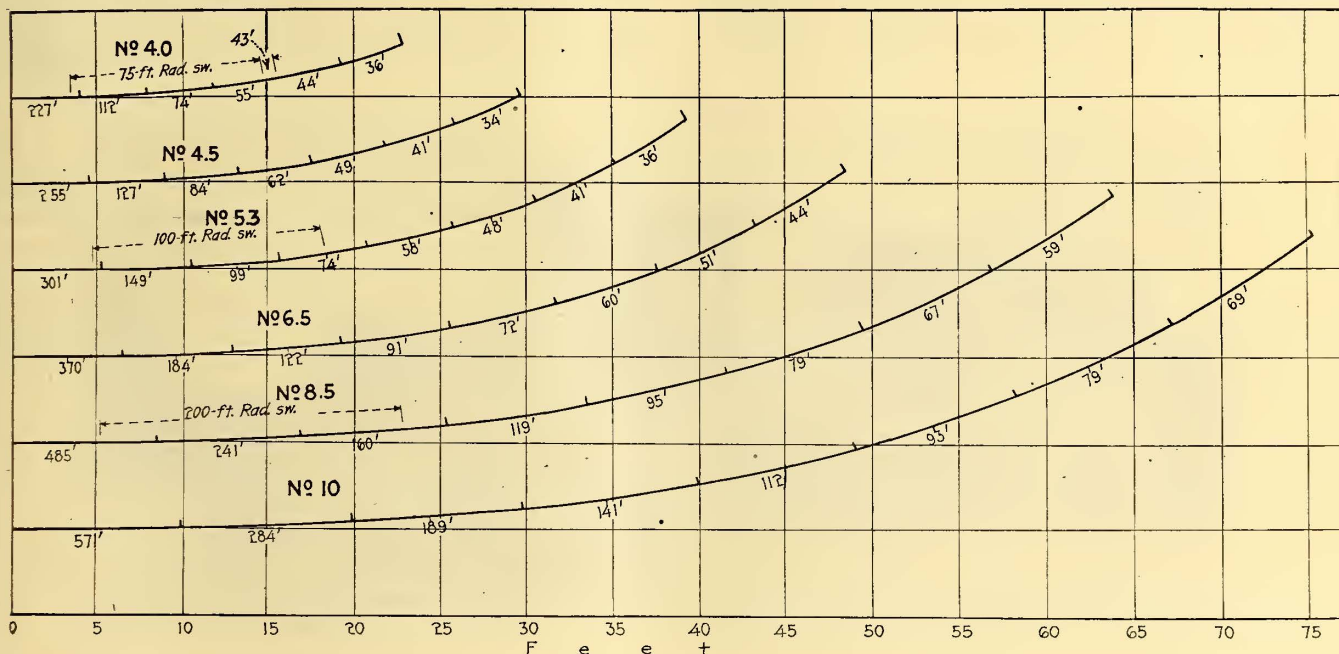


FIG. 3—COMPARISON OF PROPOSED UNIFORM SPIRALS
NOTE—Spiral number equals length of arcs of that spiral in feet and tenths. Figures below arcs give to nearest foot radii of inner gage lines.

Likewise in subway and in extensive surface changes in larger cities, it is often essential to know clearance points at odd intervals to determine on the one hand whether existing posts, manholes or similar objects will have to be shifted, or on the other hand to fix locations of such objects. Under these conditions, will the proposed standard be a help or a hindrance?

The proper step is to choose that spiral which will work best considered from all angles. As it will be necessary for the manufacturers to make a change at the time of the adoption of any standard spiral, they are the least concerned with the mathematical end of it, as the calculations for them when once made are complete. The man who works in the field and finds himself confronted with the necessity of determining intermediate points is the one who is going to be most affected. The question is, whether with remarkable ease the field man can calculate the elements he wants, or whether it will prove to be a problem calling for a branch of higher mathe-

pared with the spirals now in use, and he does not think that any engineer will have any trouble in using them. As to the location of obstructions before the drawings are made, any manufacturer will send representatives without cost to the purchaser and design the curves, taking into account any manholes or obstructions which may be there.

Roy C. Cram expressed the thought that the convention might be overlooking the fact that the tables show quite clearly that the proposed spirals are based on a simple law. The base is No. 10.0 followed by 8.5, 6.5, 4.5, and 4, which figures are very easily remembered, and then there is the odd one, 5.3. These figures can be easily retained in the mind, and when once an engineer has become used to working with them, and has tabulated values of *x* and *y*, that is all that is needed.

W. R. Dunham, Jr., raised the question as to how the new spiral if adopted would fit into the old work when making temporary renewals; in other words, if there is

a switch which has gone bad, or a frog that must be renewed, will it not be necessary for the manufacturer to renew with the original spiral, at least until all the special work is renewed?

To this question, Mr. Ryder replied that there is always considerable difficulty in changing from any set of standards to any other. It is possible to make the renewal of a switch and mate together very readily, and the amount of "fudging" would be very small. Take, for instance, the old No. 2 standard Lorain spiral in comparison with the proposed uniform spiral No. 5.3. A standard 13-ft. 6-in. switch goes in a little further back, but if the excavation is carried 4 to 5 ft. further from the heel of the switch, it leaves only about $\frac{3}{8}$ in. to fudge. It would be impossible to renew a switch without renewing the mate.

The changes at the frog in some cases also are small. It would be necessary to go far enough in excavating the pavement to be able to spring the rails sufficiently to make a separate renewal of the frog. The change at the center of the curve is not great, so that if at a certain layout it was desirable to renew the curve without renewing the frog, it would mean practically no difference in the amount of clearance and the amount of pavement

was extended to Mr. Ryder and the other members of the committee and to the manufacturers for the work which had been done in bringing the information on the subject up to the present state. The subject was continued with the way committee for 1920.

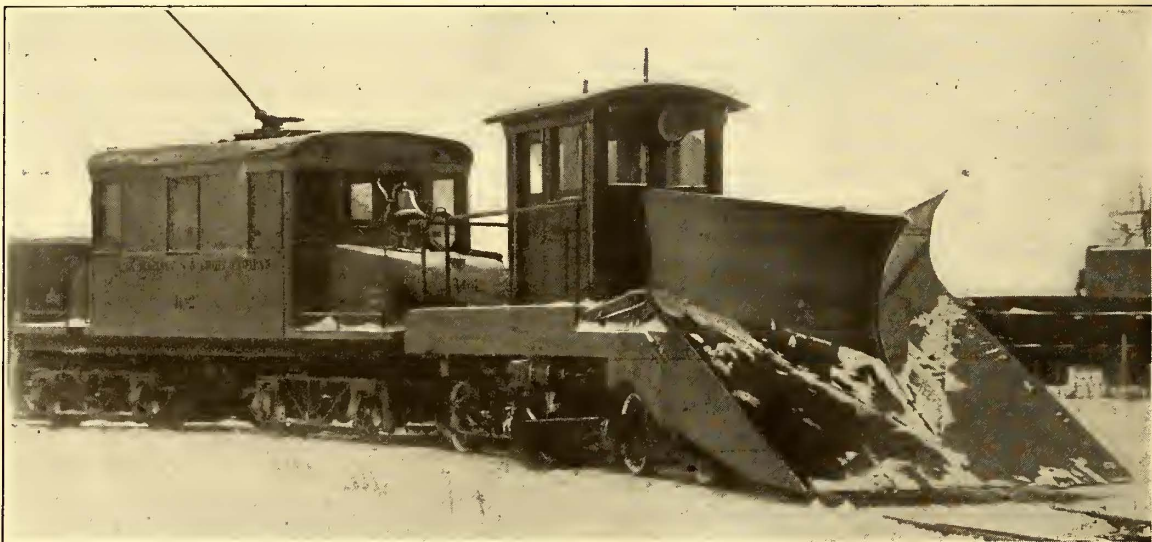
A Heavy-Duty Interurban Snow Plow A Nose Plow Built by Indiana Line, Equipped with Air and Designed for Operation with Locomotive

By M. S. FERGUSON

Master Mechanic Indiana Railways & Light Company, Kokomo

AS IT IS essential that the lines be kept open at all times in order properly to handle the comparatively heavy passenger traffic and the constantly increasing freight business, the operating directors of the Indiana Railways & Light Company recently decided to add a new snow plow to the snow-fighting equipment of the road.

The lines of the company are all on private right-of-way except through a few small towns. In these the tracks are paved with brick and there is, therefore,



NEW HEAVY DUTY SNOW PLOW, DESIGNED AND BUILT BY INDIANA INTERURBAN LINE

to be removed. If it is borne in mind that both the switch and the mate must be removed at the same time, it is possible to make partial renewals with the new system. In answer to a question that if Lorain Steel Company spiral is now in the track, would one of the new spirals be used and leave the frog point in the same location, Mr. Ryder said that this was the case, but that it would be necessary slightly to change the center radius of the curve. There is a change in the length of the lead rail as the heel of the switch comes in a different position. Most of the cutting is due to the new A. E. R. A. switch being 13 ft. 6 in. long, instead of 12 ft. long, as it was in the old standard.

In closing the discussion on the proposed standard spirals, President Phillips said that the point seems to be approaching where the much mooted question of standard spirals will be settled, and settled very likely to the complete satisfaction of the railway men as well as to the manufacturers. He suggested also that the association should express its gratitude for the excellent way in which the subject had been handled. A vote of thanks

no objection to the use of a plow of the nose or double-shear type. The writer, in making a survey of the line, found that it would be necessary to design a plow that could be raised in order to clear some bridges and station platforms, and at the same time be rugged enough to withstand the severe strains encountered in bucking heavy drifts. The plow was designed and built in the company's shops at Kokomo, Ind., under the supervision of the writer.

The body of the plow is 20 ft. long, built on a set of freight-car trucks. As there is no electrical equipment necessary except for lights and heaters, current for these is furnished by a jumper cable from the locomotive which is used as a pusher. This locomotive, which also was built in the company's shops, will be described in an early issue of the *ELECTRIC RAILWAY JOURNAL*. The snow plow is equipped with automatic air brakes and there is an emergency valve in the plow cab within easy reach of either the pilot or the operator. On the exhaust of the emergency valve there is a very shrill whistle which acts both as a signal to the motor-

man and as a warning to pedestrians or vehicles who might be on the track.

The nose of the plow is raised by air from the locomotive furnished through standard air hose and couplings and through an engineer's valve located at the pilot's position. In addition to the whistle there is on the cab a standard chime whistle supplied with air from the main reservoir.

The flangers are hung between the trucks and are raised by a large lever in the center of the cab. They are built of a 1-in. x 20-in. plate, bent into the form of an "A," and extend 14 in. outside the rails. These flangers are balanced on three $\frac{5}{8}$ -in. chains passing up through the floor and connected to a 1-in. x 6-in. iron bar. In the center of this bar is a $1\frac{1}{4}$ -in. rod which couples onto the raising lever. The flangers are held in place by three 8-in. x 8-in. oak timbers bolted to the cross sills of the car and braced back to the rear bolster with one 6-in. x 6-in. oak timber and six 3-in. x 3-in. x $\frac{3}{4}$ -in. angles. Two of the $\frac{5}{8}$ -in. chains are attached to eyebolts through the center post and then into eyebolts through the plate. These act as a guide to keep the flangers at all times in the proper position. The flangers have an effective rise of 6 in.

The body bolsters of the car are 12-in. x 12-in. x 8-ft. x 10-in. oak timbers, and the side, intermediate and end sills are 8-in. x 8-in. oak, bolted through the bolsters with $1\frac{1}{4}$ -in. bolts. Between the bolsters are two 4-in. x 12-in. x 14-ft. oak planks bound in place by two $1\frac{1}{2}$ -in. truss rods. The ends of these truss planks are supported on 6-in. x 6-in. x $\frac{1}{2}$ -in. angle brackets bolted through the bolster. Extending from the front bolster to the rear end of the body is an extra set of side sills of 8-in. x 8-in. oak bolted through the lower sills. These act as a stiffener for the car and also as a retainer for the reinforced concrete ballast. Two 2-in. x 2-in. x $\frac{1}{2}$ -in. angle irons are bolted to the lower inside of the sills to support the ends of the false floor, which is of 2-in. oak plank. The center of the false floor is lagged to the two oak timbers that are between the bolsters. For ballast there is a solid block of concrete reinforced with $\frac{5}{8}$ -in. rods and scrap brake shoes. This block measures 16 in. x 8 ft. x 18 ft.

The cab of the car is 4 ft. 6 in. x 5 ft. 8 in. built of wood and provided with eight windows. The sills of the cab are bolted to the intermediate sills and there is a filling consisting of 8 in. of concrete both inside and outside. A wooden floor is laid on 2-in. oak strips placed on top of the concrete. This gives a 2-in. air space under the floor. Three Consolidated electric heaters are placed under a seat which extends the full length of the cab. A standard Crouse-Hinds headlight is used with the resistor placed inside the cab. The car is equipped at each end with a standard M. C. B. coupler.

On the front ends of the side and intermediate sills are four heavy castings with a $2\frac{1}{2}$ -in. hole through the nose. These act as the stationary part of the plow hinge and are bolted through the sills with $1\frac{1}{4}$ -in. bolts. Four 8-in. x 8-in. x 28-in. oak stopper blocks are bolted in an upright position under the ends of the sills and are braced with a $\frac{7}{8}$ -in. x 18-in. plate. The sloping legs of the plow are 6-in. x 6-in. x $\frac{1}{2}$ -in. x 10-in. angles through the top end of which is a $2\frac{1}{2}$ -in. hole accommodating a $2\frac{7}{16}$ -in. shaft which passes through the hinge castings. The two bottom center braces are made of 3-in. x 6-in. x $\frac{1}{2}$ -in. angles while the two bottom

outside braces are 3-in. x 3-in. x $\frac{3}{4}$ -in. angles. The plow frame is covered with $\frac{1}{4}$ -in. plate riveted with $\frac{1}{2}$ -in. rivets on 5-in. centers and driven hot. The plow is 9 ft. 6 in. wide, 10 ft. long and 8 ft. 3 in. high. It sets $4\frac{1}{4}$ in. above the rail and has an effective rise of 18 in. at the nose.

For raising the plow a 12-in. x 12-in. oak timber is used. It is butted against the front bolster and extends 4 ft. ahead of the end sill. It is attached to the bolster by means of 6-in. x 6-in. x $\frac{1}{2}$ -in. angle brackets and is hung under the end sills with three $1\frac{1}{4}$ -in. bolts, using a 1-in. x 10-in. x 16-in. plate for a washer. On the front end of the timber two 10-in. sheaves are fitted. A 10-in. x 12-in. air cylinder is set between the two center hinge castings with a 1-in. x 5-in. x 12-in. spreader-bar attached to the plunger. Two $\frac{5}{8}$ -in. twisted chains extend from the spreader-bar over the sheaves and are attached to the center bottom braces. The lateral bracing is of 3-in. x 3-in. x $\frac{3}{4}$ -in. angles.

In making a test of the lifting power of the snow plow air hoist ten men were placed on the nose of the plow and it rose with seemingly no effort on the part of the apparatus.

Western Society of Engineers Holds Annual Meeting

General Wood Was the Principal Speaker at Banquet Marking End of Fifty Years of Society Activity

THE Western Society of Engineers held its annual banquet on Jan. 29 at the Morrison Hotel, Chicago. Frederick P. Vose acted as toastmaster and Major-General Leonard A. Wood was the principal speaker. General Wood extolled the work of engineers in connection with great public accomplishments and cited some of his experiences in connection with the development of Cuba and the work on the Panama Canal. He also stressed the importance of keeping alive the Engineer Reserve Corps.

The retiring president of the society, A. Stuart Baldwin, chief engineer Illinois Central Railroad, then made a very brilliant address of which the principal theme was that good will was the great need of the present day in the relations between labor and capital and all peoples. He summed up his thoughts in the statement that the progress or retrogression from our present state of civilization will be in direct proportion to the extent to which the golden rule is practiced.

Mr. Baldwin also announced the names of the new officers of the association as follows:

President, F. K. Copeland, president Sullivan Machinery Company, Chicago; first vice-president, C. F. W. Felt; second vice-president, J. L. Hecht; third vice-president, Linn White; treasurer, F. F. Fowle.

In his inaugural address, President Copeland indicated certain lines along which the society might direct its efforts to secure a substantial and consistent growth during the coming year. He pointed out the great advantages of the society to the younger engineers, but stated that the society held forth no promises of influencing any increase in salaries, but rather that it would benefit the members through the opportunity which it afforded for expansion, through the educational value of the meetings and the contact with older engineers and the wider acquaintance made possible.

Chicago Elevated Railways Organize for Safety

New Organization Headed by Safety Engineer Has Been Perfected on the Chicago Elevated Railways—Employees and Division Safety Committees Meet Bi-Weekly, Central Safety Committee Monthly

A NEW safety organization has recently been perfected on the Chicago Elevated Railways with Melvin W. Bridges as safety engineer. During the period of the war, when many of the regular employees were in army service, their places were filled with inexperienced men, and the safety work was permitted to lag. The result was an increase in the number of accidents. President Britton I. Budd of the Elevated Lines is determined to place that property at the top of the column of electric railways in the matter of safety both to employees and to the public, and for that reason has appointed Mr. Bridges to give his entire time to this work.

At a meeting of the supervisory force held on Dec. 30, Mr. Budd outlined briefly what he expected under the new plan. During his remarks he said:

Safety work is the most important thing in connection with our job. It is more important than keeping trains running on time. We must bring the organization up to the highest point of efficiency in the matter of safety of the employees and the public. Recently the enthusiasm has died down a little, and I wish to see it restored. You have all been trained to cultivate the faculty of observation, but while that is very necessary it is not enough by itself. There are many who observe a condition which might be the cause of an accident, but it fails to register in their minds. An accident has to happen before we act.

Every man must be on the alert. When he sees a dangerous condition it must so impress itself upon his mind that he feels impelled to call attention to it at once and have it remedied. He must not wait for the accident to occur. That is what I mean when I say a dangerous condition must register itself on the mind the moment it is observed.

A case in point occurred recently up on the North Shore Line where some street improvements were being put in contiguous to both the steam and electric railroad tracks. The street was closed to traffic and the ordinary barrier put up, but a vehicle had to cross the railroad tracks before coming to the barrier. Now I suppose during the day or two that the barrier stood at that particular point, there probably were hundreds of persons passed, yet no one observed that the condition was dangerous. It would not have required five minutes time to carry that street barrier across to the other side of the railroad tracks, so that a person driving an automobile would know that the street on the other side was closed. The inevitable happened. An automobile drove across the tracks and was stopped by the street barrier. In trying to shift gears and turn around in the small space, the automobile backed in front of a train on the steam railroad. Then the danger of the situation was made apparent to all. Why didn't some one see it before the accident occurred? It was because the faculty of observation was not developed to the point where it registers such a situation on the brain.

As we go about our daily work we all see somewhat similar situations. We must try to train ourselves to act immediately in such cases and not wait until some one is killed. There is something more in life than merely making money and achieving success in a business way. In safety work you are doing for your fellowmen something that is worth while in life and it is in that spirit that I bid you put your hearts into it and make "safety first" more than a mere phrase.

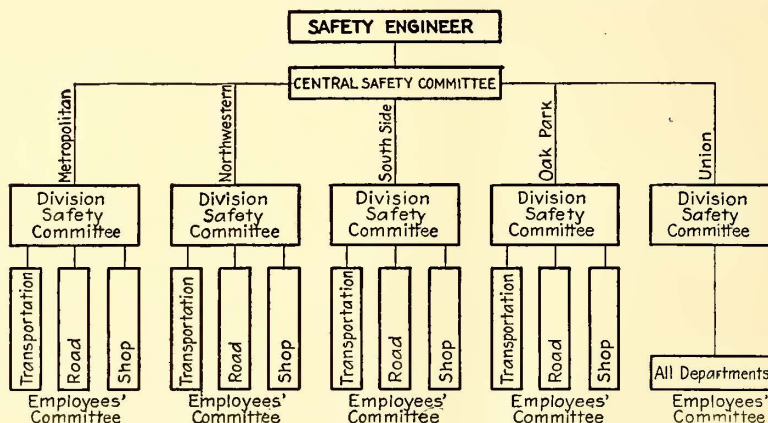
The Chicago Elevated Railways is a consolidation of four systems, the Metropolitan West Side Elevated Railway, the Northwestern Elevated Railroad, the South Side Elevated Railroad and the Chicago & Oak Park Elevated Railroad. All of these four systems pass through and around the loop in the business district of Chicago, and this section

of the combined systems forms a fifth unit known as the Union Elevated Railroad.

The new safety organization is composed, first, of employees' committees, each of the four elevated systems furnishing three employees, committees respectively from the transportation, road and shop departments. The transportation department employees' committee includes one man in each of the following positions: Motorman, conductor, guard, switchman, tower man, gateman and agent. Each road department committee includes one trackman, one interlocking man, one carpenter, one tieman, one painter and one electrician. The shop department committee includes a machinist, a truckman, a car inspector, a carpenter, an electrician, a car cleaner and a painter. The loop, or union system furnishes one employees' committee which includes representation from all departments, namely, a towerman, a platform man, an electrician and an agent.

All employees' committees are composed of employees below the grade of foreman, who are selected to serve for four months. Meetings are held every two weeks on company time, and at regular rates. They even are paid for time consumed in the performance of committee duties. The safety engineer sets dates for the meetings of the employees' committees, and each superintendent and foreman arranges to have the members of the committees released from duty to attend the meetings and provides a room where the meetings may be held.

Members of the employees' committees are selected by the superintendents and general foremen. All suggestions coming to the attention of any employees'



ORGANIZATION CHART, CHICAGO ELEVATED RAILWAYS SAFETY DEPARTMENTS

Form 7, E. 331 6M. 12-15.
REPORT IT NOW

(Read) _____ Date _____

Dear Sir: I suggest that _____

Signed _____ Position _____ Road _____ Dept. _____

Recommendation of Employees Committee: _____

Signed _____ Chairman _____

REPORT IT NOW

CARD USED IN MAKING SAFETY SUGGESTIONS

committees for consideration are acted upon and turned over to the general foreman or superintendent of their respective departments who is a member of the division safety committee.

Each employees' committee records the minutes of its meetings and forwards them to the chairmen of the respective division committees. A copy is also forwarded to the safety engineer. The minutes comprise the names of the members present and absent, and a record of suggestions received, and acted upon favorably or unfavorably.

DIVISION COMMITTEE PASSES ON SUGGESTIONS OF EMPLOYEES' COMMITTEE

As already stated, all suggestions acted upon by the employees' committees are turned over to the respective division committees. Each of the five systems has a division committee which is made up of the division superintendent of transportation, general shop foreman, general track foreman, general foreman of electrical department, supervisor of service and claim department investigator. On the loop system committee, the place of the shop representative is taken by the foreman of the telephone department. This committee has no representative of the service department.

The division safety committees hold their meetings every two weeks. All recommendations referred to the division committees by the employees' committees are taken up and disposed of at each meeting. The minutes of each meeting are recorded and a copy is sent to the safety engineer.

Forms such as the accompanying "Report It Now" illustration are used by employees in making safety suggestions. When these pass through the employees' committees and are turned over to the division committees for action they are each given a number and copied

in triplicate on another form also reproduced in an accompanying illustration. The original and duplicate are forwarded to the safety engineer together with the minutes of the meeting. The third copy is filed with the original suggestion card and kept as a record in the office of the chairman of the division committee.

SAFETY ENGINEER WITH CENTRAL COMMITTEE TAKES FINAL ACTION

All suggestions which pass through the hands of the division committees, together with the minutes of that committee, are referred to a central safety committee. This committee is composed of the safety engineer and four other members. These four members are the assistant superintendents, respectively of transportation, shop and roadway, together with the organization engineer of the consolidated system.

The central safety committee holds monthly meetings. Special meetings are called by the chairman when matters of importance are presented which should receive immediate attention. At the meetings of the central committee all recommendations sent in by the division committees are reviewed, and those suggestions which have been disapproved either by the employees or division committees are taken up for final action.

The safety engineer has direct supervision of all safety matters. He maintains a record in his office of all suggestions made, and all suggestions that have been approved are followed up by him until such time as the work is completed. It is his duty to advise any employee who has made a suggestion what action was taken on same. He attends all employees' committee meetings, and as many division-committee meetings as is convenient. He also endeavors in every way to stimulate the spirit of safety among employees and officers of the company.

As this new organization has been so recently perfected, there has as yet been little time for results. Even in this short period, however, many safety suggestions have been placed before the various committees.

New Paving at San Diego

A NEW type of permanent paving, differing in character from the usual asphalt surface paving, is to be tried out between the tracks of the San Diego Electric Railway. The paving will consist of crushed rock, coarse at the base and fine at the surface, rolled and watered into a solid mass.

The city has authorized the laying of a few blocks of this type of paving on trial because the officials of the company have stated that the company cannot continue to operate if compelled to place asphalt paving between all of its tracks on paved streets. The new type of paving proposed will be almost as expensive in first cost as asphalt paving, but it is said that it will be practically everlasting, subject to quick and inexpensive repairs. For this reason the company will be relieved of a great burden in paving maintenance.

If upon trial the new paving proves successful and is satisfactory to the city authorities, it will be used by the company in its reconstruction work in the outlying districts. It will be divided from the solid surface paving by concrete curbing, which will be deep enough to protect the solid surface paving from water seepage from below, and will conform in all respects with the general outline of the streets.

Form 2, E. 302, 5M to trip. 12-19.
ORIGINAL

ROAD _____ Number _____

Suggestion made by _____ Date _____

Position _____ Road _____ Dep't _____

Suggestion _____

ACTION: Approved. Disapproved. Employees Committee. Date _____

 Approved. Disapproved. Division Committee. Date _____

Referred To _____

Report of Person to whom Referred _____

Date Authorized _____ Date Started _____ Date Completed _____ Cost _____

Proposer Advised of Action _____

To be made in Triplicate; Original and Duplicate to be sent to the Safety Engineer, Triplicate to be filed.

CARD UPON WHICH ORIGINAL SUGGESTION IS COPIED IN TRIPLICATE

The light yellow card, the next in the series, is to cover reports of violations of rules. Only the front of this card is reproduced; the back contains space for remarks. The dark yellow card contains spaces for a brief record of accidents. Finally, there is a blue slip used when the man reports late.

The file is kept adjoining the large file of original papers and has been found very convenient. The principal labor in connection with it was to start it and bring it up to date. This was done by filling out the slips for current events as they occurred and filling out the past records of the older employees when the time of the clerk permitted. The file was begun in 1914, and from that time records were available immediately, but it was some two years before all of the back records had been entered.

Powdered Coal Plant for P. R. T. Power House

AN EQUIPMENT for burning powdered coal will shortly be installed in the Mount Vernon St. power plant of the Philadelphia Rapid Transit Company by the Quigley Furnace Specialties Company. The Mount Vernon St. plant is in the downtown section of the city, at 13th St., and is a direct-current plant which has been in operation for many years.

The plant at present is producing about 7,500 kw., employing twenty 375-hp. Babcock & Wilcox water-tube boilers. It is estimated that with powdered coal firing the needed output will be secured by using only ten boilers, even though the fuel to be employed is low in volatile matter and high in ash content.

The equipment will be installed according to what is known as the Quigley system. By means of compressed air, pulverized coal will be transported through small wrought pipe from an adjacent milling plant to the present coal bunker which will be partitioned into ten sections, each section supplying coal individually to its corresponding boiler. In this system the fuel is not mixed with air in transport but travels through the pipe in compact masses. The equipment from milling plant to burners is entirely inclosed and dust tight.

A blowing-tank unit of 5 tons capacity equipped with a quick-reading scale located in the milling plant, will insure accurate fuel records for each boiler. Pushing valves, located along the fuel distribution lines will divert the coal to each section of the bunker. The capacity of feeding and burning equipment for each boiler is to be 3,000 lb. of coal per hour. The regulation of the fuel fed to each boiler will be controlled by simply turning a hand wheel.

The change from hand power to powdered coal will be made without interruption of service, and it is expected that the new installation will be completed during the coming summer.

It is understood that when supplied with the powdered-coal equipment, the station will be used primarily for peak-load power supply, for which it will be admirably adapted. It is planned to use "river coal" or "wash coal" taken from deposits in the beds of streams in the anthracite mining regions, which exist in "buckwheat" sizes. A recent newspaper statement contains the information that the Shamokin Valley Company has assured the Philadelphia Rapid Transit Company that at least 2,000,000 tons of river coal can be obtained. O. M. Rau, of the railway company, stated, however, that no definite amount of the fuel had been contracted for.

Simply Constructed Truck Turntables Facilitate Repair Work at Hampton

TWO truck turntables of simple home-made construction were recently installed in the shops of the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., as an effective means of expediting the work of truck overhauling. These were placed in two adjacent tracks in the shops, the forward half of which are equipped with pits and the rear half with concrete floors on which the truck dismantling and assembling work is done. Through the installation of a turntable in each of these tracks, just to the rear of the pits, the flexibility of the limited facilities and the convenience of shifting trucks from one track to another are greatly improved.

While the use of such turntables is a common practice in many shops, the construction features of those in the Hampton shops are interesting. Two circular concrete pits 16 in. deep and 8 ft. in diameter were first made, and the perimeter of the pits was faced with a circular steel plate held in place by bolting to brackets on the ends of the main running rails and the short run rail pieces between the two turntables. An ordinary Brill friction center-bearing plate for the center bearing of the turntable was placed in the bottom of the pit and held in place by two anchor bolts set in the concrete. Twelve supporting brackets for the 4-in. wide x $\frac{3}{4}$ -in. thick circular plate tracks were also set in the concrete in the bottom of the pits.

For the framework of the turntables, two pieces of old girder rails, turned bottom side up, were used to form the main cross members. These were cross tied and braced with angle irons and bound into a solid structure by an iron plate forming the circumference of the table and bolted to brackets on the end of the girders and to the stiffener pieces. Then 3-in. I-beams placed on top of the underframing were used to support the board deck for flooring. Brackets for the four rollers supporting the perimeter of the table were bolted to the ends of the two sections of girder rails.

Some Points About the Ford Engine for Street Cars

THE new Ford internal-combustion engine designed for use in street cars has the cylinders mounted horizontally in two units so as to comprise two 80-hp., 4-cylinder double-opposed motors, operating on a planetary transmission drive to both the forward and the rear trucks. The construction is such that the over-all height is but 24 in. and the entire driving apparatus will be installed underneath the floor of the car so as to permit the utilization for passenger service of practically the entire floor space.

The operation of the engine is similar to that of the Ford automobile. Throttle, switches, gears and brakes are all operated like those of the Ford car. The engine is a self-contained unit with air pump and generator. The generator supplies current to a storage battery for lighting the car as well as for self-starting purposes. The air from the radiator is circulated through the car for heating. The trucks are fully spring mounted with no frame for separation.

It is the intention to operate the engine with gasoline on its trial trip, but it is adapted to operate with kerosene, alcohol or benzol.

Association News

Additional Assignments to Engineering Association Committees

ON RECOMMENDATION of President E. R. Hill, the executive committee of the Engineering Association has assigned to the respective committees a number of subjects in addition to those listed in the issue of this paper for Jan. 3: To committee on power distribution—Compilation of data on safe limit of wear on trolley wires, on frogs, on life of insulators and on cable insulation. To committee on way matters—Compilation of data on safe limit of wear on rails and special work and on life of track construction of various types. To committee on equipment—Compilation of data on wear and life of parts of rolling stock and equipment, such as wheels, journals, axles, brake shoes, trolley wheels, motor bearings, brushes and commutators, on life of motor windings, on dipping and baking, on re-insulation, etc. To committee on buildings and structures—Compilation of data and information on methods and standards of maintenance. To committee on heavy electric traction—Recent development and progress in design of motors and motor drives for heavy traction, both direct current and alternating current, with comparison of weight, space efficiency, etc. Description and illustrations of recent types of electric locomotives (supplementing report of 1916). The electric switching engine in freight yards; comparison with steam.

Standards Committee Holds Winter Meeting

A MEETING of the Engineering Association Committee on Standards was held in New York City on Feb. 9 to consider several matters assigned to it at the convention, as well as the normal business of the committee accruing about mid-year. In the absence of the chairman, H. H. Adams, the vice-chairman, Martin Schreiber, presided. In attendance also were H. L. Andrews, General Electric Company, Schenectady, N. Y.; C. C. Beck, Ohio Brass Company, Mansfield (representing W. C. Starkey); E. J. Blair, Elevated Railways of Chicago; C. H. Clark, Cleveland Railway; H. H. Norris, ELECTRIC RAILWAY JOURNAL; F. R. Phillips, Pittsburgh Railways; K. A. Simmon, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. (representing N. W. Storer); N. B. Trist, Carnegie Steel Company, Pittsburgh Pa., and J. W. Welsh of the association.

The routine business transacted comprised the referring of the 1919 report of the Committee on Equipment back to the committee for further revision with a view to harmonizing the proposed standards on wheel and flange contour, journal bearing and wedge gages, and the adoption of the joint specifications for electric light, power supply and trolley lines crossing steam and electric railways. The crossings specifications had been approved by the American Railway Engineering Association at its last meeting.

Under "Miscellaneous Business" the committee considered the desirability of affiliation with the American

Engineering Standards Committee, the organization of which was explained by Mr. Schreiber, who is a representative of the A. S. C. E. on the committee. It was voted to recommend to the executive committee that the association apply for representation in the American Committee. For a sub-committee of the Standards Committee, appointed to prepare a plan for making the Engineering Manual more convenient for reference, Mr. Schreiber reported informally. The relative merits of the loose-leaf and permanently bound forms of the Manual were discussed and, while the merits of the latter were recognized, sentiment seemed to favor the present form, in the interest of economy, with possible elimination of folding plates and miscellaneous practices reports. All agreed upon the desirability of making every effort to insure the revision of the Manuals now in the hands of the membership.

Letter to the Editors

More About Car Weight Comparisons

THE J. G. BRILL COMPANY

PHILADELPHIA, PA., Jan. 20, 1920.

To the Editor:

I have read C. W. Squier's comments in the ELECTRIC RAILWAY JOURNAL of Jan. 17 on my letter of Dec. 26 in regard to the computation of car weights for comparison on the maximum load basis, and conclude that the only fair method is to give the weight of car both per passenger seat and on the total-passenger basis.

Simply to give the weight on the per-passenger-seat basis is very unsatisfactory, as cars are constructed to carry a definite maximum passenger load of so many seated plus so many standing passengers. In some cars increased standing space is secured at the expense of seating capacity, so that the number of passenger seats will vary, depending upon the total carrying capacity.

For instance, the standard double-end Birney safety car, weighing about 15,000 lb., is constructed to carry thirty-two seated and sixty-eight standing passengers, which, taking 150 lb. as the average weight per person, gives a passenger load also weighing 15,000 lb. or a pound of car to a pound of passenger.

It is true, as Mr. Squier states, that in some few localities a maximum load of sixty passengers for the Birney safety car has been established, but as a railway is privileged to place any limit it desires, up to the maximum, on the passenger load, this limitation does not affect the maximum load which the car is constructed to carry.

However, it is an interesting comparison on the per-passenger-seat basis and, as stated above, I consider that in all fairness to the various types of cars both weights should be given, then where a car has a small seating capacity but large standing space, a comparison based on the total passengers carried may be favorable although one based on the per-seat basis may be unfavorable.

I wish to thank you for your consideration of this subject and it is hoped that other readers of the ELECTRIC RAILWAY JOURNAL will add their opinions to the discussion.

W. S. ADAMS.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

\$2,500,000 for Improvement

Cleveland's Street Railway Commissioner Recommends This, His Suggestion Covering 100 New Cars

Eight resolutions, based on recommendations of Street Railway Commissioner Fielder Sanders for extending, bettering and making permanent improvements calculated to relieve congestion and to aid in bringing the railway system of Cleveland, Ohio, to the requirements of a greatly increased population, have been introduced in City Council.

COUNCIL WILL INDORSE PLAN

Councilman Alva R. Dittrick, chairman of the street railway committee, to which the resolutions were referred, predicts that they will be acted upon favorably. This means that by March 1 they will be indorsed by Council unless opposition develops.

The principal recommendations of the commissioner embodied in the resolutions are:

Fifty cars and fifty trailers immediately be acquired at a cost of \$1,200,000.

Complete development plans for the west side of Public Square, which lay the basis for routing cars when the proposed subways are under construction, provide that Madison, Lorain, W. Twenty-fifth St., Clifton, Fulton and Detroit cars make only one stop in the square at a designated shelter house. To accomplish this, new switch tracks will be laid. Plans for relieving congestion in the east side of the square will be worked out soon.

Prohibition of all vehicular traffic through the square during the rush hours, and the stopping of all parking of such traffic in the square. The rush hours generally are understood to be from 8 a.m. to 6 p.m., in the opinion of Councilmen.

All Cleveland, Southwestern & Columbus and Lake Shore interurban cars shall stop only on W. Third St., between Superior Ave., N. W. and St. Clair Ave., N. W., and all Northern Ohio Traction & Light Company, Cleveland & Chagrin Falls & Eastern Ohio Traction Company cars running north of Central market house and west of E. Ninth St., shall stop only on W. Third St., between Superior Ave., N. W. and Champlain Ave., N. W. These cars have taken on and unloaded passengers in the square, causing much congestion.

That the Clark Ave. and Union Ave. lines be joined, making a cross-town line by laying a double track along Pershing Ave., S. E.

EIGHT NEW SHELTER HOUSES

When this is done it is proposed to have cars operated from E. 131st St. and Corlett Ave., S. E. to E. 116th St., on E. 116th St. to Union Ave., S. E., on Union Ave. to Broadway, S. E., on Broadway to Pershing Ave., on Pershing Ave., Clark Ave., S. E., Clark Ave. bridge, Clark Ave., S. W. to W. 73rd St., on W. 73rd St. to Denison Ave., S. W. and on Denison Ave. to Loraine Ave., with through service as a cross-town line.

Request the director of public service to give estimates on the cost of constructing eight new shelter houses in Public Square.

Give the Cleveland Railway right to construct a single track line in W. 117th St., from Lake Erie to Thrush Ave., S. W. The cost of this improvement is estimated at \$300,000.

Permit the Cleveland Railway to issue \$2,500,000 additional stock to cover costs of improvements.

Probably the most important step for relief of congestion lies in that part of Mr. Sanders' recommendation dealing with the west side of the square. Additional rails will be laid to make a pair of parallel tracks around both the north and south sections and cross-overs would be put in to make all sections of both tracks available if necessary for every car using the loops.

Monorail Suggested in Chicago

Mayor's Traction Commission Hears About System—\$2,000,000, 8-Mile Line Proposed as Experiment

The proposal to solve Chicago's traction problems by building a monorail system has again bobbed up in Chicago. This time, F. D. Flint, president of the National Suspended Monorail Company, appeared a few days ago before Mayor Thompson's traction commission to explain the advantages of the monorail rapid transit system.

MONORAIL TALK GAINS IN FAVOR

Mr. Flint argued that the monorail system could be built for \$100,000 per mile of double track as compared with \$150,000 for surface lines and \$500,000 for elevated. It was also claimed that the monorail could be operated at a saving of 65 per cent over the present systems and that the running time could be more than cut in half.

At the last meeting of the traction commission the talk about the monorail installation seemed to be gaining in favor. It is now proposed that a double-track line be built on Monroe St. from the loop to the Western city limits, a distance of 8 miles. The claim is that such an installation could be built for \$2,000,000 and it is proposed that the City Council be asked to appropriate that sum from the \$26,000,000 traction fund. In some quarters it is thought that perhaps the city administration is "all set" for the adoption of the monorail scheme to make good Mayor Thompson's promise of "the best transportation system in the world at a 5-cent fare."

COMMISSION OF ENGINEERS

It is understood that six engineers for the commission have been proposed to Mayor Thompson as candidates for the job of working out the municipal ownership scheme. The first job assigned to the engineers selected will be a thorough investigation of the monorail plan presented by Mr. Flint of the promoting company.

Against New City Loop

Detroit Administration Opposed to Further Construction by Detroit United Railway

The City Council of Detroit, Mich., on Feb. 6 decided against the proposed plan of the Detroit United Railway for relieving congestion of cars in the down town district by means of a loop that would turn Woodward cars at Grand Circus Park. Permission had been requested to construct a loop to provide a means by which a part of the Woodward cars might be turned for the northbound trip, and do away with running all these cars through the congested part of Woodward Ave., near the southern end of the line.

MATTER LAID OVER

Although this plan has been favored by several city officials and the Council has endeavored for several years to have the plan carried out, it was decided that the matter should be laid over until after the April 5 election when a vote will be taken on Mayor Couzens' plan for a \$15,000,000 municipal railway system.

The reason given for denying the company's request at this time was that in the company's move to build the loop at the present time was seen an attempt to strengthen its hold on the section of Woodward Avenue line south of Milwaukee Avenue, which Mayor Couzens plans to use as one of the down town outlets for his proposed municipal system. The Mayor proposes to take over this section of the Woodward line by right of the expired franchise decision.

At the same meeting the Council approved the Detroit United Railway's plan for rerouting part of the West Sherman cars over the new Springwells line, an action which the company held was necessary because of the rapid development of the district served by the line.

DAY-TO-DAY AGREEMENT

According to the company's statement, it has undertaken the construction of all the railway extensions the city has permitted it to build. That was the fact before the Aug. 7, 1913, agreement and has been the fact ever since.

When the agreement was entered into it was with the hope that the costs then prevailing would be pretty well adhered to for some time to come. However, the agreement was made day-to-day—terminable by either the city or the company, in case events developed that made a termination seem advisable.

In spite of aldermanic slowness in adopting the proper resolutions, litigation by some citizens opposing one extension, slowing up of the extension program while an appraisal was being made by engineers and accountants hired by the city prior to the vote on the so-called "pig-in-a-poke" purchase plan of November, 1915, the abnormal

conditions brought about by the European war with restrictions on material and labor, and the continued labor shortage, yet within the one-fare zone alone, since Aug. 7, 1913, the company's property has been added to in the way of cars, of tracks, of land and of power requirements to the sum of more than \$8,500,000.

\$15,000,000 Subway

Voters of Cleveland Will Be Asked on April 27 to Pass on New Project

An agreement has been reached between the city and the Cleveland (Ohio) Railway whereby radical changes will be made in handling traffic, especially in connection with the electric railway. With a few minor changes, this agreement will be acceptable to the railway interests. Within a few weeks the voters will pass upon a project that will eliminate traffic congestion in the downtown sections. There is every reason to believe the project will be acted upon favorably. Within a few months the project for relief is expected to be under way.

TERMINALS AND SHORT TUBES

The principal work decided upon is the construction of subways. They are advocated for two purposes:

1. To speed up service of surface cars, now much slowed down because of traffic congestion.

2. To clear the downtown streets of one of the principal forms of traffic, resulting in quicker handling of railway passengers and the quicker handling of automobile, vehicular and pedestrian traffic.

The program calls for terminals and short tubes in the congested district. These will be so constructed that each may be built by itself, and increased in size as future requirements dictate. There will be five units to a terminal and four tubes.

Practically all surface traffic will be diverted underground from the edges of the business districts to the center of the downtown section, known as the Public Square. Not all the cars will go underground in this district, but a few will be retained on the surface, merely to care for short haul business.

The entire program, in the opinion of members of the Rapid Transit Commission, is the beginning of a comprehensive system of transportation for Cleveland, the idea being to connect the system under consideration now with tubes, elevated structures or right-of-way over steam railroad lines reaching into the outlying districts.

SAVING IN TIME IMPORTANT

The significant feature of the present program is that it is estimated that from three to five minutes will be saved over each line from the present running time. This saving will be increased as the lines are extended. This will be a benefit to car riders directly. Other savings will accrue to the rail-

way in that there will be less paving to be maintained, fewer accidents, reduced platform expense, increased speed, and ease of transferring of passengers at principal points.

The cost of the initial project will be \$15,000,000, according to the plans now being completed by Parsons, Klapp, Brinckerhoff & Douglas, consulting engineers to the Street Railway Commission. The funds will be obtained by the city of Cleveland on its credit or general bonds. The city will build the subways and equip them with tracks, wires, signals, stations—everything except power and cars—and turn the lines over to the railway for operation.

The Cleveland Railway will rent the system for a period coincident with its present surface grant. The rental will be 6 per cent of the cost of equipment in the subways, but not on the cost of the subways themselves. No rental for the tubes and stations will be charged. The charge to the car rider will not be increased by this plan of rental, which will continue as long as the company operates at its present, or limited return, method.

CLEVELAND GROWING RAPIDLY

If for any reason the present franchise should be nullified, and the railway obtain a grant different from the present service-at-cost arrangement, then the company will be required to pay a rental on the cost of the entire subway system. If the present franchise is not renewed ten years from now or during the last fifteen years of the surface franchise, the company will pay the city the differences in cost in operation in subways or on the surface. The present franchise runs until May 1, 1944.

The tremendous growth of the city industrially is the prime factor that has spurred the officials of the city to act for better transportation. It is estimated roughly that all surface traffic other than street cars will be speeded up 50 per cent. The speed of car traffic will be increased from 10 per cent to 20 per cent. Based upon an average working wage of \$1 an hour, it is estimated that in a year of 300 working days the saving will be \$15,000,000.

The projects will be constructed with funds accrued by the issuance of bonds, authority for which is vested in the Rapid Transit Commission, which also

will contract for the operation. The project will be placed before the people on April 27, the regular presidential primary day in Ohio. If the vote is favorable work will probably start late during the coming summer. It is expected that work can be completed in two years.

Preliminaries in connection with the project consist of the issuance of \$30,000 in bonds in connection with engineering work and the appointment of the Rapid Transit Commission. The commission includes: Charles A. Otis, of Otis & Company; Clarence J. Neal, director of finance; M. A. Bradley, capitalist; Charles E. Adams, Cleveland Hardware Company; Fielder Sanders, Street Railway Commissioner.

The subways will extend as follows:

1. From the High Level Bridge at Superior Ave. and West Ninth St. through West Superior Ave., to Public Square for West Side cars.

2. From the Market House along Ontario St., to Public Square, for South Side cars.

3. From East Twenty-second St., along Euclid Ave., to the Public Square for East Side cars.

4. From East Twelfth St., along East Superior Ave., to the Public Square for East Side cars.

There will be terminals under the Public Square linked with five loops for the different branches of the subway lines. Under the Public Square there will be three levels—terminals, concourse and tracks.

The project has been planned by Parsons, Klapp, Brinckerhoff & Douglas. They will supervise the awarding of contracts and the construction.

Recent New York Bills

Bills have recently been introduced in the Legislature at Albany, N. Y., providing as follows:

Senate Intro. No. 129, Print No. 129, Introduced Jan. 21 by Mr. Fowler, Adding new article 9-b Conservation Law, empowering conservation commissioner to acquire, control and utilize the waters in state and boundary waters, appropriate for power purposes; develop water power and generate electric current, power and energy and transit, distribute, sell or lease same to municipalities and inhabitants of the state. Current is to be supplied at cost. Municipalities contracting for supply of electricity are authorized to light public places, to sell power to persons or corporations and to make rules concerning price. \$250,000 is appropriated.

Senate Intro. No. 151, Print No. 151, Introduced Jan. 22 by Mr. Knight. Amending § 45-a Tax Law, relative to hearing on special franchise valuation, by providing that notice for hearing must be at least 25 days in advance hereof instead of 10 days as at present. If any person, association or corporation whose franchise is assessed proposes to complain at such hearing concerning valuation or rate of equalization, a written complaint specifying objections thereto in detail must be served on authorities of city, town or village in which franchise is subject to assessment, at least 10 days before date of hearing. If the local authorities propose to complain, they shall in like manner serve written complaint on the person or corporation assessed.

Assembly Intro. No. 258, Print No. 260, Introduced Jan. 22, by C. P. Miller. Amending section 35 and subdivision 4, section 49, Public Service Commissions Law, relative to interchange of facilities by common carriers, by striking out provision that section 45 shall not be construed to require a common carrier to allow any other common carrier to use its tracks or terminal facilities.

Want Tacoma Problem Settled

City Officials Suggest Basis of Negotiations to Continue Until Railway Matter Is Settled

Efforts of City Attorney U. E. Harmon and Mayor C. M. Riddell of Tacoma, Wash., to arrive at some settlement of the differences with the Tacoma Railway & Power Company in regard to railway operations came to a head recently when Mr. Harmon and Mr. Riddell reported to the City Council on their recent Eastern trip, with recommendations for a basis of settlement. A provision of the recommendation calls for a revaluation of the railway property on a basis of what is "usable and useful," the city to pay half of the cost of the revaluation.

NEW FRANCHISES IMPERATIVE

Whether the Council will agree to pay this bill and whether the company will agree to a new valuation on the basis the city will demand, will probably form the main themes for discussion. The report shows that the franchises are expiring; that streets uncared for are going to pieces; that the public is suspicious of the company; that the city will not favor municipal ownership; that better service is demanded and required, and that revenues are not adequate to support expenditures.

The following suggestions for negotiations were made in the report: All franchises should be cancelled and new ones granted. New valuation to be made of street railway property. Only useful and usable property to be considered. City to guarantee profit on company's investment. Sliding scale of fares to be provided. Five cents suggested as basis of fares, with additional charges for transfers. City to have official to approve all expenditures by company. Arbitration of all disputes. City to have an option to buy the lines any time.

The report follows in part:

Some have advocated that the Council refuse to renew any expired franchises and stop the operation of railway traffic over that portion of the lines on which the franchises have expired and will expire. It is plain to be seen, however, that this would not contribute to the public service and would only add to the complications already existing.

The only remedy suggested by the railway companies to meet the financial condition is the raise of fares to 10 cents. The railway corporations have filed a tariff and are asking the Public Service Commission to grant this increase in fares.

COMPANY CAN'T PAY FIXED CHARGES

The application thus made is based upon the assertion that the companies cannot, under existing conditions, pay their fixed charges and operating expenses and provide for the upkeep of their property out of the present income. Protest against the proposed raise is heard on every hand and a long contest must necessarily ensue unless some permanent solution is found.

An effort, therefore, should be made to work out a plan promising more satisfactory results. Before suggesting a possible solution we desire to call attention to several fundamental things:

1. The city by authority of law controls the streets. Under the statutes as they now stand the city is the only tribunal which has the power to grant the use of streets. This is the most valuable concession which the city has the power to grant and it can grant this concession only in the interests of a public use.

2. The use or service contemplated and which is made the consideration of franchise contracts is safe, adequate and suffi-

cient service. These two elements of the contract, namely, occupation and service, are reciprocal and dependent.

3. All investments made by the public utility in order to render such service must be limited to property useful and usable and reasonably necessary to that end, and the expense of operation must be confined within the limit of strict economy. Extravagance in investment or in the operation of the system ought not to be charged to the general public and it should not be called upon to pay therefor or to pay a return thereon, either out of fares exacted or taxes imposed. Legitimate investment, economy in the expenditure of revenue, and efficiency in service is the only basis upon which the people can be expected to ratify an agreement providing for safe, adequate and sufficient service and a return to the companies.

The situation has become so much involved that it seems necessary to have a reinvestigation by competent persons of all of the elements which enter into the problem. Therefore, we recommend that the city submit to the railway companies the following plan for the determination of all matters in controversy:

1. That a reinvestigation of the value of their investment be made by disinterested engineers, the expense thereof to be borne equally by the companies and the city.

2. That traffic conditions and expenses of operation be likewise examined with the view of securing improvement in the one and greater economy in the other.

3. That a new franchise be proposed, covering the average life of existing franchises, which, when accepted by the company and ratified by the people, shall take the place of existing franchises; and that such franchise, among other things, shall provide:

(a) For the valuation so fixed as the basis for a guaranteed return, with pro-

vision made for addition to capital account as improvements are required, such additions to be governed by regulations stated in the franchise.

(b) For a fixed rate of guaranteed return with suitable provision to insure payment thereof.

(c) For the maximum fare to be charged, with a sliding scale within such maximum adaptable to conditions as they arise affecting the rate of return.

(d) For a railway commissioner, as in the city of Cleveland; such commissioner to be given a large measure of supervision over further investment, improvement of property, regulation of service and all other matters entering into the practical operation of the system, and the salary and expense of such provision to be charged to operating expense.

(e) For the arbitration of disputes, protecting both parties to the contract.

(f) For an option during the life of the franchise to the city to purchase the railway systems on such terms and such notice as may be prescribed. By such an option to purchase is not meant that the city will be compelled to buy the systems, but that it shall have the privilege of purchase if it should so elect.

There are many details which would have to be worked out in connection with such a franchise as we have suggested which cannot now be covered, but the foregoing statement embodies the more important features which seem to have solved in the most practical way the street railway problems concerning other cities.

In working out the details of any plan which may be the subject of negotiations between the city and the railway companies, we suggest that a practical man be secured, having knowledge of all the questions to be dealt with, he to be the city's representative during such negotiations. In making this suggestion we are following the best advice we have been able to obtain.

We recommend that the street railway companies be asked to meet with the Council for the purpose of trying to arrive at a basis for a permanent settlement, and that the matters to be determined be given continuous attention until finally disposed of.

Service-at-Cost Plan Almost Ready

It Was Expected Mr. Doherty Would Have Toledo Proposal This Week—Will Enter Any Objections in Writing

The proposed franchise for a service-at-cost plan for the Toledo Railways & Light Company, Toledo, Ohio, has been practically completed by the commissioners appointed by the federal court at Toledo. It will be printed and submitted to Henry L. Doherty, operating head of the railway company.

The new ordinance provides a maximum rate of fare of 7 cents with a 1-cent charge for transfer. The minimum rate provided is 3 cents on a ticket basis or a 5-cent cash fare. The initial fare will be 6 cents with a 1-cent transfer charge. The present fare is 6 cents with a 2-cent transfer charge.

The municipal ownership commission has placed its only hope for an ordinance incorporating its plan for a settlement in a favorable decision of the Ohio Supreme Court on a test case which will be argued on Feb. 10, to determine whether under existing laws a municipality has the right to issue general credit bonds to purchase a transportation system.

Mayor Schreiber and Law Director Martin will represent the city and Former Attorney General U. G. Denman will present the brief for the publicity and efficiency commission which became a party to the suit when it refused to publish the ordinance passed by Council authorizing the issuance of \$1,000 of bonds to acquire a transportation system.

The Brach bill, granting the specific right which the city will attempt to obtain in the case before the Supreme Court, after being passed by a vote of sixty-seven to six, when reconsidered by the House of Representatives at Columbus was definitely lost when it was called out for a vote in the upper house of the General Assembly.

When service-at-cost commissioners and Mr. Doherty became deadlocked on several financial provisions to be inserted into the ordinance now being written, a committee of local bankers and bond men was called in to arbitrate differences. The following recommendations of the financiers will be incorporated in the ordinance:

Issuance of 7 per cent stock and 6 per cent bonds.

Creation of a sinking fund by setting aside annually an amount equal to 1½ per cent of the existing capital value, until it reaches a maximum of 20 per cent of the capital value.

Such a fund would be used for the purchase of the bonds of the company, to be held by the sinking fund trustees of the city of Toledo and to be recognized as junior securities; coupons of the bonds to be forwarded to the trustees of the mortgage to be used for the purchase of additional bonds of the company which would also be held by the local sinking fund trustees.

A call premium of 4 per cent on bonds and 8 per cent on stock.

Henry L. Doherty told the commissioners that there was nothing in those recommendations he could not accept.

In addition to the sinking fund, a depreciation fund with an annual mini-

num of $\frac{1}{2}$ per cent and a maximum of $1\frac{1}{2}$ per cent of the capital value will be provided, according to present intentions of commissioners.

Nothing has been said concerning the valuation and rate of return which will be incorporated in the new franchise. It is expected that there will be considerable bargaining on these two points on account of the wide difference in the city and company valuation figures submitted two weeks ago.

The question of a maximum fare and amount allowed for call premium on the stock and bonds will undoubtedly result in negotiations between Mr. Doherty and the commissioners.

It is expected that Mr. Doherty will have a completed copy of the franchise on Feb. 11. He will make all objections in writing. The differences will be ironed out before the document is submitted to the voters for ratification.

Many Lines Snowbound

Storm Ties Up Traffic in Atlantic Coast Section—New York City Chief Sufferer

City and interurban lines in the section along the Atlantic Coast from the New England States to Pennsylvania, are slowly resuming normal operation, interrupted by the storm of snow and sleet which swept over the section on Feb. 4 and 5. The storm, the most severe of its kind in years, demoralized traffic for almost a week. Many lines were closed for several days. A number, including most of the Manhattan surface lines, have not yet been reopened, and it will be a week more before service is restored.

Boston and New York have been the chief sufferers from the storm. The Boston Elevated Railway kept most of its lines open, although hampered by lack of men to clear the tracks. This scarcity of men has hampered the work of snow removal in many other cities, notably in New York City.

It seems incredible that ten inches of snow could paralyze all forms of street transportation—street cars, buses and automobiles—in the Borough of Manhattan. Nevertheless, it was a fact. On Feb. 13, a week after the storm, the main arteries were far from being open for traffic and not more than four or five miles of trolley routes were in operation.

In Brooklyn, due to the efforts of the two traction companies, the streets on which tracks were laid were at all times in passable condition, and in less than twenty-four hours after the storm the trolley car companies were operating the regular quota of cars on all routes with the exception of a few outlying shuttle lines. The situation in Manhattan Borough was far more complicated. Traffic on the lines of the New York Railways and the other trolley companies was absolutely at a standstill for several days, and the subway and elevated stations were swamped by the inrush of thousands of persons who ordinarily use the street cars.

This tieup resulted from the method of propulsion of the Manhattan lines. In Manhattan the lines are forced to use the underground conduit system, whereas Brooklyn lines are permitted to operate with the overhead trolley. Under storm conditions existent last week the "sugar snow," so called because it does not pack down or "stay put," so filled the conduit slots and manholes on the Manhattan lines that when the storm was at its height the life blood of the car was cut off, with the result that the sweepers and cars literally dropped dead in their tracks—to remain thus until the ice-covered rails and conduits had been cleared with pick ax, shovel and hoe. To clear 250 miles of track by hand is no small task and one that is likely to take days to accomplish.

The real cause of the traffic tie-up in which Manhattan finds itself can be attributed to the fact that in the past the city has been more or less dependent upon the surface transportation companies to keep open the streets on which they have tracks. With the transportation companies unable to use their snow removal equipment and the borough without the necessary reserve snow fighters, the whole work fell upon the street cleaning department, and was more than it could handle. The result was that instead of having soft snow to handle, six to nine inches of solid ice confronted the snow shovelers.

Chilean Representatives Study Electrification

Ricardo Solar and Rafael Edwards of the State Railway Commission of Chile have arrived in the United States to study heavy electric traction installations in the interest of the plan to electrify the old steam railroad from Valparaiso to Santiago. This road traverses mountainous country for almost its entire length of 116 miles. The Chilean government has appropriated \$5,000,000 to start the work.

Messrs. Solar and Edwards have been in Seattle recently. They are interested particularly in the Chicago, Milwaukee & St. Paul installation. This, they say, very nearly approximates the conditions with which they will have to contend. The grades and other physical conditions encountered on this line are very similar to those of the line in Chile.

The railroad problem in Chile is complicated by the very high price charged for coal. Water powers are available, but coal in Chile at present costs more than \$15 a ton. Most of the coal used there now is imported from Australia, with a small amount coming from the United States. It has been estimated roughly that the saving in freight rates on this line resultant from electrification will be about 40 per cent.

The engineers expect that the full equipment for the line, including the generating apparatus, cars, car equipment, etc., will be purchased in the United States.

Threshing Over Old Straw

The editors of New York's dailies are becoming wearied at the traction investigation in that city. The more conservative papers some time ago expressed their disapproval of the conduct of the inquiry and of the futility of it to correct a condition which demands some kind of immediate emergency action.

This spirit of fair play is now beginning to manifest itself in the papers which while pronouncing judgment slowly on matters affecting corporation management stand squarely for the right as they see it. One of these papers is the New York *World*, the editorials of which are noted for their vigor. That paper now demands a constructive municipal traction policy. It says:

Only to readers very young or most forgetful can the so-called revelations of the Board of Estimate transit inquiry seem new. Practically all the facts thus far elicited were made public by the Thompson committee, along with many others not yet recalled by the Board of Estimate.

If no new data are to be unearthed, why not act now? If action must, after all, be based upon familiar facts, why not use the Thompson committee records instead of threshing old straw? Scandalous waste or worse in the past must be considered in planning the future, but it is present conditions that must be faced.

What New York wants and must have is a constructive policy. To date, Commissioner Nixon is the only man concerned in the problem who has had the courage to propose one. The Mayor has no policy except drift. He seems not even able to realize that he needs a policy.

Traction companies should have income to pay expenses and a fair return on capital actually expended; to pay fair wages; to keep up equipment; to pay proper damage awards. Experience in other cities and shifting prices suggest the need of sliding scales of fares based on costs. Mr. Nixon is right in holding that local transit should be treated as one problem—with one administering body if union can be arranged without too great condonation of past wrongs.

Is the Hylan Administration capable of evolving an intelligent traction policy? There is no evidence of it as yet.

Service-at-Cost Suggested at Buffalo

Revival of the service-at-cost plan as a permanent solution of the railway problem in Buffalo, N. Y., is proposed by Mayor George S. Buck in a letter to Elliott C. McDougal, chairman of the protective committee of the bondholders of the International Railway which is now in possession of the property. As a means of putting the plan into operation the Mayor proposes the following plan:

Acceptance of the \$13,000,000 valuation of the property in Buffalo as fixed by the Public Service Commission in its 7-cent fare decision.

Ratification at a referendum election of an agreement between the city and company, designed to make the plan effective.

A complete reorganization of the controlling interests of the International, eliminating a management which the Mayor characterizes as "so regardless of the welfare of the public, so indifferent to the public goodwill and so defiant in its attitude generally that every scheme proposed by it has immediately met with suspicion, irrespective of its merits."

The Mayor believes that the proposed referendum for ratifying the agreement between the city and company will overcome the objection to the service-at-cost plan which led to its

veto by Governor Smith after it had been passed by the last Legislature.

Under the service-at-cost plan, the Mayor believes that the company's daily loss through fares not turned in by conductors will drop to a minimum. He says the present daily loss is close to \$2,000 as compared with less than \$300 daily in Cleveland where the service-at-cost plan is in operation. He believes the public would take a greater interest in the successful operation of the railway properties if the plan is accepted by the company and put into operation.

Mr. Morse Makes Final Address

In addressing the City Council of Pittsburgh, Pa., for the last time before he left office, E. K. Morse, transit commissioner of Pittsburgh, declared this is not a propitious moment for constructing either of the subway systems which have been at issue in Pittsburgh. Mr. Morse was dismissed by Mayor E. V. Babcock, because of his opposition to the downtown subway loop fostered by the Mayor and authorized by the people of the city in a bond issue election. Mr. Morse, in his final presentation to Council, explained the subway system he has in mind for Pittsburgh, to consist of two intersecting subways crossing the downtown section at right angles.

Objecting to the subway loop, Mr. Morse insisted it could only be used by the Pittsburgh Railways and could not conceivably result in any more revenue to that company. "The railways company," he said, "ought not to be allowed to spend a cent for any so-called improvement which will not be a revenue-earner." The subway loop, he said, "could not accommodate one-half of the surface cars now operated by the traction company, and would not be, in any sense, a step toward the solution of transit problems." The two subways he proposed for the Council's consideration were the ones he outlined in his annual report for 1917.

Washington Men Ask Wage Increase

The trainmen of the Washington Railway & Electric Company and the Capital Traction Company, Washington, D. C., are agitating for more pay. Already the Brotherhood of Electric Railway Employees of the Washington Railway & Electric Company not in the Amalgamated Association have presented a demand for 60 cents an hour. They say:

We, the Brotherhood of Electric Railway Workers, solemnly declare that the brotherhood is and has a right to be free and independent of all other labor organizations. We wish to state that on this day we are progressing in our efforts to incorporate under the laws of the District of Columbia, as a free labor organization and the charter is being drawn under our constitution and by-laws as follows:

The motto of this organization shall be "Peace."

The purpose is to promote the social welfare of its members and to assure its members all the rights and privileges guaranteed under the Constitution of the United States.

This organization shall at no time affiliate itself with any other organization whatsoever.

The name, Brotherhood of Electric Railway Employees, shall be always retained, and, with the further support of its members, this declaration, made with a firm reliance on the protection of the Divine Providence, we mutually pledge our loyalty to each other on our sacred honor.

J. H. Cookman, representing the Amalgamated Association, said the amount of the increase to be asked for has not been decided on. While the men appreciate the increase of 3 cents an hour granted by both companies a few months ago, they still find it impossible properly to support their families on the present wage scale. They contend that their wages have not kept pace with the cost of living. The present scale is 46 cents an hour for the first three months, 49 cents for the next nine months and 51 cents thereafter.

News Notes

Strike in Columbia.—Employees of the Columbia Railway, Gas & Electric Company, Columbia, S. C., went on strike on Jan. 28. Negotiations between the men and the company for a new wage scale contract ended in a deadlock.

Steam Displaces Electricity.—The United States Railroad Administration has begun the operation of steam cars over the lines of the Rock Island Southern Railway between Rock Island and Aledo. All of the electric cars are eliminated. The new train being operated by steam is a mixed train for passengers and freight service.

Legislature Wants Transit Evidence.—Minority Leader James J. Walker introduced in the New York Senate on Feb. 4 a concurrent resolution asking that the New York City Board of Estimate & Apportionment be requested to transmit to the Legislature evidence and information it may receive through its inquiry on the transit situation.

Office of Safety League Removed.—The offices of the Ontario Safety League have been moved to 189 Church St., Toronto. The honorary president of this league Hon. L. H. Clarke, lieutenant-governor of Ontario; the president is Hon. T. L. Church, Mayor of Toronto; the organizer and engineer is J. F. H. Wyse, and the general manager is R. B. Morley.

Bridgeport Franchise Renewed.—The controversy between the Wheeling (W. Va.) Traction Company and the Council over the company's franchise at Bridgeport, Ohio, was settled when it was agreed that the company's franchise was to be renewed for twenty-five years. Bridgeport is to have a 5-cent fare for five years. The company also agreed to continue to maintain the streets over which its tracks pass, as heretofore.

Bus Concession in Buenos Aires.—The Commission of Public Works of Buenos Aires, Argentina, has granted a concession to a private concern to operate lines of autobuses for a period of fifty years, after which the concession will revert to the city. To begin with, there will be four lines operating from the center of the city to the suburbs, with twenty-five busses to each line. The fare will be 10 centavos, the same as charged by the tram lines and the subway.

Illinois Leagues Combine for Home Rule.—A consolidation of the Illinois Municipal League and the Home Rule Municipal League was effected at a joint meeting in Springfield on Jan. 29 and 30. The new league will make a determined effort on behalf of the municipalities to secure unlimited power in the revised constitution to acquire, construct and operate their own public utilities and to regulate those privately owned. Mayor Harry P. Pearsons, Evanston, is the president and Prof. John A. Fairlie, University of Illinois, is the secretary-treasurer of the consolidated league. The new body will now operate under the name of the Illinois Municipal League & Home Rule Municipal League, Consolidated.

Court Overrides Commission on Bus Line.—A certificate of convenience and necessity was denied by the Public Utilities Commission of Illinois to the Bartonville Bus Line which petitioned for the right to operate motor vehicles over public highways of the State outside the corporate limits of cities and villages. The State Supreme Court has handed down a decision in connection with this ruling of the commission in which it is stated that "there is nothing in the act which authorizes the commission arbitrarily to deny the certificate because a portion of the route over which the utility proposes to operate is a highway outside the corporate limits of a city or village." The court holds that the commission's decision is unreasonable and therefore unlawful.

Programs of Meetings

New England Street Railway Club

The annual meeting and dinner of the New England Street Railway Club will be held at the Copley-Plaza Hotel in Boston on March 25. The speakers include Matthew C. Brush, Governor Sproul of Pennsylvania, Governor Coolidge of Massachusetts and Mayor Peters of Boston.

National Railway Appliance Association

The National Railway Appliance Association will hold its annual exhibition at the Coliseum and Annex, Chicago, March 15 to 18, inclusive. The exhibit will be open from 8 a.m. to 6:30 p.m. each day, except Tuesday, March 16, when it will not close until 11 p.m. Practically the full amount of space has been contracted for, assuring a good exhibition of railway materials, supplies and equipment.

Financial and Corporate

Good Showing in South

Operating Statistics Indicate Favorable Conditions Throughout the United States, but Influenza Epidemic Makes Conclusions Difficult

The influence of the influenza epidemic which had about reached its peak in October, 1918, is sharply reflected in the comparison of the returns of electric railways for October, 1919, and 1918, as shown in Tables I to IV of the returns as made public by the information bureau of the American Electric Railway Association as contained on page 351. For this reason it is impossible to draw any accurate conclusions based on statistics as to the development in the electric railway operating situation of the railways during that month.

INFLUENZA AFFECTS RETURNS

The effect of the influenza plague upon operations of electric railways is too well known to require any comment or exposition at this time. Probably the most interesting feature of the tables is the extraordinarily good showing of the South as brought out in Table II. It is known, of course, that the South suffered more severely from the influenza epidemic than any other section of this country, and this would naturally produce a correspondingly good showing for the 1919 month as compared with the same month in 1918 when the epidemic was at its height, but it does not explain the net income, after all deductions, of 4.18 cents per car mile which the South earned in 1919, while the East was earning only 1.79 cents per car mile and the West was showing a deficit of 0.64 cents per car mile.

MANY ONE-MAN CARS

Since October, 1918, a good portion of the mileage of the Southern companies represented in the tables introduced one-man cars on their lines and it is quite probable that this fact contributed in some measure to the good showing made by the South. To what extent this is true, however, it is impossible at this time to determine because the results of one-man car operation as reflected in the operating statistics cannot be distinguished from the effects of the epidemic, which also operate to make a favorable showing in 1919. Only a comparison of returns of a month in which normal operating conditions prevailed in both years under consideration will shed any real light on this question.

In the West operating conditions were very nearly normal. It will be remembered that the influenza did not begin to make any headway in that section until after it had been gotten

under control in the East and South. For this reason the statistics of October, 1919, and 1918, for the West can be fairly compared.

The most favorable thing that can be said about these returns from the West is that the deficit for the month was slightly reduced—from 0.76 cents per car mile to 0.64 cents per car mile. And as the number of car miles operated was practically the same both years, this reflects a reduction in the actual cash amount of the deficit.

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

Maine Road Organizes Permanently

The Androscoggin & Kennebec Railway, Augusta, Me., the successor to the Lewiston, Augusta & Waterville Street Railway, has organized permanently. The new officers are William B. Skelton, president; William H. Newell, vice-president and counsel; Miss Grace E. Fitz, treasurer; Alfred Sweeney, clerk and general manager. The directors are Mr. Skelton and Mr. Newell, Frank Silliman, Jr., and C. S. Newhall, Philadelphia; Henry W. Cushman and John Wilson, Bangor; Frank D. True, Portland, and Rupert H. Baxter, Bath.

The company has in contemplation an extensive plan for improving the line. About \$500,000 will be expended upon the roadbed and transmission system. It is also proposed to order thirty-six new cars.

It is pointed out that under the foreclosure and reorganization, to which reference was made in the *ELECTRIC RAILWAY JOURNAL* for Jan. 10, control of the electric railway system is now vested principally in the hands of Maine interests.

Whereas formerly fixed charges had to be met on about \$4,000,000, the company is now required to meet such charges on only \$1,345,000.

In the article in the issue of this paper for Jan. 10, referred to previously, details were given of the new capitalization, the mileage and the discontinuance of the so-called Turner line. The new company is operating 157.165 miles as compared with 165.909 miles formerly.

\$144,055,177 New York Value

These Are Experts' Figures on War-Time Basis for New York Railways, Before Disintegration

The report of Stone & Webster showing the appraised values of the lines in the New York (N. Y.) Railways system was made public on Feb. 5 by Federal Judge Mayer. The total value of the property, including all of the leased lines before the disintegration began, is fixed at \$88,998,970 before the war and at \$144,055,177 in June of last year.

In figuring these values the report accepts the arbitrary 10 per cent allowance for depreciation set by the Public Service Commission. Deducting these allowances the two totals are \$71,516,188 and \$112,526,657. Outstanding against the June estimate of \$112,526,657 are underlying securities of \$18,000,000 of 4 per cent bonds and \$30,000,000 of 5 per cent income adjustment bonds.

The lines owned by the company, with the 10 per cent allowance for depreciation, are appraised at \$34,926,660 before the war and \$55,153,210 in June last; the leased lines are appraised at \$34,304,903 and \$54,691,361, and the values of the property not used in railroad operation for the two periods are fixed at \$2,285,525 and \$2,682,086.

The value of the three leased lines separated from the railways system for the pre-war and after the war periods, less depreciation, are: Eighth Avenue Railroad, \$5,480,360 and \$8,885,975; Ninth Avenue Railroad, \$3,586,341 and \$6,206,838; Fourth & Madison Avenue Railroad, \$5,761,722 and \$9,878,675, making totals of \$14,828,423 and \$24,971,488 which must be deducted from the totals of the values given above to show the appraised value of the railways company's property as it exists at present, as well as totals of \$1,513,769 and \$1,667,743, showing the value before the war and after it of the property owned by the Eighth and the Ninth Avenue Companies not used in operating the lines.

Predicts Deficit for Six Months

Frank Hedley, president of the Interborough Rapid Transit Company, New York, N. Y., sees a deficit for that company of \$3,210,400 for the six months which will end on June 30, 1920. In a statement which he made on Feb. 2, Mr. Hedley declares that in consequence of the present increase in travel, officers of the company expect a total estimated revenue from Jan. 1 to June 30 of \$26,800,000. Total operating expenses are estimated at \$23,859,900, leaving a balance of \$2,940,100. He says disbursements for interest and rentals during the time will amount to \$6,150,500, and will leave the company \$3,210,400 short. The statement continues:

On June 30 the company is also obligated to pay the principal and interest of the \$2,900,000 note issue made on Dec. 31 last, which represents the amount of money borrowed to weather the crisis of Jan. 1, 1920. It is expected that the auction sale of real estate will take care of a substantial proportion of this particular debt.

TABLE I—INCOME STATEMENT OF TWENTY-SIX ELECTRIC RAILWAYS FOR OCTOBER, 1919, COMPARED WITH OCTOBER, 1918

	United States		East		South		West	
	1919	1918	1919	1918	1919	1918	1919	1918
Railway operating revenues	\$7,472,644	\$5,585,555	\$2,902,384	\$2,135,197	\$800,031	\$499,115	\$3,770,229	\$2,951,243
Railway operating expenses	5,919,067	4,613,438	2,303,524	1,918,347	521,019	411,211	3,094,524	2,283,880
Net operating revenue	1,553,577	972,117	598,860	216,850	279,012	87,904	675,705	667,363
Net revenue: Auxiliary operations	361,450	302,347	192,107	158,565	159,558	119,350	9,785	24,432
Taxes	496,020	436,838	187,465	200,261	83,418	67,714	225,137	168,863
Operating income	1,419,007	837,626	603,502	175,154	355,152	139,540	460,353	522,932
Non-operating income	221,071	36,133	57,025	23,866	176	211	163,870	12,056
Gross income	1,640,078	873,759	660,527	199,020	355,328	139,751	624,223	534,988
Deductions from gross income	1,463,769	1,261,811	565,237	447,009	208,867	201,142	689,665	613,660
Net income	176,309	388,052	95,290	247,989	146,461	61,391	65,442	78,672
Operating ratio (per cent)	79.21	82.60	79.35	89.85	65.12	82.37	82.06	77.40
Car miles operated	19,019,147	17,794,936	5,346,523	5,153,921	3,505,812	2,458,040	10,184,812	10,182,975

TABLE II—INCOME STATEMENT IN CENTS PER CAR-MILE OF TWENTY-SIX COMPANIES APPEARING IN TABLE I FOR OCTOBER, 1919, COMPARED WITH OCTOBER, 1918

	United States			East			South			West		
	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase
Railway operating revenue	39.29	31.39	25.16	54.29	41.42	31.07	22.82	20.31	12.25	37.02	28.98	27.74
Railway operating expenses	31.12	25.93	20.00	43.08	37.22	15.74	14.86	16.73	11.18	30.38	22.43	35.44
Net operating revenue	8.17	5.46	50.00	11.21	4.20	166.90	7.96	3.58	122.34	6.64	6.55	1.37
Net revenue: Auxiliary operations	1.90	1.69	12.42	3.59	3.08	16.55	4.55	4.86	6.38	0.09	0.25	64.00
Taxes	2.61	2.45	6.53	3.51	3.88	9.54	2.38	2.76	13.77	2.21	1.66	33.13
Operating income	7.46	4.71	58.38	11.29	3.40	232.05	10.13	5.68	78.34	4.52	5.14	12.07
Non-operating income	1.16	0.20	480.00	1.07	0.46	132.60	0.01	0.01	0.01	1.61	0.12	1,241.66
Gross income	8.62	4.91	75.36	12.36	3.86	220.21	10.14	5.69	78.20	6.13	5.26	16.53
Deductions from gross income	7.70	7.09	8.60	10.57	8.67	21.91	5.96	8.18	27.14	6.77	6.02	12.46
Net income	0.92	2.18	137.50	1.79	4.81	111.69	4.18	2.49	100.00	0.64	0.76	15.79
Operating ratio (per cent)	79.21	82.60	4.11	79.35	89.85	11.69	65.12	82.37	20.95	82.06	77.40	6.02
Car miles operated	19,019,147	17,794,936	6.88	5,346,523	5,153,921	3.73	3,505,812	2,458,040	42.63	10,184,812	10,182,975	0.08

TABLE III—OPERATING EXPENSES OF FORTY-TWO *ELECTRIC RAILWAYS FOR OCTOBER, 1919, COMPARED WITH OCTOBER, 1918

	United States		East		South		West	
	1919	1918	1919	1918	1919	1918	1919	1918
Operating expenses	\$1,065,043	\$4,628,988	\$1,852,898	\$1,540,572	\$787,312	\$559,718	\$3,424,833	\$2,528,698
Way and structures	687,776	453,336	272,677	179,378	76,123	80,092	338,976	193,866
Equipment	689,403	581,464	228,247	206,354	105,340	67,831	355,816	307,279
Power	793,155	729,672	294,697	322,755	48,386	10,922	450,072	395,995
Conducting transportation	2,909,543	2,054,768	836,582	633,610	438,803	304,181	1,634,158	1,116,977
Traffic	26,077	22,873	15,461	7,547	2,352	2,788	8,264	12,538
General and miscellaneous	803,598	654,407	205,236	190,928	116,308	93,904	482,054	369,575
Transportation for investment—Cr	6,285	5,702	6,285	5,702	6,285	5,702	6,285	5,702
Car-miles operated	19,744,285	18,663,969	5,673,030	5,607,269	3,505,812	2,458,040	10,565,443	10,598,660

* NOTE.—This table includes the expenses of the companies shown in Tables I and II, and in addition other companies which are not included in Tables I and II because of the fact they do a power and light business and do not separate their railway taxes and fixed charges from the taxes and fixed charges of their other business.
¹ Includes \$161,780 for undistributed depreciation.
² Includes \$138,170 for undistributed depreciation.
³ Includes \$161,780 for undistributed depreciation.
⁴ Includes \$138,170 for undistributed depreciation.

TABLE IV—OPERATING EXPENSES IN CENTS PER CAR-MILE OF FORTY-TWO COMPANIES APPEARING IN TABLE III, FOR OCTOBER, 1919, COMPARED WITH OCTOBER, 1918

	United States			East			South			West		
	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase	1919	1918	Per Cent Increase
Operating expenses	53.72	24.80	23.87	32.66	27.47	14.34	22.46	22.77	1.37	32.42	23.86	35.88
Way and structures	3.48	2.42	43.80	4.81	3.19	50.71	2.17	3.26	33.44	3.21	1.83	75.40
Equipment	3.49	3.12	11.85	4.02	3.68	9.23	3.00	2.76	8.70	3.38	2.90	16.55
Power	4.02	3.91	2.81	5.19	5.76	9.90	1.38	0.44	213.63	4.26	3.72	14.52
Conducting transportation	14.75	11.01	33.97	14.75	11.31	30.32	12.52	12.38	1.13	15.47	10.54	46.77
Traffic	0.13	0.12	8.33	0.27	0.13	107.60	0.07	0.11	36.37	0.08	0.12	33.33
General and miscellaneous	4.07	3.51	15.90	3.62	3.40	6.47	3.32	3.82	13.09	4.56	3.49	30.66
Transportation for investment—Cr	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.07	0.06	16.67
Car-miles operated	19,744,285	18,663,969	5.78	5,673,030	5,607,269	1.17	3,505,812	2,458,040	42.63	10,565,443	10,598,660	0.32

¹ Includes 0.81 cents per car-mile for undistributed depreciation.
² Includes 0.74 cents per car-mile for undistributed depreciation.
³ Includes 1.53 cents per car-mile for undistributed depreciation.
⁴ Includes 1.31 cents per car-mile for undistributed depreciation.

TABLE V—INCOME STATEMENT OF EIGHTY-ONE *RAILWAYS FOR OCTOBER, 1919

	United States		East		South		West	
	1919	1918	1919	1918	1919	1918	1919	1918
Railway operating revenue	\$14,468,435	\$7,118,194	\$1,526,963	\$5,823,278				
Railway operating expenses	11,098,344	5,532,000	1,006,254	4,560,090				
Net operating revenue	3,370,091	1,586,194	520,709	1,263,188				
New revenue: Auxiliary operations	844,165	455,426	334,223	54,516				
Taxes	906,741	432,137	143,438	331,166				
Operating income	3,307,515	1,609,483	711,494	986,538				
Non-operating income	349,612	130,572	9,042	209,998				
Gross income	3,657,127	1,740,055	720,536	1,196,536				
Deductions from gross income	3,003,262	1,496,290	410,233	1,096,739				
Net income	653,865	243,765	310,303	99,797				
Car-miles operated	35,374,196	18,283,852	4,323,169	12,767,175				

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

TABLE VII—DETAILED STATEMENT OF OPERATING EXPENSES OF NINETY-SEVEN *ELECTRIC RAILWAYS FOR OCTOBER, 1919

	United States		East		South		West	
	1919	1918	1919	1918	1919	1918	1919	1918
Operating expenses	\$1,362,345	\$5,681,555	\$1,282,594	\$4,398,196				
Way and structures	1,394,928	797,807	145,800	451,321				
Equipment	1,398,792	700,127	206,219	492,446				
Power	1,477,307	830,710	78,898	567,699				
Conducting transportation	5,335,383	2,584,451	689,605	2,061,327				
Traffic	57,612	39,444	2,750	15,418				
General and miscellaneous	1,536,816	723,317	159,322	654,177				
Transportation for investment—Cr	5,972	5,972	5,972	5,972				
Car-miles operated	38,348,518	19,022,136	5,553,257	13,773,125				

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

¹ Includes \$167,479 undistributed depreciation.
² Includes \$5,699 undistributed depreciation.
³ Includes \$161,780 undistributed depreciation.

TABLE VI—INCOME STATEMENT OF TABLE V IN CENTS PER CAR-MILE

	United States		East		South		West	
	1919	1918	1919	1918	1919	1918	1919	1918
Railway operating revenue	40.90	38.93	35.32	45.61				
Railway operating expenses	31.37	30.26	23.28	35.72				
Net operating revenue	9.53	8.67	12.04	9.89				
Net revenue: Auxiliary operations	2.39	2.49	7.73	0.43				
Taxes	2.56	2.36	3.32	2.59				
Operating income	9.36	8.80	16.45	7.73				
Non-operating income	0.99	0.71	0.21	1.64				
Gross income	10.35	9.51	16.66	9.37				
Deductions from gross income	8.49	8.18	9.49	8.59				
Net income	1.86	1.33	7.17	0.78				
Operating ratio per cent	76.70	77.73	65.91	78.32				
Car-miles operated	35,374,196	18,283,852	4,323,169	12,767,175				

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

	United States		East		South		West	
	1919	1918	1919	1918	1919	1918	1919	1918
Operating expenses	29.63	29.87	23.10	31.93				
Way and structures	3.64	4.19	2.63	3.28				
Equipment	3.65	3.68	3.71	3.58				
Power	3.85	4.37	1.42	4.12				
Conducting transportation	13.91	13.59	12.42	14.97				
Traffic	0.15	0.21	0.05	0.11				
General and miscellaneous	4.01	3.80	2.87	4.75				
Transportation for investment—Cr	0.01	0.01	0.01	0.01				
Car-miles operated	38,348,518	19,022,136	5,553,257	13,773,125				

¹ Includes 0.43 cents per car-mile for undistributed depreciation.
² Includes 0.03 cents per car-mile for undistributed depreciation.
³ Includes 1.17 cents per car-mile for undistributed depreciation.

Financial Outlook Better

Signs Point to Possible Reconciliation of Differences Among Rhode Island Security Holders

The traction interests may agree upon a plan for the reorganization of The Rhode Island Company, Providence, R. I., in time to be presented to the State Legislature at its present session which will end late in April, according to one of the spokesmen representing the security holders. One of the investors said:

Legislation will be requested to make jitneys and buses common carriers, subject to regulation by the Public Utilities Commission.

The law will be so framed that it will be impossible for automobiles to compete with the existing services of the Rhode Island Company. Such legislation is the very first essential to a successful reorganization of the traction properties.

The men who have invested money in these properties are not going to be content to let that money go much longer without earning any return. They will junk the road first. And the elimination of the present unfair and ruinous jitney competition is absolutely necessary if the business is to be put upon its feet again.

Another man, intimately identified with reorganization activities in Rhode Island, said:

We have not as yet agreed upon a plan, but we are getting together slowly and ironing out the difficulties.

The two stumbling blocks which have kept apart the security holders since negotiations were begun last July still prevent complete agreement upon a reorganization plan.

There has not been a settlement of the question of how the bondholders of the Rhode Island Suburban Railway are to fare in a rehabilitation of the properties. These bondholders own securities valued at \$5,000,000 at par and bearing 4 per cent interest. They have a first lien upon the physical assets of the Suburban Company, including the power house, the Elmwood Avenue car-house, the repair shops and a number of trolley lines.

The Suburban bondholders have, from the first, aligned themselves with the traction stockholders as against the traction bondholders. At a meeting of all interests on Dec. 31, the traction bondholders submitted a reorganization plan under which the Suburban bondholders would exchange their \$5,000,000 of 4 per cent bonds, based on a first mortgage on the physical assets of the Suburban Company, for \$2,400,000 of 5 per cent bonds issued against a general mortgage on the assets of the proposed new company.

The Suburban bondholders flatly refused to listen to such a plan or to compromise from any such basis. At a succeeding meeting they offered to enter a reorganization under which their holdings would not be shrunk in value, would continue to bear 4 per cent interest, and would still have as security the property now held by the Suburban Company.

This issue is still unsettled, but it is believed that the Suburban bondholders are to insist that their \$5,000,000 bonds be not shrunk to less than the taxable

valuation of the properties of the Suburban Company upon which they are based. This taxable valuation is \$4,114,912.

A stockholders' plan submitted as a basis for a settlement proposes that the new working capital be raised with a first mortgage on the property as security and that a sinking fund be created which would retire the new securities within a short term of years, thus leaving to the present bondholders a first lien upon the underlying assets.

Men competent to pass judgment say that a compromise is in sight on the

Net Off 22 Per Cent

Toronto Unable to Pay Dividends Due To Abnormal Wages Although Gross Increased

That the financial condition in which the Toronto Railway Company finds itself at the end of the calendar and also its fiscal year for 1919 are not much different than those confronting many other electric railway companies, is reflected in its 28th annual report just issued. No dividends were declared during the year due entirely to the abnormal increase in wages during

COMPARATIVE STATEMENT OF TORONTO RAILWAY

	1919	1918	Per Cent + Inc. - Dec.
Passenger revenue	\$7,114,036	\$6,289,611	+ 13.10
Gross earnings	7,234,895	6,526,302	+ 10.82
Operating expenses	5,655,658	4,509,651	+ 25.40
Net operating revenue	1,579,237	2,016,651	- 21.78
Deductions:			
Bond interest, etc.	128,433	138,660	- 7.42
War and provincial government taxes..	39,059	75,155	- 48.10
Payments to city:			
Percentage on earnings.....	1,152,515	1,046,495	+ 10.13
Pavement charges	98,794	98,817	- 0.02
General taxes	147,161	155,955	- 5.64
Dividends	none	480,000	-100.00
Profit and loss account	13,275	21,569	- 38.60
Traffic:			
Revenue passengers	182,377,494	166,510,326	+ 9.54
Transfer passengers	70,446,128	63,176,397	+ 11.51
Total passengers	252,823,602	229,686,723	+ 10.08
Operating ratio	78.00	68.30	+ 13.60

basis of a reorganization capitalized at about \$25,000,000, of which \$2,000,000 would be in working capital to be paid in by the stockholders. This would accommodate the holders of \$9,000,000 traction bonds, \$5,000,000 Suburban bonds and \$8,000,000 traction stock and leave \$1,000,000 in stock to be set aside for the purchase of the New Haven's present holdings.

Before such a plan could be acted upon by the General Assembly, it would have to be ratified by the Federal District Court for the Southern District of New York, from which the Federal trustees of the New Haven's stock derive their authority, by the governments of Providence and the various surrounding cities and towns.

Confer on Foreclosure Sale

Attorney John J. Coniff of Wheeling, W. Va., counsel for the West Virginia Traction & Electric Company, and J. D. Whittemore, receiver of the company, conferred in Pittsburgh recently with counsel from New York for the entering of a degree of foreclosure in the State of Pennsylvania.

This procedure is necessary as a portion of the company's property near Morgantown touches Pennsylvania territory. Following the decree in Pittsburgh the property will be advertised for auction in Morgantown, W. Va., and a date will be set for the sale.

The properties involved include real estate, rights, leases, franchises and other assets of the company and its subsidiaries. This embraces the traction lines, City & Suburban Gas Company's property, real estate along the pike in Wheeling and Wheeling Park and other property.

the past few years, combined with the rapidly increasing cost of materials.

Wages of trainmen in 1916 reached a maximum of 27½ cents per hour. In 1917 this was increased to 37 cents per hour by an arbitration board. Before this agreement had expired the trainmen sought a conciliation board and secured a war bonus of 2 cents per hour, bringing the maximum rate up to 39 cents. In 1919, under the action of the Conciliation Board and the Ontario Railway & Municipal Board the maximum rate was fixed at 55 cents per hour, with an 8-hour working day and 30-min. break, after which overtime rates were to be paid. Special rates, which are higher, are paid for work on Sundays and holidays. The actual cost to the company was estimated to be approximately \$1,500,000 per year. With the scale paid but half a year the company without the payment of dividends had only a balance of \$13,275.

In consequence, the money that would otherwise have gone toward improvements in the property and dividends has been utilized solely to pay the increases in wages and the increased cost of materials.

These expenditures have been faced with the revenues from rates fixed 28 years ago. The average fare during 1919 was but 8.9 cents per revenue passenger.

The city has persistently refused to allow an increase in fare to care for the increased costs thrust upon the company. The Ontario government has likewise refused relief. The company even offered to sell out to the city upon the terms set forth in the franchise agreement for sale on Sept. 1, 1921, but the Council would not favorably consider the offer.

\$418,665 Added to Surplus

At the annual meeting of the Detroit (Mich.) United Railway, held on Feb. 3, the annual report of the company was presented by President F. W. Brooks. A summary of the business of the Detroit United Railway, the Rapid Railway System, the Sandwich, Windsor & Amherstburg Railway, the Detroit, Monroe & Toledo Short Line Railway and the Detroit, Jackson & Chicago Railway, for the years 1918 and 1919 follows:

COMPARATIVE STATEMENT OF DETROIT UNITED RAILWAY		
	Year Ended Dec. 31	
	1919	1918
Gross earnings from operation:		
Passenger.....	\$23,108,561	\$17,696,781
Express.....	1,514,238	1,265,311
Mail.....	12,926	12,433
Special car.....	47,311	39,492
Total gross earnings from operation.....	\$24,683,037	\$19,014,018
Deduct—Operating expenses.....	19,792,528	14,758,339
Net earnings from operation.....	\$4,890,509	\$4,255,678
Add—Other income.....	546,406	449,736
Gross Income less operating expenses.....	\$5,436,915	\$4,705,415
Deduct—Interest on funded and floating debts and taxes.....	2,868,250	2,610,831
Net income for the year before providing for depreciation or contingencies....	\$2,568,665	\$2,094,584
Deduct—		
Amount credited to depreciation reserve.....	\$600,000	\$600,000
Amount credited to contingent liability reserve.....	150,000	150,000
Amount provided for Federal taxes.....	200,000	150,000
Dividends paid.....	1,200,000	1,200,000
Together.....	\$2,150,000	\$1,950,000
Balance from all lines, including city of Detroit, transferred to surplus acct ...	\$418,665	\$144,584

During the year the track mileage of the company increased from 915.46 miles to 928.39 miles.

Additions to the properties during the year reached the sum of \$1,799,301.

As required the accounts of the company are kept according to the plans and under the supervision of the interstate commerce commission.

Time for Deposit Extended

In addition to the statement of facts recently sent to the holders of un-deposited general mortgage 5 per cent bonds of the Columbus, Newark & Zanesville Electric Ry., Newark, Ohio, due in 1926, the protective committee of that issue calls attention to the fact that ever since the property of the Columbus, Newark & Zanesville Electric Ry. was leased to the Indiana, Columbus & Eastern Traction Co., the earnings of the former company have been sufficient to cover the interest on all of its bonded debt, and 6 per cent dividends on its preferred stock and in addition a surplus for the common stock, (all of which is owned by the Indiana, Columbus & Eastern Traction Co.) aggregating for the period of the lease, in excess of \$1,100,000.

The committee further says that even during the twelve months ended Dec. 31, 1918, a most unfavorable year, the Columbus, Newark & Zanesville Electric Ry. showed net earnings in excess of all interest and preferred dividend requirements. Furthermore the committee is advised that for the ten months ended Oct. 31, 1919, the net earnings exceeded those for the corresponding period in 1918, by more than \$20,000. In spite of these ade-

quate earnings, says the committee, the interest has not been paid.

The period of grace stipulated in the deed of trust securing the mortgage under which the bonds mentioned were issued will expire on Feb. 1, and the committee, therefore has notified non-depositing holders that the Land Title & Trust Co., Philadelphia, depository, will accept, without penalty, bonds received by it on or before Jan. 24. After that date bonds may be deposited only upon such terms as the committee may then impose.

City Blamed in Receivership Case

Failure of agents of the City of New York to serve a Supreme Court order on the proper officials of the Midland Railway, Staten Island, N. Y., ordering them to show why they should discontinue operation of cars on Staten Island released the company from any responsibility for disobedience of the order, Supreme Court Justice Cropsey of Brooklyn said in handing down his decision on the case.

Although the Supreme Court order was obtained by Corporation Counsel for the city on Saturday three weeks ago it was not served upon Henry J. Blackman, superintendent of the road, until the following night, only a few hours before the cars were scheduled to cease operation. Mr. Blackman, in his position as head of the physical operation of the trains, Justice Cropsey decides, did not have the power to order the service to continue in accordance with the court order.

Several directors of the road, upon whom the order should have been served, the court said, were in New York City all of Saturday and Sunday, and could have been found by the city's agents had they shown the proper perspicacity and zeal.

The Midland road went out of business following a warning to the Board of Estimate that it could not continue unless allowed to charge a 7-cent fare. When the board refused to grant this privilege the road continued a short time, and then after another preliminary warning sent to the city it shut down.

The City of New York then started suit to compel the road to continue the service it had been rendering, the first move being to obtain the order from the court, which was improperly served. The next move was to sue the road for failure to obey the court's order. This action has been nullified by the decision which has just been rendered in the Supreme Court by Judge Cropsey.

19.3 Per Cent Increase in Gross

Gross earnings of the Eastern Massachusetts Street Railway, Boston, Mass., under the management of the board of public trustees headed by Chairman Loring, increased 19.3 per cent during the seven months to Dec. 31 last as compared with the corresponding period of 1918. October and December each showed gains of more than 30 per cent.

Aggregate receipts for the seven months' period were \$7,892,626, compared with \$6,610,783 for the same seven months in 1918.

The gross earnings by months for the period in question as compared by the *Boston News Bureau* follows:

	1919	1918	Inc.	Per Cent Inc.
June.....	\$988,319	\$909,360	\$78,958	8.7
July.....	1,169,775	1,029,111	140,664	13.7
August.....	1,286,010	1,114,068	171,942	15.4
September.....	1,104,618	969,768	134,850	13.9
October.....	1,073,463	795,616	277,847	34.9
November.....	1,055,809	879,325	176,484	20.
December.....	1,214,632	913,535	301,097	32.9
Total.....	7,892,626	6,610,783	1,281,783	19.3

It is understood that the trustees charged with the operation of the road plan to make public monthly financial statements beginning with January. This will permit the patrons of the road to know the exact gross and net earnings of the lines which are operated by the company in their particular district.

It is probable that the statement for January and eight months of the entire system will just about show the bond interest was covered.

Testifies on Merger Bill

W. F. Ham, president of the Washington Railway & Electric Company, testifying before the House committee on the District of Columbia, which is considering a bill to merge that company and the Capital Traction Company, operating within the District, declared on Jan. 29 that Congress has stood in the way of a merger of the systems.

Unless something is done immedi-

ately to alleviate the financial condition of the company, Mr. Ham said, it would be forced to cut off some of the suburban service in order to reduce operating costs.

Mr. Ham asked that street railways be relieved of the cost of maintaining traffic policemen. He argued that the cost of new pavement between the tracks and for 2 ft. on either side should be laid upon the community rather than on the companies. He said that every one of the suburban lines which he characterized as "city builders and tax producers," had been operated by the company at a loss.

Sold for Junk

Kroger Line of 53 Miles, Long Since a Liability, Will Profit Railway Materials Dealers

Despite the efforts of a firm of Dayton engineers and various citizens' committees, boards of trade and municipal authorities, to work out a re-financing and reorganization plan for the Cincinnati & Columbus Traction Company, as related in the *ELECTRIC RAILWAY JOURNAL* for Jan. 17, the road has finally had to be sold for junk. The Union Savings Bank & Trust Company, Cincinnati, which has been the receiver of the company since 1913, would have sold the road for \$300,000 if the proposal recently made by the Dayton engineers had been carried out.

The Hyman-Michaels Company, Chicago, and the Joseph Joseph Brothers Company, Cincinnati, have now jointly purchased the entire 53 miles of line and all equipment for the purpose of dismantling and selling. There were outstanding capital stock of \$1,853,500 and funded debt of \$809,200.

The road runs between Norwood, Ohio, a suburb of Cincinnati, through Milford, Fayetteville and Hillsboro. The fact that it was a standard gage road precluded the possibility of its entrance into the city over the wide-gage track of the Cincinnati Traction Company.

The road was equipped with eight motor passenger cars and twenty-one freight cars. A small power house, the substations, shop and all equipment, are included in the purchase. The dismantling operations will begin at once. The power house will be continued in operation until April 1, which is the date of termination of a contract with a local distribution company for the lighting of the village of Madeira.

Toronto Railway Offered to City

The Toronto Railway Company on Feb. 6, through D. L. McCarthy, K.C., offered to sell the railway system to the city, without waiting for the expiration of the franchise. The offer was made at a conference in the Attorney-General's office called to consider the city's demand that 200 additional cars be ordered at once, and placed in operation at the earliest possible moment to relieve congestion during the

rush hours. Mr. McCarthy said that it was impossible for the Toronto Railway to raise another dollar to buy new cars, but suggested that the city go into the market and buy some and turn them over to be operated, under any condition imposed by the railway board.

After hearing all the arguments the Attorney-General said the case would have to go before the railway board. Meantime he asked the Mayor to present a memorandum to the Government setting forth the city's side.

The franchise of the company expires in September, 1921.

Financial News Notes

Refunding Operation Approved.—The Georgia Railway & Power Company, Atlanta, Ga., was granted permission by the State Railroad Commission at a recent meeting to issue \$2,500,000 of collateral notes for the purpose of refunding notes of that amount which matured on Feb. 1.

Purchase Negotiations Reported.—Reports are being circulated at Niagara Falls, N. Y., that the Niagara Falls Power Company is negotiating with the Niagara Gorge Railroad for the purchase of its double track line through the lower gorge of the Niagara River between Niagara Falls and Lewiston, N. Y., a distance of 7 miles.

Municipal Line Run at Loss.—A deficit of \$84,603 was shown in the operation of the municipal street railway at Tacoma, Wash., for the year 1919, according to a report made public on Jan. 22 by City Comptroller John M. Roberts. The line is a comparatively short one, running from the center of the city to the Todd shipyards across the tide flats.

New Directors for Grand Rapids Railway.—L. J. DeLamarter was elected vice-president and general manager of the Grand Rapids (Mich.) Railway at the annual meeting and also a director of the company. He succeeds Benjamin S. Hanchett as general manager, Mr. Hanchett being re-elected president. New directors, besides Mr. DeLamarter, are Clay H. Hollister, Claude T. Hamilton, Dudley E. Waters, E. W. Clark, III, Philadelphia, and T. J. O'Brien.

Towns Urge Restoration of Service.—At a meeting in Newburyport, Mass., on Feb. 2, a committee was appointed to investigate and estimate the expense of having the five communities affected by the suspension of service by the Georgetown, Rowley & Ipswich Street Railway restore the service. The committee is expected to report in time to permit voting upon the question at the town meetings in March.

Want Service Restored.—Residents of Westfield, N. Y., have signed a peti-

tion asking for the return of service on the lines of the Chautauqua Traction Company, Jamestown, N. Y., between Westfield and Barcelona, which was discontinued some time ago because the line did not pay expenses. The petition has been sent to the Public Service Commission for the Second District.

\$8,468,278 in Salt Lake Value.—The Public Utilities Commission of Utah in passing on the value of the property of the Utah Light & Traction Company, Salt Lake City, Utah, said: "We find that your property is worth \$8,468,278. And that is all that interests us. We don't care whether you are capitalized for \$8,000,000 or whether you are capitalized for \$80,000,000. We shall fix for you a rate of fare that will permit you to earn a fair return on \$8,468,278 and not on a dollar more."

Liquidating War Finance Debt.—J. D. O'Keefe, federal receiver of the New Orleans Railway & Light Company, New Orleans, La., has been authorized by Judge Rufus E. Foster, in the Federal District Court, to pay the sum of \$25,000 monthly to the War Finance Corporation, so that the debt owed by the company to the corporation amounting to \$660,000 could be wiped out quickly. Judge Foster also approved the payment of \$125,000 on Oct. 31 and Jan. 24, to the War Finance Corporation, as well as \$37,275 in interest which was paid to the same body on Dec. 31, 1919.

Ottawa Company Prosperous.—The established record of the Ottawa (Ont.) Electric Railway has been fully maintained, as shown by the annual report for 1919 of the Ottawa Traction Company, Ltd., and receipts have shown a steady increase, even though service was suspended for eighteen days in July due to a strike of the trainmen. The operating company paid dividends of \$278,958 on its capital stock held by the Traction Company amounting to \$1,860,100. This is equivalent to 15 per cent return. The holding company, however, paid only four quarterly dividends of 1 per cent and in the last quarter also a bonus equivalent to the dividend rate.

Inventory Nearing Completion.—John C. Brackenridge, New York, N. Y., who has been making a survey of the city property of the International Railway, Buffalo, N. Y., for the municipal authorities, will make a spot-check of the inventory of the company's property. The inventory is rapidly nearing completion under the direction of Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, who is a factor in the operation of the International Railway on behalf of the bondholders' committee, of which he is a member. The city authorities have refused to aid in making the inventory, but Mr. Brackenridge will make the spot-check to determine the accuracy of the report. The city believes the inventory will be used by the International Railway in a new rate case before the Public Service Commission.

Traffic and Transportation

\$7,000,000 Loop Plan

Unprecedented Traffic Demands Make Relief Necessary in New York's Terminal and Theatrical District

At the recent hearing before Transit Construction Commissioner John H. Delaney on proposals now pending for bringing about the betterment of rapid transit facilities in the vicinity of New York, representatives of both the Interborough Rapid Transit Company and the Brooklyn Rapid Transit system gave the views of the engineering and operating experts of the two systems as to the most satisfactory way of meeting the increasing traffic at the Times Square, Grand Central, and Pennsylvania Terminal Stations.

TWO-TRACK LINK PLANNED

In addition to the plan to extend the Steinway tunnel route to Seventh Ave., the petition to provide a subway loop between Forty-second and Thirtieth Sts., Seventh and Fourth Aves., and the construction of a moving platform under Forty-second St., the possibility of constructing a new link under Fortieth St., between the east side and the west side trunk lines, was considered.

This idea was originally pressed by B. L. M. Bates. It has been revised as to many details, but it is still proposed to construct either a two-track or a four-track link that will make it possible to restore the through traffic between the east side south of Forty-second St., and the west side north of Forty-second St., by again utilizing the tracks under the thoroughfare for through traffic and utilizing tracks to be built under Fortieth St., for making possible through service between the lower west side and the upper east side.

This project contemplates a switching of a percentage of through trains at a point immediately north of the Pennsylvania Terminal Station on the Seventh Ave. Subway to tracks to be built either outside or inside of the existing tracks. The new tracks are to gradually descend to a deep level under Fortieth St., and to continue at a deep level under the existing express station at the Grand Central Terminal and north of that point to ascend gradually until they reach the level of the existing subway tracks in Lexington Ave., just south of the Fifty-first St. local station.

CONGESTION AT GRAND CENTRAL

It is stated that this new link can be constructed from a subway reservoir north of the Pennsylvania Terminal at Seventh Ave., to a similar reservoir at Fiftieth St. and Lexington Ave., for approximately \$7,000,000, and that the switching from the exist-

ing trunk line tracks to the new connecting link can be made without grade crossings and without encroachment upon private property, so that there will be no expenditure needed for the purchase of real estate or for easement purchases.

Ticket sales during the year ended June 30, 1919, at the Forty-second St. stations of local rapid transit lines, including the Manhattan "L," the Interborough Subway, the New York Municipal Subway, and the Steinway Tunnel, amounted to 69,259,117, a daily average for the year of 203,672 tickets. In addition there were 14,492,285 tickets, a daily average of 39,731, sold during the year at the Grand Central Terminal for passage over the New York Central and the New York, New Haven & Hartford lines. This brought the total sales at passenger traffic stations located at Forty-second Street up to 83,751,402 for the year, a daily average of 243,403 fares paid by passengers at that point. This does not take into consideration surface railroad traffic originating there.

In the territory immediately below Forty-second St., ticket sales at the subway and "L" stations are also unusually heavy. During the year ended June 30, 1919, for instance, ticket sales at the express station of the Seventh Avenue Subway Line at Thirty-third St., (Pennsylvania Station) were 11,812,877, a daily average of 34,774, and at the Thirty-third St., Station of the Fourth Avenue-Lexington Avenue Subway, 5,639,367, a daily average of 16,586. At the Herald Square station of the New York Municipal Subway line the ticket sales for the year were 7,698,891, a daily average of 22,644.

Flat Seven-Cent Fare in San Antonio

A flat 7-cent fare with free transfers became effective on the lines of the San Antonio (Tex.) Public Service Company on Feb. 2. Children's fares are now 3.5 cents each. The new schedule replaces the zone system which the company installed on Nov. 30, and which provided a maximum fare of 10 cents for a ride across the city. The zone system was later modified by the addition of a second 3-cent zone, making the fare from the center of San Antonio to the city limits 8 cents.

The company's revenue was increased only 2 per cent under this plan, owing to the fact that many persons preferred to walk to the beginning of the second zone rather than pay the extra fare. The company formerly charged a straight 5-cent fare. Judge Duval West several months ago issued an injunction restraining the city authorities from collecting fares in excess of this amount.

Columbus Ordinance Passed

Provides for Six-Cent Cash Fare With Five Tickets for a Quarter—Arbitrators Announce Decision

The City Council of Columbus, Ohio, on Feb. 9 passed an ordinance by the terms of which the Columbus Railway, Power & Light Company will be permitted to charge a 6-cent cash fare for a period of six years. The ordinance will become effective at the end of thirty days. The present fare in Columbus is 5 cents, with eight tickets for 25 cents.

The ordinance as passed by the Council is substantially similar to that drafted by the company some time ago at the instance of the board of arbitration appointed to pass on the demands of the company's employees for an increase in wages. It provides for the sale of five tickets for 25 cents, as suggested by the company, but limits the life of this ticket rate to a period of two years. For the remaining four years a ticket rate of six tickets for 25 cents is provided. The company is also required to expend certain sums for improvements and extensions during the six-year period.

COMPANY WILL ACCEPT

Owing to the latter provision it was at first reported that the company would refuse to accept the terms of the ordinance. It is now understood that the ordinance will be accepted, although the company has not yet acted officially. The Mayor refused to sign the bill because of objection to details regarding extensions to the company's lines, and it will become effective without his signature.

The carmen in the company's employ are to receive a wage increase of 12 per cent. This increase has been awarded them by the board of arbitration, of which S. D. Hutchins of the Westinghouse Traction Brake Company is chairman, and which withheld its decision pending action by the City Council on the question of granting the company a higher fare. Mr. Hutchins declared before the Council on Dec. 4 that the company could not increase wages unless fares were also raised. He urged the city authorities to take action, so that the board could announce its award.

NEW WAGE SCALE

The new wage scale fixes the maximum pay for platform men at 50 cents an hour. The pay of linemen is raised from 20 to 30 per cent. The new scale is satisfactory to the men, who have expressed their intention of abiding by the board's award.

There has been some effort to submit the ordinance to a referendum vote as allowed by law. Petitions calling for a referendum are being circulated, but are receiving little endorsement. The labor unions oppose the submission of the question to popular vote, owing to the fact that the increase in wages depends upon the advance in fare.

Still Delving Into New York Details

The hearing of the city of New York into the need of the Interborough Rapid Transit Company for an increase in fare will be continued on Feb. 18.

The principal witness at the session on Feb. 11 was Dr. John Bauer, special technical adviser to the Corporation Counsel on franchise questions. Dr. Bauer went into detail on some of the charges of the company. It was his opinion that the railroad had improperly claimed as subway investments under contracts one and two items totaling \$40,217,700. In summing up Dr. Bauer said that the Interborough should have paid off at least \$40,000,000 during its profitable days, with the result that instead of having that amount or more in book figures the railroad would have that sum in actual cash or equipment property.

James L. Quackenbush, general counsel for the company, declared that if the system were broken up, following a default in the next payment of interest on the outstanding bonds, there was no legal way of preventing the Manhattan (Elevated) Railway from charging a 15-cent fare from the Battery to Harlem River.

Tacoma Wants Ten Cents

A hearing has been started on the legal fight between the city and the Tacoma Railway & Power Company, Tacoma, Wash., over a 10-cent fare the company is asking. The company management, in a statement, asked that an agreement be reached in time for submission to the voters at the April city election.

The matter of fares is one of the subjects referred to by the mayor and the city counsel in their report to the Council, referred to elsewhere in this issue. These officials quote chapter 33, page 61, of the laws of 1919, amending the Public Service Commission law as providing as follows:

No street railroad company shall charge, demand or collect more than 5 cents for one continuous ride within the corporate limits of any city or town; Provided, That such rate may be exceeded or lowered as to any municipally owned street railroad when the corporate authorities of the municipality owning such railroad shall, by an ordinance duly passed, authorize the collection of a higher or lower rate of fare, to be specified in such ordinance, and as to any other street railroad company, such rate may be exceeded or lowered with the permission or upon the order of the Public Service Commission after the filing of a tariff or a complaint by such street railroad company and a hearing thereon as provided in this act.

Will Restore Buffalo Owl Service

R. Harland Horton, traffic engineer for the Philadelphia (Pa.) Rapid Transit Company, who has been making a survey of traffic conditions on the lines of the International Railway, Buffalo, N. Y., especially with the view of determining whether or not owl car service shall be restored on all lines, has submitted his report to Herbert G. Tul-

ley, acting president of the company. He recommends that no owl car service be given on five lines and that service be restored on three additional lines, making twelve lines upon which the company has restored all-night car service. Lines upon which the company will not restore all-night service parallel within a quarter of a mile lines upon which owl service has been restored, according to Mr. Horton. Hourly service will be maintained upon lines where service has been restored.

At a recent hearing before Chairman Charles B. Hill of the Public Service Commission, Second District, on the petition of the city for the restoration of half-hour owl service on all lines, Commissioner Frank C. Perkins of the municipal public utilities bureau urged the purchase of one-man safety cars for operation on all lines throughout the night. He believed that the use of one-man cars on owl lines would effect a big saving in operating costs and make the all-night service a paying proposition.

Service-at-Cost Bill for New York

The hearing on the public service bills introduced into the Legislature of New York at Albany has been postponed until Feb. 17. The hearing was originally set for Feb. 11.

Meanwhile there is much talk of action being contemplated looking toward the enactment of legislation at the present legislative session authorizing higher fares on the traction lines in New York City.

A measure already drafted embodying a service-at-cost plan will be introduced by J. Henry Walters, president pro tem, of the Senate. It is said that this measure will have the support of Speaker Sweet and his Republican followers in the Assembly.

Corporation Counsel Burr, apparently speaking for the New York City administration, said on Feb. 12 that the proposed Walters bill would undoubtedly solve a very perplexing problem providing its provisions met with the approval of the city administration.

Committee Favors Rochester Increase

A citizens' committee, whose members are representative of the commercial organizations, clubs and other societies of Rochester, N. Y., has been organized to co-operate with the municipal authorities and the officials of the Rochester lines of the New York State Railways to secure improved transportation facilities for the city. The committee has suggested that the City Council enact a resolution allowing the company to charge more than a 5-cent fare for a period of six months.

The suggestions for a higher fare during the probationary period call for the sale of five tickets for 25 cents for use only in the rush-hour periods, with a charge of 6 or 7 cents during other

periods of the day. If fares of 6 cents in non-rush hour and 5 cents in rush-hour periods do not produce sufficient revenue, the committee suggests that 6 cents be charged in non-rush hours and 5 cents in rush hours with an additional 1-cent charge for transfers.

It is also suggested that an informal referendum be held on the proposal to grant the fare increase, so that an evidence of popular feeling can be secured before final action is taken by the City Council. Legislation which would empower the municipality to take over the property of the company for municipal operation is also proposed by the committee.

Transportation News Notes

Six-Cent Fare Continues.—The Illinois Public Utilities Commission has issued an order continuing in effect until March 31 next, the 6-cent fare now charged by the Evanston Railway.

Ten Cents on Vermont Line.—The Public Service Commission of Vermont has authorized the Military Post Street Railroad, Burlington, to raise the fare on its line between Winooski and Essex Junction from 5 cents to 10 cents. The line is five miles in length.

Seven Cents in Douglas.—The Douglas Traction & Light Company, Douglas, Ariz., has installed a 7-cent cash fare on its lines. The ticket rate is 6 cents. The increase was made on authority of the State Corporation Commission. The company had applied for an 8-cent cash fare with a ticket rate of 7 cents.

Asks Seven Cents in Aberdeen.—The Gray's Harbor Railway & Light Company, Aberdeen, Wash., has filed with the State Public Service Commission a new tariff, fixing fares in Aberdeen, Hoquiam and Cosmopolis at 7 cents. The Aberdeen-Hoquiam interurban rate remains at 10 cents.

One-Man Cars Sanctioned in Muscatine.—The City Council of Muscatine, Iowa., on Jan. 16 repealed the ordinance barring one-man cars within the city limits. The Clinton, Davenport & Muscatine Railway will install one-man cars on its lines in Muscatine in the near future.

Increase on Ohio Interurban.—The Northwestern Ohio Railway & Power Company, Toledo, Ohio, on Feb. 1 placed in effect a new tariff involving an increase of 5 cents between several points on its lines. The fare between Genoa and Toledo was reduced from 45 cents to 40 cents.

Seven-Cent Fares Approved in Glen Cove.—An increase in the fare of the Glen Cove (N. Y.) Railroad from 5 cents to 7 cents has been approved by the Board of Supervisors. Children's fares are raised from 2.5 cents to 3.5

cents. The higher rates are provided for in a modification of the company's franchise which has already been approved by the Glen Cove City Council.

Interurban Fare Reduced.—The Saginaw-Bay City Railway, Bay City, Mich., has reduced the fare between Bay City and Carrollton from 27 cents to 25 cents. The reduction was made following a hearing before the State Public Utilities Commission at which it was charged that the rate was 2 cents higher than that fixed by franchise.

Richmond Five-Cent Fare Extended.—The City Council of Richmond, Va., has passed an ordinance authorizing the Virginia Railway & Power Company to continue to charge a straight 5-cent fare for a period of six months. Labor tickets will be sold as formerly at the rate of six for 25 cents. The company's petition for a 6-cent fare is under investigation.

Seven Cents in Chattanooga.—The Railroad & Public Utilities Commission of Tennessee on Feb. 4 issued an order authorizing the Chattanooga Railway & Light Company to raise its fare from 5 cents to 7 cents, effective Feb. 10. Free transfers are continued. The rate for school tickets is unchanged. The order stipulates improvements in physical property and operation as a condition under which the increase is granted.

Fare Bill Passed by Assembly.—The Assembly of Ohio has passed the Pearson bill giving the Public Utilities Commission power to fix rates of fare for steam and interurban railroads at a rate not exceeding 3 cents a mile. Not a vote was cast against the bill. Steam roads are now charging 3 cents a mile under wartime orders. The Senate is expected to pass the Pearson bill. A 2-cent passenger fare law was passed in Ohio in 1906.

Asks City-Owned Bus Line.—The Central Labor Council of Los Angeles, Cal., has asked the City Council to appropriate \$25,000 for the establishment of an experimental line of buses. Forty thousand trade unionists are represented by the request. The establishment of a bus line for experimental purposes was recommended recently in the report of a committee of which Van Griffith, commissioner of motor bus transportation, was a member.

Wants Increase on Interurbans in City.—The Gary & Southern Traction Company and the Gary & Hobart Traction Company, Gary, Ind., are seeking to increase the fare from 5 cents to 6 cents on interurban cars within the city limits of Gary. The company has had in effect a 6-cent fare for some time on city cars, but the fare on interurbans has not been increased. As a result congestion of intra-city traffic on interurban cars leaving and entering the city has become a burden.

Eight Cents in Youngstown.—The Youngstown (Ohio) Municipal Railway has raised its cash fare from 7 cents to 8 cents in accordance with the terms

of the cost-of-service franchise under which the company operates. The 1-cent transfer charge is retained. The Mahoning & Shenango Railway & Light Company has increased the fare between Girard and Youngstown from 8 cents to 9 cents. The fare between the two cities automatically changes with the rate in Youngstown, being 1 cent greater than the latter.

One-Way Traffic Proposed for Portland.—The one-way traffic plan proposed by Mayor Baker and members of the City Council of Portland, Ore., is still under discussion. The plan to date has not met with opposition on the part of the Portland Railway, Light & Power Company. However, the proposal to include Washington and Morrison Sts. in the plan has met with objection from the company, on the ground that such a change would necessitate the handling of four-track traffic on two tracks.

Asks Seven Cents in Mobile.—The Mobile Light & Railroad Company, Mobile, Ala., has filed a petition with the Mobile City Commission for permission to charge a 7-cent fare for a period of two years. The wages of the company's employees were advanced on Jan. 1, and the latter have been promised a second increase if the fares are raised. Representatives of the carmen's union and other unions in the city sent representatives to the city hall to indorse the petition. Last May the company applied for 6-cent fares, but later withdrew its petition.

Wants Seven Cents in Salt Lake.—The Utah Light & Traction Company, Salt Lake City, Utah, has applied to the State Public Utilities Commission for permission to raise the fare in Salt Lake City from 6 cents to 7 cents. The company also asks the privilege of charging 1 cent for each transfer. Without waiving the right to protest the valuation fixed by the utilities commission on the property of the company, the latter in its petition accepts that estimate, \$8,468,278, for the purpose of establishing a basis on which to found its request for an increase in fares.

Milwaukee Injunction Effective.—The city of Milwaukee, Wis., on Feb. 2, entered judgment in the Circuit Court of Milwaukee County, thus making effective the injunction of Judge Fairchild, restraining the Milwaukee Electric Railway & Light Company from operating interurban cars within the city limits. In issuing the injunction Judge Fairchild held that, to continue operating such cars on the city lines, the company must obtain an interurban franchise from the city. Officials of the company announced that, as soon as car schedules could be re-arranged, interurban and city service would be segregated.

Parking Barred in Los Angeles.—Parking of vehicles within the business district of Los Angeles, Cal., will be prohibited after April 10. The City Council has unanimously passed an ordinance to this effect. The ordinance establishes a zone in which no parking

will be allowed between 11 a.m. and 6:15 p.m., but gives two minutes for the loading and unloading of passengers at any point in that section. Within this district commercial vehicles have a maximum of fifteen minutes for loading or unloading between 11 a.m. and 4 p.m. Between 4 and 6:15 p.m. no commercial vehicles will be permitted to load or unload within the congested district.

One-Man Cars a Success in Saginaw.—The Saginaw-Bay City Railway, Saginaw, Mich., some time ago began to operate all but two of its double-truck and single-truck two-man cars with a single operator. While some difficulty was experienced during the holiday rush the company is apparently getting along with the one-man operation, though some of the men have objected. All operators are paid the 5-cent bonus which has been in force for operators of the company's fourteen safety cars. The service has naturally been slowed up somewhat, but it is contended that the schedule is faster than it used to be with the pay-within operation and all entrance and exit of passengers at the rear of the car.

Bus-System for Louisville.—Forty buses will begin operating in Louisville, Ky., on March 1. Articles of incorporation of the Kentucky Automobile Transportation Service Company, which will provide the bus system, were filed on Feb. 2. The company is capitalized at \$150,000. Five-cent fares will be charged, transfers will be given and only white persons will be transported. E. C. Marsh is president of the corporation, J. L. Bierach is vice-president and treasurer, and A. T. King, is a director. It is planned to have 100 of the buses operating on a number of lines by Fall. The company plans to operate as a private corporation without a city franchise. For protection it will carry liability insurance.

One-Way Rules for Fifth Avenue.—Fifth Avenue, most famous of New York City's thoroughfares, is to be made a one-way street. The great increase in traffic in recent months has resulted in growing congestion of the avenue. To relieve the situation the Police Department on Feb. 16 will put into effect regulations under which all traffic will move south in Fifth Avenue and North in Park Avenue, two blocks to the east. The rules will be in effect from 10 a.m. to 5 p.m., and at other hours two-way traffic will be permitted. Traffic policemen will be stationed 12 feet above the pavement in towers which will be constructed at the principal intersections of the avenues with cross-streets. A system of flash-light signals will be installed to control the movement of vehicles in the avenues and cross streets. The Fifth Avenue Coach Company, which operates the buses in Fifth Avenue, is faced with the problem of rearranging routes to conform to the new regulations. It may be necessary for the company to obtain a franchise to permit it to operate in Park Avenue.

Personal Mention

L. J. DeLamarter, treasurer of the Grand Rapids (Mich.) Railway, has been elected vice-president and general manager of the company.

Frederick J. Macleod, formerly chairman of the Massachusetts Public Service Commission, has resumed the general practice of law in Boston.

W. M. Bowen, of the Western Maryland Railway, has been appointed general track supervisor of the Monongahela Valley Traction Company, Fairmount, W. Va.

Benjamin S. Hanchett, president of the Grand Rapids (Mich.) Railway, has relinquished the position of general manager of the company. Mr. Hanchett will continue to serve as president.

Thomas R. McAuley, manager of construction and operation of the Calgary (Alta.) Municipal Railway, has accepted the position of general manager of the New Brunswick Power Company, St. Johns, N. B.

W. E. Livingston, purchasing agent of the Grand Rapids (Mich.) Railway, has succeeded L. J. DeLamarter as treasurer of the company, the latter having been elected vice-president and general manager.

W. G. Yates, for several years assistant superintendent of the Wheeling (W. Va.) Traction Company, has been promoted to superintendent of the company, succeeding William A. Underwood, who recently resigned. Mr. Yates has been in the employ of the company for twelve years.

F. H. Knox, vice-president and general manager of the South Carolina Light, Power & Railways Company, Spartanburg, S. C., has been elected president of the Columbia Railway, Gas & Electric Company and the Parr Shoals Power Company, Columbia, S. C., to succeed Edwin W. Robertson, resigned.

Edwin W. Robertson, president of the Columbia Railway, Gas & Electric Company, Columbia, S. C., has resigned. Mr. Robertson's resignation resulted from his wish to obtain relief from the innumerable details of the office of president, to the end that he might devote his attention to the carrying out of plans for the betterment of the working and social conditions of the company's employees.

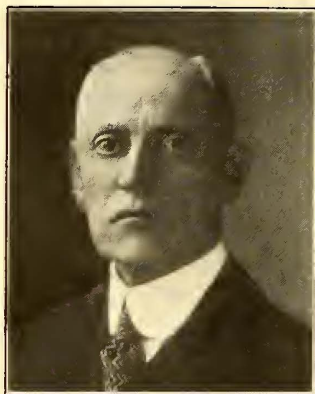
George Van Namee, secretary to Governor Smith of New York, has been named by the Governor to be Public Service Commissioner, Second District, for a term of five years to succeed Thomas F. Fennell, whose term expired on Feb. 1. Mr. Van Namee has been secretary to the Governor since the latter's inauguration a year ago. He

was assistant clerk and clerk of the State Assembly in 1911 and clerk in 1913 and was later a member of the Legislative Bill Drafting Commission.

Mr. Coleman at Scranton

Former District Engineer for Emergency Fleet Corporation Becomes Railway Executive Again

Jilson J. Coleman, well known in electric railway circles and lately with the Emergency Fleet Corporation, has been made manager of the Scranton (Pa.) Railway, succeeding W. E. Boileau, who has gone to Dayton as man-



JILSON J. COLEMAN

ager of the People's Railway. Mr. Coleman is one of the pioneers of the industry. He helped to father the infant through some of its growing pains. After it had become a lusty child Mr. Coleman went into other work, but the call was too strong to resist and he returned to railway management.

Mr. Coleman started railway work in Louisville, Ky., in 1882 as a clerk with the Central Passenger Railway. His pay was 75 cents a day. This was during the old horse and mule car days. Mr. Coleman worked his way up to chief clerk and then managed the lines in New Albany, Ind., where he was married. Later Mr. Coleman moved to Cleveland and associated himself with Tom L. Johnson and assisted in electrifying the horse-car lines there.

After that work had been finished Mr. Coleman and Albert L. Johnson, a brother of Tom L. and also a cousin of Mr. Coleman, built the lines from Allentown to South Bethlehem and from Allentown to Catasauqua, now included in the system of the Lehigh Valley Transit Company. The company at Allentown, which was financed by R. T. Wilson & Company, purchased the

lines from Allentown to Bethlehem and consolidated the two companies. They next rehabilitated the Yonkers system, and in 1895 started the Nassau Electric Railroad, Brooklyn, N. Y., now included in the Brooklyn Rapid Transit System.

Mr. Coleman then managed the consolidation of the St. Louis and the Washington systems for Brown Brothers, bankers, New York. He next built the line of the New Jersey & Pennsylvania Traction Company between Trenton and Princeton, left unfinished by the death of Albert L. Johnson. Mr. Coleman also examined for bankers the railway properties in Pittsburgh, St. Louis, Washington, San Francisco, Indianapolis and Baltimore.

For the last two years he has been district engineer of the passenger transportation division of the United States Shipping Board, Emergency Fleet Corporation, under A. Merritt Taylor, former transit commissioner of Philadelphia. In this position he was charged with the responsibility of seeing that adequate transportation was provided for the ship workers in the territory extending from Boston, Mass., to Houston, Tex.

O. J. Shaw, secretary of the Lincoln (Neb.) Traction Company, has been appointed general manager of the company. Mr. Shaw will continue to perform the duties of secretary in addition to his new ones. For two years after his graduation from the University of Nebraska he had charge of light and power properties at Aurora, Neb. He joined the Lincoln Traction Company nine years ago, his first position being in the contract department. Shortly thereafter he was made assistant secretary, and in 1913 he became secretary. For several years he has been in charge of all of the company's overhead lines, the steam heating plant, the commercial department and the accounting department. As general manager he succeeds John M. Bramlette, who resigned several months ago.

W. E. Boileau, general manager of the Scranton (Pa.) Railway, has resigned to accept the position of general manager of the People's Railway, Dayton, Ohio. Mr. Boileau entered railway work in the early 80's with a large steam railroad system. In 1888 he undertook electric railway work and spent a number of years constructing and operating properties in the South. In 1904 he went to Dubuque, Iowa, where he was in charge of the construction of a power station, carhouse and shops and the rebuilding of tracks for the Union Electric Company. In 1905 Mr. Boileau became connected with the New York, Westchester & Boston Railway, New York, and remained with the company until the property passed into the control of the New York, New Haven & Hartford Railroad. He was at one time general manager of the Chattanooga Railway & Light Company, the Lookout Mountain Railway and the Lookout Incline Railway, Chattanooga, Tenn.

Mr. Blair in Control on a Platform of Service Assumes Important Task of Operating Largest City System in World—Other Changes in Officials

The election of Henry A. Blair to the three principal positions of the Chicago (Ill.) Surface Lines, chronicled in *ELECTRIC RAILWAY JOURNAL* last week, marks the assumption on the part of this able financier and railway man of the gigantic task not only of operating the largest electric railway system in the world in a manner to win public approval, but also of solving the uncertain financial future of the properties. What Mr. Blair will do or can do to re-establish the soundness of the financial structure supporting the enormous investment of capital in the Chicago street railways is only a matter of conjecture. What he will do toward winning the support and allaying the antagonism of the public and public officials is perhaps intimated in the following statement which he issued upon his election:

MR. BLAIR'S STATEMENT

The change that has become effective in the management of the Surface Lines properties is merely a reorganization which places the administration of these properties in the hands of the majority interest—a right which the majority interest possesses and deems it advisable to exercise at this time.

The conditions that have obtained in the electric railway business throughout the United States during the last three or four years are not the fault of the management of the companies. They have been the direct result of the world war in which this nation participated. The national war program involved the electric railways and other public utilities to a very great extent. In many respects the control of the properties was taken over by the national government, which greatly increased the costs and the difficulties of operation and supplying service to the public.

This management believes, and proposes to work on the theory, that what the people of this city want is service, and it hopes that, by working in conjunction with the city authorities and with the State Utilities Commission, it will be able to provide the additional facilities required to enable it to so adjust the operation of the street railway cars to the requirements of traffic that Chicago will have better transportation service than any other city in the world. It has faith that the people of Chicago will co-operate with it and lend their full support in the effort of the management to fulfill the program it has in mind.

Mr. Blair's new responsibilities come as the culmination of fifteen years' active connection with the Chicago Railways and Chicago Surface Lines. He began his railway career in 1904 when he was appointed receiver of the North Chicago Street Railroad and of the West Chicago Street Railroad. He carried these companies through the receivership and through the 1907 ordinance settlement, and later became chairman of the board of the Chicago Railways. At the reorganization of the subsidiaries which took place on Feb. 1, 1908. He has also served continuously since that time as chairman of the finance committee. At the time of the operating unification of the Chicago Railways with the Chicago City Railway, in the early part of 1914, he became president of the Chicago Railways and chairman of the board of operation and a member of the executive committee of the Chicago Surface Lines. In addition to accomplishing the

unified operation of the surface lines, Mr. Blair brought about on July 1, 1911, the merger of the Chicago & Northwestern Elevated Railroad, the South Side Elevated Railroad, and the Metropolitan West Side Elevated Railway, serving until 1916 as chairman of the governing board, a member of the executive committees and a trustee of the Chicago Elevated Railways, though not officially connected with the elevated system at present.

Mr. Blair was born in July, 1852, at Michigan City, Ind. He was educated at Williston Seminary, Easthampton, Mass. His business career began in the Merchants National Bank, Chicago, which was founded by his father. Subsequently he was elected



Copyright Underwood & Underwood

HENRY A. BLAIR

vice-president of the bank, continuing in that capacity until 1902, when it was consolidated with the Corn Exchange National Bank. Mr. Blair is now a vice-president of the Illinois Trust & Savings Bank and a director of the Commonwealth Edison Company, Public Service Company of Northern Illinois, Chicago & Interurban Traction Company, and the Elgin National Watch Company.

OTHER CHANGES IN CHICAGO

F. P. Edinger has been appointed acting superintendent of transportation, Chicago Surface Lines, succeeding W. M. Weatherwax. Mr. Edinger was formerly division superintendent of the Sixth division, which comprised the Lawndale and Blue Island stations. He has been with the Chicago Railways or its subsidiaries since 1893, beginning his career as a conductor and working up through the transportation department to become superintendent of one of the north side districts. In 1914, at

the time of the unification of the surface lines, he was transferred to the West Side and placed in charge of the Sixth division.

Edward L. Maguire, formerly assistant superintendent of the Sixth division, has been made acting division superintendent. His connection with the Chicago Railways began in 1880 as a conductor at the Blue Island station.

William Hall, formerly a supervisor in the Sixth division, has been made acting assistant division superintendent to succeed Mr. Maguire.

H. H. Hansen, General Manager

Harry H. Hansen, superintendent of the Middlesex & Boston Street Railway, has been appointed general manager of the company. Mr. Hansen succeeds George M. Cox. He will perform the duties of general superintendent in addition to that of general manager, the former office having been abolished. He will make his headquarters in Newtonville, Mass.

Mr. Hansen entered street railway work in 1889 as a conductor for the Boston Elevated Railway. He worked up through the various grades in the operating department, becoming in 1901 district supervisor for the company at the Dudley Street terminal, Roxbury district. In 1913 he was appointed superintendent of district No. 2 and served in this capacity until he was transferred to more important work. He served as superintendent of division No. 7 for two years, with headquarters at Cambridge. In April, 1919, Mr. Hansen became general superintendent of the Middlesex & Boston Street Railway, continuing to act in that capacity until his promotion to the general managership.

Edeard C. Gramling, dispatcher of the Georgia Railway & Power Company, Atlanta, Ga., has been promoted to the position of assistant superintendent of transportation of the company. He has been at Atlanta since 1901.

Obituary

Alvin S. King, eastern manager of the Sterling Varnish Company, Pittsburgh, Pa., died on Feb. 3 in New York City from pneumonia.

J. A. Wheelwright, a director of the Monongahela Valley Traction Company, Fairmont, W. Va., is dead. Mr. Wheelwright was president of the Consolidated Coal Company, Fairmont.

Daniel D. Martling, at one time superintendent of the old Atlantic Avenue Railroad, Brooklyn, N. Y., died in Brooklyn on Feb. 6 at the age of eighty-seven years. Mr. Martling aided in the construction of the old Culver Street Railroad, of which he was superintendent until its merger with the Brooklyn Rapid Transit System.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

Sheet-Steel Gear Cases Up 10 to 15 Per Cent

Deliveries on Quantities of Fifty or Less Can be Made in Two to Three Weeks

Effective the second week in Feb., reinforced spot-welded, sheet steel gear cases are advanced 10 to 15 per cent owing to the increase in price of steel sheets which are becoming more and more difficult to obtain. Production is satisfactory and is improving gradually. Railways usually break most gear cases when the frost comes out of the ground, the roadbed then becoming more uneven and harder on the rolling stock and equipment than at other times. The need for gear cases at this time is largely accountable to the weather which causes frequent breakdowns and renewal of parts.

Good deliveries are being maintained but there is no telling how long they will last. For the present, good quantities can be made up in three weeks.

In the malleable gear cases, an advance will be announced soon. This is because of a recent heavy advance in the cost of malleable iron from which they are made. There are now on hand, a considerable number of malleable gear cases, made up for stock that may be had for immediate delivery. These, however, it is expected will not last long as the railways are coming into the market actively for maintenance needs for the coming spring.

Car Shortage Affecting Coal and Steel Markets

Lack of Raw Materials Will Seriously Cut Down Production if Car Shortage Grows Worse

During the week ended Jan. 31, the car supply in the coal and coke regions was but 50 to 70 per cent of normal. Although figures are not yet available, the bad weather accompanied by heavy slides on several coal-carrying roads no doubt has resulted in a largely decreased tonnage reaching tide water. According to the Geological Survey figures, production for the week ended Jan. 28 declined 737,000 tons due to car shortage and bad weather. The fuel shortage which prevails throughout the country became critical during the past week in the east where both rail and water transportation were paralyzed by the heaviest blizzard and storm that has been experienced since 1888.

Some blast furnaces in the Pittsburgh and other districts are being banked for lack of coke. Fabricated

steel is piling up in the yards of steel manufacturers who estimate that not over 20 to 30 per cent of their output is being shipped.

One large eastern manufacturer of wire products requested 100 cars and after some delay received seventeen, most of which had leaky roofs and could not be used for the shipment of insulated wires and cables which had been planned.

Wood Hulse Yates Co., Inc.

B. F. Wood Engineers, Inc., New York, announce a change of name to Wood Hulse Yates Company, Inc., to act as engineers and contractors. Active members of the firm are Benjamin F. Wood, William S. Hulse, and Eugene A. Yates.

Mr. Wood, who is a graduate electrical engineer, was for sixteen years with the Pennsylvania Railroad. During this time he had charge of the electrical work east of Pittsburgh, Pa., including the design and construction of power houses and of principal terminals, such as the Pittsburgh Station and Union Station in Washington, D. C. He was also a member of the electrical and mechanical advisory committee which had general supervision of the mechanical features of the tunnels, the new Pennsylvania Station in New York City and the Long Island City Power Station and the motive-power facilities of Sunnyside yards. In 1913, he became vice-president and chief engineer of the United Gas & Electric Engineering Corporation.

W. S. Hulse joined the Fort Wayne Electric Company in 1894. Two years later he went to Europe and as engineer for one of the largest foreign electrical concerns, designed and built for a French syndicate, the first complete lighting and power system in Buenos Aires, Argentine, costing \$1,500,000. He has directed the design and construction of large plants in many foreign countries and more recently has spent considerable time in England for the General Electric Company and later as managing director of a Belgium Holding Company.

E. A. Yates from 1902 until 1912 was associated with MacArthur Brothers Company and other contractors as superintendent on railroad and hydroelectric work. He spent four years as assistant engineer on the construction of the Pennsylvania tunnels in New York. From 1912 to 1914 he acted as chief engineer for the Alabama Power Company. In 1914, he became chief engineer and later vice-president of the T. A. Gillespie Company engineers and contractors.

Shellac Advances 45 Cents Per Gallon

Trouble Reported In India from Which Most of Supply Is Imported—Production Greatly Reduced

The amount of shellac being brought down the river to Calcutta, India, is much reduced owing to troubles with the natives in the interior. On Jan. 1 the quotation in Calcutta was \$1.80 a pound, while on Jan. 19, prices ranged from \$2 to \$2.05 per pound.

Prices in New York as of Feb. 7 are as follows: Orange, \$1.70 per pound; T.-N., \$1.60 per pound; bleached, ground, \$1.50 per pound, and bone dry, \$1.80 per pound. White shellac cut 4 lb. to the gallon is \$5.50 per gallon in barrel lots, while orange shellac is quoted at \$5.25 per gallon in barrel lots. Prices of small lots in the jobbing trade have been advanced 45 cents per gallon.

Malleable Deliveries May Be Worse

Production About 80 Per Cent of Normal—Plants Badly Handicapped By Lack of Capacity

Foundries throughout the country are unable to turn out malleables sufficient to keep up with the demands. Capacity is lacking everywhere with the result that malleable deliveries are from six to ten weeks on light castings in medium quantities and from three to six months on heavy castings in large quantities. Regardless of the amount of business offered, malleable plants so far have been forced to refuse orders unless purchasers are willing to wait a long time. Railways will do well to place orders now for their requirements even if they are in a position to wait for deliveries.

Many automotive industries are now in the market for enormous quantities of malleables and if successful in gaining the amount of space to fill their requirements, the railroads, railways and other malleable users will no doubt suffer greatly.

Manufacturers of malleables who formerly accepted business on a contract basis over a number of months have suffered through increased prices of pig iron and of labor. Some have adopted the plan of making adjustments quarterly on a sliding scale basis, so that an increase in the cost of pig iron or labor will be adjusted in a more equitable manner.

The American Malleable Casting Association, which held its annual meeting in Cleveland, January 14, have elected officers for the coming year as fol-

lows: President, John A. Penton, Cleveland; vice-president, Western Section, E. E. Walker, Erie Malleable Iron Works, Erie, Pa.; vice-president Eastern Section, F. J. Epele, president Trenton Malleable Iron Company, Trenton, N. J.; secretary and treasurer, Robert E. Belt who was re-elected to office. E. M. Griswold, Frazer & Jones, Syracuse, N. Y., and John E. Walker, Wilmington Malleable Iron Works, Wilmington, Del. were elected to the executive committee of which John C. Haswell, president of Dayton Malleable Iron Company, Dayton, Ohio, is chairman.

Materials and Supplies Cost Figures Brought Up-to-Date

Below is a revised tabulation of the costs of various railway materials and equipment taken from the *Kansas City Railwayman*, showing a comparison with the prices four years ago. The last item of advertising is significant in view of the vociferous attacks of the *Kansas City Star* against any increases in street car fare.

Item	Unit	1915	1919
Coal.....	ton	\$1.95	\$3.46
Fuel oil.....	Bbl.	.78	1.40
Copper—base....	lb.	.13	.24
Tin.....	lb.	.32	.72
Lead.....	lb.	4.67	5.00
Steel bars—base...	cwt.	1.21	2.35
Yellow pine.....	M ft.	25.00	47.50
Oak.....	M ft.	70.00	150.00
Linseed oil.....	gal.	.58	2.38
Cement.....	bbl.	.99	2.26
Paving brick.....	M	13.50	24.50
Fire brick.....	M	31.00	46.65
Sand.....	yd.	.65	1.30
Malleable castings. lb.		.04	.10½
Grey iron castings. lb.		.02	.10
Brass castings.....	lb.	.18	.36
White lead in oil... lb.		.06	.13½
Rotary converter (3,000 kw.).....		19,450.00	27,300.00
Transformer for 3,000 kw.....		10,500.00	16,600.00
Motor and electrical equipment for car.....		3,200.00	5,300.00
Car wheel.....	each	9.50	16.63
Car axle.....	cwt.	13.25	6.50
Roof paint.....	gal.	1.40	2.20
Brake shoes.....	net ton	36.33	64.00
Gears.....	each	26.65	53.14
Steel sheets.....	cwt.	2.60	5.09
Glass—30x34½.....	each	.98	1.85
Rails.....	gr. ton	40.95	69.50
Ties—6x8x8 white oak.....	each	.62½	1.40
Street poles—30 ft. 900 lb.....	cwt.	2.68	6.31
boiler tube.....	ft.	.25½	.71
Frog.....	each	85.00	200.00
Switch.....	each	150.00	350.00
Mate.....	each	110.00	300.00
Crossing—2—track each		1,100.00	2,200.00
Advertising.....	per line	.22½	.40

Promotion of Westinghouse Electric Officials

The Westinghouse Electric & Manufacturing Company has announced a number of promotions among its officials at East Pittsburgh. Among the more important of these are the following:

Alexander Taylor, for many years Manager of Works, has been made Assistant to Vice-President in general charge in all plants of production, stocks and stores. R. L. Wilson has been promoted from the position of general superintendent to works manager at East Pittsburgh. E. R. Norris has been appointed director of works equipment. C. B. Auel is made man-

ager of the Employees' Service Department.

Other appointments announced were: G. M. Eaton as chief mechanical engineer of the company, C. W. Johnson and H. W. Cope as assistant directors of engineering, C. H. Champlain and E. S. McClelland as assistant works managers, John E. Bonham as assistant to works manager, and F. E. Wynne as manager of the railway equipment engineering department.

100 Cars for Cleveland

The purchase of fifty motor cars and fifty trailers by the Cleveland (Ohio) Railway is recommended to the Council of that city by Street Railway Commissioner Sanders as part of a program of improvements for the company calling for the expenditure of \$2,500,000 in all. The matter has been referred to the street railway committee, but it is regarded as quite certain the program will be approved. The Cleveland Railway would of course be permitted by the city to capitalize the new work by selling additional stock.

Rolling Stock

Concord (N. H.) Electric Railway expects to purchase four safety cars.

Grand River (Col.) Railway Company, is in the market for one safety car.

Cairo & St. Louis Railroad Company, Cairo, Ill., is in the market for a few new cars.

Baton Rouge Electric Company, Baton Rouge, La., has purchased eight Birney safety cars.

Beaver Valley Traction Company, New Brighton, Pa., are asking for prices on three safety cars.

Lincoln Traction Company, Lincoln, Neb., will place an order for fifteen safety cars within a short time.

Escanaba Traction Company, Escanaba, Mich., will be in the market for motors, supplies and for one snow plow.

Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., has purchased new trucks and control equipment for six cars.

Granite City Railway Company, St. Cloud, Minn., will purchase trucks for two single-truck cars and install airbrakes on six additional cars.

Cincinnati & Dayton Traction Company, Dayton, Ohio, purchased one single-truck snow sweeper from the McGuire Commings Manufacturing Company.

Chicago, South Bend & Northern Indiana Railroad, South Bend, Ind., has purchased ten new safety cars from the National Safety Car & Equipment Company.

Levis County Traction Company, Levis, P. Q., is in the market for three cars which are needed immediately. Offers from any source will be considered.

Franchises

Detroit, (Mich.) United Railway.—The voters of Pontiac, Mich., have approved a franchise for the Detroit United Railway under which the company will make extensions in that city at a cost of \$500,000.

Track and Roadway

San Francisco, Napa & Calistoga Railway, Napa, Cal.—The San Francisco, Napa & Calistoga Railway has concluded arrangements with the United States Railroad Administration and the Navy Department for the construction of a line connecting its tracks with those of the new Government causeway in the vicinity of Vallejo, Cal. It is also constructing a 75-car interchange yard at Napa Junction. When these lines are completed, all freight for the United States Navy Yard at Mare Island will be moved over this route between Napa Junction and Mare Island.

Connecticut Company, New Haven, Conn.—Judge John H. Webb of the superior court has dismissed the appeal of the Connecticut Company in the case of the city of Stamford vs. the Connecticut Company from a decision of the Public Utilities commission confirming an order of the town for the relocation of the tracks on the Springdale line.

Chicago, South Bend & Northern Indiana Railway, South Bend, Ind.—The Chicago, South Bend & Northern Indiana Railway will lay 1,500 feet of double track in Michigan St., and will install two additional turn-outs.

Benton Harbor, St. Joe Railway & Light Company, Benton Harbor, Mich.—This company has ordered from the Lorain Steel Company 125 tons of high T-rail for repairs.

Seattle (Wash.) Municipal Street Railway.—Superintendent of Public Utilities Thomas F. Murphine, has announced that the 6th Ave. Northwest line of the Seattle Municipal Street Railway will be extended to the city limits and double-tracked within two months.

Power Houses, Shops and Buildings

Gadsden, Bellevue & Lookout Mountain Railway, Gadsden, Ala.—This company expects to build this spring a car-house 40 ft. by 80 ft.

Cairo & St. Louis Railway, Cairo, Ill.—The Cairo & St. Louis Railway expects to purchase a new 2,000-k.w., turbine, with condenser, auxiliary apparatus and boilers.

Chicago, Ottawa & Peoria Railway, Ottawa, Ill.—The Chicago, Ottawa & Peoria Railway will install at least one automatic substation during 1920.

Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich.—This company has placed orders for equipment to install one automatic substation at Muskegon Heights, Mich.

Empire State Railroad, Oswego, N. Y.—Fire on Feb. 2 destroyed the carhouse and a large amount of equipment of the Oswego city division of the Empire State Railroad. A number of cars were destroyed, and will be replaced with one-man cars. The loss is estimated at \$150,000.

Philadelphia (Pa.) Rapid Transit Company.—The Philadelphia Rapid Transit Company will equip its Mount Vernon St. power station with the Quigley powdered coal system for firing boilers.

Virginia Railway & Power Company, Richmond, Va.—The Virginia Railway & Power Company has authorized the expenditure of \$45,000 to reinforce its underground cables in the business district of Richmond.

Wheeling (W. Va.) Traction Company.—The carhouse of Wheeling Traction Company at West Wheeling, with all its contents, was destroyed by fire on Jan. 24. The loss is estimated at more than \$20,000. The building will be replaced at once.

Trade Notes

Portable Machinery Company, Passaic, N. J.: A pamphlet of Type B portable belt conveyors which have a maximum conveying capacity of 1 ton per minute.

Johnson Coin Counting Machine Company announces that after Feb. 2, 1920, it will occupy the building which it has recently purchased at 10 Anable St., Long Island City, N. Y.

John K. Martin has retired from the sales organization of the Gleason-Tiebout Glass Company after being connected with the glass industry for fifty years of practically continuous service.

Johns-Pratt Company, Hartford, Conn., has received the Underwriters' Laboratories "listing as standard" of its Noark renewable fuses in all sizes from 3 amp. to 600 amp. on 250 volts and 600 volts.

Standard Underground Cable Company's St. Louis Office, E. J. Pietzcher, manager, on Feb. 1 was moved from the Security Building, where it has been established since 1897, to the Arcade Building.

Chicago Pneumatic Tool Company, Chicago, Ill., announces that C. E. Laverenz, formerly an inspector in the Ordnance Department, has been made special railroad representative of the company with headquarters at Chicago.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces that seventy-five of its engineers and the machine works engineering department were recently transferred to Lester, Pa., near the South Philadelphia works of the company.

Independent Pneumatic Tool Company, Cleveland, Ohio, announces that

William R. Gummere, who for a number of years represented the company in Cleveland, Ohio, will be connected with the Pittsburgh branch, which is under the management of Harry F. Finney.

Combustion Engineering Corporation, New York, N. Y., announces that W. C. Stripe, formerly of the Pittsburgh office has been made manager of the Philadelphia District. C. L. Bachman, formerly manager of the Chicago office and E. F. Kuehne of the New York office will be associated with Mr. Stripe.

Gannett, Seelye & Fleming, Inc., engineers, Harrisburg, Pa., have opened a branch office in Memphis, Tenn., at No. 262 Randolph Building. This engineering company is engaged in all classes of work including electrical developments, appraisals and operation of public utilities. It expects to make the new office in Memphis the center for all work in the Southwest.

Arthur H. Abbott, for the last eight years district transformer specialist of the General Electric Company, New England territory, has resigned to become sales engineer of the Blake Electric Manufacturing Company, with headquarters at I Rowe's Wharf, Boston. Mr. Abbott will pay particular attention to the sale of General Electric transformers, motors, outdoor substation and other equipment.

Chicago Fuse Manufacturing Company, Chicago, Ill., through its president, Arthur D. Dana, has purchased from the Ohio Elevator Company a two-story factory building with a four-story office section at Fifteenth and Laflin Streets. With the additions contemplated the buildings, which are now 140 x 360 ft., and the equipment will represent an investment of \$500,000.

Chicago Pneumatic Tool Company, Chicago, Ill., on Jan. 21 and 22 held a conference of executives, plant and branch managers and salesmen at its Detroit plant, Second Avenue and Amsterdam St., at which time a large five-story addition was formally opened. At this conference the program of the company for 1920 was outlined, calling for largely increased production not only at Detroit but at the five other American plants of the Company. It was reported that much of the proposed increase in production was already absorbed by orders for future deliveries.

Electrical Engineers' Equipment Company suffered a loss by fire at its general offices, 710 to 714 West Madison St., Chicago, on the night of Jan. 13. This did not affect the company's manufacturing, stock and shipping departments at 711 to 715 Meridian St. The factory is running at full capacity, so there should be no delay in the shipment of orders now in production. Regular deliveries can be promised on new orders. All mail should be addressed to 711-15 Meridian St., Chicago, until further notice.

M. R. Evans and J. B. Harris, Jr., have resigned from the Pittsburgh Transformer Company, Pittsburgh, Pa., the former as sales manager and the

latter as Pittsburgh district manager of the company, to become associated under the name of Harris & Evans, district managers, Real Estate Trust Building, Philadelphia. They will operate a joint district office of the Moloney Electric Company of St. Louis, the Delta-Star Electric Company of Chicago and the Simplex Wire & Cable Company of Boston, and will handle the business of these companies in the Philadelphia district, which includes the eastern part of Pennsylvania and the States of New Jersey, Delaware and Maryland.

Lieut.-Col. L. M. Clark, who was mentioned in the issue of Jan. 31 as having become associated with the Railway Improvement Company, New York, and whose title was erroneously given as "Lieut.," has been recently re-commissioned a lieutenant-colonel in the Ordnance Section of the Reserve Corps. During the early period of the war, Colonel Clark was assigned to the manufacture of recoil mechanisms for the 240-mm. French howitzers. Later he was made district inspection manager at Chicago, having in charge the inspection of all ordnance material in eight adjoining states. After the signing of the armistice, he was appointed a member of the Chicago District Claims Board, serving in this capacity until his discharge from the service last November.

Canadian Engineering Agency, Inc., 115 Broadway, New York City, announces that the above named company has been appointed and the Pearson Engineering Corporation has ceased to act as purchasing agent for the following companies: Ebro Irrigation & Power Company, Ltd., Cataluna Railways, Ltd., and allied companies, Mexico Tramways Company, Mexican Light & Power Company, Ltd., and allied companies, Rio de Janeiro Tramway, Light & Power Company, Ltd., Rio de Janeiro and Sao Paulo Telephone Company, société Anonyme du Gaz Rio de Janeiro and allied companies, Sao Paulo Tramway, Light & Power Company, Ltd., and Sao Paulo Electric Company, Ltd., and allied companies. Louis J. Hirt is the consulting engineer for and Walter J. Plummer is in charge of the purchasing department of the Canadian Engineering Agency, Inc.

New Advertising Literature

Thompson Electric Company, Cleveland, Ohio, has moved into more commodious quarters at 226 St. Clair Ave., N. E.

B. F. Goodrich Rubber Company, Akron, Ohio: A series of twelve booklets by James A. McQueen, manager of mail sales, covering the following subjects: Form letters that sell, the right sales letters for selling the dealer, faulty expressions in dictation, building goodwill through courtesy, good paragraphing, cleanness, conciseness, handling the angry customer, the mechanical make-up of a letter, the beginning and the ending of a business letter.