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WHAT HAS BECOME OF THE APPRENTICE?

It appears that apprentice courses have gone out of vogue in many of the electric railway repair shops, and never before in the history of the industry has there been such a need for trained young men. The demand for mechanics of all kinds in connection with the manufacture of automobiles, and recently of arms and munitions, has depleted the electric railway machine shops in many localities, and it has been necessary to make the best of inferior workmanship until men can be trained to perform various mechanical operations. Moreover, it is decidedly difficult to obtain an all-around mechanic from the average manufacturing plant because of the prevailing tendency to specialize all machine operations. In the machine shops of some manufacturing plants the work is so highly specialized that mechanics may spend several years and never learn but one or two mechanical operations. Formerly, when there were plenty of first-class machinists brought up through the old style apprentice courses, the need for young blood was not so apparent. The shortage of all kinds of mechanics and the highly specialized experience of most of the mechanics that are available impress the need for the restoration of the apprentice courses. Every electric railway shop should employ young men with a view of putting them through a stated apprentice course. The need of the hour is to make the electric railway repair shop attractive to the average graduate mechanical engineer and, in fact, to all intelligent young men, but unless there is some definite plan for their future the industry need not expect real talent to present itself for work. Every master mechanic should surround himself with one, two or more incipient master mechanics if he has the welfare of his company at heart.

APPRENTICES FOR OTHER DEPARTMENTS

But especially trained men are needed elsewhere than in the shop. The same causes which have depleted the shop of its trained men have likewise deprived other operating departments of their trained employees and diverted the sources from which the raw material for such employees was formerly obtained. In other departments the apprentice problem never was so well worked out as it was in the shop because in the early days the demand for trained men in these departments was never felt to the same extent. The necessity for careful accounting, economical operation of all equipment and studies of traffic and transportation problems, which has arisen because of the increases in operating costs, demands of the public and regulative acts of public commissions, has in these latter days im-

pressed the need for trained men in all departments. If the railways are to secure their fair share of the proper sort of young men in these departments, the opportunities offered must be on a par with those offered in other fields. Some years ago a number of properties announced apprenticeship courses in the transportation department, but little has been heard of these recently. The suggestions made in the previous paragraph in regard to the mechanical department apply as well to other parts of the electric railway business. The work is of a nature that would appeal to college-trained men in many cases if an effort were made to place before them the opportunities which exist in these departments. The graduate student or cadet courses, as they are variously called, which are securing trained men for other public utilities ought to receive serious consideration by electric railway companies.

SELECTION OF APPRENTICES

This problem is of the utmost importance to the management of a railway which is contemplating the establishment or the renovation of an apprentice course. Young men who have any ambition at all about their work are ambitious either for place, fame and power or to be able to do as much, or more, work than their fellows and to do it better. From the first class may be developed men capable of filling the higher administrative positions, while from the second class there is opportunity of developing skilled artisans who will be contented with their calling and faithful to their jobs. And these are the kind of men needed in the shops to-day. The college man is pretty apt to belong to the first class, or else why should he have spent several of the best years of his life in college? If college men of the right sort are attracted to the industry there must be developed some definite plans for their training and future work and, further, these plans must be as attractive as those offered by other fields. The skilled workmen, however, must be recruited from the second class of ambitious young men. To appeal to them the attractions of their work and opportunities must be made equal to those obtaining in neighboring manufacturing plants. We believe that inherently the railway business possesses an attraction for the right kind of young man which is not had by many other lines of work. It may be the fascination of motion and mechanical power, or perhaps because cars and trains have been familiar objects from boyhood days, but whatever the cause there should be no dearth of material from which to draw. Present conditions indicate, however, that a special effort is necessary to attract good men to electric railway work.

TRAVELING FAR AND CHEAPLY

Elsewhere in this issue will be found an instructive article by D. J. McGrath in regard to the single-fare areas of various American cities. When one glances at the accompanying maps and notes that rides of 8 and 10 miles are available for a single fare in practically all the cities covered, and in some cases more than 15 miles may be ridden by transferring through the center of the city, one is led to wonder when this expansion of ride is going to be limited. Under the 5-cent fare system, the passenger riding 10 miles or more does so at the rate of less than 0.5 cent per mile. The often quoted low fares of European cities cannot begin to compare with this rate. In our American cities, of course, only a small proportion of the passengers ride these long distances, and the loss involved in transporting them is more or less made up by the profit upon the short rides. It must be remembered, however, that as the populations of the cities increase, more and more people spread out into the outlying suburbs, while the more central territory approaches its maximum capacity to house people. Consequently, the proportion of long riders may naturally be expected to increase, thus diminishing the possibility that the traction companies can continue to make both ends meet at a flat 5-cent fare. In the horse-car days of only a quarter of a century ago, when a few short and often unconnected lines constituted the entire traction system of any particular city, the people were glad to pay a nickel even for the limited service. At the present time why should they not be willing to pay a higher rate of fare more nearly commensurate with the improved transportation facilities now offered?

EFFECT OF HIGHER FARES ON REVENUE

The effect of higher fares upon the revenue of four Massachusetts street railways was an interesting piece of evidence recently filed in the Bay State Street Railway fare case. A summary of the exhibit is printed in the News Department of this issue. It shows that although the traffic fell off on three of the roads from 6 to 10.6 per cent when the 6-cent fare was placed in effect, the actual revenue increased from 3 to 9.2 per cent on these lines. By the change the Middlesex & Boston secured \$14,956 more revenue, a gain of 3.1 per cent; the Blue Hill gained \$2,009, or 3 per cent; the New Bedford & Onset gained \$2,187, or 3.3 per cent, and the Norfolk & Bristol gained \$5,385, or 9.2 per cent. The periods ranged from eight months to a year, and were of the same length before and after the increase in rates. Other things being equal, higher fares tend somewhat to discourage travel, but it is doubtful if the effect over a longer period would be so marked as in the short intervals specified in the above cases. Experience in Detroit, according to *Public Service*, December, 1914, indicates that the institution of lower fares does not necessarily stimulate riding, street railway traffic being closely related to business conditions and to the growth of the community. It is evident that in most cases additional net income available for dividends needs to be sought in the direction

of reduced taxes and other charges as well as in the fare itself, and companies facing the problems of insufficient earnings must take every possible factor into account in trying to better their financial condition. Every little helps, and even the hard-won percentages gained in Massachusetts are welcome under the local conditions prevailing.

THE NEW YORK STRIKE

As this paper is going to press a strike has been in existence for several days on all of the lines of the Third Avenue Railway System in New York, and is being threatened by the labor leaders on the lines of the New York Railways. Vague rumors that the subway and elevated systems of the city will also be drawn into the conflict are heard. The city authorities seem to be doing all that should be expected of them in the way of keeping order. As yet there has been no serious rioting. Police Commissioner Woods has announced that he intends there shall not be any, and Governor Whitman is reported to have promised the commissioner the support of the available militia to preserve order if these men are needed.

The issue seems to be very clearly defined. The labor leaders wish to organize the men on the railway systems in New York as a part of the Amalgamated Association of Street and Electric Railway Employees of America. The companies claim that the greater part of their men do not want to join this organization, and that if established it would represent outside dictation regarding their interests to the people of New York, to the transportation companies within its borders and to the men they employ. In the meantime, the position of the public in the dispute promises to be a very uncomfortable one.

There is every reason why the electric railway companies in New York should not want the outside and irresponsible dictation of their business and policies which would be the logical result of the establishment of the labor organization proposed in New York. The companies are obligated by law to give a certain service at a certain rate, and very close regulation is exercised over them as to the methods and means which they employ in giving this service, but over an essential part of the organization which they require there would be no regulation or control. The law of supply and demand which, together with the financial ability of the companies to pay certain wages, normally regulates these wages, would practically be superseded by a system under which the wages would be dictated by irresponsible labor leaders. The alternative would be a strike, which would probably be more extended than the one now threatened because the men would be organized.

We consider the labor question the most serious problem now before the electric railway companies of this country. The present method of settling labor disputes is an outgrowth of methods which may have been all right when the companies were smaller, and may still be the most available plan in industrial disputes in which the public has only a minor interest. In those

cases, if wages are forced higher in any instance, the owners of the enterprise have four courses open to them. They can raise their prices to make up for the increase in wages, or they can stop operation until they see whether they can secure cheaper help, or they can abandon the enterprise entirely, or they can move to another city. Usually any one of these plans can be followed without great loss of capital, but none of them is possible with a public utility company, and if its rates and service are regulated, we believe that there is equal reason why some regulation should be applied to the wages which it has to pay.

The necessity for the regulation of rates and service was not realized twenty years ago. It was supposed that the same principles which apply in industrial enterprises would obtain in their case, and if their expenses increased they could increase their rates or reduce their service to correspond. The idea of the desirability of regulation for public utility companies was of slow growth. We realize that the application of a similar system to wages now may appear impracticable, but, broadly speaking, there does not seem to be any other solution to the problem. If the State can fix rates it can establish wages, and while it may not be able to compel men to work permanently for a lower wage than they desire, it can require a time notice of, say, three months or more before a man can resign from public utility employment unless excused because of bodily disability or some other reasonable cause, and it can exercise the police and military power to secure greater freedom for the company to engage labor at the established rate.

SINGLE-PHASE FOR SWISS FEDERAL RAILWAYS

The selection of the single-phase system for the St. Gothard line of the Swiss Federal Railways early in the present year occasioned no surprise on the part of those who have followed the progress on the electrification of these state-owned roads. The tentative selection of this system nearly three years ago indicated that unless something spectacular happened soon to indicate considerable superiority on the part of the direct-current or some other system, the ultimate result was a foregone conclusion. While the total mileage of the Federal Railways is not great, something less than 2000, there is world-wide interest in the gradual electrification of this system, partly on account of its international character, and partly because each step is being taken with a view to the ultimate electrification of the whole system. The government has been feeling its way cautiously in the matter of selecting a system for ultimate general adoption, but it has shown a growing conviction that for the local conditions the single-phase system is best. The conditions which have produced this conviction have been clearly outlined in reports prepared by the government experts, the latest of which is abstracted in this issue.

The St. Gothard line, one section of which is to be in electrical operation by 1918, will be the third important Swiss electrification. The first was that of the Simplon tunnel, and the second the Loetschberg tunnel

and adjoining lines. The Simplon tunnel was electrified nearly ten years ago, and three-phase equipment was there used. Three-phase was undoubtedly well adapted for the particular conditions therein encountered, and it should be remembered that it had been applied successfully before that time on the nearby Italian State Railways. At the time there was little experience in heavy traction available anywhere in the world to serve as a guide. When later the Loetschberg tunnel was driven and electrified and the Simplon line was made more accessible from Berne, single-phase equipment had developed to the extent that it was deemed advisable to apply it on this very important railway, employing the heaviest electric locomotives used in Europe up to that time. Meanwhile, the decision to electrify the St. Gothard line had been reached, but it was not considered safe to select single-phase definitely for it until the Loetschberg line was a demonstrated success. It is now so considered, and the government is going ahead with confidence to apply the system on a larger scale.

There are now about a score of single-phase electrifications fairly well distributed geographically. While the larger number are designed for rather light service, several come well within the field of heavy traction. The Federal Railways had therefore ample precedent to guide them, and precedent has undoubtedly had a great deal to do with the present selection. The New York, New Haven & Hartford Railroad must be credited with considerable influence in this direction.

Without desiring to question the wisdom of the decision in this case, it is a point of considerable interest to note that the managers of the Federal Railways should have considered the development of high-voltage direct-current traction to be not sufficiently advanced to at least be seriously considered in making the final selection of system. It is true that, as the report states, at the time of making the selection no exact equivalent of the required service was being furnished by a high-voltage direct-current equipment, but it does seem as if there would have been no great risk in adopting this providing that its characteristics would meet the requirements. As we understand it, the direct-current system was adopted by the New York Central Railroad somewhat more than ten years ago, at least partly, because it was considered to be the only one which had, up to that time, demonstrated its reliability on a large scale. Like the Federal Railways, the New York Central did not wish to experiment. Now we find the single-phase system adopted largely because by the Swiss government experts it is considered in the lead for very heavy traction. The whole situation illustrates once more the fact that heavy traction is in the development stage and we cannot tell what a day may bring forth. While the steam railroads are held back from wholesale electrification partly by financial limitations, the development work on electrical equipment should be expedited, which can best be done by means of such installations as those on the St. Paul Railway, the Norfolk & Western Railway and the New Haven Railroad in the United States, and on the Swiss, Swedish and Italian and other railways, in Europe.

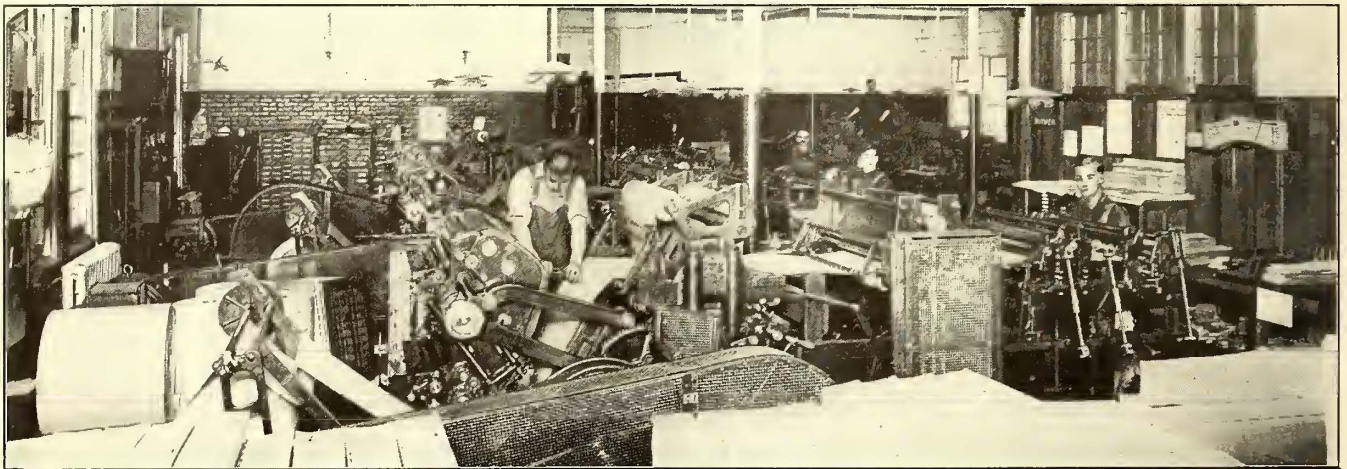
Printing 2,000,000 Transfers a Day

A Description of the
Nostrand Avenue Plant
of the B. R. T. System
Designed to Keep Pace
with Rapidly Increasing
Business

THE accompanying illustrations show in detail the plan and equipment of the modern printing plant of the Brooklyn Rapid Transit System, by which it is enabled to print 2,000,000 transfers a day on a single machine.

As far back as August, 1903, the Brooklyn Heights Railroad, which was subsequently acquired by the B. R. T. system, placed a printing plant in operation

taining printing forms, electros, printing inks, etc., and between the presses are small tables for imposing the forms. The cutting and stitching machines are located on the north side, extending the entire width of the room. An overhead line shaft drives these machines, and near the west wall there is a lathe on which all the repair work for the plant is done. A gear and tool rack for the lathe is conveniently located on the adjoining



B. R. T. TRANSFER PRINTING PLANT—GENERAL VIEW OF PRESSES

at 40 State Street and commenced making its own transfers. The machinery at that time consisted of two Kيدر presses, one Seybold cutter and one stitcher, the combined capacity of these machines being about 500,000 transfers a day. In 1906 an additional press and stitcher were obtained on account of the steadily increasing business, and in 1907 the adoption of a longer transfer caused the installation of more presses. These were flatbed Meisel presses, making 3500 impressions per hour.

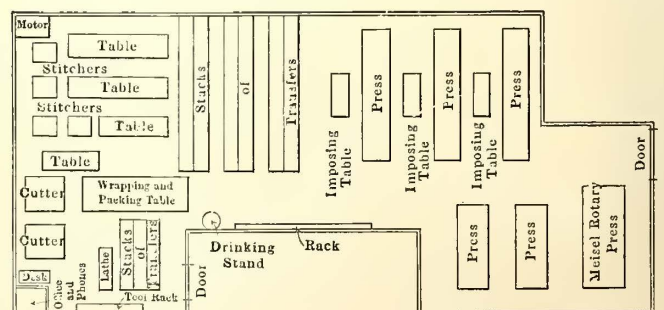
The capacity of the shop has steadily increased until now there are six presses, two cutters and four stitchers. The present plant, which is located at 849 Nostrand Avenue, has a working force of nineteen, and is in charge of N. Müller, who installed the State Street plant in 1903. The working force includes a foreman, two pressmen with three helpers, two boys, one cutter, and ten girls. Of the ten girls, three operate the stitching machines, three tie up bundles, three are engaged in sorting and billing the bundles and one is used as a checker.

The general plan of the printing room, which is about 100 ft. deep and 40 ft. wide, is shown in an accompanying diagram and in the photograph giving a bird's-eye view of the plant.

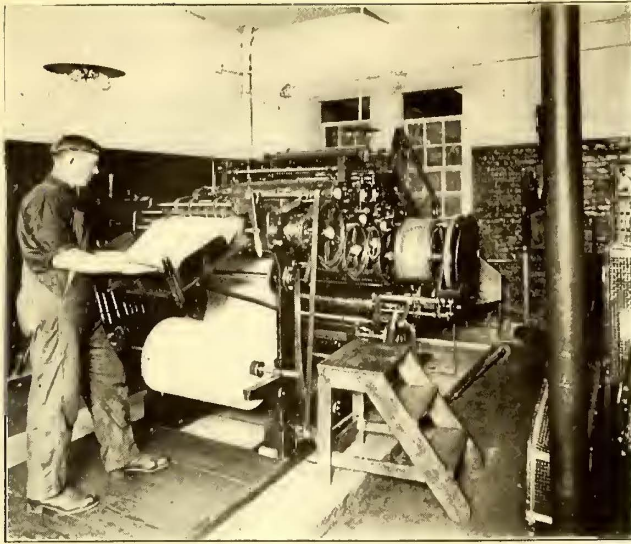
Three entirely different operations are carried on in this room, printing, cutting and stitching. The south end is occupied by the presses, three on each side of a main aisle. On the walls are shelves and racks con-

side wall. The middle of the room is used for stacking printed transfers, some of which have not been sent to the cutting machines. Part of the space is also used for packing and billing the completed pads of transfers which are ready to go out to the various depots of the railway system.

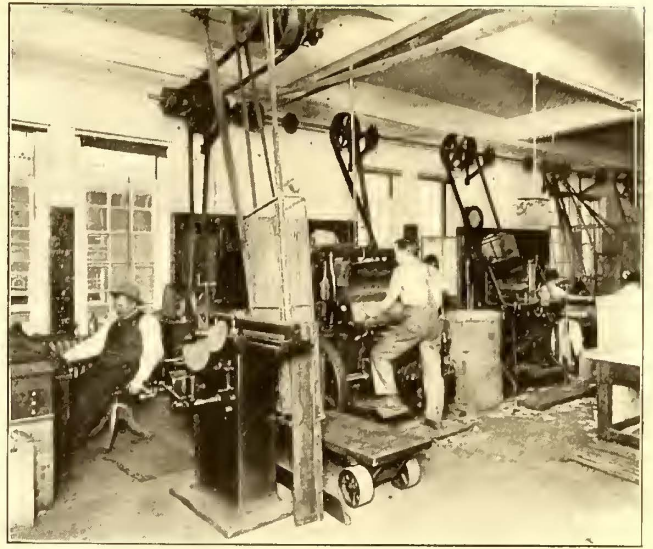
All of the printing necessary for any transfer is done in one operation by the Meisel rotary press, which is driven by a 7½-hp. Robbins & Myers motor. The dimensions of the press are such as to take a roll of paper 25¾ in. wide and 34 in. in diameter. It prints from electrotypes which are 3/16 in. thick. The transfers have one color on the under side, another color on the face side, the number being printed in one color and



B. R. T. TRANSFER PRINTING PLANT—
PLAN SHOWING LOCATION OF EQUIPMENT



B. R. T. TRANSFER PRINTING PLANT—
ROTARY PRESS



B. R. T. TRANSFER PRINTING PLANT—
CUTTING AND STITCHING MACHINES

the date in another. This press, which is shown in an accompanying illustration, was built especially for the company and has a capacity of 12,000 impressions an hour. The mechanism requires practically no attention, but keeps one man busy taking the printed sheets of transfers away from the collector in which they are deposited by the machine. This press is of the very latest type produced by the manufacturer.

After the transfers have been printed in sheets, three deep and eleven wide, they are taken to the large cutting machine, where they are stacked 1000 deep and cut in three strips, each being one deep and eleven wide. These strips are next taken to the stitching machines, where fifty of the above-mentioned sheets are stitched to a



B. R. T. TRANSFER PRINTING PLANT—
SORTING, COUNTING AND PACKING TRANSFERS

<p>Transfer Privileges Printed on Other Side</p> <p>Issued only with MAY 28 1916 Pope's Pat.—Time limit. Nov 21st, 1922.</p> <p>REGISTER READING F 50</p>		<p>THIS TRANSFER, subject to regulations printed hereon, and except as noted below, IS GOOD FOR ONE RIDE IN EITHER DIRECTION ON ANY INTERSECTING STREET SURFACE RAILWAY LINE, IF PRESENTED WITHIN THE TIME LIMIT</p> <p>THIS TRANSFER may be shown to CHURCH AVENUE conductor, and SURRENDERED FOR A FINAL RIDE IN EITHER DIRECTION ON ANY OTHER STREET SURFACE RAILWAY LINE INTERSECTING CHURCH AVENUE LINE.</p>
<p>OCEAN AVE. LINE A</p> <p>24006 N. E. R. R. Co.</p>		<p>Lines Exceptions</p> <p>ROGERS AVE., good for an "A" transfer REID AVE., good only at Rogers & Church Aves.</p> <p>TOMPKINS-CULVER, at Church & Rogers Aves. only, toward Neck Road</p> <p>LOBIMER ST., at Rogers Ave. & Malbone St., toward Prospect Park only; at Marcy Ave. & Lotimer St., toward Greenpoint only</p> <p>NOSTRAND-CULVER, at Rogers Ave. & Malbone St. only toward Neck Road.</p> <p>NOSTRAND - PROSPECT PARK, at Rogers Ave. & Malbone St. only, toward Prospect Park.</p> <p>TOMPKINS AVE., at Rogers Ave. & Malbone St. only toward Prospect Park</p> <p>FULTON ST., in both directions Toward Borough Hall, good for Special Transfer "C"</p> <p>GATES-PROSPECT PARK, at Marcy & Gates Aves. only toward Ridgewood</p> <p>DEKALB-CONEY ISLAND, toward Ridgewood only</p> <p>NOSTRAND AVE., no transfers issued to this line.</p>
<p>Not Transferable FINAL, except to Feeder Lines to which Conductor's Feeder Ticket may be issued upon surrender of this transfer.</p> <p>NO TRANSFER WILL BE ISSUED ON A TRANSFER, except as otherwise provided on back hereof.</p> <p>Passengers should note that the proper transfer is issued. Transfers issued by short cars are good to all lines named thereon; such lines, if beyond terminus, may be reached by next connecting car on Transfer Agent's Ticket.</p> <p>Good only in A.M. If P.M. Coupon is detached</p> <p>1 2 3 4 5 6 AM 7 8 9 10 11 12</p> <p>1 2 3 4 5 6 PM 7 8 9 10 11 12</p>		<p>Lines operating over a joint route between a terminus and a junction, will neither issue to nor accept transfers from each other while on joint portion of route.</p> <p>Transferring lines, the routes of which come together and continue over the same tracks to a point of separation, will accept transfer tickets only at first junction point, good either direction, unless otherwise noted.</p> <p>OCEAN AVE. (A)</p>

B. R. T. TRANSFER PRINTING PLANT—
SAMPLE TRANSFER

cardboard back as fast as an operator can feed them into the stitcher. They are now ready for the second cutting machine, into which they are stacked 1000 deep and seven stacks wide, being reduced by this machine to stacks of single pads of 50 transfers each. The single stacks are now taken away by girls, who deftly wrap them in large or small quantities as needed by the various lines and pass them on to other girls, who act as checkers and packers. They are then sent in large carriers to the shipping clerk, properly dated and tagged, ready to be sent out to the depots of the various lines.

The output of the plant is slightly in excess of 2,000,000 transfers for a working day of nine hours, the maximum number being 3,200,000. The transfers are printed three to six weeks ahead of date and are delivered to the stations three days before they are to be used. They are made from the best poster paper, which comes in rolls of 450 lb. each and is obtained from the Taggart mills. A two-months' supply of paper is kept at all times and is stored in an adjoining room in the building. The foreman of the plant, who was previously connected with the Meisel Company in the operation and installation of similar machines, makes all necessary repairs.

Chicago's Congested Streets

The Only Solution for the Problem of Providing More Surface Transportation Is the Utilization of Every Means for Passing Cars Through the Narrow Throats of Travel—Special Studies Indicate Possible Methods

FUNDAMENTALS for the study of Chicago "Traffic Conditions and Track Capacity" were presented in last week's issue, as an abstract of a new report of the Board of Supervising Engineers, Chicago Traction. The preceding article set forth the board's recommendations and deductions from data of fact. In this issue are given a review of the rerouting plans and the observed data of fact.

DISCUSSION OF PRESENT ROUTES

The first map shows the present routes and the calculated capacity of controlling points. This map is extremely valuable as indicating the complexity of present routing and the effect of superimposing service from different parts of the city. The study has been confined to the most congested areas, viz: the district north of Adams Street and west of State Street. Here much of the congestion is due to conditions at three controlling intersections over which pass practically all the routes entering that section of the Loop district. These intersections are at Dearborn and Lake Streets, Dearborn and Washington Streets, and Clark and Monroe Streets. At each point the general cause of congestion is the same, viz.: the crossing of heavy car traffic on an outside curve and heavy through traffic in other directions. Moreover, these intersections are points of very heavy

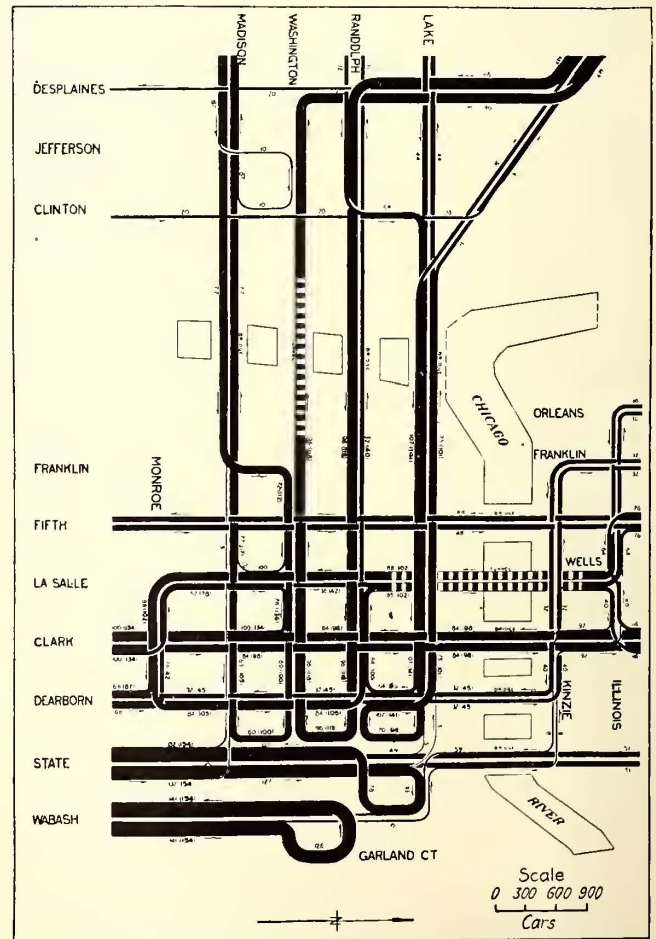
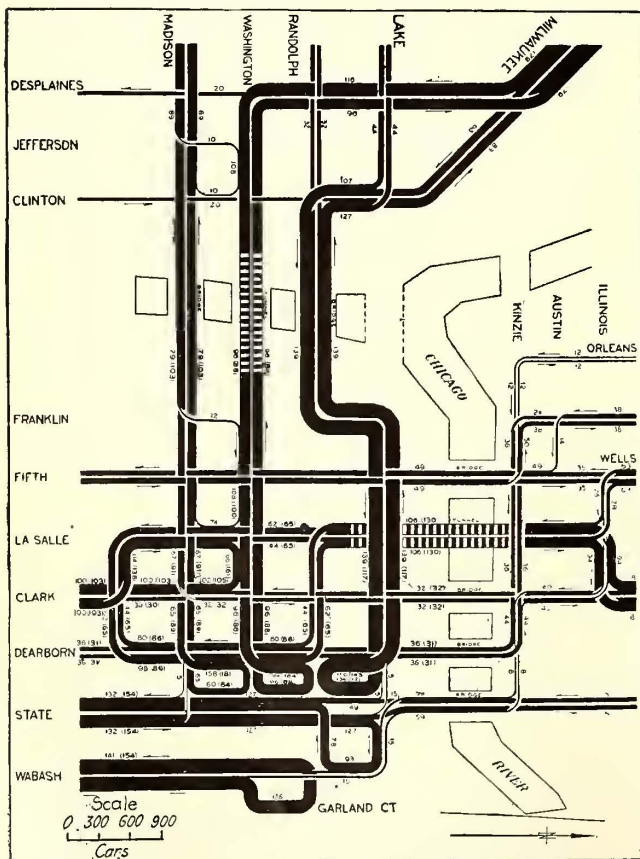
vehicular and pedestrian traffic, which further complicates the movement.

The Washington-Dearborn crossing has the heaviest total car traffic over any intersection in the downtown business district. This is caused by the convergence of the following maximum scheduled traffic rate:

LaSalle outside loop and North Dearborn routes	98 cars per hour
LaSalle inside loop and South Dearborn cars	80 cars per hour
Madison Street loop	60 cars per hour
Washington Street loop	96 cars per hour

In addition, the Washington loop traffic crosses the intersection twice—once straight and once on an outside curve, making a total rate of movement on all tracks of 430 cars per hour. Even now it is barely possible to operate the full movement called for by schedule over this intersection, and certainly no margin for growth exists except possibly on the southbound Dearborn Street track.

A summary of the results of capacity calculations under present routing is given in Table I and shows the prevailing deficit in capacity on most of the important lines measured by either the "70" or "80" serv-



These maps show the maximum rate of scheduled cars during the 30 minutes of maximum traffic, evening rush, expressed in cars per hour (figures not bracketed) and the calculated capacity of tracks determined by controlling crossings (figures bracketed), based on two-car berthing. Width of band represents the number of cars per hour based on January, 1916, schedules.

CHICAGO TRAFFIC—PRESENT ROUTING PLAN

CHICAGO TRAFFIC—REROUTING PLAN NO. II

ice standard. This surplus or deficit is expressed in per cent of traffic requirements.

BASIC REROUTING PLANS

From the preceding it is evident that some modifications in routing are necessary, and several are proposed covering a considerable range in rerouting, i.e. from the minimum effective changes to a very considerable rearrangement of the terminal situation. Car-flow maps are used to indicate graphically the distribu-

capacity and the resulting deficit or surplus gives a definite measure of how nearly the demand for service on either a "70" or "80" passenger standard may be met.

Finally, from this basis is deduced the margin of capacity available to meet probable growth during the period of rapid transit construction, using alternative service standards in conformity with previous discussions before the board. It may be added that, on some of the most important routes, none of the six plans presented provides any reasonable margin for growth to meet in the future the service demand on a 70-standard, and not much margin on an 80-standard.

TABLE I—PRESENT PLAN OF ROUTEING, SHOWING SURPLUS OR DEFICIT CAPACITY

Lines on	Surplus Capacity Available	
	70 Passengers Per Car	80 Passengers Per Car
North State Street.....	(a) 50%	65%
Madison Street.....	..	10
South State Street.....	* 2	13
Clark Street (north of Illinois).....	* 8	3
Wabash Avenue (South).....	* 12	..
Washington Street.....	* 17	* 6
Dearborn Street (North).....	* 27	* 20
South Clark Street.....	* 26	* 15
Lake Street.....	* 29	* 21
Weighted average of all lines.....	* 12	..
Weighted average of all lines, excluding North State Street.....	* 15	* 3

(a) It should be noted that although a large surplus capacity is available in the North State Street throat, yet it cannot be used very effectively because of this being a street deadened at Lincoln Park, and therefore only a branch of the Clark Street throat.
*Represents deficit in capacity.

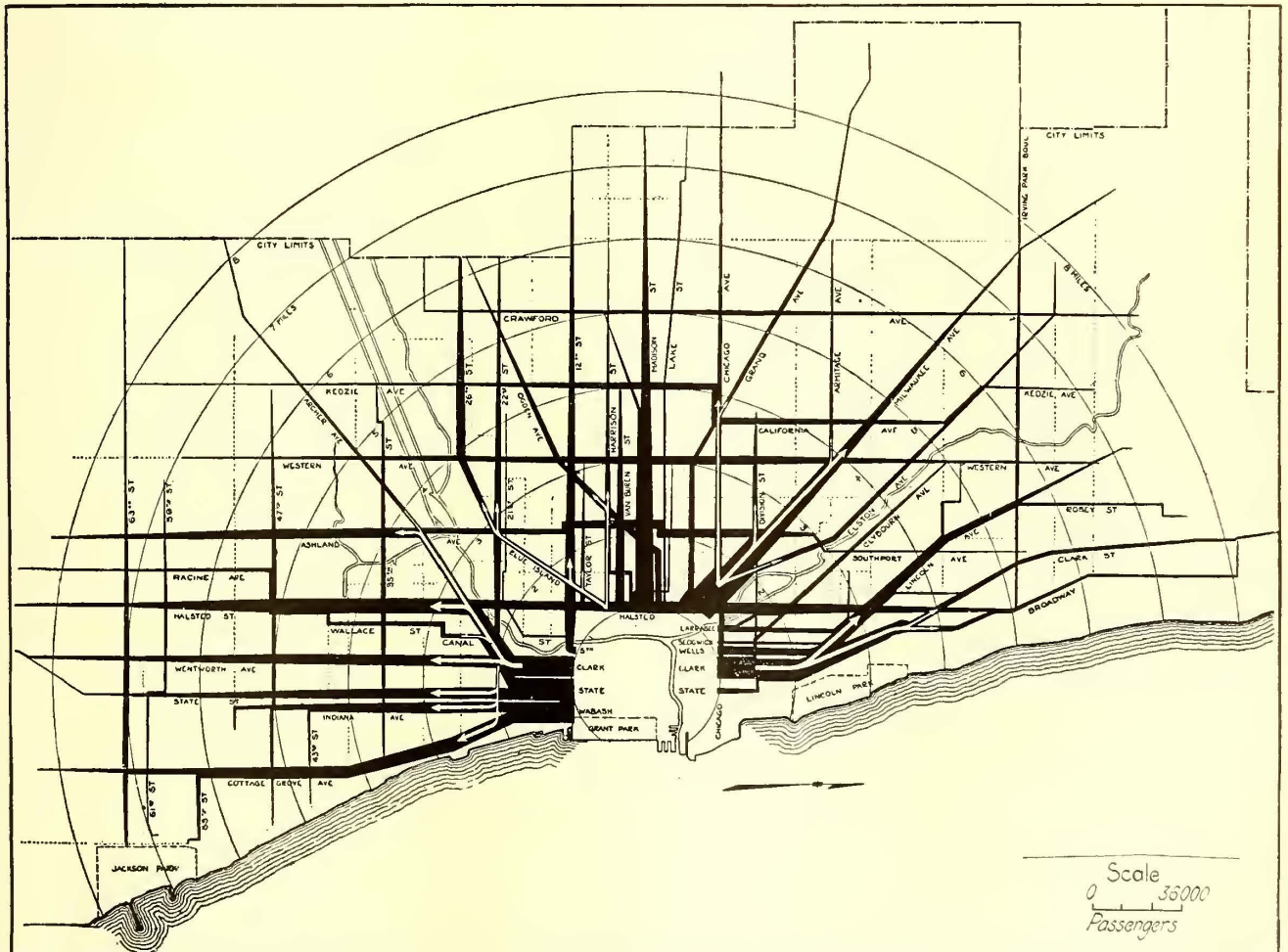
tion of car traffic under present schedules, which would result from applying the various schemes of rerouting. For each plan the terminal track capacity was then computed upon a basis of actual service requirements for each route, as measured by a uniform service standard throughout. In other words, each plan accepts fundamentally a uniform service standard as the basis of

ACCEPTED ROUTEING PRINCIPLES

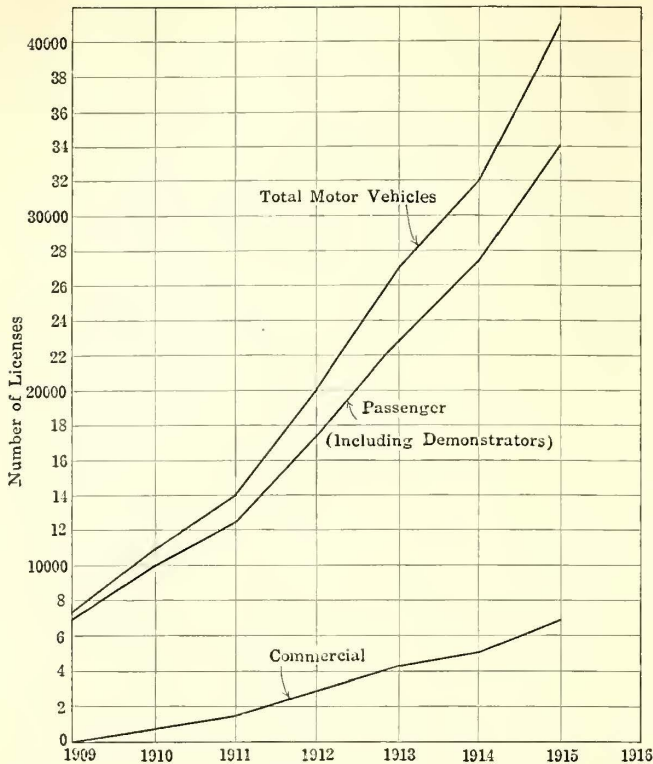
The following principles were adopted as far as practicable in all suggested rerouting plans:

1. Through routing of balanced car traffic in preference to using loop terminals.
2. Maximum reduction of outside curve movements at crossings.
3. Preferential use of inside curve, so that cars can move on either traffic signal if necessary.
4. Closing of loops outside of congested district.
5. Outbound trippers to operate on the same street as cars of the through line.

One fundamental consideration in these plans is whether it is practicable to through-route rush-hour trippers as well as all-day service. While through-routing of trippers is already carried out on two important through routes—State Street and "Through Route" No. 22—the general acceptance of this principle for all routes appears to be a point of contention. There-



CHICAGO TRAFFIC—RUSH HOUR PASSENGER TRAFFIC OUTBOUND FROM MILE ZONE, WIDTH OF BLACK LINE SHOWING RELATIVE NUMBER OF PASSENGERS CARRIED



This curve shows the rapid increase in the number of licenses issued to the respective classes of motor vehicles by the City of Chicago.

CHICAGO TRAFFIC—INCREASE OF MOTOR VEHICLE LICENSES

fore, all of the routing plans have been worked out on an alternative basis, viz.: without rush hour trippers through routed.

CAPACITY OF TUNNELS

Some study was devoted to the matter of safe tunnel capacity in order to determine whether the existing tunnels could be used to their fullest advantage, as called for by the service requirements under the proposed routing plans and service standards. This safe tunnel capacity was considered to be based upon the following simple assumption: That no car entering the tunnel at a speed of 10 m.p.h. and losing control on the descending grade could overtake the preceding car on the ascending grade, assuming a continuous line of cars moving through the tunnel at the minimum safe headway to be ascertained.

This means that both brakes and electrical equipment of a fully loaded car would become disabled simultaneously so that the motorman could not "buck the motors" for an emergency stop. Considering, then, the grades, weight of car, train friction and windage, the minimum safe spacing may be determined by superimposing time-distance curves for both regular and runaway cars. The above basis will be recognized as exceedingly improbable of occurrence in the ordinary course of events.

This analysis shows that by the time the runaway car catches up with its leader from 26 to 27.5 seconds elapse. Allowing 10 per cent excess, the minimum safe headway then becomes about 28 to 30 seconds, or corresponding to a capacity of at least 120 cars per hour. It is of interest to note that the tunnels are now being operated under a schedule rate of 108 cars per hour for the maximum 30-minute rush period and, at times, with a much higher rate—as many as four cars on the same ascent or descent.

REROUTING PLANS PRESENTED

The report, then, presents three rerouting plans and three alternatives. The details of each plan and analy-

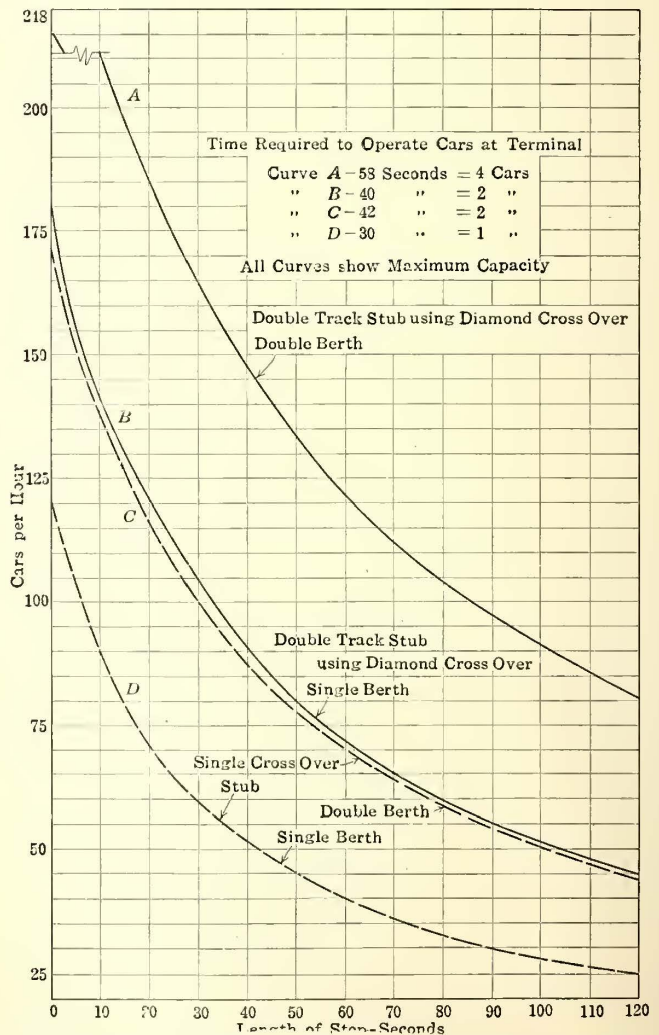
ses of the controlling intersections are discussed and a table of the surplus capacity available on either the 70-passenger or 80-passenger standard is given. Rerouting plan II, shown on page 318, is recommended for first consideration. In this plan the Clark-Wentworth rush-hour trippers, as well as day service, are through routed, and the Washington and Madison Street loops are lengthened. On the lines over the Lake-Dearborn crossing about 60 per cent more capacity is available than for the same lines under the present scheme of routing. Capacity studies for Plan II result in the following surplus capacity, measured in per cent of traffic requirements.

TABLE II—PROPOSED REROUTING UNDER PLAN II, SHOWING SURPLUS OR DEFICIT CAPACITY

Throat	Surplus Capacity Available	
	70-Passenger Standard	80-Passenger Standard
North State Street.....	(a) 50%	65%
Lake Street.....	13	27
Washington Street.....	11	25
Madison Street.....	10	22
South State Street.....	* 2	13
South Clark Street.....	* 4	10
North Clark Street.....	* 4	8
North Dearborn Street.....	* 4	5
Wabash Avenue.....	*12	..
Weighted average of all throats...	2	16
Weighted average of all throats, excluding North State Street.....	..	13

(a) See note under Table I.
*Deficit.

This table shows, among other things, that in the case of Wabash Avenue, one of the two heaviest down-



This curve shows the relative maximum capacity respectively between a single and double berth operation on a single crossover and also on a double or "diamond" crossover, estimated from observations made during rush hour operation.

CHICAGO TRAFFIC—CAPACITY OF STUB TERMINALS

town trunk lines, the capacity of the throat is now exhausted even under an 80-standard and with the most favorable routing plan, and that downtown relief subways, if started immediately, could not be completed too soon.

STUB TERMINAL CAPACITY

In connection with the rerouting plans the board also made a study of the capacity of stub terminals, of which there are four in the Loop district. The result of this study, shown in a graph on the opposite page, is based on observations on both the single and double-track stub terminals with varying lengths of stops. Thus, the diagram shows that for a total stop of 1 minute, using single berthing, a single track stub can handle only forty cars per hour and a double-track stub only seventy-two cars per hour without congestion. The report concludes from this that any routing plan involving stub terminals is subject to fixed limitations of service, even though double berth operation is resorted to.

PHYSICAL LAYOUT

Chicago, more than other cities with an extended water front, has its terminal district or traffic center artificially concentrated within a relatively small rectangle bounded on three sides by water and on the fourth largely by railroad yards, this rectangle containing for general business purposes only about 80 to 90 blocks of average size. While this condition alone would be serious, the establishment of the elevated loop inclosing thirty-five blocks in the heart of this rectangle fixed even more inflexibly this terminal "Loop" district within the confines of the river. This policy, which largely resulted from independent ownership of elevated properties, has long been realized as one of the principal elements retarding the expansion of this central business district, and the recent merger of the elevated lines under one operating company and the through routing of the Northwestern and the South Side "L" trains is an important step directed toward the expansion of the district which must eventually take place, simply from the lack of street capacity within the Loop district to handle the traffic converging from over 100 sq. miles of settled territory. Again, divisional operation of street railways formerly resulted in each system striving to reach and cover this limited Loop district as far as possible. Later, the improvement and unification of these lines created conditions of higher physical standards, operating efficiency and speed of transit, but did little else to relieve fundamentally this concentration except in one particular: the adoption of the principle of through routes. The problem of increasing traffic density still exists, as will be noted from the accompanying map of the city.

Beneath these Loop streets exist approximately 60 miles of freight tunnel, designed for the very purpose of relieving the surface of much of the package freight traffic. It is an unfortunate fact that, as at present organized, this freight Chicago Tunnel Company handles less than one-fifth of the freight transfer and less than one-third as much as the trucks operating upon the surface. How this situation may be remedied is not within the scope of this report, but is referred to here as being an important factor contributing to surface street congestion.

A total of forty-three car lines feed into this Loop district from distances as great as 10 to 15 miles. To accommodate these, there are but thirteen available through entrance streets—three from the north, seven from the west, and three from the south. While these south entrances are uncomplicated by bridge crossings, two of them are seriously obstructed by freight yard operations. These three groups of entrances may be

considered as the throats through which must be handled all traffic converging from straight as well as diagonal thoroughfares, and the concentration is the greatest from the south. This condition is well shown in the large map on page 219.

Another source of concentration is traceable to the receding lake front on the north shore, which forces the outlying diagonals into one entrance throat, viz.: Broadway-Clark and Lincoln.

PAVEMENTS

In the wholesale and factory districts granite paving preponderates, while in the retail and office building districts smooth paving is used, either asphalt or wood block. In icy weather, or after sprinkling, heavy teaming on these smooth pavements becomes extremely difficult and, as a result, car movement continues to be seriously impeded at times by vehicles in the track, a condition which has not yet been corrected by enforcement of ordinances. However, the preponderance of passenger automobile traffic, which is increasing by leaps and bounds as indicated by the curve on page 220, offers concrete evidence of the desirability of a different class of pavement within the retail district than that best adapted for trucking purposes.

The conclusion of the abstract of the report will appear in a later issue.

Baltimore Traffic Conditions

General Manager T. S. Cross in Open Letter Explains These Conditions for Enlightenment of Public

On Tuesday of this week T. S. Cross, vice-president and general manager United Railways & Electric Company, Baltimore, Md., addressed a letter to the Maryland Public Service Commission stating the company's position in regard to certain criticisms of its service made by the transportation expert of the commission, B. W. Duer. His letter abounded in data showing the actual situation as regards crowding and contained a denial of any intention of the company to overcrowd the cars.

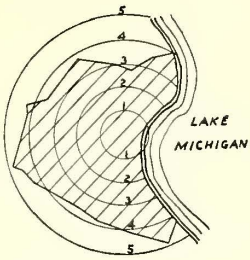
The company admits a few cases of overcrowding but claims that this is due to the habits of the traveling public. Checks taken by the company showed that the number of cars carrying more than the capacity, which is sixty-eight, amounted to an average of 27 per cent in the morning and 48 per cent in the evening. The average number of loads of less than sixty-eight in the morning was 71 per cent, and in the evening 48 per cent.

The conditions are being closely watched by the traffic department of the company, Mr. Cross states, and since July 20 four additional trips have been put on in the morning and five in the afternoon on one of the lines.

Only thirteen of the cars carried in excess of the limit of sixty-eight, while the average of cars with vacant seats during the morning rush in the three days of the check was forty, or 83 per cent of the whole number of cars checked.

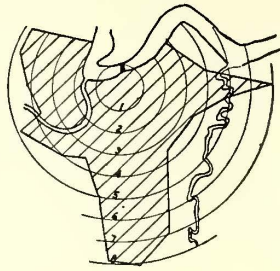
On the three days and during the period in which the checking was done a total of 1549 additional passengers, or more than twenty-two carloads at sixty-eight per car might have been accommodated in the vacant seats on cars on one line.

During the evening rush hours the average cars per day were forty-eight and the average passengers per car were sixty-four. The number of loads in excess of sixty-eight was twenty-three, while the number of cars with vacant seats was thirty, or 63 per cent of the whole number.



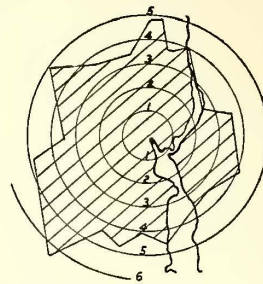
Milwaukee, Wis.

Population (1910), 373,857. Shaded area has 5-cent fare, 25 tickets for \$1, with free transfers. Area, 33 square miles. Average radius, 3.6 miles. A zone system in effect on suburban lines beyond this area.



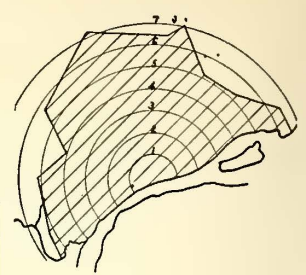
Kansas City, Kan., and Kansas City, Mo.

Combined population (1910), 330,712. Shaded area has universal 5-cent fare with free transfers. Area, 51 square miles. Average radius, 4.9 miles.



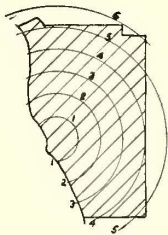
Providence, R. I.

From map in Providence report of Bion J. Arnold, 1911. Population (1910), 224,326. Shaded area has 5-cent fare with free transfers. Area, 48 square miles. Average radius, 3.9 miles.



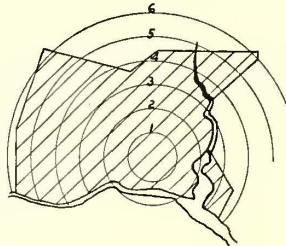
Detroit, Mich.

Population (1910), 465,766. Shaded area has 5-cent fare, or 7 tickets for 25 cents, with free transfers. On some lines 8 tickets for 25 cents are sold. Area, 58 square miles. Average radius, 5.5 miles.



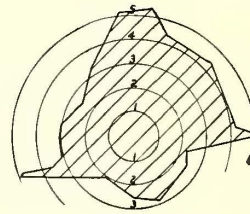
Buffalo, N. Y.

From map on file with Massachusetts Public Service Commission. Population (1910), 423,715. Shaded area has 5-cent fare with free transfers. Area, 38 square miles. Average radius, 4.8 miles.



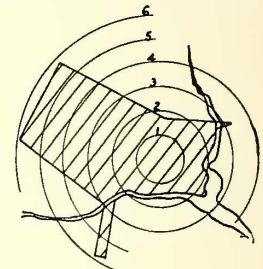
Washington, D. C.

(Wash'ton Ry. & Elec. Co.) Population (1910), 331,069. Shaded area has 5-cent fare, 6 tickets for 25 cents, with free transfers. Area, 48 square miles. Average radius, 4.6 miles.



Indianapolis, Ind.

Population (1910), 233,650. Shaded area has 5-cent fare, 25 tickets for \$1, with one free transfer allowed. Area, 36 square miles. Average radius, 3.4 miles.



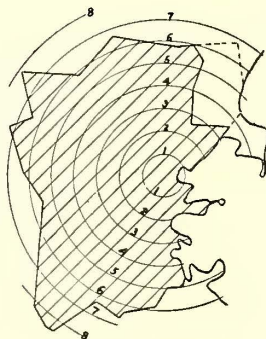
Washington, D. C. (Capital Traction Co.)

Population (1910), 331,069. Shaded area has 5-cent fare, 6 tickets for 25 cents, with free transfers. Area, 29 square miles. Average radius, 3.5 miles.



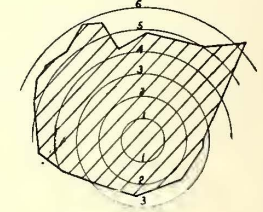
New Bedford, Mass.

Population (1910), 96,652. Shaded area has 5-cent fare with free transfers. Area, 12 square miles. Average radius, 1.9 miles.



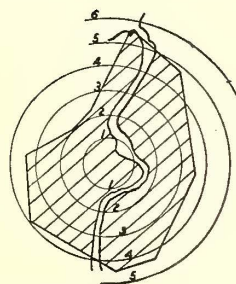
Manchester, N. H.

Population (1910), 70,063. Shaded area has 5-cent fare with free transfers. Area, 12 square miles. Average radius, 1.9 miles.



Baltimore, Md.

Population (1910), 553,485. Shaded area has 5-cent fare with free transfers. Area, 50 square miles. Average radius, 4.0 miles.

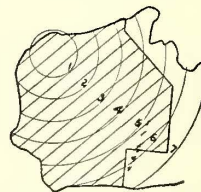


Holyoke, Mass.

Population (1910), 57,730. Shaded area has 5-cent fare with free transfers. Area, 43 square miles. Average radius, 3.7 miles.

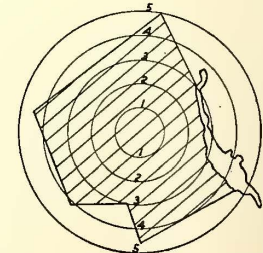
Boston, Mass.

Population (1910), including suburbs with the area shown, 1,043,546. Shaded area has 5-cent fare with universal free transfers, including transfers between all surface and rapid transit lines. Area, 81 square miles. Average radius, 6.0 miles. The dotted area on the northeast is served by a separate company for a 5-cent fare from the center of Boston. Transfers between the two companies cost 3 cents extra.



San Francisco, Cal.

From map in "Report of Transportation Facilities, City of San Francisco," by Bion J. Arnold, March, 1913. Population (1910), 416,912. Shaded area has universal 5-cent fare with free transfers. Area, 40 square miles. Average radius, 5.5 miles.



Worcester, Mass.

Population (1910), 145,968. Shaded area has 5-cent fare with free transfers. Area, 42 square miles. Average radius, 3.7 miles.

MAPS OF SINGLE-FARE ZONES IN TYPICAL CITIES

Figures indicate radii of circles in miles from traffic centers

Long Rides for a Nickel

Examination of Single-Fare Areas of Some American Cities Shows Surprising Availability of Eight and Ten-Mile Rides—Further Expansion Is a Subject of Concern to Railway Operators

By D. J. McGRATH

Research Assistant Massachusetts Institute of Technology

AN essential factor in any study of fares and fare systems is a comparison of the lengths of haul given under existing conditions. Reliable data on the actual average length of passenger hauls are available in only a few scattering cases where extensive traffic counts have been made. The length of haul which is offered for the single fare, as shown by the length of lines to the first fare limits, is a valuable and suggestive form of data which is much more readily obtained. Moreover, it is a form of data which is capable of exact determination, whereas average length of haul figures are frequently compiled from a very limited series of observations and consequently are likely to contain material errors.

In connection with the street railway research work which is being carried on at the Massachusetts Institute of Technology, a set of maps has been prepared to furnish a means of direct comparison between the areas served for a single fare, usually 5 cents, in a number of American cities. These maps are reproduced in the illustrations accompanying this article.

The information used in preparing the maps was generally obtained from officials of the street railway or the public service commission with jurisdiction in the city in question. In a number of cases the stated location of the single-fare points was checked by the personal observation or knowledge of some member of the research staff, but generally the data had to be assumed correct as furnished. In a few cases the data were derived from published reports, as noted on the illustrations. Points used as centers for the drawing of the concentric mileage circles were either named by the parties furnishing the data as the approximate traffic centers, or else chosen because of the location of the city hall or a railroad terminal near the junction of a number of street-car lines.

The method adopted in preparing the figures was to lay out, from the map furnished, a new plot fixing the ends of all city lines, or their single-fare limits at the proper angle and distance from the center. A uniform scale of 3 miles to the inch was employed in making the drawings, but this scale was reduced to about 9 miles to the inch in the course of reproducing the figures for printing in this paper. The ends of the lines thus laid out were then connected so as to form a completely inclosed area, which is generally a polygon approximating a circle, except where large bodies of water or other topographical features have interfered with the circular growth of the city.

It is no doubt a fact that the average city line furnishes service to the population of more or less territory beyond the outer terminus of the line. As the extent of such service, however, is so indeterminate under the varying conditions encountered, it was deemed best for comparative purposes to extend the single-fare area maps only to the ends of the various lines or to their respective single-fare limits.

The area of each single-fare district was determined by planimetry of the plotted area, and the result in

square miles is stated with each figure. The mere comparison of areas, however, does not always furnish an adequate idea of all the circumstances, for a number of cities are prevented from spreading out in a normal radial manner because of limiting topographical features. Information as to the average radius of operation from the central traffic point affords a more useful comparison. This average radius may be determined approximately by considering the measured area as a circle and computing the radius by the ordinary formula of the circle:

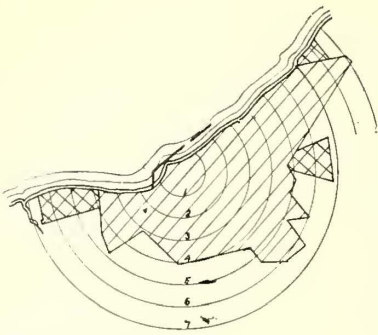
$$\text{Radius} = \sqrt{\frac{\text{Area}}{3.14}}$$

When a body of water or other natural obstacle has distorted the growth of the city in any particular direction, the existing area may be considered as a sector of a circle and the approximate angle subtended may be measured with a protractor. In some instances where the figure is very irregular, an average radius of operation is best obtained by averaging the distances from the center to the various fare limits. Such data are at best only approximate figures, and their reasonableness may be roughly checked by an inspection of the map itself.

Since a number of the various companies have rates other than the straight 5-cent fare, the existing fare system and also the transfer arrangements are briefly described with each map. On the Cleveland map, for example, the extent of the 3-cent fare system is illustrated, and the 5-cent fare territory is also designated. It will be noted that practically all transfers in Cleveland cost 1 cent extra.

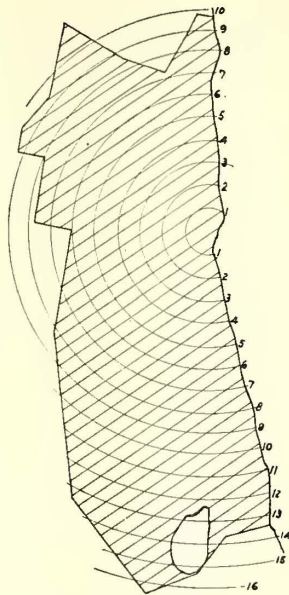
New York City and its environs present a rather special case in that there are a number of more or less independent companies operating in the district, with practically no transfer privileges between them. Transfers are usually given, with certain limitations, between lines of the individual systems. The map shown here with fairly illustrates the distances which may be ridden for a single 5-cent fare from the central point, but rides from one extremity of the area through the center and out toward the other extremity are not generally available for one fare. On the Hudson & Manhattan railroad system fares from uptown points to New Jersey are 7 cents.

The populations of the several cities are given on the maps, the figures being taken from the federal census of 1910. These census figures are only approximately indicative of the populations actually served by the urban traction systems, since the single-fare areas shown in the maps do not always correspond with the political boundaries of the municipalities. In practically all the cases shown, however, the city populations cited are sufficiently correct to give a reasonable idea of the number of people served. One peculiar exception is in the case of Boston. The traction company operating in that city includes within its single-fare area a large number of politically independent suburban cities and



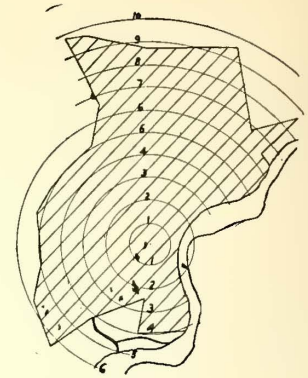
Cleveland, Ohio

Population (1910), 560,663.
 Lightly shaded area has 3-cent fares, with 1-cent extra charge for transfers.
 Heavily shaded area has 5-cent fare from center of city, i.e., 2 cents in addition to the regular urban fare.
 Area (3-cent fare territory), 46 square miles.
 Average radius, 5.0 miles.



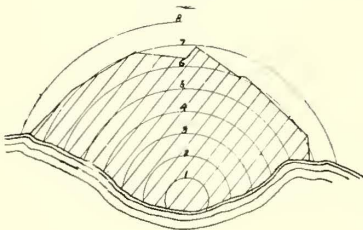
Chicago, Ill.

Population (1910), 2,185,283.
 Shaded area has 5-cent fare with free transfers between surface lines.
 Area, 182 square miles.
 Average radius, 10.8 miles.



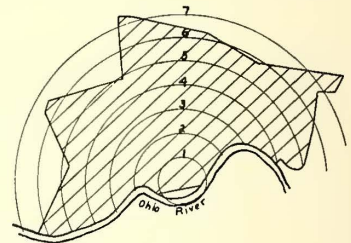
Philadelphia, Pa.

Population (1910), 1,549,008.
 Shaded area has 5-cent fare, with limited free transfer system, and some 3-cent transfers.
 Area, 91 square miles.
 Average radius, 6.2 miles.



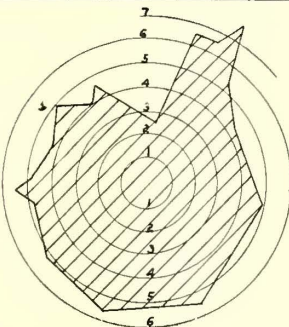
St. Louis, Mo.

Population (1910), 687,029.
 Shaded area has 5-cent fare with free transfers.
 Area, 56 square miles.
 Average radius, 6.5 miles.



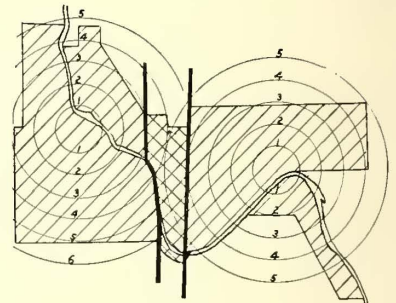
Cincinnati, Ohio

Population (1910), 363,591.
 Shaded area has 5-cent fare with free transfers. Children's fare, 3 cents.
 Area, 58 square miles.
 Average radius, 5.9 miles.



Los Angeles, Cal.

(Urban system only)
 From map furnished by Board of Public Utilities, City of Los Angeles.
 Population (1910), 319,198.
 Shaded area has 5-cent fares with free transfers.
 Area, 72 square miles.
 Average radius, 4.8 miles.



Minneapolis, Minn.

Population (1910), 301,408.

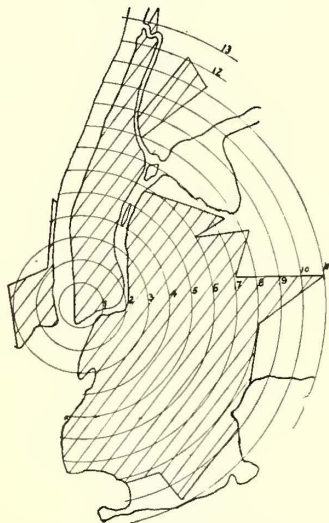
St. Paul, Minn.

Population (1910), 214,744.

These two cities constitute two separate single-fare areas, with separate 5-cent fares charged in each city. Between them is a "neutral" or "overlap" zone into which a passenger may ride for one fare from either city, or vice versa. This zone is shown by special shading on the map.

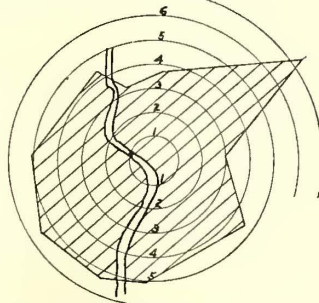
Minneapolis area (including neutral zone), 61 square miles.
 Minneapolis, average radius, 4.4 miles.

St. Paul, area (including neutral zone), 50 square miles.
 St. Paul, average radius, 4.0 miles.



N. Y. Metropolitan District

From data on Map No. 10 in report of Transit Commission, city of Philadelphia, July, 1913.
 Includes territory served by the Interborough Rapid Transit Company, New York Railways, Brooklyn Rapid Transit Company, Hudson & Manhattan Railroad and other smaller traction companies.



Springfield, Mass.

Population (1910), 88,926.
 Shaded area has 5-cent fare with free transfers.
 Area, 64 square miles.
 Average radius, 4.5 miles.

MAPS OF SINGLE-FARE ZONES IN TYPICAL CITIES

Figures indicate radii of circles in miles from traffic centers

towns, which are really a part of the metropolitan district. The total population of Boston in 1910 was 670,585, but when the combined populations of the suburban towns and cities within the 5-cent fare are added a total of more than 1,000,000 is obtained. The populations included are as follows: Boston, 670,585; Cambridge, 104,839; Somerville, 77,236; Malden, 44,404; Everett, 33,484; Chelsea, 32,452; Brookline, 27,792; Medford, 23,150; Watertown, 12,875; Arlington, 11,187; Belmont, 5,542—total, 1,043,546. The 1915 State census has been completed, but the foregoing figures are taken from the 1910 census in order to keep them on a level with the data cited for the other cities.

A little study of the maps reveals some interesting comparisons. There are single-fare areas ranging all the way from those of a 2 or 3-mile radius in small urban centers up to the greatly extended 5-cent fare lines of the largest cities, such as New York, Chicago, Boston and Philadelphia. Extensions to 6, 8 and even 10 miles are no longer uncommon, and in some cases more than 15 miles may be ridden by transferring through the center of the city. Such a condition represents a tremendous expansion from the short horse-car lines of twenty-five years ago, and it is a development which is giving many street railway operators a great deal of concern at the present time.

Progress on the St. Gothard Electrification

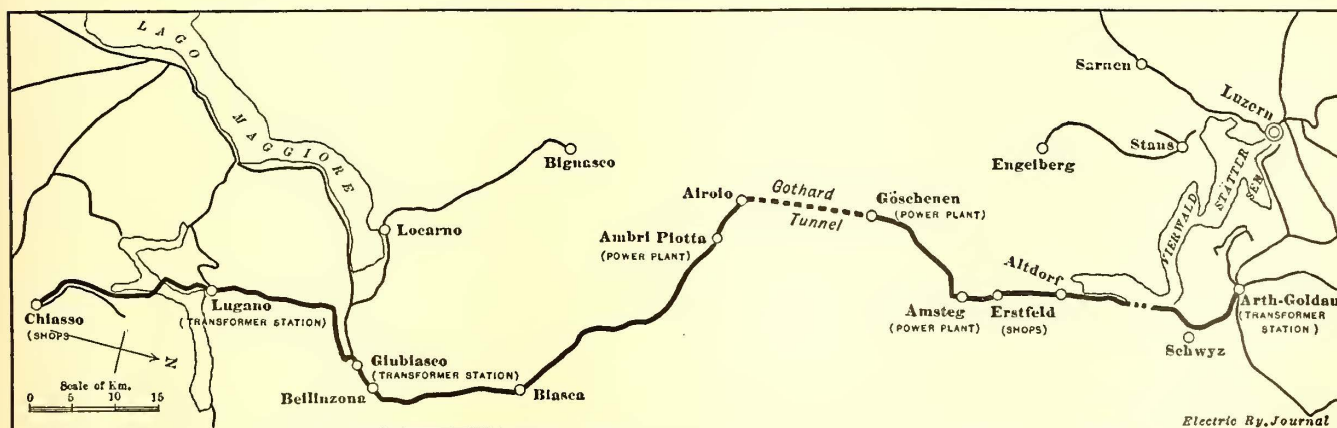
In Their 1916 Report the General Managers of the Swiss Federal Railways Show Why They Still Consider Single-Phase Best for This Electrification

EARLY in the present year the board of general managers of the Swiss Federal Railways presented to the board of directors a report concerning the choice of system to be adopted for the St. Gothard electrification. It was definitely decided to use single-phase current on the line between Erstfeld and Bellinzona and to install single-phase equipment in the power plants located respectively north and south of the tunnel, that at Amsteg being at the northern slope of the mountain, and the other, which is to be known as the Ritom station, being near the summit of the southern slope. The latter plant will have as a storage basin the Lago Ritom, with a capacity of more than 670,000,000 cu. ft., and it will work under a head of more than 2600 ft. Abstracts of previous reports on this electrification were published in the issues of the *ELECTRIC RAILWAY JOURNAL* for March 7, 1914, page 524, and March 21, 1914, page 657. The decision to use single-phase was announced at the meeting of the New York Railroad Club on March 17, 1916, as noted on page 605 of the issue of the *ELECTRIC RAILWAY JOURNAL* for March 25. Work on the power plants has been in progress for some time.

While the previous reports favored single-phase, the actual selection of system was postponed by the managers until the moment when the advancement of the work made a final decision necessary. This point arrived early in the present year and, after reviewing carefully the progress which had been made by con-

tinuous current, three-phase and single-phase systems during 1914 and 1915, the tentative selection of single-phase was confirmed.

In the 1916 report the board of managers point out that the system selected for the Erstfeld-Bellinzona line must also be applied later on the sections between Lucerne and Erstfeld and between Chiasso and Bellinzona, and that it should be, if possible, the same as on the other federal lines to be electrified later. They state also that a wrong impression seems to have been given by the fact that the 1916 budget provides for certain experimental work which some seem to think was connected with the choice of system for the St. Gothard electrification. The fact is that the experimental equipment provided for was simply to permit certain investigations to be made in regard to the mounting of the contact wire, the procedure to be followed in the main work and the determination of certain electrical constants not sufficiently known. As the report points out, it was not necessary to make experiments in choosing a system, because there has already been sufficient experience on numerous railways to permit a decision on this point, at least as far as the single-phase and three-phase systems are concerned. In the case of the direct-current system, it was not considered possible to secure information early enough on its value, and such information as could be obtained would not be as conclusive as that which will be furnished by the application of this



OUTLINE MAP SHOWING LOCATION OF ST. GOTHARD LINE NOW BEING ELECTRIFIED

system by an American company which, at the time of the report, was about to introduce it on a part of its system.

The project approved by the board of directors on Nov. 25, 1913, was based on the single-phase system. In view of the fact that the Loetschberg electrification with single-phase had not then been crowned with the success which it has since achieved, the reservation made in the earlier report as to the type of system was a wise one. The board of managers has, in accordance with its promise, carefully studied all available systems in the meantime, and has utilized competent advice as to the form and frequency of the primary electrical power which should be used.

COMMENTS ON SYSTEMS OF ELECTRIC TRACTION

The three-phase system was not considered applicable on account of the impossibility of securing satisfactory speed control, and of the necessity for using two contact conductors.

The results obtained with single-phase on the Loetschberg line are such that this system can be recommended without reserve. This opinion is confirmed by the developments on the New Haven, New York, Westchester & Boston, Boston & Maine, Pennsylvania, and Norfolk & Western electrifications in North America. These developments have furnished the solution of all technical problems which have presented themselves on the federal railway system. The adaptability and elasticity of the single-phase current have been well demonstrated, and it has been applied for a considerable time and on a large scale successfully. In addition, nearly all of the manufacturers have participated in the single-phase development.

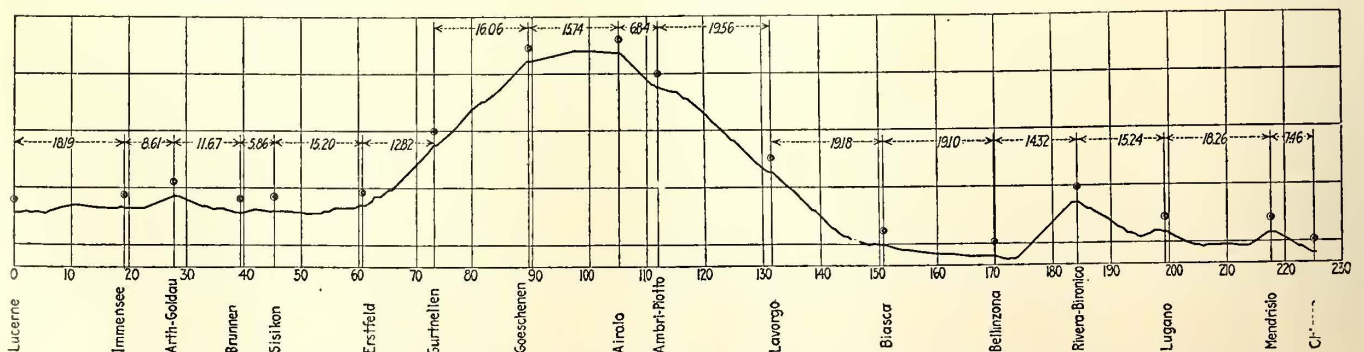
In order to show that the difficulties encountered in single-phase development had not been overlooked the managers give a number of examples of difficulties encountered in several installations, namely, on the Loetschberg line, the New York, New Haven & Hartford Railroad, the Midi Railway in France and the Wiesenthal line in the Grand Duchy of Baden. In the case of the Loetschberg Railway one of the difficult problems was the design of the locomotives. Even the New Haven Railroad had, until within a few years, a struggle with various technical difficulties. The experience thus gained no doubt influenced the Pennsylvania Railroad to adopt single-phase on the Philadelphia electrification in spite of the good results obtained on three lines of the first importance with low-tension direct-current with the third-rail contact system. In spite of difficulties on the Midi Railway with inductive interference there is no thought of changing the system. The mechanical difficulties on the Wiesenthal line in connection with the locomotive have long since been overcome. The results obtained by the Swedish State Railway on the Kiruna-Riksgraensen line cannot yet be considered definite on account of the interference with its traffic

by the present war, but the experience has been sufficiently satisfactory to warrant the equipment of a much longer line between Kiruna and Lulea.

PROGRESS IN DIRECT-CURRENT HEAVY TRACTION

The report reviews the progress which has been made in increasing the voltage on direct-current lines which, while formerly slower in America than in Europe, has lately progressed there much more rapidly and on a larger scale. The managers had followed with great interest the Butte, Anaconda & Pacific Railway electrification and the Canadian Northern Railway electrification at 2400 volts. The former was only of general interest because the capacity of the single locomotive was small and the speed low. The Lancashire & Yorkshire electrification was also mentioned, attention being called to the fact that after experimenting with a 3500-volt line, a 1200-volt third-rail system was adopted on a later section of the same system. The Michigan Railway installation at 2400 volts was also mentioned. In referring to experiments on the last-named railway with voltages higher than 3000, the managers state that these did not appear to be of great interest. They point out that in their previous report they called attention to the necessity of using at least 3000 volts with direct current as applied to heavy trains moving at high velocity. They state that the partisans of the direct-current system, in citing the great increase in the length of line electrified with high-tension direct-current or on the point of being electrified, have principally in mind cases where light trains are used or where the voltage is less than 3000. These cases have little bearing upon the present one. In Europe there is not a single line of this kind which justifies a decision based on immediate experience. At the time of the completion of the report, the Chicago, Milwaukee & St. Paul electrification had not developed far enough to furnish data of value in connection with the St. Gothard line. Further, there has been no opportunity in Europe to experiment with sample direct-current locomotives, which would be particularly necessary as the manufacturers have not had the occasion to construct locomotives which could serve as models. At the same time, generators suitable for heavy direct-current traction, with large capacity at high voltage, have never been built in Europe. Hence, it was not considered possible to use the direct-current system for the St. Gothard line because it is not sufficiently perfected in the form necessary, and because the line between Erstfeld and Bellinzona could not be of an experimental nature nor could it be partially equipped.

While stating the above convictions in regard to the single-phase system, the report of the board of managers points out that the experience with high-tension direct-current traction in America and in Europe justifies the hope that in the near future it will have a value nearer that of the single-phase system. If the latter



PROFILE OF LINE OF WHICH PART IS NOW IN PROCESS OF ELECTRIFICATION BY SWISS FEDERAL RAILWAYS

had not been available, experiments with the direct-current system for the St. Gothard line would have been recommended. The possibility of using the mercury vapor converter increases the chances of success of the direct-current system, because this apparatus can be properly considered as a means of rendering this system more useful in combination with the alternating-current, which tends more and more to be produced in three-phase form at 50 cycles. This result would be important in the present case because it is probable that in the near future mercury vapor converters may be constructed for voltages and of capacities to permit substituting them for motor-generators in substations for heavy direct-current traction. Two of these converters, of small capacity and for 600 volts, had been used on a railway in Switzerland with good results. It is impossible, however, at this time to predict when such apparatus can be produced in a form suitable for such a project as the St. Gothard line. In spite of the progress already made, the mercury vapor converter has not been sufficiently perfected and popularized to furnish a reason for not selecting single-phase current for this line, which in its natural form can be employed directly without transformation other than that of voltage.

UNITY IN FORM OF ENERGY AND OF FREQUENCY

The concluding part of the report of the board of managers is devoted to a consideration of the above topic, although after taking into account all the advantages of three-phase, 50-cycle current, the decision was reached to generate single-phase current in the Amsteg and Ritom power stations. The influence that the choice of system by the federal railways would have on the relation of the power plants of the country to the railways was not overlooked, as it was realized that the prevailing tendency toward a standard form of current for transmission would be furthered by its adoption for the primary power of the railway. The railways could, of course, use standard primary power with the single-phase system, and even with the direct-current system, by the use of substations. However, the desire to avoid the transformation of the power from three-phase to single-phase form finally led to the conclusion already mentioned.

It was decided also to plan the two power stations so that when fully equipped they can supply power for the entire line from Lucerne to Chiasso. It is expected that means will be found to utilize the surplus power of these plants in spite of its form and frequency, even if it is necessary at first to transform the greater part of the power. Later the entire single-phase capacity at low frequency will be needed for traction purposes.

Vancouver Railways Furnish Many Recruits

Men from all departments of the British Columbia Electric Railway, Ltd., and the Western Canada Power Company, Vancouver, have enlisted for overseas duty so that business is being conducted with a minimum force of employees. Since August, 1914, the British Columbia Electric Railway has had 368 of its employees enlist and the Western Canada Power Company eighty.

A roster of the men who have enlisted from the latter company is posted in a prominent place at the entrance to the company's offices. On returning from the front the men are reinstated as far as possible and their applications for re-employment receive preference.

For the Movies

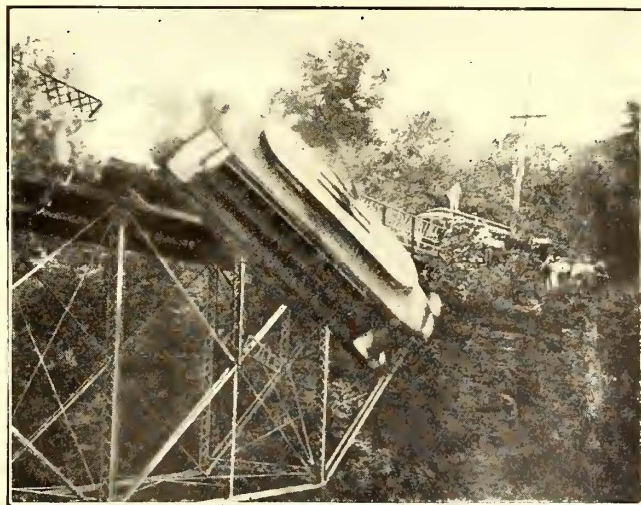
A Realistic Bit of Work in Photographing Street Car Wreck

THE illustration shown herewith, from a picture which hangs in the office of Roger B. Williams, Jr., president Ithaca (N. Y.) Traction Corporation, was taken by Wharton, Inc., a moving picture firm located in Ithaca.

The title of the scenario is "The Prince of India," the final scene of which runs about as follows:

"The villain, who had stolen the Prince's jewel, in order to make his escape, steals a street car at the end of a branch line while the motorman and conductor have left it to obtain a drink of water. The car is started by the villain and is, of course, chased by the motorman and conductor, but without success. The hero, the Prince of India, is riding in an automobile and sees the car being driven by the villain and gives chase, jumping on the rear platform while the car is running at full speed. A fight ensues, in which the villain is knocked out and falls unconscious over the front dashboard and controller of the car just as it is running away down a grade. As the car reaches the bridge at a supposedly terrific speed the hero jumps off on one side safely onto the bridge and the car is derailed, breaking through the railing and falling to the bottom of the gorge."

As a practical matter the moving picture people bought one of the discarded cars of the Ithaca Traction Corporation. The motor had not yet been removed, so that this particular car was used in taking the pictures leading up to the final plunge. There is a slight grade to the north of Fall Creek bridge, and after all the necessary pictures leading up to the final scene were taken the car was stripped of motors and ail valuables of every kind. A dummy was then placed on the front platform, in the position left by the villain when he was knocked out by the hero, and the car was permitted to obtain the necessary headway down this grade and, by means of a derailing switch, was derailed at the proper point on the bridge. The iron rail at the side of the bridge had been replaced by a false wooden one built and painted to represent iron. Examination of the illustration shows a piece of this railing falling in advance of the car. The scene was indeed very realistic and, as the distance from the bridge floor to the bottom of the gorge is about 300 ft., the car took as pretty a plunge as could be desired, landing head-on on the ravine floor.



CAR OF ITHACA (N. Y.) TRACTION CORPORATION PLUNGING INTO RAVINE IN "MOVIE" SCENE

Shall New York Street Railways be Run for the People of New York?

To the People of New York City:

The threat to tie up the street railroads of this City is your problem.

A definite expression of public opinion will be overwhelming.

We believe we are profoundly right, and we want the public of this City to know why.

* * * *

See what is threatened:

An organization from another city, in order to bolster up its side of a dispute in a neighboring community, seeks to stop the very life-blood of the City of New York.

There are no differences between our men and ourselves. It is not even claimed that there are.

But this alien organization proposes to call a strike anyway!

* * * *

We are not fighting labor unions or the principles of organization.

Our problem is a simple one—but very practical.

It is this: We are responsible to the people of New York for providing safe, prompt and continuous transportation service.

For that responsibility we are held vigorously to account by public opinion re-inforced by a Public Service Commission with drastic powers.

The very life of the City depends upon the continuity of our operations. Disrupt it, and New York is prostrate.

* * * *

Our men are being threatened and intimidated by the Amalgamated Association of Street and Electric Railway Employees, an organization with interests in various parts of the United States.

Its main offices are in another city.

Its interests are not primarily the interests of the people of New York, of the transportation companies within its borders, or of the men they employ.

* * * *

To accept the regime of this organization would immediately make the operation of the street railroads of New York a prey to the orders, the prejudices and the disputes of the officers of an alien organization with alien interests, working for alien purposes, and with no responsibility whatever to this community.

Our men want to stay by their jobs. A careful canvass makes that clear.

There is no question, however, of the purpose of this organization, without consultation with, or authority from, our own employees, to call a strike on the lines of the New York Railways, with a hope that through threats and intimidation our men may be induced to stay away from their work.

We are ready, and have always been ready, to

meet with our own men to discuss our mutual interests.

* * * *

The management of these lines has worked harmoniously with its men for many years.

We have recognized the impossibility of providing the service the people demand unless men and officers co-operated heartily.

* * * *

Our men themselves know that we want to share with them the increased prosperity of the Company.

We have increased wages twice this year.

During the past several years we have made other increases, as well as constantly adjusted working conditions so as to make them more favorable.

But this alien organization, to serve its own ends, now proposes to throttle the daily life of this Great City in spite of all that.

* * * *

It would be impossible for us to recognize or to deal with this organization without stultifying ourselves in the performance of our supreme duty to the people of this City.

We wish to make it clear, therefore, that we cannot and will not have any dealings whatsoever with this alien organization, although our willingness to meet with our own men stands—and will stand.

* * * *

The public interest in this situation far transcends that of any corporation or its employees.

We are gravely conscious of our duty to leave no step untaken that will avoid an interruption of transportation service.

We are relying upon the loyalty of the uniformed employees of this Company to co-operate with us in maintaining the service we are obligated to give to the people of New York.

The men may, on their part, rely upon us to do everything in our power to see to it that their interests and safety are protected to the full extent of the law.

* * * *

The City authorities of New York have assured us of their determination to preserve order and give ample police protection to our passengers and employees.

With such protection, there will be no doubt of our ability to maintain our service—and maintain it with our loyal, uniformed employees.

* * * *

If every man in New York makes up his mind that insofar as his influence is concerned he will not tolerate an interruption of traffic on the street railways of this City, there won't be any question as to what will happen.

NEW YORK RAILWAYS COMPANY,

THEODORE P. SHONTS, *President.*

Advertisement Appearing During Strike Crisis in New York This Week

General Tie-Up Threatened in New York

Strike in Westchester County Spreads to Third Avenue System, and Effort of Amalgamated Association to Unionize Other Railway Employees Creates Fear of Strikes on All Metropolitan Lines

SPREADING with marked rapidity from Westchester County, where, as described in last week's issue, the employees of the Yonkers Railroad and the Westchester Electric Railroad went out on strike on July 22, the strike situation in New York City has now become so serious as to threaten the maintenance of transportation service in the whole metropolitan district. The remaining employees of the Third Avenue Railway system, which besides the lines in Westchester County controls important lines in the Bronx and Manhattan, have joined the strikers, and the persistent efforts of outside parties connected with the Amalgamated Association of Street and Electric Railway Employees of America to unionize other lines, make the outlook doubtful. Efforts made by Mayor Mitchel and the Public Service Commission for the First District of New York to bring about a peaceful adjustment of the situation have served only to show clearly that alien interests are seeking to unionize the traction lines in New York at any cost, while the companies are firm in their refusal to recognize such outside interests. The alleged successes of the Amalgamated Association in organizing the employees have been denied by the various companies, and at this writing it looks as if the deadlock would force strikes on many if not all of them to show how far the intrigues of the union organizers have gone and to settle the question of whether the entrance of the Amalgamated Association into New York is to be tolerated.

SPREAD OF STRIKE TO THIRD AVENUE SYSTEM

The strike which began on the lines of the Third Avenue Railway system in Westchester County on July 22, and on the Union Railway on July 27, was extended on Sunday, July 30, to all the remaining lines of the system, *i.e.* in Manhattan. The company was compelled to stop running cars on all of its surface lines in Manhattan late Sunday afternoon, because of the strike of motormen and conductors. A sympathetic strike by the uniformed employees of the allied Brooklyn & North River Railroad was declared Sunday evening. With the exception of such cars as were operated in the Bronx by strike-breaking crews on the lines of the Union Railway, the strike temporarily tied up the entire Third Avenue system from the Battery to the boundary of Westchester County. The next morning the company was quick to resume as much of its service as possible, and at present it is operating in the day time about 50 per cent of its normal service in the Bronx, and about 30 per cent of its normal service on the lines in Manhattan. Night service, however, is mostly if not totally suspended on account of the fear of violence by strikers. The cars on the Yonkers Railroad and the Westchester Electric Railroad are still totally out of operation, owing to the experience ordinances in force in Yonkers, Mount Vernon and New Rochelle.

Unionism the Issue

PRESIDENT SHONTS

"We wish to make it clear that we cannot and will not have any dealings whatsoever with this alien organization (the union), although our willingness to meet with our own men stands—and will stand."

UNION PRESIDENT MAHON

"We will arbitrate gladly every question but our constitutional right to organize."

MAYOR MITCHEL

"It is inconceivable that there should be differences not susceptible of mutual adjustment."

Owing to the vigilance of the New York police force, not much disorder has existed in the districts affected by the strike. Most of the New York police are on strike duty, either detailed on the cars, along the routes or on reserve duty. Police Commissioner Woods as an extra precaution has organized an automobile patrol, using all the department automobiles and borrowing cars from many other city departments. This patrol, like the patrol of the motorcycle, bicycle and horse-policemen in the Bronx, is guarding the lines in Manhattan. Policemen on foot are stationed within sight of each other and in convenient proximity to telephones.

With the employees of the Third Avenue Railway on strike, officials of the Amalgamated Association

began to turn their attention to other lines. They were quoted as intending to organize every car line (surface, subway or elevated) in New York, Brooklyn, Queens and Staten Island, as well as the Hudson & Manhattan Railroad in New Jersey. Whether or not strikes would be called would depend upon the manner in which the men were treated by each company after they were organized. The opportunity given by the strike in Westchester County was one which the union officials did not intend to miss if possible.

HIGHER WAGES FOR NEW YORK RAILWAYS

Theodore P. Shonts, president New York Railways, at the annual gathering of the employees of the company at the Manhattan Casino on July 27 had announced an increase in the wages of the motormen and conductors to the following scale: First year, 26 cents; second, third and fourth years, 29 cents; fifth year and thereafter, 30 cents. The former rate of pay per hour of the conductors on the electric lines was as follows: First year, 25 cents; second year, 26 cents; third and fourth years, 27 cents; fifth year and thereafter, 28 cents an hour. The former pay for motormen of electric lines was 26 cents the first year, 27 cents the second year, 28 cents the third and fourth years and 29.5 cents the fifth year and thereafter. Conductors on storage battery lines received 23.5 cents the first year and 24 cents thereafter. Motormen on storage battery lines were paid 25 cents the first year and 26 cents thereafter.

In spite of this increase in wages, however, the union organizers tried to enroll men among the employees of the New York Railways, which with the Third Avenue Railway furnishes practically all the surface transportation in Manhattan and the Bronx. On Sunday night, July 30, Frank Hedley, vice-president and general manager of the New York Railways, issued a statement notifying the employees that labor agitators from various outside cities had announced in secret meetings that they had come to New York to tie-up all street railway traffic regardless of hardships to the

Our Efforts to Fulfil Our Duty To the People of New York

To the People of New York City:

Our supreme duty is to prevent an interruption in the street railway service of New York.

A communication alleged to represent the demands of our men has been handed to the Mayor. This communication was signed by non-resident officers of an alien organization.

We have had no disputes with our men, and no communication from them. We shall, of course, however, confer with the Mayor, and—at any time—with our own men.

* * *

The canvass we have made convinces us that our men are loyal and wish to cooperate with us in maintaining service for the people of New York.

I addressed two large mass meetings of our men at the Ninety-ninth Street and Fiftieth Street car barns last night. At least 2500 men were present. I told the men very frankly our position, and with great enthusiasm these men promised their support.

* * *

We have had a very happy family in the years in which I have been associated with the management of these companies, and no questions have hitherto arisen which could not be satisfactorily settled without necessity for outside interference.

In order that there may be no mistake on our part, however, as to the present attitude of our men, we have asked them to select by secret ballot a group of their fellow-employees empowered to discuss matters of common interest and to consider effective methods of maintaining uninterrupted the transportation service expected by the people of New York.

* * *

We are in no attitude of resistance toward our own men.

Our policy is and has been to work with them and to stand by them.

The sole reason why we feel it unwise that they ally themselves with an alien organization is that we—and they—are responsible to New York, and to New York alone, for maintaining without interruption from any cause the transportation service in this city.

The present tie-up on the Third Avenue Railroad is wholly due to the exigencies of a dispute in a neighboring community.

Alliance by New York street railroad employees with a foreign organization would mean that the transportation service of this city might at any time be interrupted without reference to conditions in New York, and solely to promote in some other city the interests of an organization in no sense responsible—as we are and as our employees are—to the people of this community.

* * *

We recognize a peculiar obligation to our men, and we have felt that they should receive more than ordinary consideration.

As the company has prospered, therefore we have many times in recent years increased the wages of the men.

* * *

We now propose to go a step farther in an effort to get closer to our men and to protect the public against interrupted service.

We believe there are no subjects which may arise at any time which cannot be disposed of at a friendly conference between accredited and representative employees and ourselves.

In addition to considering with a committee of our employees any questions now at issue, we shall invite these representatives to join with us in perfecting a permanent plan for securing more effective understanding and co-operation between management and men.

* * *

We therefore appeal to the people of New York to co-operate with us and our loyal employees in working out a satisfactory and permanent solution of the relationship between management and men which shall be fair to all concerned, and which shall, above all else, protect the supreme right of the people of New York to enjoy—without alien interference—an uninterrupted transportation service.

NEW YORK RAILWAYS COMPANY
THEODORE P. SHONTS, *President.*

Advertisement in Daily Papers of Aug. 2

families of the men and to the public in general. One union man alleged that with twenty-five members he could create enough disturbance to intimidate the rest of the New York Railways employees. Mr. Hedley, therefore, took this means of notifying his employees to be on their guard against the promises and threats of meddlers, and telling them that the management had arranged for adequate protection.

NO DISSATISFACTION ON B. R. T.

On Monday morning the Brooklyn Rapid Transit Company, the third large surface system in New York, issued a statement to the effect that so far as it knew there was no dissatisfaction among its men. It said:

"We think we have as loyal a body of men as any large enterprise in the country. We think they have been given to understand that as the company prospers, their conditions will improve and their remuneration will be increased. Our transportation employees have

had their wages increased three times within the last four years. Under these conditions, a strike with all its terrible consequences would seem to be an impossibility. We are confident that it would not originate by general act of our own men. We have no knowledge that outsiders would attempt to stir up dissatisfaction among our workers. If they should, we will stand by our men and protect them in the discharge of their duties."

EFFORTS DIRECTED AGAINST
NEW YORK RAILWAYS

On Monday night officials of the New York Railways announced that the Amalgamated Association was still trying to add its "green-car" system to the "red-car" system of the Third Avenue Railway so as practically to deprive Manhattan of all its surface transportation. In a statement issued by Mr. Hedley, the company accused the striking car men of other lines of having made efforts to intimidate employees of the New York Railways. All day Monday small groups of men tried to persuade the company's employees to leave their cars, and mass meetings were continually held, made up principally of strikers from Westchester County. At these meetings volunteers were called for to go out and pull New York Railways men off their cars. As the result hundreds of policemen were detailed to watch the carhouses of the company, and detectives were ordered to accompany all the green cars. More-

over, no passengers were allowed to ride with the motormen on the front seats of the cars.

The remainder of the statement issued by Mr. Hedley shows the general attitude of the company toward the Amalgamated Association and toward its employees, as follows:

"The propaganda of the foreign labor union which is now seeking to interfere with the comfort and convenience of New York, involves domination of the city transportation system by a labor union with interests in various parts of the United States, with main offices in another State and with no responsibility whatever to this community. There is no question whatever of the purpose of this union, without consultation with or authority from our own employees, to call a strike on the lines of the New York Railways, with a hope that through threats and intimidations our men may be induced to stay away from their work.

"Our policy is to do for our men everything that the

financial condition of the company will permit. Our men themselves know that we are disposed to share with them the increased prosperity of the company. We have increased wages twice this year. During the last several years we have made other increases, as well as constantly adjusted working conditions so as to make them more favorable. We have conducted an exhaustive canvass of our men, and with a single exception every man seen has assured us of his purpose and desire to continue at work. We know that our men are loyal and that they want to stand by us. We propose to stand by them. We are confident that the city authorities will afford passengers on our cars and the employees who man them adequate protection. Relying on this confidence, we propose to continue to give service to the people of New York."

MAYOR MITCHEL'S INTERVENTION FAILED

The repeated reports that the strike of the motormen and conductors on the Third Avenue Railway would be extended to the other traction lines in New York, caused Mayor Mitchel to call a conference for Tuesday afternoon in his office between representatives of the Third Avenue Railway and the Amalgamated Association.

Representatives of the two sides met with the Mayor as requested, but in a very short time matters reached a deadlock over the question of unionizing the men. The meeting was attended by Edward A. Maher, Sr., vice-president and general manager Third Avenue Railway; Edward A. Maher, Jr., assistant general manager of this company; W. D. Mahon, president of the Amalgamated Association, and William B. Fitzgerald, labor organizer.

In his preliminary remarks, Mayor Mitchel stated that the dispute between the Third Avenue Railway and its employees was a matter of concern to the city on account of the question of maintaining service that was involved, and he expressed the conviction that no differences existed which would not be susceptible of adjustment. Asked for an expression in regard to the demands of the men, Mr. Mahon stated that the men wanted (1) the right to organize; (2) a recognition of the union, in that committees from the men voicing grievances should be received by the company, and (3) an increase in pay. From the present rate of 26 cents an hour for the first year, 29 cents for the second, third fourth and fifth years, and 30 cents thereafter, the men desired an increase to 30 cents an hour for the first year and 33 cents an hour for each succeeding year.

Mr. Maher, Jr., stated that the company had received no demands from its employees themselves, that pay had been raised twice in the last six months, and that it felt it could do no more in the line of higher wages. As to the unionization of its employees, Mr. Maher stated that the company was now opposed to it, and would always be so opposed. In Westchester County, where unions existed when the roads were taken over, the company had not opposed the continuance of such organization. On the other lines, however, while Mr. Maher was ready at any time to meet the men as individuals, he would not meet them on a union basis, and in the present instance there was nothing at all to be arbitrated. Mr. Mahon insisted that the employees could not arbitrate the question of union organization and recognition, inasmuch as it was the constitutional right of the men to organize if they so desired.

With the conference at such an *impasse*, Mayor Mitchel dismissed the representatives with a few words of warning to each side in regard to the character of men to be utilized in the strike districts, and stated that in the event of a fight to the finish, the city would do its utmost to perform its duty of maintaining order.

After the conference the Mayor held private conversations with each side, but the only result announced was that the union representatives promised to give him a twenty-four-hour notice of any further demands that might result in an extension of the strike situation to other city lines.

MORE INTIMIDATING EFFORTS AGAINST NEW YORK RAILWAYS' EMPLOYEES

Tuesday night, after the failure of the Mayor's peace move, Mr. Hedley and Mr. Shonts issued another statement showing that the efforts of the Amalgamated Association to unionize the employees of this company were still being continued. According to these officials, a careful canvass of the employees convinced them that the men desired to be left free to continue to perform their daily duties with the company. Yet out of town men, it was learned from several sources, were threatening employees of the company if they should continue to operate its cars. In amplification of its previous promise to take care of its men, the company therefore stated:

"The company will do everything in its power to see that these men from out of town shall not interfere with the comfort and convenience of our passengers and employees. We have to-day arranged to establish dormitories and enlarge our restaurant service, so that employees who desire to avail themselves of this privilege, should they consider it an additional safeguard, can sleep in the dormitories and have their meals served to them, free of expense, on this company's property."

In following out the promises made above the company has installed 1800 cots in four of its carhouses, and has arranged for the necessary food supplies to be furnished by its co-operative stores.

GENERAL APPEAL MADE TO THE PUBLIC

On Wednesday morning, Mr. Shonts made a general appeal to the public through the local newspapers, asking the public for a definite expression of opinion in support of the company. The advertisement containing its appeal is reproduced on page 228. The chief point made was that the company was not fighting labor unions or the principles of organization, but that inasmuch as it was responsible to the people of New York for providing safe, prompt and continuous transportation service, it could not submit to the orders, prejudices and disputes of the officers of an alien organization having no local responsibility. This advertisement was repeated in the evening papers, and on Thursday morning a follow-up advertisement appeared, which is reproduced on page 230.

In amplifying the point made in the preceding advertisement that the company was not fighting the principles of organization, Mr. Shonts in the later advertisement said that in order that there might be no mistake as to the present attitude of the New York Railways employees, the company had asked them to select by secret ballot a group of fellow employees empowered to discuss matters of common interest, and to consider effective methods of maintaining uninterrupted the transportation service expected by the people of the city. The company even proposed to go a step further in an effort to get closer to its men, believing that there were no subjects which may arise at any time which could not be disposed of at a friendly conference between accredited and representative employees and officers of the company. Hence, in addition to considering with a committee of its employees any question now at issue, the company stated that it would invite these representatives to join with it in perfecting a permanent plan for securing more effective understand-

ing and co-operation between the management and the men.

PUBLIC SERVICE COMMISSION BEGINS INVESTIGATION

In the meantime, before the second advertisement appeared, the Public Service Commission had decided to investigate the general strike situation, and summoned before it for a hearing on Wednesday afternoon representatives of the Third Avenue Railway and the Amalgamated Association. The commission, Chairman Oscar S. Straus announced, had no power to make orders following such an inquiry, but it had the right and duty to express to the companies, to the employees and to the public its impartial conclusion with respect to the facts. The hearing would be an investigation as to the manner of operation and the adequacy and safety of service.

At its first session, held Wednesday afternoon, the commission did little more than lay a foundation for its investigation. The session was attended by Mr. Maher, Jr.; Alfred J. Cook, counsel; Mr. Mahon, Mr. Fitzgerald and counsel. Mr. Maher told the commission how the whole trouble started with the motormen and conductors on the lines of the Yonkers Railroad and the Westchester Electric Railroad, after the company had offered the men an increase from 25 cents an hour for the first year and 28 cents thereafter, to 26 cents an hour for the first year, 29 cents for the second, third, fourth and fifth years, and 30 cents after five years. The men, however, desired an increase of 5 cents an hour over the present rate and insisted upon a two-scale rate. The company had refused to arbitrate the question, because it had gone as far as it could in granting an increase to the men, inasmuch as the Yonkers Railroad earned only about \$2,000 the last year and the Westchester Electric Railroad lost about \$56,000.

The Union side of the question was presented by Mr. Fitzgerald, who stated that the men on the Union Railway and the remainder of the Third Avenue Railway system in Manhattan struck out of sympathy with their fellow employees in Westchester County and because they knew the company was opposed to unionization. Mr. Fitzgerald admitted, however, that even if the question at issue in Westchester County had been submitted to arbitration and satisfactorily settled, the danger of a strike on the lines of the Third Avenue Railway in the Bronx and Manhattan would not have been avoided, for the Amalgamated Association would still have endeavored to unionize the employees on these lines. The association did not make an issue of unionization in Westchester County, inasmuch as old unions already existed and recognition of these had been sufficiently made in an old trade agreement informally accepted by the present management. At the end of the hearing, the commission decided to omit a session on Thursday morning in order to allow a second peace conference to be held before Mayor Mitchel, but stated that thereafter sessions would be held both morning and afternoon until the strike situation had been cleared up.

INCREASE GRANTED TO INTERBOROUGH EMPLOYEES

On Wednesday afternoon the directors of the Interborough Rapid Transit Company, which is controlled by the same interests as the New York Railways, adopted a resolution increasing the pay of eleven classes of employees on its subway and elevated lines. Most of the advances were from 15 to 20 cents a day, although some classes of employees received an increase of 10 cents and others an increase of 30 cents. The complete schedule of old rates and the new rates, which are effective from Aug. 1, follows:

		Per 10-Hour Day	
		Present Rate	New Rate
*Conductors:			
First year.....	\$2.45	First year.....	\$2.60
Second year.....	2.45	Second year.....	2.65
Third year.....	2.55	Third year.....	2.75
Fourth year.....	2.65	After third year.....	2.80
Fifth year.....	2.70		
*Guards:			
First year.....	2.10	First year.....	2.20
Second year.....	2.10	Second year.....	2.30
Third year.....	2.20	Third year.....	2.40
Fourth year.....	2.30	After third year.....	2.50
Fifth year.....	2.35		
*Motormen:			
First year.....	3.25	First year.....	3.35
Second year.....	3.50	Second year.....	3.60
Third year.....	3.50	Third year.....	3.70
Fourth year.....	3.60	Fourth year.....	3.80
Fifth year.....	3.70	Fifth year.....	3.90
After fifth year.....	3.80	Sixth year.....	4.00
After eighth year.....	4.40	After sixth year.....	4.20
*Special Officers:			
First year.....	2.40	First year.....	2.50
After first year.....	2.50	After first year.....	2.60
†Porters:			
First year.....	1.70	First year.....	1.80
‡Switchmen:			
First year.....	2.70	First year.....	3.00
Second year.....	2.80	After first year.....	3.10
Third year.....	2.90		
‡Starters:			
First year.....	2.50	First year.....	2.60
Second year.....	2.70	First year.....	2.60
‡Train Clerks:			
First year.....	2.50	First year.....	2.60
Second year.....	2.60	Second year.....	2.70
Third year.....	2.70	After second year.....	2.80
*Agents:			
First year.....	2.10	First year.....	2.20
Second year.....	2.20	Second year.....	2.30
Third year.....	2.30	Third year.....	2.40
Fourth year.....	2.40	Fourth year.....	2.50
After fifth year.....	2.50	After fourth year.....	2.60
*Gatemen:			
First year.....	1.90	First year.....	2.00
After first year.....	2.00	After first year.....	2.10
‡Towermen:			
First year.....	2.60	First year.....	2.70
After first year.....	2.70	After first year.....	2.80

*One day off per month with pay.

†Two days off per month with pay.

‡Two and three days off per month with pay.

§Per eight-hour day.

Mr. Fitzgerald, according to newspaper reports, stated that this new schedule was not satisfactory, mainly for the reason that it did not carry with it recognition of the union. The union organizers, he said, would continue to make efforts to enroll employees of the Interborough Rapid Transit Company as if no increase in pay had been granted.

DEMANDS MADE ON NEW YORK RAILWAYS AND NEW YORK & QUEENS COUNTY RAILWAY

In compliance with the terms made at the first peace conference, Mr. Mahon forwarded to Mayor Mitchel on Wednesday the demands which the employees of the New York Railways and the New York & Queens County Railway were said to have decided to present to their respective companies in regard to wages and the recognition of the union organization. The demands alleged to have been formulated by the motormen and conductors of the New York & Queens County Railway were identical with those for the New York Railways, with the exception that those for the former company included no schedules for storage-battery and horse-car lines. The demands on the New York Railways follow:

1. That the company will allow its employees to organize without any intimidation or interference of any kind.

2. That the officers of the company will agree to meet and treat with the duly accredited officers and committees of the organization upon all questions arising between them in the future.

3. That the company will establish the following rates of wages for the future: Motormen and conductors on the electric lines to receive 30 cents an hour for the

first year of service and 33 cents an hour thereafter; motormen and conductors on the storage-battery lines to receive 28 cents an hour for the first year and 30 cents an hour thereafter; conductors and drivers on horse-car lines to receive 25 cents an hour for the first year and 28 cents an hour thereafter.

It was understood in connection with these demands that the union would consent to the arbitration of all questions except the right to maintain an organization.

SECOND CONFERENCE IN MAYOR'S OFFICE ALSO MEETS DEADLOCK

Immediately upon the receipt of these demands from Mr. Mahon, Mayor Mitchel arranged for a conference on Thursday morning between the officials of the New York Railways and the New York & Queens County Railway and the representatives of the Amalgamated Association. This conference, however, proved no more fruitful than the one held previously in the Third Avenue case, inasmuch as the two parties were absolutely deadlocked on the question of unionizing the employees. The union men asserted that their demands represented the wishes of a large majority of the employees of each company, and the railway officials emphatically stated that such was not the case. Mr. Shonts in particular said that on Wednesday evening he addressed two meetings of New York Railways employees, including 2700 men or about two-thirds of the operating force, and asked them whether the demands made upon the company were with their knowledge and consent. There was a unanimous "No" in reply. Furthermore, he asked them whether they wanted outsiders to come and intervene between them and the company, and again there was an emphatic negative.

President Shonts then read a formal statement to the Mayor, in part as follows:

"You have handed to us a communication alleged to represent demands of our employees. We do not know whether it represents our employees or not. We do know that at two large and enthusiastic mass meetings of our employees which we addressed last night there was every indication of loyalty, and of a disposition to settle our family affairs within our family ranks. Our men know that we have been and are sincere in our purpose to share with them any increased prosperity of the company. We have increased wages of our men twice this year, and have made other adjustments and increases in recent years.

"It may be said that we can very quickly ascertain whether these demands represent the views of our men if a strike should be called. Our answer is that the interests of the people of New York demand above all else that there should be no strike and no possible interruption in the continuity of transportation service. We know that there has been no strike-vote taken among our employees. We know that the rank and file of our employees have given no one authority to call a strike.

"We nevertheless recognize the unlimited possibilities arising out of threats and intimidation, and that if a small number of men should be induced to strike, many others in no sense desiring to leave their jobs might, out of fear or on account of threats, consider it better policy to remain away from work until the trouble is settled."

After describing the plan of the company to meet with a representative committee of employees, as noted previously in connection with the advertisement to the public, Mr. Shonts concluded with the following words:

"In the event that any effort is made to rush the situation and precipitate trouble, all we ask is that the city authorities protect passengers and our loyal

uniformed employees from molestation. Believing that the city will not hesitate to preserve order, we feel confident enough of the sentiment of our men to assure you that transportation service will be maintained."

In regard to the charge that four men had been discharged for joining the union, Mr. Shonts said that this was untrue. In reply to a query by Mayor Mitchel, he stated that until the investigation of the company into the attitude of its men toward unionization was completed, it would be unwise and impolitic to discuss the demands presented by the union officials.

Concerning the demands, William O. Wood, president and general manager New York & Queens County Railway, stated that his company objected to its men organizing under the Amalgamated Association, that it would not recognize the union, and that it was not prepared now to go any farther in the matter of wages. In the last eight years it had increased wages from 25 per cent to 45 per cent.

Mr. Mahon assured Mayor Mitchel that the recognition of the union did not mean a closed shop, for this was seldom demanded and had not been mentioned in the present situation. Mr. Mahon then presented a letter in which he stated that the committees organized on the New York Railways and the New York & Queens County Railway would wait until 3 p. m. Friday for the replies of these companies to their demands and that the employees would vote thereon Friday night. This, Mr. Mahon said, was the final notification. After the conference it was reported that the power-house and shop employees of the companies would also be organized.

COMMISSION SEEKS FUTURE LEGISLATIVE REMEDY

The hearing before the Public Service Commission in connection with the strike was continued on Thursday afternoon. Mr. Straus, chairman of the commission, made a plea to both sides on behalf of the public. He said that the commission proposed, without fear or favor, to place the blame where it belonged. The case might develop the need for authority being vested with the commission by the legislature to act in a case of the present kind. He could not foretell what action would be taken. He pleaded that pending the commission investigation nothing be done to increase the present difficulty. Either side that took a decisive step in the meantime would put itself clearly in the wrong.

Counsel for the company pledged himself to preserve the status quo. He challenged the correctness of the poor working conditions charged by the union to exist on the Third Avenue system. If the commission investigation established the correctness of the contention of the union representatives the company would have to bow before public opinion, even though the commission was without authority to issue compelling orders. Mr. Maher offered in evidence the resolution of the board of directors of the company authorizing President Whitridge to deal with the situation. With respect to the lines in Westchester County, Mr. Whitridge had instructed Mr. Maher, in the event of a strike, to put the cars into carhouses until the experience ordinances were appealed or changed. Mr. Maher had no instructions on any other points. He expressed his willingness to submit to the directors of the company the question of policy with regard to the union. He also said that he would submit to the directors any recommendations of the commission.

MANHATTAN EMPLOYEES PLEDGE THEIR LOYALTY

On Thursday evening the situation was somewhat lightened by pledges of loyalty received from a large number of employees of the New York & Queens County

Railway and the Interborough Rapid Transit Company. At a meeting of employees of the former company, addressed by Mr. Wood, 400 motormen and conductors signed a paper declaring loyalty to their employers, and at a similar meeting for Interborough employees 100 of these expressed their support of the management. Mr. Shonts read the pledge, which was in part as follows:

"We, the undersigned, conductors of the Broadway and Lenox Avenue division of the subway, solemnly declare it is not our desire to join any street car organization, and our company can rely on our loyalty. We will co-operate with our company in maintaining our standard of efficient service given to the public, and will do everything possible to protect the interest and safety of the company's property and to maintain our loyalty and courtesy to the patrons of the subway.

"The public can depend on us and we assure also the Interborough Rapid Transit Company that the subway employees will never be the prey of or obey any orders given us from any prejudiced organization, but we will continue to obey the orders given us by the officers of our own company. Intimidation and threats will never induce us to abandon our work and our positions, no matter what the threats may be.

"The above statement is the subway employees' stand through the strike and unionizing crisis, and the public may be assured they can travel in safety on the lines of the subway division, and they will have a continuous service from an army of loyal and efficient trainmen and conductors."

This was signed by 100 men engaged in active operation of the train service. The signers added this to the pledge:

"The above 100 conductors and guards represent the voices of all the trainmen of the entire subway system, and request the management of the company, if it deems it proper, to give this letter to the public."

In the Friday morning papers Mr. Shonts issued a general advertisement to the effect that arrangements had been made to have uniformed policemen on all cars as soon as a strike was called, and he quoted sections of the penal law about interference with car operation.

REFUSAL OF UNION DEMANDS

At noon on Friday President Shonts of the New York Railways replied to the men with respect to the demands made on the company by the union, as noted on page 232. He expressed his willingness to treat on Saturday with an accredited committee of employees selected by the men themselves but flatly refused to deal with the men through the union. At the same time President Wood of the New York & Queens County Railway sent his reply to "the chairman of the committee of such of the men as had been proselyted by the representatives of the Amalgamated Association in their effort to tie up transportation in New York City." He also refused to consider the demands made upon his company, because the demands had emanated from an outside organization and did not express the sentiments or desires of his employees any more than the seven men on the committee represented the employees. A copy of this letter was sent to the Mayor, calling attention to the fact that employees who were disaffected might quit Saturday and asking for police protection in the shape of uniformed policemen on the cars and along the lines.

POSITION TAKEN BY THE B. R. T.

While not fearing a strike on its lines, the Brooklyn Rapid Transit Company, as this issue goes to press Friday morning, has published a statement through its president, T. S. Williams, urging its employees to preserve their good relations with the company. Mr. Williams says in part:

"Within a week a handful of men from other cities have injected themselves into the transportation situation on some of the lines in Greater New York and threaten, if they cannot rule, to stop the operation of every car in the community. They include Brooklyn in their boastful plans. The remarkable thing about this demonstration is that it is aimed not only at some small companies where possible differences existed as to conditions of employment, but at companies whose men seemed generally satisfied with conditions and have presented no grievances. The declared purpose of the agitators relates only incidentally to wages or hours—demands as to these would apparently be waived if the companies would concede the right of the outsiders to speak for the companies' men. To accomplish their purpose they would deprive between five and six million people of transportation facilities, and inflict an irreparable loss and injury upon the business of New York.

"I have no reason to believe that any of my co-workers looks with favor upon this outside agitation and wishes it to extend to Brooklyn. On the contrary, there seems to be every evidence that the vast majority of them regard it with disfavor and will not be parties to destroying the relations which now exist, or to inconveniencing the public by severing their connection with the company on such an issue. The company will not compromise or sacrifice what it believes to be the interests of its men by dealing with these outsiders. It will protect its workers in the discharge of their duties. It will continue to encourage faithful service. It will to the extent of its ability, not only as a matter of wise corporate policy but as a matter of justice, continue to conform working conditions and compensation to the reasonable satisfaction of its men. It has not required the assistance or advice of outsiders to bring about three increases in wages during the last four years. It has not required such help to establish pensions, sick benefits, life insurance, medical attendance, good fellowship and the principle of reward for merit.

"I ask that any employee who knows of any general or particular grievance, or who has any suggestion to make for the betterment of conditions or of service, will write directly to me over his signature. I assure him that his statements and suggestions will receive very careful consideration from myself and from heads of departments, and that if reported grievances are found to exist and can be corrected the disposition is here to correct them."

EMPLOYEES REFUSE SEPARATE ARBITRATION IN WESTCHESTER COUNTY

With respect to the strike in Westchester County the mayors of Yonkers, Mount Vernon and New Rochelle on Monday addressed letters to the presidents of the Yonkers Railroad and the Westchester Electric Railroad asking that they consent to arbitration, the men to return to work pending the findings of the board of arbitration. This, it was suggested, should consist of three representatives of the companies, three representatives of the men and the mayors of the three cities. The companies replied that they would be pleased to attend such a meeting. The men in these cities, however, refused to consider arbitration unless the grievances of the men in Manhattan and the Bronx were considered also.

As is often the case the deadlock has resulted in talk of the municipalization of the lines in Yonkers. Mayor Lennon of that city is reported as considering a bill to authorize the city to purchase the Yonkers Railroad. A similar measure died in the Legislature after the strike of 1913. At that time Mr. Whitridge, in his inimitable fashion, asked why the city did not take over the lines there if the people were dissatisfied with the way he ran them.

1916 CONVENTION
ATLANTIC CITY
OCTOBER 9 TO 13

ASSOCIATION NEWS

1916 CONVENTION
ATLANTIC CITY
OCTOBER 9 TO 13

Engineering Standards Committee Approves Many Recommendations of Technical Committees — Mr. Van Hoven Says Claim Agent's Education Is Never Complete—Electrolysis and T. & T. Association Standards Committees Hold Meetings

Engineering Association Committee on Standards

As announced last week, the Engineering Association committee on standards met in New York on July 27 and 28 to act upon the recommendations of the several technical committees. A brief digest of the first day's session was given last week. The second day was devoted to the work of a special committee on the revision of the standard stranding table and to that of the committees on equipment, heavy traction, block signals and power generation.

The first-named committee recommended certain changes in the standard stranding table, made after conference with committees of other interested associations. The purpose of the revision is to provide a more varied classification and in some cases to cheapen the cost of production due to the use of a smaller number of wires in each cable.

The equipment committee desired approval of revisions in flange and tread contours in the standard wheel designs, which was given contingent upon the making of slight modifications to meet the approval of the committee on way matters. A revision of the recommended designs of steel wheels was also approved with the further recommendation that the committee next year give attention to the matter of rim thickness with respect to allowable wear. The revisions mentioned included the elimination of 35-in. and 37-in. wheels, the addition of wheels of smaller sizes, and the simplification of the matter of rim thickness. Revised designs of brake-heads were also approved. These covered the "plate" type of head, a new form developed since the present standards were prepared.

The following recommendations of the equipment committee were also approved: That new designs of car axles as submitted be adopted as standard designs in place of the present standards. That certain changes in the A.I.E.E. standardization rules be suggested. That a submitted design of journal bearing, wedge boxes and thrust plates be substituted for the present standards. That a submitted design of limit-of-wear gage be adopted as standard. That a submitted recommended design be adopted as such.

The joint committee on block signals presented two signal clearance diagrams for adoption as standard, and the recommendation was approved, as was also one to the effect that Section Ss6a, referring to the use of continuous track circuits for the control of automatic signals for high-speed interurban service, be omitted from the manual. A set of requisites for automatic block signal installations was also approved, subject to revision in wording by the committee.

In reviewing the work of the committee on power generation the boiler code of the A.S.M.E. was approved for recommendation as standard, and certain suggestions regarding the A.I.E.E. standardization rules were approved for transmission to the appropriate A.I.E.E. committee.

The meeting of the committee on standards closed with a general discussion of the more general use of

the association standards, particularly with relation to securing cost reduction.

Manila Section Discusses the Claim Agent

At the seventeenth regular meeting of the joint company section of the Manila Electric Railroad & Light Company held in Manila, P. I., on June 13, the discussion centered in a paper by C. H. Van Hoven, claim agent, on "How the Claim Agent Earns His Salary." For the membership committee J. M. Bury reported the names of eight new railway members, all from the accounting department. There were also many new members in the electric lighting division of the section, in which the accounting department was again well represented.

Mr. Van Hoven's paper contained an analysis of the opportunities afforded by work in the claim department for promoting friendly relations between the public and the corporation. His decisions reflect the fairness and integrity of his employers, for many claimants are so situated that they cannot enforce their rights even if aware of them.

The claim agent must be able to grasp situations quickly, and to act promptly for the protection of his employers. His education is never complete, and he must keep abreast of the times by keeping up with current literature upon subjects connected with his work. This includes the reading of the technical journals as well as the decisions of the courts in damage cases. From a constant observation of the various kinds of injuries he gains an intuitive knowledge as to their probable results.

After referring to the claim agent as above, Mr. Van Hoven explained the local situation in regard to accidents, especially as it relates to the safety-first movement. His principal points were reinforced by several speakers during the discussion, two of whom made detailed suggestions as to how the other departments can co-operate with the claim department. An interesting feature of the meeting was the interpretation of the discussion from English into Spanish and from Spanish into English by the official interpreter of the section.

Committee on Electrolysis

The joint committee on electrolysis of the American Electric Railway Association and the American Electric Railway Engineering Association held a meeting at the headquarters of the association on July 21. The entire day was devoted to a discussion of the proof sheets of the preliminary report of the American Electrolysis Committee. The latter is the new name of the national joint committee on electrolysis.

T. & T. Standards Committee

The committee on standards of the Transportation & Traffic Association met in New York on Aug. 3 and 4. In addition to the study of committee recommendations, the desirability of changing the name of the standards committee was considered.

Some Recent Advances in EQUIPMENT AND ITS MAINTENANCE

Notes by a Car Equipment Inspector
Shop Kinks—Ventilating Motors, Babbitting Bearings, Changing Wheel Flange Contour
Special Overhead Line Switch

Novel Car Unloading Machine
Joint Welding Practice

New Electrical Apparatus for the Power Department

Unloading New Cars in Five Minutes

Detroit United Railway Cuts Cost of Unloading Cars
by Use of Simple Hoist

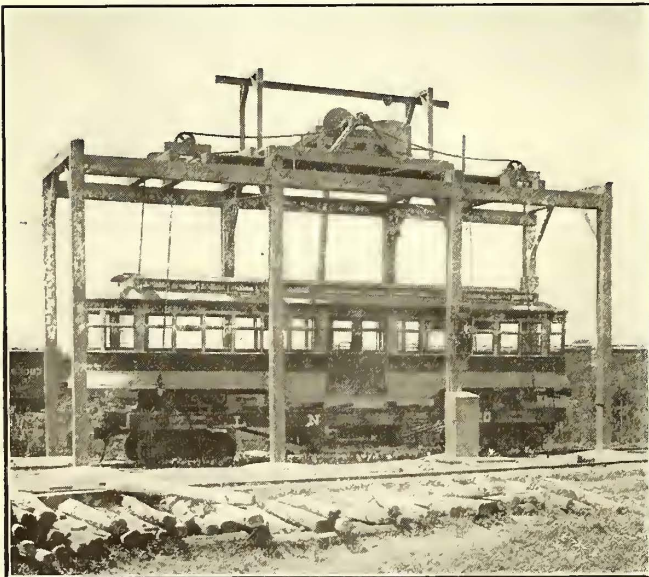
BY SYLVESTER POTTER
Master Mechanic Detroit United Railway

The hoist shown in the accompanying illustrations which is used in the Highland Park Shops of this company is intended for the purpose of unloading cars received from car builders as well as for loading cars for

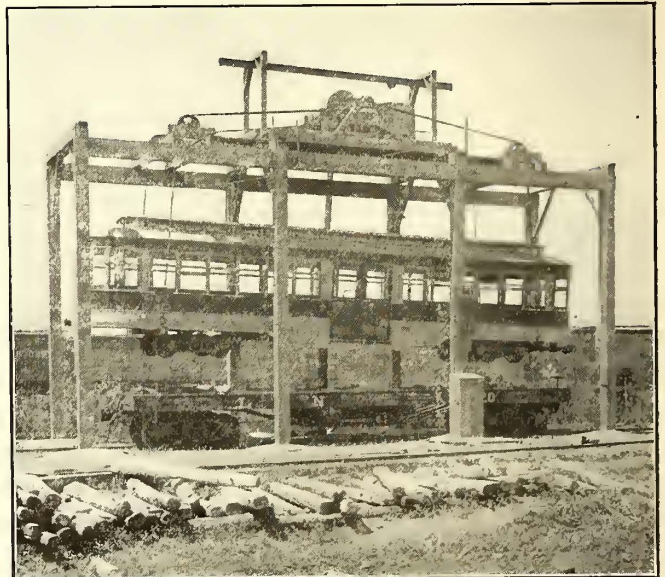
shipment. It may also be used, should occasion require, for loading or unloading heavy and bulky machinery that could not be handled with the regular shop equipment.

The unloading of street or interurban cars without the use of a hoist or crane is a process that requires quite a force of men and may consume considerable time.

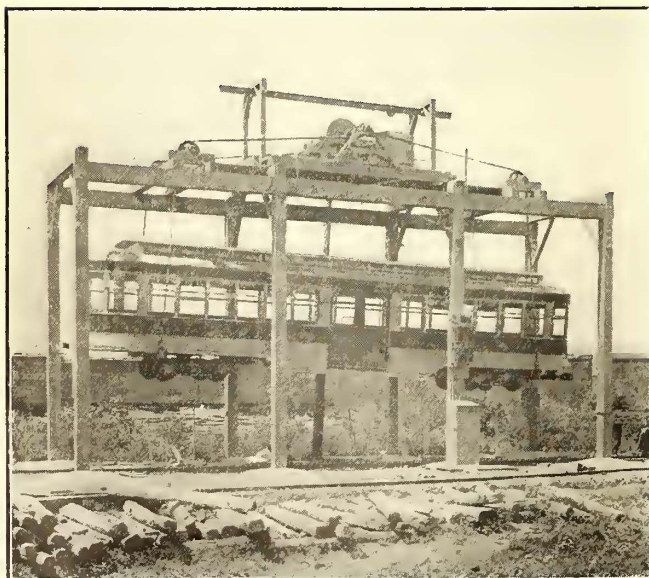
The lifting chains after passing over the chain sheaves are wound on the right and left hand drums, one of which may be seen in the illustrations at the top and center of the hoist. The shaft upon which both



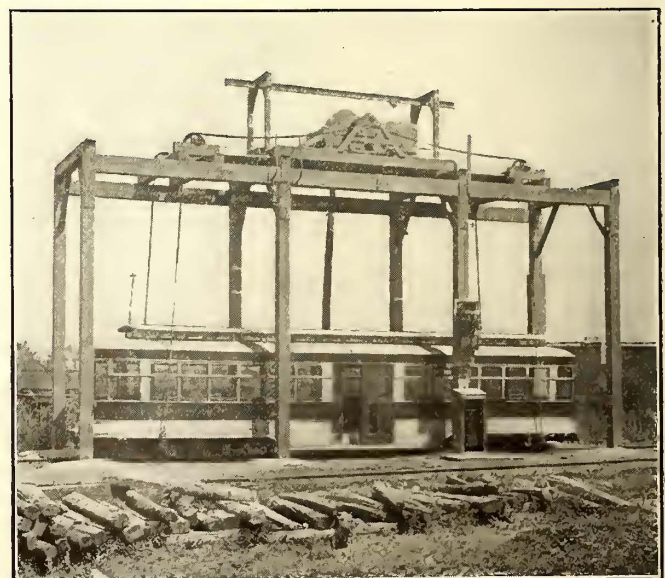
STREET-CAR RECEIVED ON FLAT-CAR READY TO BE UNLOADED



STREET-CAR IN PROCESS OF BEING LIFTED FROM FLAT-CAR



STREET-CAR LIFTED WITH FLAT-CAR REMOVED



STREET-CAR LOWERED ONTO THE RAILS

drums are mounted carries an ordinary railway gear. Power is supplied by an old Westinghouse 12A motor with a gear ratio of 14:68. This gives the hoist the proper lifting speed.

With this hoist the time of unloading a car is greatly reduced, ranging from one and one-half to four or five minutes. In addition it requires the services of only two men.

Severe Service Requires Special Overhead Switch

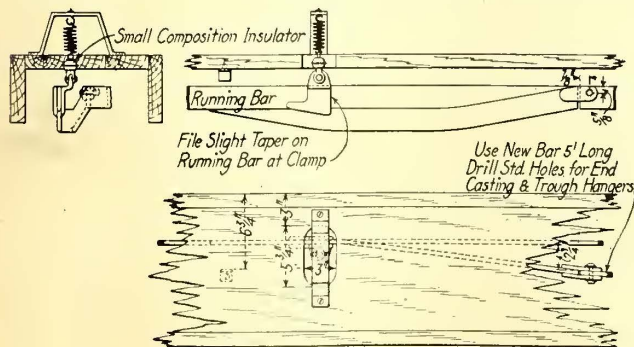
This Switch Forms Element in Insurance Against Interruption to Service

BY G. H. MCKELWAY
Line Engineer Brooklyn Rapid Transit System

On the East River bridges between New York and Brooklyn the traffic is so heavy that delays to the cars passing over the bridges must be minimized as much as possible. With 300 cars per hour in the rush hours even a slight delay of a few minutes is a serious proposition, and any hold-up of traffic for a longer time than that is a catastrophe felt more or less by thousands on both sides of the river. For that reason two wires have been installed on both of the roadways of the Brooklyn Bridge, so that in case of a break in one of the wires the poles of the cars can at once be shifted to the other wire and, as soon as the broken wire is tied up, the cars can pass over the bridge as quickly as if nothing had happened. While trolley wire is used on the bridge structure where the tracks are straight, yet at the ends of the bridge, where there are loops on the Manhattan side and curves on the Brooklyn side, the trolley wire is replaced by iron bar. This iron bar is practically unbreakable and therefore does not have to be installed in duplicate.

The problem presented by the circumstances outlined above was to design some kind of an overhead switch, to be located at the junction between the iron bar and double wire construction, which would operate satisfactorily so as to permit of throwing the service from one wire to the other when circumstances so required. The heavy service of approximately a million and a quarter cars in a year added greatly to the difficulty in finding a switch which would stand the severe wear to which it would be subjected.

After several devices had proved unsatisfactory, the switch shown in the accompanying drawing was designed. As will be seen from the drawing, it consists of a tapered iron bar, one end of which can be placed under the running bar and is then held against it by means of a spiral spring attached to the bracket above the trough. The tongue is guided into position by the jaws on the hanger, one of which fits on each side of the running bar. The other end of the bar is fastened



OVERHEAD SWITCH USED WITH IRON BAR TROLLEY CONSTRUCTION

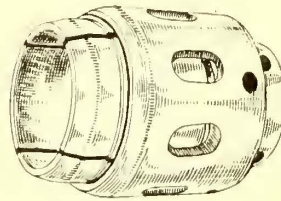
to the adjoining iron bar as shown, the bolt being loose enough to permit a slight swing of the bar laterally. When not in use the tongue is swung to one side and held up against the trough by the spring. A stop made of angle iron keeps the tongue from coming in contact with the running bar when in the "off" position. The switch is operated by means of a wooden pole with a hook on the end.

Babbitting Bearings at the Third Avenue Railway Shops

Simple Centering Chuck Is Utilized in Cutting Down Time in Finishing Bearings

BY A. R. JOHNSON
Assistant to Superintendent of Equipment Third Avenue Railway

The question of babbitting bearings has been given careful consideration and is a matter of great importance in the upkeep and reliability of railway equipment. The following methods are employed at the shops of the Third Avenue Railway, New York City.



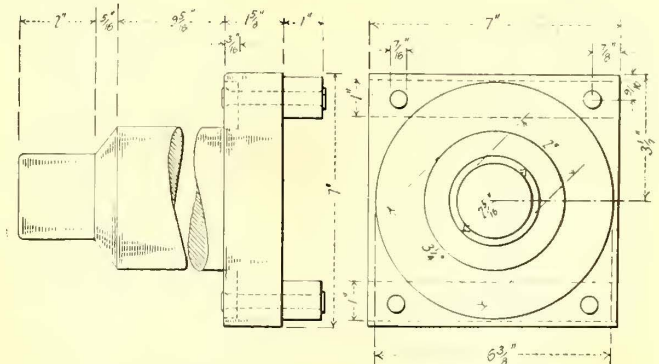
CENTERING CHUCK FOR MACHINING BEARINGS AFTER BABBITTING

All babbitt metal is made according to specifications, there being two grades, one for armature and the other for journal bearings. The better grade, which is used for the armature bearings, comprises 83 1/3 per cent tin, 8 1/3 per cent copper and 8 1/3 per cent antimony.

When re-babbitting bronze bearings the old babbitt is melted out entirely and the outside of the shell is given a coat of lampblack. After this the bearing is submerged in a bath of molten metal, using a little acid if necessary in order to properly tin the inside of the shell and prevent the outside of the bearing from becoming tinned. Iron bearings are thoroughly cleaned and heated before pouring in the babbit for the purpose of insuring equal contraction of the two metals to avoid loosening of the babbit when the bearing is finished and cool.

A mandrel such as is shown in the accompanying drawing is used, the one shown being suitable for GE-210 armature bearings. The diameter of the mandrel is slightly smaller than the diameter of the armature shaft, which permits the boring of the bearing to the proper size after babbitting, thus removing the hard surface or skin which adheres to the babbit metal when it comes into contact with the mandrel in process of pouring.

Numerous methods and devices have been tried out for accurately machining or boring the bearings after



FRONT AND END ELEVATIONS OF MANDREL USED FOR BABBITTING ARMATURE BEARINGS

babbiting, few of which have proven satisfactory. A chuck shown in the drawing has been designed by H. Krombach, foreman of the armature winding department at the Sixty-fifth Street shop. It is constantly in use at this shop. It enables a man skilled or unskilled to turn out a bearing perfectly true in about one-third of the time taken with the old-style lathe chuck. As the principle of this new-style chuck is practically the same as that of an ordinary drill chuck, all that is necessary is to place the bearing in the chuck and turn the tightening sleeve, which causes the bearing to be clamped in a true and centered position. Bushings must be provided for the different size bearings, as the movement of the jaws is only about $\frac{1}{8}$ in.

Summer Ventilation for Motors Obtained by Slight Alterations

Scrap Brake-Hanger Springs Are Utilized to Raise Motor Covers

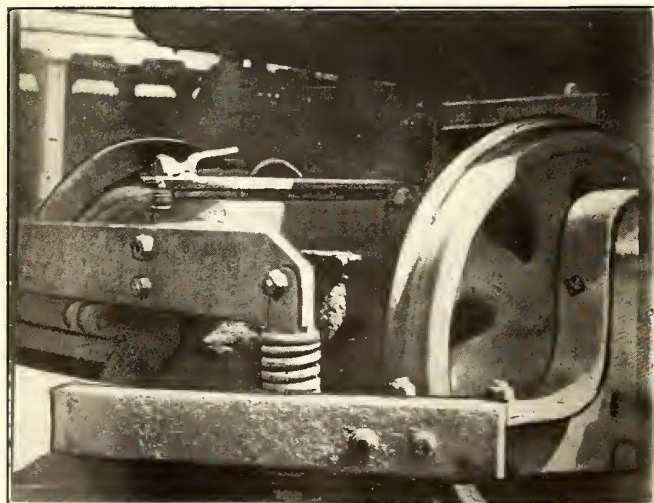
BY H. E. WURZBACH

Master Mechanic Ogden, Logan & Idaho Railway Company

The writer has been reading with interest the various articles published in the *ELECTRIC RAILWAY JOURNAL* in reference to the ventilation of old railway motors at a minimum cost. As Utah does not suffer a great deal from extreme heat, the ventilation of railway motors during the warm months is not as essential here as in some other parts of the country. It was felt, therefore, that we could not make any costly changes in order to ventilate our motors. They could not be left open, however, in the winter time without danger of damage by snow.

The accompanying illustration shows the method by which the necessary ventilation has been secured. The top motor lid of a GE-54 motor has been raised about an inch. It is held in this position by old brake-hanger springs which have been discarded as being too weak or too short. As nearly all of the holding clamp studs are quite long it was only necessary to unscrew the studs, place a spring with a flat washer on each side on each stud and screw the studs on again, adjusting them to the height and tension desired. If the lower handhole plates are removed from the bottom of the housing it is readily seen that the motor will be well ventilated. The air circulates from both bottom parts up through the motor and out through the cover over the commutator.

Raising the cover in the manner above described is



TOP COVER OF MOTOR RAISED FOR SUMMER VENTILATION

much cheaper than providing a perforated cover over the commutator, and in the writer's opinion it is less liable to allow dirt and water to enter the motor.

Cost of Overlooking Details

Co-operation of Technical Experts and Maintenance Men Necessary to Secure Best Results

BY AN INSPECTOR OF CAR EQUIPMENT

When a railway contemplates the purchase of new rolling stock much consideration is given to the embodiment of many of the latest improvements with the idea of not only improving the general appearance, but of adding to the convenience of the passenger. In this connection the representative of the accessories manufacturer plays an important part by willingly co-operating and rendering many valuable suggestions to the designing engineer in charge. Before the order is finally placed with the car builder, the plans and specifications are generally submitted for criticism to a consulting engineer, and, in case the order is large, the opinions of several experts are obtained. After passing the muster of this array of technical and expert talent, it is remarkable to note the many points which are overlooked on the sample product from which the remainder of the order is to be constructed. While these points may seem to be of minor importance individually, in the aggregate they assume great proportion, and the ultimate cost of the equipment, such defects as are described in the following paragraphs have been finally corrected, is greatly in excess of the original estimate.

As an example of this condition, a company recently had built a number of cars which were equipped with ventilators, and to harmonize with the interior lighting fixtures and painting, all the inside port shutters were made of highly polished nickel-plated steel, each of which was held in place by a score of nickel-plated steel screws. These screws and shutters after short service became rusty from the moisture that gathered, not only presenting an unpleasant contrast, but also permanently streaking the composition head and side lining. As there are twenty-four shutters to each car, it will readily be seen that the replacing of these shutters and screws by others made of nickel-plated non-rusting material involved no small outlay, whereas had this detail been foreseen in the first instance, expense and inconvenience would have been avoided.

On side-door cars of a rapid transit system it is customary to have a bench which can be lowered when the door is not in use. Usually such a bench is supported by a collapsible leg which folds under when not in use. If a passenger should unthinkingly place his hand on the edge of this bench while the guard is hurriedly raising it upon arrival at a terminal, the folding leg would catch and crush the hand. The expense of adjusting claims arising from this source has been eliminated in a large measure by placing a bar parallel with the edge of the seat to guard the leg. During the rush-hour period this bench is raised to allow greater freedom to passengers while boarding and alighting. The original location of the bench obstructed the guard's view of persons about to board, resulting in many passengers being struck and thrown to the station platform by the premature closing of the door. The shifting of the bench to the opposite side of the doorway gave the guard a clear view, effecting a decided reduction in the number of accidents of this class.

The most profitable concession which a railroad company controls is the sale of the advertising space in its cars, and the position for which the greatest amount is readily obtained is that over the end doors, it being visible to the largest number of passengers at all times.

This position affords accommodation for a much wider advertising card, yet in the case under discussion, the retaining molding was so spaced as to hold only the narrower regulation side card. To overcome this a number of tacks were used to hold these larger cards in place. These tacks damaged the composition backing and the vibration of the car caused them to fall out, thus allowing the cards to assume such positions as to be unreadable to anyone but a "Cubist."

No threshold plates were provided under the end doors and as a result during a rainstorm much water forced its way through the crevice, the quantity depending upon the intensity of downpour and the speed of the train. The water accumulated between the composition flooring and sheet metal base, causing the former to bulge and crack. During such storms passengers usually stood where their feet would not get wet rather than occupy the several seats in the affected area. All cars will require shopping for the installation of the plates necessary to remedy this defect.

Experience has clearly demonstrated that current derived neither from the tractive supply, nor from a set of batteries on the car is dependable for the purpose of illuminating the red tail lights of a train. Either source of supply is subject to a number of unforeseen interruptions, hence the use of oil-burning lamps is the best solution. In this particular case the batteries supplied current for a signal buzzer, a new style motor control system and an emergency lighting circuit. A derangement of any one of these features would extinguish the tail lights, yet no provision was made for the oil lamp. Soon after service was inaugurated many trains became stalled due to mechanical and various other failures. To overcome the danger of rear-end collisions, the ordinary hand lantern was hung from its handle over the top bar of the pantograph safety gate to supplement the electrically lighted tail lamps. This, however, is open to criticism, as the swaying of a rapidly moving train permitted the lantern to oscillate to such a degree as to be out of the line of vision of the motorman in charge of the following train. In many places the clearance between the car and structure was reduced to a minimum and frequently the oil lamp swung out and was broken, thus introducing a fire hazard. Finally, to eliminate this source of expense and danger, a hook was installed on the bulkhead of each car to securely hold the lantern.

The handhole covers for the inspection of the marker lights were so installed that the vibration of the car caused them to drop out of place. A passenger seated in the vicinity at the time received serious injury as a consequence. By securely hinging at the top and latching the bottom of these covers this source of danger was overcome. The fact should not be overlooked that the cars under discussion were of all-steel construction and that holes for additional screws and bolts had to be drilled, with the resultant high cost.

The foregoing instances are but a few of a large number illustrating the advisability and importance of consulting, in addition to the technical expert, the man thoroughly familiar with maintenance work to whom such points would be immediately apparent.

Stops in the curtain guides 10 in. up from the window stools prevent the curtains of the Kansas City (Mo.) Railway cars from being used as rain shields. It has been the experience of this company that its Pantasote curtains are frequently used in place of the glass sashes to keep out the rain, after which the curtains are rolled up when wet. This moisture in the rolled curtain causes it to mold and soon destroys the curtain fabric.

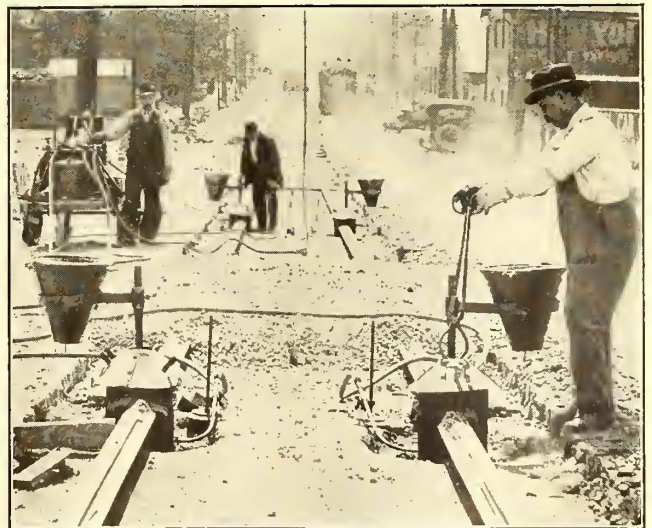
Joint Welding in Youngstown, Ohio

Rehabilitation of Track Being Undertaken by Mahoning & Shenango Railway & Light Company

The installation of Trilby 134-lb. grooved rails with welded joints and the use of steel twin ties embedded in concrete are among the interesting features of the overhauling of several miles of track of the Mahoning & Shenango Railway & Light Company in Youngstown, Ohio. The work, which is being done by a local branch of the Stone & Webster Engineering Corporation, includes the construction of 2½ miles of double track through the busiest part of the city.

The old track and pavement are being torn up by the use of heavy jacks placed under the rails, while the bricks, concrete and earth are removed by a steam shovel. International steel twin ties placed on 6-ft. centers are used, the rails being supported on the steel plates which connect the twin ties. In laying the track ¾ in. is left between the abutting ends of the rails, which are spliced with temporary plates until the concrete is poured. The concrete foundation is 19 in. thick at the rail and arched to 8 in. at the center of the track, and tile for drainage purposes is placed in the center of the devil strip along the greater part of the way. On top of the concrete foundation is a layer of sand and cement with a tar binding, forming a suitable cushion in which the paving brick is laid.

The rails are welded by the Goldschmidt thermit insert process. After the concrete has set sufficient space is dug out around each joint to permit the placing of the welding molds, and an insert of rolled steel similar in composition to the rail heads is placed between the ends of the rail. The two parts of the mold are made of sand and are formed by a foundry squeezing machine. To insure a good tight fit between the rail and the mold, strips of asbestos dipped in molasses are wrapped around each rail a few inches from the end. The mold is then clamped in position around the joint. As an added safeguard to prevent the molten steel running out, powdered fireclay is blown into the mold through the pouring gate, after the other openings have been temporarily plugged. The fireclay also gives a smooth appearance to the weld, as it forms a thin coating over the interior of the mold. This leaves the molds ready for the preheating process, which brings the rail to a high temperature, dries out the mold, and at the same time heats a small sheet-iron can which is placed on top of the mold and contains the metals to be added to the thermit to improve the quality of the steel.



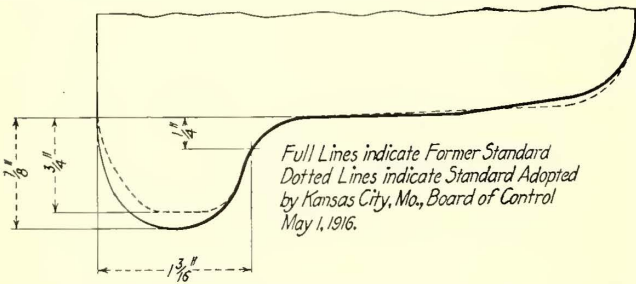
WELDING RAILS AT YOUNGSTOWN, OHIO

The illustration shows four molds in the process of being preheated by means of gasoline compressed air torches connected to a single Goldschmidt preheater, which is carried on a small truck. The crucibles for holding the thermit charge are shown above and at one side of the molds. After the preheating, the can of additional metals is placed in the center of the crucible and the charge ignited. The molten steel collects at the bottom of the crucible as a result of the chemical reaction between the metals of the charge. When the reaction is complete the molten steel is tapped into the mold. After cooling the molds are removed, the risers are knocked off and the rail is ground to a true running surface.

The character of the construction above described is giving a solid and permanent track, considered to be equal to any used in our other modern and progressive cities.

Change in Wheel Flange Reduces Noise and Wear

In view of the recommendation of the committee on equipment of the American Electric Railway Engineer-



*Full Lines indicate Former Standard
Dotted Lines indicate Standard Adopted
by Kansas City, Mo., Board of Control
May 1, 1916.*

KANSAS CITY RAILWAYS' OLD AND NEW CAST IRON WHEEL FLANGES

ing Association regarding certain changes in flange and tread contour of standard wheels, the following information from Kansas City is of interest. The Kansas City Railways have made a change from what was virtually wheel A to the width and depth of flange specified for standard wheel B.

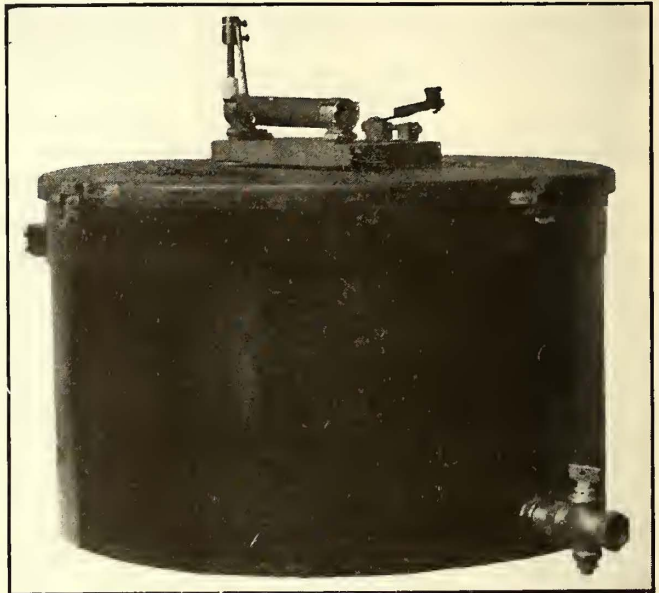
In other words on the Kansas City Railways the depth of wheel flange has been reduced from $\frac{7}{8}$ in. to $\frac{3}{4}$ in. so as to reduce squealing of wheels on curves and, at the same time, to minimize the wear on the rail groove or lip. Also in accordance with standard practice, the mechanical department formerly gaged its wheels at 4 ft. $8\frac{1}{4}$ in. when they were pressed on the axle, but it found that this gage did not provide any lateral wheel play, either in special work or in grooved-rail track. On the other hand, an increase in the wheel gage to 4 ft. $8\frac{7}{16}$ in. produced sharp flanges. It was therefore decided that a change in the dimensions of the flange as well as the section was necessary to obviate sharp flanges, and at the same time lateral play in the wheels was obtained by returning to the 4 ft. $8\frac{1}{4}$ -in. gage. The change in flange dimensions is shown in the accompanying illustration. This change, in conjunction with the return to the 4 ft. $8\frac{1}{4}$ -in. gage, gave a uniform clearance on the rail guard and head sides of the wheels. It also minimized the wear on both sides of the wheel at curves and in special work and, at the same time, reduced the noise and the wear on the grooves or lips of the rails.

To produce this flange in chilled cast iron it was necessary to put the parting line between the sand and the chill at the back edge of the flange. The parting line of flanges on the original wheel was made at the apex of the flange, but this could not be followed in the

new flanges because the chilled metal did not amalgamate with the unchilled metal. Moreover, a large percentage of the chipped flanges broke outward, hence, by placing the parting line at the back edge of the flange, a heavier section of metal was provided on the chilled side which produced a stronger flange. The flat periphery of the flange facilitates molding and casting and, at the same time, it has proved very satisfactory in operating over flange-bearing special work.

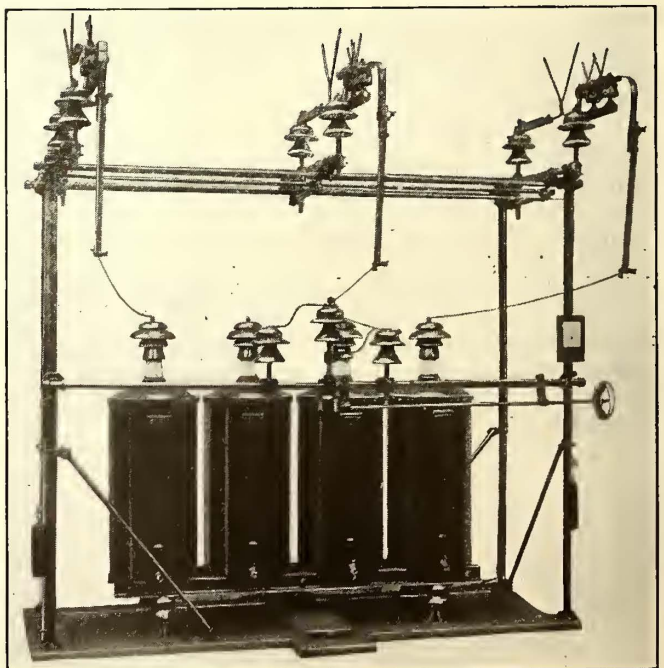
Improved Electrolytic Lightning Arresters

Two types of electrolytic lightning arresters, illustrated herewith, have recently been put on the market



INDOOR TYPE OF ALUMINUM CELL ARRESTER

by the Westinghouse Electric & Manufacturing Company. The type A arrester shown here is designed for direct-current operation for voltages up to 2450 and



OUTDOOR TYPE OF ELECTROLYTIC ARRESTER

for low voltage alternating-current service. It is used only for indoor installations. The type AK arrester is for alternating-current operation on voltages above 2000. An outside installation of this type is shown in a second illustration. The construction of the two types of arrester is similar, one of the distinctive features being the use of a new inorganic electrolyte, less affected by heat and causing less dissolution of the film between charging periods than the electrolytes previously used. Double cone-shaped aluminum trays are used, the shape being such as to give a large area exposed to the electrolyte. The trays are spaced by porcelain pieces so that they do not touch the wooden frames and the holes in the centers of the trays form a ventilating duct for additional circulation of oil. The linings of the tank are of bakelite micarta.

Horn gaps which can be adjusted to the line voltage are provided for all type AK arresters. They are arranged so that the necessary bridging for charging is readily accomplished. The outdoor and indoor arresters are similar except that the former are provided with terminals and are not made for voltages under 10,000.

A composition known as "Koppat," said to possess the quality of remaining practically uniform under all service conditions, is used for the charge and discharge resistance which is connected between the main horn gap and the arrester proper.

A New Safety First Truck-Type Switchboard

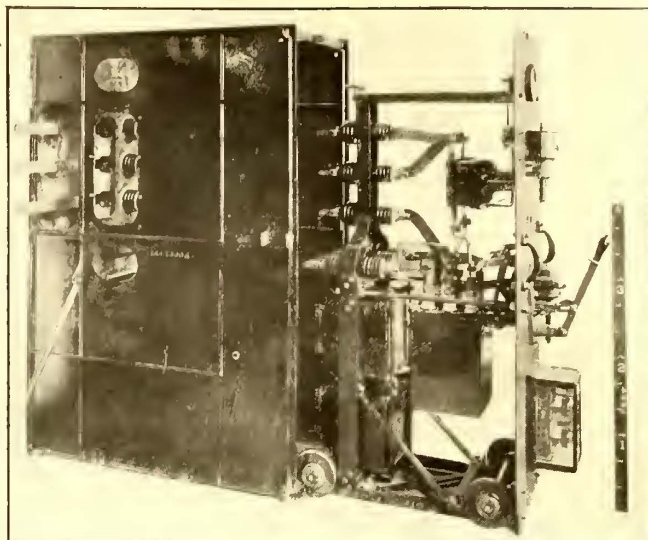
The accompanying illustration is of a new safety-first truck-type switchboard which has recently been placed on the market by the General Electric Company. All live parts are inclosed and danger of coming in contact with live circuits is practically eliminated. Oil switches and other live parts are in compartments.

Another marked advantage of this type of construction is the ease of inspection or replacement. The switchboard panel is mounted on a carriage which can readily be removed from and replaced in a stationary structure, but only when the oil switch is open. With the oil switch closed it is impossible to remove or insert the truck because of an interlock between the operating toggle of the oil switch and the stationary unit. In plants where feeders are standardized, spare panel trucks will permit systematic inspection of equipment with the least possible interruption of service.

The stationary member of the switchboard carries current and potential buses and disconnecting switch studs. Barriers between the current bus studs prevent accidental contact by anyone who enters the compartment. The rear ends of the current disconnecting switch studs run to buses and incoming or outgoing leads, the potential bus wires to small contact studs near the top of the compartment. The side walls have handholes, so that the busbars and bus wires can be continued from unit to unit. These openings when not required can be closed by removable covers. Access to the rear of a compartment can be had by means of a two-section sheet steel door.

The removable truck is mounted on wheels, and when withdrawn the equipment is dead and accessible from all sides. The fore part of the truck carries a sheet steel panel on which is mounted the instruments, meters, oil switches and other appliances as shown. The current transformers are mounted on steel brackets on the back of the instrument panel.

The field of application of standard size units is limited to 7500 volts and 2000 amp. at 60 cycles, and 3000 amp. at 25 cycles on the main bus. Special units can be obtained for use up to 15,000 volts and 300 amp.



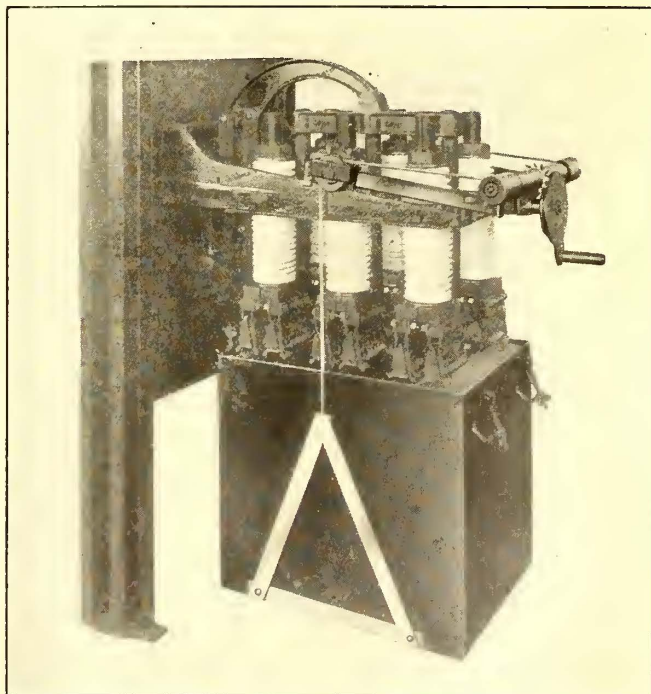
SINGLE PANEL SWITCH UNIT ROLLED OUT FROM THE CABINET

The current capacity of the removable element is limited to 500 amp. at 2300 volts and above, and 800 amp. up to 600 volts. The units illustrated are 76 in. high, 24 in. wide and 52 in. deep.

Tank Lifters for Oil Switches

The General Electric Company has recently developed a number of tank lifting arrangements for oil switches of various forms and sizes. For capacities up to 1500 amp. the lifter as herewith illustrated is employed. With it the oil tanks can be lowered the entire distance from the switch frame to the floor.

The method of removing an oil tank is as follows: The lifter is placed on the oil switch frame and fastened there by turning two winged nuts; the operating handle, connected to a worm gear, is then turned until the two triangular tank supports engage the tank, which is next unfastened from the switch frame and lowered to the floor or to any intermediate position desired.



LIFTER ATTACHED TO OIL SWITCH WITH TANK REMOVED, SHOWING SWITCH CONTACTS

LONDON LETTER

(From Our Regular Correspondent)

Manchester, Sheffield, Brighton and London Reports Reviewed Briefly—Other Developments Noted

The report of the Manchester Corporation Tramways for the year ended March 31 shows that during the year 209,000,000 passengers were carried, 7,000,000 more than last year. The profits enabled £100,000 to be paid in relief of rates and £21,000 to be placed to reserve. The earnings per car mile were more than 1s. The growth of the parcels department is shown by the fact that in the year under review 1,225,718 parcels were carried, and that the total receipts were £14,185, compared with £13,571 for the preceding year. Beginning with the year 1902, when £20,000 was contributed, and ending with the year which closed on March 31 the Manchester tramways have helped the rates to the extent of £1,015,090. The gross capital expenditure so far has been £2,231,547. The population served by the tramways is approximately 969,900.

The report of the Sheffield tramway and motor bus services for the year ended March 25, 1916, shows that on the year's working of the tramcars there was a net profit of £95,779. This is an increase of £25,840 over the previous year. The report states that during the year the department's resources have been severely taxed to meet the demands for increases in car services required in consequence of the many extra hands employed in the munition factories. This has resulted in an increase in the workmen's traffic morning and evening, and in an increase in the ordinary traffic at all hours of the day, to such an extent that records of passengers carried and total receipts have been made and broken week by week. On Tinsley cars alone 16,408,000 passengers were carried during the year. This is an increase of 4,677,000, or 40 per cent, for the year. To enable the department to carry on its work it was necessary to secure women to act as car conductors. In fact, the only men who remain as conductors are those unfit for motormen and not eligible for the army. Women are also employed at the carhouses in cleaning cars, and are gradually replacing men on this work. More than 700 women are employed on the Sheffield Tramways. The motor-omnibus section—as distinct from the car section—shows a total income of £27,565; the gross profits are £5,516, but when deductions are made for interest and sinking fund, income tax on profits, earnings of renewals, and special reserve funds transferred, the balance on the year's working is £3,816.

The annual report of the Brighton Corporation tramway engineer and manager states that, notwithstanding the large numbers who have enlisted in His Majesty's forces and the apparent reduction in the population which this would involve, the number of passengers carried and the revenue earned (£57,936) have eclipsed all previous records. In the spring the work of arranging the service became a daily fight against the inconvenience caused by a depleted staff, and the employment of women conductors undoubtedly saved the situation and enabled the public to have a much better service of cars than would otherwise have been the case.

The accounts of the London County Council for the year ended March 31 last show that the total income from the tramways was £2,339,291, while the working expenses, including war service allowances, amount to £1,683,660. This leaves a surplus on working of £655,631. The following debt and other charges have to be set against the surplus working: Interest (gross), £326,476; redemption, £425,908; rent drawbacks, etc., £6,767; income tax, £40,000, and Parliamentary expenses, £2,260, amounting altogether to £801,442. On the other hand, a number of items, amounting in all to £72,016, such as interest on cash balances, rents from surplus property and debt charges on money advanced, have to be deducted. The gross expenditure, therefore, stands at £729,426, which leaves a deficiency of £73,795, to be met out of the general reserve fund. On March 31 last the renewals fund amounted to £329,967. There has been no payment into this fund since 1912-13. The general reserve fund, after meeting the deficiency of £73,795 on the year's working, amounted to £70,118. The total number of passengers carried during the year was 545,423,397; the

number of car miles run was 47,879,675. The corresponding figures for 1914-15 were 550,497,993 and 58,978,792.

In reviewing the past year's operations at the annual meeting of the British Electric Traction Company, Emile Garecke, the chairman, said the average yield on the investments was 5.19 per cent, which was a little higher than that of the previous year. The revenue account showed an increase of £11,000 in profit balance. In view of the abnormal conditions created by the war it was preferable to strengthen the reserve and to distribute 3 per cent instead of the anticipated 4 per cent on the new ordinary stock. The amount applied to reserve is £20,300, against nothing last year. The balance carried forward was increased by £15,000.

The newly electrified mineral line between Shildon and Newport is showing good results. The service is still restricted, for the contractors have to complete certain portions, but on an average the total weight hauled in a week by electric locomotives is about 65,000 tons. Part of this Shildon-Newport track runs over a portion of the original Stockton & Darlington Railway, the first public railway on which steam locomotives were used.

At the annual meeting of the Tramways & Light Railways Association, held recently in London, the chairman, Sir Albert Stanley, general manager of the London General Omnibus Company, said that the employment of women as conductors had proved satisfactory. Also, while women were taking the place of drivers on some systems, that they would be in general use as drivers did not seem likely. Driving a tramcar, he said, is different from driving a motor car, and the strain is not one that in his opinion should be placed upon women, nor would it be to the public safety.

The Institute of Electrical Engineers has drawn up a scheme for training disabled soldiers and sailors as switchboard attendants, and has invited the co-operation of the London County Council in carrying it out. No fees will be charged to the men, and those who go through the course successfully will be sent as probationers to an electric station in London or in the provinces. If the period of probation is satisfactorily completed, they will receive appointments at the usual rate of pay.

The action taken by the petrol control committee in reducing supplies of petrol for other than war purposes is likely to cause considerable inconvenience to the public, both in the curtailment of the omnibus services and of the supply of motor cabs. The London General Omnibus Company finds it necessary to withdraw certain services entirely and to restrict the services upon others. It has, however, obtained from the commissioner of police a withdrawal of the limit of five passengers as the maximum number to be permitted to stand inside an omnibus. The present prohibition of standing on the top of an omnibus still continues in the interest of public safety.

When the contract for the construction of the London Post Office Tube Railway was placed in October, 1914, it was hoped that the work would be completed in eighteen months. That this expectation will be nearly fulfilled, in spite of the dearth of labor, is shown by the information that the tunnel is nearly completed. The purpose of the railway is to accelerate the transmission of mails and parcels, reduce the expenditure on road vans and relieve congestion in the streets. Its total length is about 6½ miles, and its depth below the surface varies from 28 ft. to 37 ft. Between stations there is a single tunnel, 9 ft. in diameter, containing two tracks of 2 ft. gage, but at stations separate tunnels of larger diameter are arranged for the up and down lines, with space between them to give accommodation for lifts, shoots, and control cabins. The trains will be operated electrically without a driver, and worked on a distant-control system. The present line is only part of the complete scheme, which in its final form provides for three other lines.

An aftermath of the Irish outbreak appears in the interim ordinary dividend announcement of the Dublin United Tramways for the first half of the current year. In 1915 and 1914 the rate was 5 per cent per annum, but now it is only 4 per cent. Traffic declined to the extent of more than £13,000 while the rebellion lasted and some damage was done to the rolling stock and plant.

A. C. S.

NEWS OF ELECTRIC RAILWAYS

RETURN TO NORMAL CONDITIONS IN HARRISBURG Fifty Union Men Desert the Cause in Face of Impending Collapse of Strike

While more than 130 of the Harrisburg (Pa.) Railways men were still out on strike on Aug. 2, nevertheless the company officials declared that they no longer considered that a strike exists. The usual number of cars was running, and nearly fifty of the strikers were back at work. Thousands of people are again riding the cars, and there has been a big falling off in the jitney business, although Mayor Meals has not yet ordered the jitneys off the streets.

On July 28, the strikers' committee headed by Hugh L. McLaughlin met Mayor E. S. Meals and the City Council of Harrisburg, and for the first time the men's side of the controversy was officially presented to the officials. President F. B. Musser of the railways met the Council on the afternoon of July 27. The net result of these two conferences was a request by the commissioners that Mr. Musser again meet them at 4 o'clock in the afternoon. This Mr. Musser did, and practically repeated his statement of the day before that he would have no further dealings with the strikers' committee.

John A. Moffat, commissioner of conciliation of the United States Department of Labor, left the city after his efforts to bring about arbitration failed.

J. J. Thorpe, the Amalgamated organizer, gave out a statement denying that he had instructed the men to return to work and again take up the question of organization six months later. Mr. Thorpe also wired the American Federation of Labor to send an organizer to work among the members of other unions in order to get them to stay off the cars. Following Mr. Musser's ultimatum in regard to treating with the strikers, Chairman McLaughlin and Mr. Thorpe both issued statements that they would fight to the bitter end, saying:

"We mean to fight this thing to a finish."

Mr. Thorpe in a statement entitled "Another Job for the Public Service Commission," declared the stock of the Harrisburg Railways was watered. He said that the company could double the wages of its men and still make a fair percentage of profit on the real value of the property.

Five of the strikers applied for their old positions on July 28 and two were accepted. Later on the others were accepted. Forty-six cars were operated during the day, and service on all lines was continued until midnight.

President Musser issued a lengthy statement to the afternoon newspapers of July 28 setting out the position of the company. This statement follows in part:

"The company has always considered matters presented by the men and adjusted them. This applies also to the question of wages. Notwithstanding the greatly decreased receipts and loss of revenue due to general conditions and the jitneys, an increase was made last April, with the understanding that further increase would be made as soon as conditions warranted. It may not be generally known, but the scale of wages paid by the company has been higher than that of any of the adjoining larger cities, and only exceeded by a few of the larger companies under special conditions.

"There is only one policy that the company can pursue, and that is to treat with its employees in the adjustment of any differences there may be. This it has done in an agreement which is satisfactory to both sides. The duty of the company is to operate its cars.

"The non-recognition of the union is not a sentiment, but a matter of policy in the management of the property of the company. It cannot delegate the management and control of its business to an organization which has no financial interest in its property, and which from experience has shown that it can be tyrannical and arbitrary, subjecting the public to great inconvenience and the company to great loss. The company has no issue with the union, but it cannot be sub-

jected to the arbitrary control of its men by organizers to the detriment of its interests.

"The company has satisfactorily adjusted all matters, including wages, with its employees, and now proposes as far as it is able to operate its cars on full time with full crews, and requests from the public, whom it is endeavoring to serve, assistance and encouragement in preserving order and removal of false impressions due to false statements. It has not been the policy of the company to refute the many foolish and untruthful statements made or allegations as to the acts of the officers and stockholders. The public must expect statements of this kind. The company proposes to conduct its business in a dignified manner, confining itself strictly to the operation of its cars, serving the public and treating with its employees."

Forty-seven cars were operated on July 29 and ten more strikers reapplied for their old positions and were re-employed, all retaining their old standing with the company.

In a paid advertisement in the newspapers of July 28 entitled "This Is Final," the Harrisburg Railways said:

"The Harrisburg Railways is not bluffing.

"We have made known our position to our men and we want the public to know what it is because it is final. We believe it will benefit the city, our employees and the company. We think we should go to great lengths to uphold it and we are willing to.

"We have just entered into an agreement with our loyal employees, numbering about sixty-five. We have adjusted all questions with them satisfactorily. We will be glad to receive from the 165 former employees who left our service, applications for positions, providing they apply as individuals, and each application will be received and treated on its merits. They will not be re-employed under any other circumstances.

"We will not recognize or have any dealings with the Amalgamated Association of Street & Electric Railway Employees of America. This is final.

"We will not discharge those employees who have been loyal to the company. It may be some time before conditions are normal, but the management will do everything it can to accommodate the public. We only ask that law and order be enforced.

"The Harrisburg Railways is a Harrisburg institution. Its directors are all Harrisburg men. All but one live here. Ninety-five per cent of the stock of the Harrisburg Railways is owned in Harrisburg. We have no outside entanglements and we are responsible only to Harrisburg people. We intend to maintain this relationship.

"We feel we are doing right and acting in the best interest of the city, its people, the company and its employees when we refuse to have any dealings with any organization entirely controlled by outside parties.

"We are making a fight for Harrisburg, and it will be a winning one.

"This is final."

On July 30, there were no new developments in the situation. Nearly fifty cars were operated and many people rode. On July 31 the company in another paid newspaper advertisement announced it would use newspaper space each day to set forth facts taken from the records explaining the company's position. This ad said at one place, "We believe the readers of this paper are amply able to decide what is fair, just and right, without comment from any company or organization whether it be from Harrisburg or Detroit."

The strikers on July 31 asked Mayor Meals not to interfere with unlicensed jitneys until the settlement of the strike. Twenty-one of the strikers were back on their cars on July 31. Among these men who returned were C. C. Page, financial secretary of Amalgamated Division 709, and Harry Dalton, treasurer. It was generally conceded that this marked the breaking of the backbone of the strike. Fifty cars, just two less than normal, operated throughout the day. In dis-

curring the applications of strikers for their old jobs, Mr. Musser said:

"We are taking the men back with the understanding that by-gones are to be by-gones. Any that we re-employ are given to understand that so long as they do what is right we will treat them as if nothing had happened."

Thirty-six cars were operated on Aug. 1, but the falling off in the number of cars operated was largely due to the sending back to New York of many of the strike breakers. Mayor Meals announced that jitneys would be allowed to run until the company was able to maintain regular schedules without the aid of strike breakers.

On Aug. 2, the company placed an advertisement entitled "Thirty-four Conductors and Motormen Have Returned to Work. Only 39½ per Cent of Our Employees Went on Strike." The ad continued:

"This company regularly has 448 employees. On July 16, last, 177 of these employees walked out without notice and insisted that you stop riding on the cars, for the reason that they were not satisfied with their jobs.

"What about the remaining 271 loyal employees?"

"The real truth is that you were asked to prevent the large majority of our employees (271) from working and earning an honest living under conditions and with wages that were and are satisfactory to them.

"Thirty-four of the 177 who stopped work are now at their old jobs.

"And—

"To-day only 29½ per cent or 133 men are still requesting you to prevent the large majority, 70½ per cent or 315 men, from working regularly when and with whom they choose to work."

CINCINNATI ACCOUNTANTS REPORT

According to the report of Edgar Briggs, an accountant employed by the city of Cincinnati to make an examination of the books of the Cincinnati Traction Company for use in revising the rate of fare under the franchise agreement, the total net income from Feb. 22, 1901, when it took over the property and franchise rights of the Cincinnati Street Railway, to Dec. 31, 1915, was \$25,233,809. The annual net income varied from \$1,439,130 in 1902 to \$1,929,716 in 1915. The gross earnings for the period were \$67,209,642 and dividends paid stockholders aggregated \$1,485,753. The gross earnings have increased steadily since 1902 and in 1915 they were \$5,320,568. During the period \$1,356,947,014 passengers were carried. Of this number 1,347,305,039 paid fares, 8,242,293 rode free as employees and 1,398,682 rode on passes. Transfer passengers aggregated 450,874,476.

According to the records as shown in this report, the cost of carrying passengers has varied from 2.7 cents each in 1904 to 3.02 cents in 1913. Last year the cost was 2.86 cents per passenger. The net income per passenger was highest in 1902, 2.08 cents, and lowest in 1913, 1.69 cents. Last year the net income per passenger was 1.82 cents.

The period covered in the examination of the Cincinnati Street Railway's books was from July 1, 1889, to June 30, 1915. The original capital stock of the company was \$4,500,000, but up to and including 1900 it had been increased to \$20,000,000. Of this \$18,511,950 had been issued. Under the lease to the Cincinnati Traction Company, the latter agreed to pay the following rentals: 1902, \$982,958; 1903, \$1,027,699; 1904, \$1,072,441; 1905, \$1,117,182; 1906, \$1,124,337. For each fiscal year after 1906 the company was to pay the same as for that year and in addition \$10,000 a year for the maintenance of the lessor's organization.

Mr. Briggs' report states that the value of the properties and franchises of the Cincinnati Street Railway at the time of the transfer was \$19,172,364, less the surplus credited to the Cincinnati Traction Company, \$703,522, leaving the value of the leased property \$18,468,841. According to the report, the balance in undivided profits on June 30, 1915, was made up of the following items: Rentals, Feb. 22, 1901, to June 30, 1915, \$15,478,996; other sources, \$411,465, making a total of \$15,890,461. From this is deducted regular dividends paid, \$15,172,233; spe-

cial dividends, \$37,023; bond interest, \$191,625; damages, licenses, premiums on bonds and sundries, making an aggregate of \$15,678,978. On June 30, 1915, the credit balance was \$211,482. From 1882 to 1903 dividends were paid at the rate of 5 per cent; 1904, 5½ per cent; 1905 to 1915, 6 per cent.

The revenues of the Cincinnati Traction Company from all sources during the fifteen years are listed in the report as follows:

Passenger receipts.....	\$65,777,303
Chartered cars.....	89,749
Freight inclines.....	215,226
U. S. mail.....	169,604
Advertising.....	342,431
Rent of land and buildings.....	138,617
Rent of tracks and terminals.....	31,169
Discounts and interest.....	170,501
Miscellaneous income.....	94,659
Freight, interurban.....	171,408
Other sources.....	8,975
Total.....	\$67,209,642

Operating expenses during that period are classified as follows:

Ways and structures.....	\$2,528,427
Equipment.....	3,537,498
Operation of power plants.....	5,854,623
Operation of cars.....	18,300,509
General expenses.....	4,945,134
Total.....	\$35,176,191

The net income of the company, year by year, was as follows: 1901, \$1,158,929; 1902, \$1,439,130; 1903, \$1,452,938; 1904, \$1,527,047; 1905, \$1,637,040; 1906, \$1,738,346; 1907, \$1,615,478; 1908, \$1,631,121; 1909, \$1,794,079; 1910, \$1,899,221; 1911, \$1,898,365; 1912, \$1,926,005; 1913, \$1,741,406; 1914, \$1,852,923; 1915, \$1,929,716.

The number of passengers for each year from 1901 to 1915, the gross earnings and net income per passenger are shown in the following table:

Year	No. of passengers	Gross earnings	Net income
1901.....	65,432,231	4.45c	1.77c
1902.....	69,245,274	5.08c	2.08c
1903.....	72,279,640	5.04c	2.01c
1904.....	74,629,370	5.05c	2.05c
1905.....	79,694,825	5.08c	2.06c
1906.....	85,108,148	5.09c	2.04c
1907.....	88,167,938	5.10c	1.83c
1908.....	87,381,934	5.11c	1.87c
1909.....	93,404,369	5.12c	1.93c
1910.....	98,655,444	5.10c	1.92c
1911.....	101,607,139	5.05c	1.87c
1912.....	104,831,237	5.05c	1.84c
1913.....	102,994,455	5.06c	1.69c
1914.....	105,588,392	5.03c	1.76c
1915.....	106,110,593	5.01c	1.82c
Total.....	1,347,305,039		

Operating expenses of the company increased from \$1,842,553 in the year 1901, to \$2,648,550 in 1915, according to the report.

MESSRS. JOSSELYN AND HILD WELCOMED HOME

A rousing "home-coming" welcome was extended to two former officials of the Portland Railway, Light & Power Company, Portland, Ore., at the fashionable Arlington Club, in that city on July 12. The function was a complimentary luncheon by Franklin T. Griffith, president of the company, in honor of B. S. Josselyn, formerly president of the Portland Railway, Light & Power Company, and Frederic W. Hild, formerly general manager of the company. Mr. Griffith had invited a group of about twenty-five of the present officers and department heads of the company to greet their former associates. It was a family reunion, and the speakers often referred to the gathering as the best evidence of the excellent feeling that existed among all those who in the past and present have been identified with the growth and development of the corporation. Mr. Josselyn, who has been spending most of his time in the East, announced that he had come back to Portland to make the city his home permanently. Mr. Hild, who is now vice-president and general manager of the Denver (Col.) Tramway, was on his first visit to his old home since he took his new post last year. Accompanied by some of his "boys" of former days he spent part of his vacation in climbing some of the difficult mountain peaks in Oregon and in other long hikes.

CINCINNATI VALUATION HEARING RESUMED

When the hearing on the tentative valuation of the Cincinnati (Ohio) Traction Company's property was resumed before the Public Utilities Commission of Ohio, on July 26, City Solicitor Charles A. Groom placed on the stand Edgar Biggs, accountant who made an examination of the company's books for the city, and attempted to establish the book value of the stock from his figures. Counsel for the company objected and the commission decided that testimony on this point was irrelevant, but that Mr. Biggs might testify as to the earnings and surplus account. Mr. Groom insisted upon his point, and it was finally decided that he should submit briefs on the question. It is generally believed this will delay the hearing about one month. George C. Bloss, Thomas Punshon and B. S. Hughs were other witnesses who gave detailed engineering information regarding the property.

At a meeting of the committee of the Cincinnati Council on street railways during the week ended July 29 Attorney Henry Bentley said that provision should be made in the revised franchise of the company for the interchange of business between the rapid transit loop and the surface lines. He contended that this would insure outside bidders for the lease of the loop that no difficulties would arise in the transfer of passengers from one line to the other. The prevailing sentiment among the members of the committee and the Rapid Transit Commission was that the Cincinnati Traction Company was the logical company to operate the loop. Mr. Bentley insisted that the provision would make no difference in case such an arrangement was entered into.

Chairman Michael Mullen of the committee assured Price Hill residents that their appeal for an extension of the Warsaw Avenue line to Coverdale was a worthy one and would receive first consideration.

Walter Draper, vice-president of the Cincinnati Traction Company, told the committee that the views of the company on all requested extensions would be ready for its consideration at the next meeting, on Aug. 10.

PROSPECTS FOR POWER DEVELOPMENT

The conference committee of the Senate and House are endeavoring to reach a compromise agreement on a general dam bill which can be approved by both houses and become law before the end of the present session of Congress.

Both branches of Congress have passed bills for the granting of permits for power dams and plants in navigable streams. The House measure contains a number of provisions placing more drastic restrictions upon development enterprises than are provided in the Senate bill. The difference in the two measures which the conferees expect to be the most troublesome, however, is that relating to the manner in which power permits shall be granted.

The Senate bill proposes that the Secretary of War shall have authority to grant such permits, under uniform and general terms, conditions and regulations prescribed in the measure. The House bill provides terms and conditions under which dams may be built, to be administered and enforced by the Secretary of War, with the condition that before any plans shall be approved or agreements entered into for the construction of such dams, Congress shall in each case pass a special enabling act granting its consent to the location and construction. This is the procedure provided under the present general dam act. No grants of any kind have been made by Congress since 1912, while in the six years before that date in which the law was in operation, about thirty enabling acts were passed by Congress, but only four comparatively small power plants were built under them, it being impossible in most cases to finance the projects under the terms of the present law.

In view of the declaration, favoring the use of natural resources, contained in the St. Louis platform, it is believed that the President and the Democratic leaders will make every effort to secure the passage at this session of a water power bill that will bring about development, and it is expected that an agreement on such a measure will be reached by the conference committee on the navigable streams bill before adjournment.

PLEA FOR UNIFIED SYSTEM

An address made by William Cooper Proctor, a member of the Cincinnati (Ohio) Rapid Transit Commission, before the street railway committee of the City Council on July 19, is of special interest at this time, because of the hearing on the valuation of the property of the Cincinnati Traction Company before the Public Utilities Commission for the purpose of arriving at an adequate rate of fare. The subject before the Council committee at the time was the revision of the company's franchise. Mr. Proctor advocated unified transportation service, 5-cent fare and universal transfers. He said that the terms of the franchises under which the rapid transit line and the surface lines operate should be fair to the company and the city alike. This will insure the best possible service. Mr. Proctor said, in part:

"The Rapid Transit Commission believes in one unified system of transportation for the city. It is not practicable to have two. We feel that the proposed rapid transit system and the present surface lines should be operated as a unit. What I judge to be the wish of the citizens of Cincinnati is a 5-cent fare, with universal transfers. This, I believe, can be accomplished.

"I do not think the city of Cincinnati should insist on an unfair contract. It is not good business to do that. If you have an unfair contract with the company so it can not make any money, it will go into receivership.

"If you get a contract unfavorable to the city, you are going to have continuous opposition on the part of the citizens. That contract must give the citizens of Cincinnati all they are entitled to for their money.

"The general matter of extensions will follow along that line. A great many extensions will not be necessary after the loop is built. Those that are necessary can be brought up and built as they should be built. If you unify the system, you can have extensions which will be serviceable to the city and I believe fair to the company.

"No traction company is prosperous unless a city is growing. Any city that is growing rapidly has a profitable traction system. So the very fact of our building the loop, with the probable increase in population, will enable us to work out our traction problem on a much better basis than would be practicable without it."

Chief Engineer Frank S. Krug of the commission said that 100 men had been employed to begin work on the traffic survey on the morning of July 24. They will have cards printed with blanks to be filled in, showing the points where passengers board the cars, their transfer points and their final destination. These men will board the cars and secure the desired information on the cards. They will begin with the lines centering at the Walnut Hills car-house. Mr. Krug stated that about two weeks will be required to make the survey.

A number of persons from different suburban towns were present and discussed details with regard to requested changes and improvements. A resolution was adopted requesting City Solicitor Groom to deliver to the committee the report of the examination of the company's books made by Edgar Biggs, referred to on page 344 of this issue.

TOLEDO COMMUNITY PLAN CONFERENCE

At the conference on July 22 Johnson Thurston, president of the Street Railway Commission at Toledo, Ohio, claimed to have found a joker in the plan that would destroy the possibility of municipal ownership. The commission had just agreed to a clause which provided that the city might acquire the road at any time by paying to the Community Traction Company 106 per cent of the par value of the stock. Previously the commission had submitted an amendment to the city charter which limits the authority of the city to raise money on its general credit to 15 per cent of the purchase price. There seems to be a clash between the two. Other members of the commission suggested that the proposed amendment be withdrawn until the plan is completed, so that they would know just what is needed in the way of amendments. Henry L. Doherty is reported to have offered to accept payment for the road in city bonds, if he could have them at once while there is a demand in the market for such securities.

Thompson Investigation Cost B. R. T. \$4,850.—The Brooklyn (N. Y.) Rapid Transit Company has included in the comparative statement of the results of the operation of the system for the year ended June 30, 1916, this entry, "Expenses in connection with Thompson legislative investigation of Public Service Commission, \$4,850."

Free Outing for Chicago Mothers.—With the sanction of the committee on transportation of the City Council of Chicago, Ill., L. A. Busby, president of the Chicago Surface Lines, recently furnished 10,000 tickets for distribution free through the South Side Woman's Club to mothers and children in need of an outing, the tickets to be used between 9 a. m. and 4 p. m.

Detroit Student Trainmen to Be Paid.—The Detroit (Mich.) United Railway has decided upon the payment of wages to motormen and conductors during the term of their apprenticeship. Heretofore, students have exchanged their time while under training for the instruction which they received. The company now plans to pay \$1.50 a day to all students provided they remain in the service more than ninety days.

Roseburg M. O. Veto.—The municipal ownership ordinance vetoed by the Mayor of Roseburg, Ore., as noted in the *ELECTRIC RAILWAY JOURNAL* of July 29, page 203, provided for a steam railroad. On May 22 the city was authorized by vote of the people to spend \$300,000. The Oregon Supreme Court decided that the city had the right to issue the bonds and the City Council approved the plans and specifications. It was expected that bids would be opened on Sept. 5. A tentative lease of the railroad for thirty years had even been agreed upon.

Society for Electrical Development Increases Membership.—As an indication of the increased interest evinced by central stations in the work of the Society for Electrical Development it is interesting to note that recently 141 central stations have become members. The increased membership is representative of all parts of the country and includes as well the subsidiary companies of four important holding companies. Among the companies that have recently become society members are Sanderson & Porter, New York; Hagerstown & Frederick Railway, Frederick, Md.; Kanawha Traction & Electric Company, Parkersburg, W. Va.; Wilmington & Philadelphia Traction Company, Wilmington, Del., and the Reading Transit & Light Company, Reading, Pa.

Hearing in Vincennes Track Case.—The Public Service Commission of Indiana on July 24 began a hearing in the case in which the Vincennes Traction Company seeks to prevent the city of Vincennes from compelling the company to leave double tracks in Seventh and Second Streets and Fairground Avenue, Vincennes. The company is seeking to replace the double track with a single track. The city filed an injunction to prevent the company from placing single tracks in these streets, and the case was sent from Knox County to Sullivan County. The company then filed a demurrer in the civil court and filed a petition with the Public Service Commission. On July 24 the city of Vincennes filed a demurrer with the Public Service Commission on the ground that the commission has no jurisdiction until the civil court disposes of the case.

Franchise Case to Supreme Court.—Following the refusal of Judge A. W. Frater in the King County Superior Court to grant the city of Seattle's claim for \$13,078, alleged due as a gross earnings tax on the franchise of the defunct Seattle, Renton & Southern Railway, preparations were made by Corporation Counsel Hugh M. Caldwell to carry the matter to the Supreme Court. Recently Judge Frater signed a decision formally denying that the city was entitled to the franchise tax for the years 1912, 1913, 1914 and the first two months of 1915, because of the city's action in attempting to revoke the franchise of the company. The franchise was revoked by the City Council in December, 1910, but the Federal Court early last year held the attempted revocation illegal. Assistant Corporation Counsel Walter F. Meigs recently filed his formal exceptions to Judge Frater's findings of fact and conclusions of law, and will perfect an appeal to the State's highest court. According to reports, an attempt will be made to have the matter heard during the fall term.

Sixteen Cars Destroyed in Buffalo.—Sixteen cars were destroyed by fire which swept the north wing of the Cold Springs carhouse of the International Railway, Buffalo, N. Y. The total loss is estimated at \$106,000 by Edgar J. Dickson, vice-president of the company. Of the cars which were destroyed, thirteen were of the near-side P-A-Y-E type, valued at approximately \$6,000 each; two funeral cars, valued at \$10,000 each, and a private car, "Tatanka," used by President Edward G. Connette, valued at \$9,000. The investigation of the fire conducted by company officials did not reveal the cause of the blaze. The rapidity with which the fire spread and the congestion of cars in the carhouse at the early morning hour prevented trainmen from saving the destroyed equipment. The work of repairing the damaged carhouse is being handled by the company. The loss is covered by insurance. The loss of the two funeral cars will temporarily prevent the company from handling local funerals, but funerals to out-of-town cemeteries will be handled with an express car.

Under River Tunnel Contract Let.—The Public Service Commission for the First District of New York has awarded to Patrick McGovern & Company, New York City, the lowest bidder, the contract for the construction of the new East River tunnel, opposite East Sixtieth Street, for \$4,194,797. The Board of Estimate has appropriated the necessary funds and the contract will in all probability be executed within a few days by the Public Service Commission and the construction will start within a short time. This is the last piece of under-river tunnel construction to be let by the commission under the dual system contracts. When the work on the Sixtieth Street tunnel, which is to connect the new Queens elevated lines with the crosstown line under Fifty-ninth and Sixtieth Streets, to be operated by the New York Municipal Railway Corporation, is completed there will be eight under-river tubes in process of building, four rapid transit tunnels in all, namely, the Whitehall-Montague Street tunnel, the Old Slip-Clark Street tunnel, the Fourteenth Street-Eastern tunnel and the Sixtieth Street tunnel. Of the four, all except the Old Slip-Clark Street tunnel will be operated by the New York Municipal Railway Corporation.

Efforts to Settle Buffalo Suburban Strike Fail.—After a series of conferences between representatives of striking platform men on the Buffalo (N. Y.) Southern Railway and Nathan A. Bundy, receiver and general manager of the line, an agreement was reached on practically all points at issue with the exception of the right of the receiver to employ only those he desired. The union demanded that he select crews according to seniority of service. Failure to agree on this point has again broken off negotiations, but a partial restoration of the service between Buffalo, Orchard Park, Ebenezer and Gardenville has been effected by the employment of new crews. A maximum wage increase of 5 cents an hour, bringing the scale up from 25 cents to 30 cents an hour, was agreed upon, together with partial recognition of the union. The conference was brought about by Public Service Commissioner Devoe P. Hodson after Justice Marcus in Supreme Court denied the application of Henry Lyons and other stockholders in the road for the removal of Mr. Bundy as receiver for refusing to recognize the union. Following the rejection of the proposed agreement by the men, Mr. Bundy notified Commissioner Hodson that he considered he was released from assent to every part of the proposed agreement and would operate the road with new men.

PROGRAM OF ASSOCIATION MEETING

Pacific Claim Agents' Association

Claim agents representing the steam and electric railroads on the Pacific Coast will assemble in Tacoma, Wash., on Aug. 9, 10 and 11 for the eighth annual convention of the Pacific Claim Agents' Association. The addresses of welcome will be delivered by Dr. E. C. Wheeler, president of the Tacoma Commercial Club, and L. H. Bean, manager of the Tacoma Railway & Power Company. T. N. Henry, safety lecturer in the Tacoma Public Schools, will tell about his work there. J. W. Brown, of the Tacoma Railway & Power Company, will speak on the regulation of motor vehicles along traffic lines.

Financial and Corporate

ANNUAL REPORT

Philadelphia Rapid Transit Company

The comparative income statement of the Philadelphia (Pa.) Rapid Transit Company for the fiscal years ended June 30, 1915, and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Earnings				
Gross passenger earnings	\$24,871,254	96.21	\$22,971,594	96.38
Receipts from other sources	968,088	3.79	872,011	3.62
Total	\$25,839,344	100.00	\$23,843,605	100.00
Expenses				
Maintenance and renewals:				
Maintenance	\$2,506,731	9.70	\$2,435,415	10.21
Reserve fund for renewals	1,369,170	5.30	1,141,125	4.78
Total appropriation	\$3,875,901	15.00	\$3,576,540	14.99
Operation of power plant	1,441,421	5.58	1,417,239	5.94
Operation of cars	6,447,078	24.95	6,205,101	26.11
General	1,343,326	5.20	1,329,829	5.57
Taxes	1,264,701	4.89	1,348,723	5.66
Total	\$14,372,427	55.62	\$13,877,432	58.27
Net earnings from operation	\$11,466,916	44.38	\$9,966,173	41.73
Fixed Charges				
Interest	\$2,308,779	8.94	\$2,259,471	9.48
Rentals	7,365,433	28.51	7,364,996	32.14
Sinking fund, city contract	120,000	0.46	120,000	0.54
Total	\$9,794,212	37.91	\$9,744,468	42.16
Surplus	\$1,672,704	6.47	\$221,705	00.93

The year ended June 30, 1916, marked the end of the five-year period for which the Stotesbury management originally assumed the responsibility of directing the affairs of the company. The report therefore contains a summary of the five-year period. The Stotesbury management, upon assuming charge and control of the affairs of the company, undertook within a five-year period to furnish to the public an adequate system of transportation, to recognize the efforts of the motormen and conductors in the way of co-operation by such wages as the resulting increased efficiency makes possible, and to build up the property to the end that it might be a credit to the city of Philadelphia and produce to its owners a return upon the \$30,000,000 of capital stock actually paid in. It is the opinion of the management that the improvement in service to the public is an accomplished fact.

As a matter of fact the expectation that the rehabilitated and improved property might be productive of a return upon the \$30,000,000 of capital stock actually paid in has been borne out by the experience of the period, particularly during the latest fiscal year when the net earned surplus amounted to \$1,672,704. The management hopes that the present earning power will rehabilitate the credit of the property, as the participation of the Philadelphia Rapid Transit Company in the plans of the city of Philadelphia for the construction and operation of an extensive system of subway and elevated lines is essentially a financial problem, the company only asking from the city such co-operation as may be necessary properly to protect it against the diversion of earnings from the present system.

The results from operation during the year ended June 30, 1916, are presented in the income account. The gross earnings show an increase of \$1,995,738, or 8.37 per cent for the year. This is attributable principally to the vigorous recovery in the industrial situation, the beneficial results of which were first felt during September, 1915. The operating expenses, including taxes, show an increase of \$494,994. This is brought about mainly by the larger appropriations for maintenance and renewals and to the 22 per cent fund which, being based upon fixed percentages of earnings, are therefore greater when the earnings increase. The fixed charges show an increase of \$49,743, due to added interest charges. The resultant surplus for the year ended June 30,

1916, was \$1,672,704, as against \$221,704 for the preceding year.

At the time of the original negotiations during the winter of 1910-11, immediately preceding the Stotesbury management assuming control, an estimate of the operating results for the six-year period 1910-11 to 1915-16 was prepared. This estimate is submitted below in comparison with the actual results:

Year ended June 30	Gross Earnings		Surplus—Deficit*	
	Estimated	Actual	Estimated	Actual
1911	\$20,900,000	\$21,529,469	\$652,000*	\$415,560*
1912	21,750,000	22,700,692	416,750*	150,489*
1913	22,625,000	23,927,179	283,625*	509,583
1914	23,525,000	24,255,813	310,236
1915	24,475,000	23,843,606	382,500	221,705
1916	25,450,000	25,839,344	678,000	1,672,704

The normal increase in gross earnings has been estimated at 4 per cent per annum, and this rate of increase was estimated when the forecast of the results for this period was prepared; the gross earnings for the year ended June 30, 1908, being used as a base figure. The actual average increase in gross earnings has been 4.22 per cent per annum, the total gross earnings for the year ended June 30, 1916, being \$25,839,344 as against the original estimate for that year of \$25,450,000 on a basis of 4 per cent annual increase.

It was originally estimated that only the last two years would reveal a surplus which would aggregate \$1,060,500. The actual results of operation, however, show surplus earnings during each of the last four years amounting in total to \$2,714,228.

As a part of the policy of this management, 15 per cent of the gross earnings has been set aside for maintenance and renewals, this in order that the physical integrity of the property might be maintained out of earnings and without any increase in capital obligations. The 15 per cent appropriation was made effective for the year beginning July 1, 1910, and has therefore been in force for six years to June 30, 1916.

The renewal fund as at June 30, 1916, amounted to \$1,875,000, of which \$772,245 is in cash, the balance of \$1,102,754 representing securities.

An accident reserve was set up in the books in respect of the liability known to exist on account of the pending suits. As at July 1, 1911, this reserve amounted to \$1,311,996. Owing to liberal appropriations from earnings during the five-year period, the accident reserve shows a balance of \$1,032,686, as at June 30, 1916, or a reduction of only 22 per cent, as against a decrease of over 60 per cent in the number of suits pending.

NORTHERN OHIO SALE RUMOR REVIVED

Rumors have been revived of the possible acquirement of control of the Northern Ohio Traction & Light Company, Akron, Ohio, and the Republic Railway & Light Company, Youngstown, Ohio, by eastern capitalists and the consolidation of the two. It is known that a group of New York men have inspected the Northern Ohio Traction & Light Company's properties recently and that there has been some talk in regard to the price of the stock, but this is about as far as negotiations have gone.

The newspaper accounts of inspections by engineers and accountants are largely due to the work that has been done in anticipation of placing the bonds that have recently been authorized by the Public Utilities Commission and preparations for improvements that are to be made by the Northern Ohio Traction & Light Company within a short time. Already \$4,000,000 of the bonds have been sold. Half of this amount will be used in taking up underlying securities and the remainder for improvements. The road will be double-tracked between Cleveland and a point 4 miles south of Akron. A new terminal is now under construction at Akron and various lines in that city will be extended. Improvements and extensions will be made in Canton and at other points.

There is no physical connection between the Northern Ohio Traction & Light Company and any of the lines controlled by the Republic Railway & Light Company, but this would not be difficult to secure through other roads which operate between the two roads mentioned. The Stark Elec-

tric and the Cleveland, Alliance & Mahoning Valley, now under construction, could be used for establishing connections.

The Northern Ohio Traction & Light Company is now financed in such a way that all underlying securities will be taken up as they become due and the new mortgage, recently authorized, will eventually become a first mortgage on the entire property.

According to dispatches received in New York from Cleveland on Aug. 3 a special meeting of the stockholders of the Northern Ohio Traction & Light Company has been called for Aug. 15 at Akron, when it is expected the sale of the property to Eastern bankers at \$100 a share, or \$9,000,000 for the entire issue of common stock of the company, will be authorized.

DEAL COMPLETED FOR LEAVENWORTH & TOPEKA RAILWAY

A syndicate, largely Kansas City men, it is said, has taken over the Leavenworth & Topeka Railway, a steam road with one locomotive and some coaches, which has been operated between Leavenworth and Topeka six days a week by the Union Pacific and the Missouri Pacific. The plan is said to be to operate the line as a steam road until such time as it can be changed to electrical operation. The project is backed by W. E. Winner, who is now building the Kansas City & Tiffany Springs Interurban Railway. Leavenworth is 8 miles from Tiffany Springs and apparently the projected interurban can with comparative ease be extended to Leavenworth and connect with an electric railway on the Leavenworth & Topeka route, providing a through route from Kansas City to Topeka north of the Missouri River to Leavenworth. It is said to be possible, however, that the Leavenworth-Topeka line may be used as a western extension of the Kansas City-Western, an interurban now operating between Kansas City and Leavenworth, which Mr. Winner built. The Winner companies have an option on a piece of steam road line between Gower and Trimble, north of Kansas City, which may be used for an extension of the property northward of the Tiffany Springs line.

BOSTON ELEVATED FINANCIAL COMMISSION ORGANIZES

A meeting to organize the special commission to investigate the finances of the Boston (Mass.) Elevated Railway was held on July 21 at the library of the Massachusetts Public Service Commission in Boston. Lieutenant-Governor Calvin Coolidge was named chairman and James B. Noyes of the Boston Transit Commission was elected secretary. Beside these and the full boards of the Public Service and the Transit Commissions the special commission includes in its membership President Wells of the Senate, Speaker Cox of the House, Senators Bates of Boston and Eldridge of Somerville, and Representatives Jewett of Lowell, Newhall of Stoneham, Lawler and J. L. Donovan of Boston. No date for beginning hearings was selected, but these will be inaugurated soon after the company prepares its case. Hearings will be held either in the State House or at the Public Service Commission's offices. The company is working vigorously on the preparation of its case.

Illinois Traction Company, Peoria, Ill.—Bodell & Company, Providence, R. I., have sold \$500,000 of new 6 per cent cumulative guaranteed preferred stock of the Danville, Champaign & Decatur Railway & Light Company. This stock is preferred as to assets and dividends. The dividends are payable quarterly on Jan. 1, April 1, July 1 and Oct. 1. The stock is redeemable as a whole at 110 and the dividend. The stock and the cumulative dividends at the rate of 6 per cent are guaranteed by endorsement by the Illinois Traction Company. After allowing for depreciation the income for the twelve months ended April 30, 1916, available for dividends was more than twenty times the preferred dividend requirements on the basis of the securities outstanding on April 30, 1916.

Martinez & Concord Interurban Railway, Martinez, Cal.—The California Railroad Commission has issued an order approving a trust deed by the Martinez & Concord Interurban Railway to secure an issue of \$200,000 of first mortgage 6 per cent twenty-five-year bonds.

Nashville-Gallatin Interurban Railway, Nashville, Tenn.—Under the plan recently adopted for the reorganization of the Nashville-Gallatin Interurban Railway for the building of an extension from Edenwold on the present line of the company to Springfield, 90 per cent of the bonds and 85 per cent of the stock of the company have been deposited with the First Savings Bank & Trust Company. An outline of the plan for the construction of the extension, which contemplates the organization of a new company, was published in the ELECTRIC RAILWAY JOURNAL of July 1, page 34. It is proposed that a new company be organized that will own the enlarged system. The Nashville-Gallatin Interurban Railway has a capital stock of \$750,000 and has \$600,000 of 5 per cent first mortgage bonds outstanding. To make the proposed extension it is estimated that \$600,000 will be required, and an exchange of stock of the present company for that of the new company and in equal amount is being arranged among the stockholders, and new bonds will be issued to provide funds for the extension and improvements. If the deal is successful the E. W. Clark & Company Management Corporation will have charge of the construction. An agreement is also to be made with the E. W. Clark & Company Management Corporation for the operation of the combined lines.

Toledo Traction, Light & Power Company, Toledo, Ohio.—Cities Service Company has offered to buy the outstanding stocks as represented by the voting trust certificates of Toledo Traction, Light & Power Company, issuing its own securities in payment therefor on the following basis: For each share of Toledo Traction, Light & Power Company preferred stock Cities Service Company will give in exchange one share of Cities Service Company 6 per cent preferred stock. For each share of Toledo Traction, Light & Power Company common stock Cities Service Company will give in exchange 0.35 of a share of 6 per cent preferred stock and 0.07 of a share of common stock of Cities Service Company. The privilege of making these exchanges extends until Sept. 1, 1916, and conversion will be made as of that date. The first dividend to be received on Cities Service Company preferred and common stocks issued through these exchanges will be the dividend payable on Oct. 1. The offer of Cities Service Company to make these exchanges is contingent upon the assent of the holders of a substantial majority of both classes of stock, and the company reserves the right to withdraw the offer unless the holders of 75 per cent of each class of stock assent to this exchange.

Union Electric Company, Dubuque, Iowa.—The Union Electric Company has been succeeded by a new corporation, the Dubuque Electric Company, in which I. C. Elston, Jr., senior member of Elston, Clifford & Company, investment bankers of Chicago and associates, are interested. The officers of the Dubuque Electric Company are as follows: I. C. Elston, Jr., president; H. B. Maynard, Waterloo, Iowa, and C. L. Ayling, Boston, Mass., vice-presidents; Thomas M. Levi, Chicago, Ill., secretary; A. C. Allyn, Chicago, Ill., treasurer. Elston, Clifford & Company, Chicago, Ill., and Baker, Ayling & Young, Boston, Mass., are offering at 97 and interest, yielding 5.45 per cent, \$2,300,000 of first mortgage 5 per cent bonds of the Dubuque Electric Company due June 1, 1925. The bankers are also offering at 94 and the dividend to net 6.38 per cent 7,500 shares of the 6 per cent cumulative preferred stock of the company. The authorized capital of the company consists of \$2,000,000 of common stock, \$2,000,000 of preferred stock and \$6,000,000 of first mortgage 5 per cent bonds. Of these amounts there are outstanding \$600,000 of common stock, \$750,000 of preferred stock and \$2,300,000 of bonds.

Virginia Railway & Power Company, Richmond, Va.—The stockholders of the Virginia Railway & Power Company have approved the plan to absorb by merger the Richmond Railway & Viaduct Company and to increase the authorized preferred stock from \$8,000,000 to \$9,000,000. In the circular to the stockholders calling the meeting Thomas S. Wheelwright, the president of the Virginia Railway &

Power Company, said that the committee to which the matter of the merger was referred recommended that the Richmond Railway & Viaduct Company be merged with and into the Virginia Railway & Power Company. In order to provide for the retirement of the stock and the indebtedness of the Richmond Railway & Viaduct Company held by the Virginia Railway & Power Company and to make provision for its capital charges carried as an indebtedness to the Virginia Railway & Power Company, it was determined to issue \$1,000,000 of preferred stock of the Virginia Railway & Power Company in exchange for stock and indebtedness of the Richmond Railway & Viaduct Company. Under this arrangement the \$1,000,000 of preferred stock so issued will pass into the treasury to be disposed of in the future by the board if it should be found desirable to do so. Mr. Wheelwright said that the plan did not contemplate the present disposition of any of this stock and would not result in any increase of the capital stock of the company in the hands of the public. It will merely increase the treasury stock of the company by \$1,000,000 par value. In the spring of 1915 the properties and franchises of the Richmond & Henrico Railway, consisting of a street railway and toll viaduct in the city of Richmond, were sold under foreclosure proceedings and acquired by the Richmond Railway & Viaduct Company. At the time of the sale the Virginia Railway & Power Company had acquired all of the outstanding bonds and stocks of the Richmond & Henrico Railway and thereby acquired all of the stock of the Richmond Railway & Viaduct Company and advanced to that company the money or securities necessary to pay for its properties and to discharge its capital obligations. The property has since been operated in connection with the system of the Virginia Railway & Power Company.

Visalia (Cal.) Electric Railroad.—The California Railroad Commission has authorized the Visalia Electric Railroad to issue 460 shares of its common stock of a par value of \$100 a share to the Southern Pacific Company.

DIVIDENDS DECLARED

Connecticut Railway & Lighting Company, Bridgeport, Conn., quarterly, 1 per cent, preferred; quarterly, 1 per cent, common.

Illinois Traction Company, Champaign, Ill., quarterly, three-quarters of 1 per cent, common.

Lincoln (Neb.) Traction Company, quarterly, 1½ per cent, preferred.

Massachusetts Consolidated Railways, Greenfield, Mass., quarterly, 1½ per cent, preferred.

Union Street Railway, New Bedford, Mass., quarterly, 2 per cent.

United Power & Transportation Company, Camden, N. J., \$1.43.

ELECTRIC RAILWAY MONTHLY EARNINGS

ATLANTIC SHORE ELECTRIC RAILWAY, SANFORD, ME.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., June, '16	\$28,422	*\$27,222	\$1,200		
1 " " '15	28,455	*30,536	†2,081		

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., June, '16	\$740,848	\$16,520	\$724,328	\$28,858	\$695,470
1 " " '15	294,520	14,023	280,497	40,843	239,653
12 " " '16	6,459,297	203,841	6,255,456	491,479	5,763,977
12 " " '15	3,977,733	148,171	3,829,562	490,000	3,339,562

EL PASO (TEX.) ELECTRIC COMPANY

1m., May, '16	\$84,029	*\$45,025	\$39,004	\$4,671	\$34,333
1 " " '15	71,624	*42,642	28,982	4,187	24,795
12 " " '16	1,036,343	*534,684	501,659	52,913	448,746
12 " " '15	1,004,534	*550,173	454,361	50,337	404,024

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

1m., June, '16	\$438,871	\$268,048	\$170,823	\$49,343	\$121,480
1 " " '15	331,976	200,878	131,098	52,504	78,594
6 " " '16	2,379,499	1,432,575	946,924	306,365	640,559
6 " " '15	1,756,651	1,101,646	655,005	308,465	346,540

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., June, '16	\$853,190	\$511,481	\$341,709	\$140,000	\$201,709
1 " " '15	770,717	490,359	280,358	139,445	140,913
6 " " '16	5,009,415	3,142,623	1,866,792	853,388	1,013,404
6 " " '15	4,604,536	3,035,016	1,569,520	841,482	728,038

*Includes taxes. †Deficit.

Traffic and Transportation

AUTOMOBILISTS STILL RECKLESS

Warnings and Prosecutions on Long Island No Deterrent to Mad Drivers

In a statement made on July 31 by J. A. McCrea, general manager of the Long Island Railroad, emphasis is placed upon the fact that reckless driving of automobiles and other vehicles over Long Island grade crossings is increasing rather than diminishing. Mr. McCrea said:

"It is very difficult to believe that we are making any headway in the prevention of accidents at our grade crossings. We have records of 140 distinct cases of recklessness which have occurred in the last seven months, and if drivers continue to violate the safety rules at this rate for the remainder of the year the record for recklessness in 1916 will exceed that of 1915.

"This year sixty-one automobiles ran through lowered gates and twenty-two horse-drawn vehicles broke through, making a total of eighty-three broken gates. So far this year there have been twelve collisions between trains and automobiles. In some cases automobiles actually ran into the trains. Seven wagons were struck by trains at crossings.

"Last February two persons were killed and there have been seventeen people injured at crossings. In the past seven months some sixteen automobiles have been destroyed or damaged.

"All of the above accidents have happened at crossings where we have crossing watchmen who operate gates or use signals. In addition, we have a record of nineteen drivers of automobiles and wagons who drove over railroad tracks ahead of trains, with apparently no desire to exercise caution. These are cases which have been reported to us by our employees.

"On July 27 the company prosecuted, in the Magistrate's Court at Hempstead, a boy who drove a farm automobile truck into the side of a train. The train did not strike the auto truck, but the truck did hit the middle of the locomotive. This was the first trip for the boy in the new auto truck. The jury found him not guilty, but there is no question that if he had been driving carefully and was competent to control his car, he certainly would not have run against the train. The railroad company can seldom get a conviction in a case of this kind, but it can demonstrate to the public that they cannot run into our trains with impunity, and whenever they do it we propose to make them prove themselves not guilty.

"We have a set of crossing gates at Locust Avenue, Springfield. They are operated day and night, painted with black and white stripes, and protect a perfectly straight piece of highway. Since July 1 these gates have been broken down twice. To the best of our knowledge and belief, there is no let-up in the recklessness that is being shown by a certain class of drivers. They should heed our oft-repeated warning before it is too late."

BUFFALO PASSENGER RECORDS BROKEN

More passengers were handled by the International Railway, Buffalo, N. Y., during the week of July 9 than during any other single week in the company's history. The annual conclave of the Ancient Arabic Order Nobles of the Mystic Shrine, being held in Buffalo, brought to the city more than 500,000 visitors from every section of the United States and Canada and from the islands of the Pacific. Special events were on each day's program and the problem of handling the immense throngs of visitors together with Buffalo's riding population of more than 400,000 was the most difficult ever handled by the company officials. On the night of July 12, when the illuminated parade of the Shriners was held, the police officials estimated there were 700,000 persons along the line of march with more than 40,000 men in line.

From an especially constructed platform built out of his office window in the Ellicott Square Building, eight stories above the street, N. H. Brown, general superintendent of transportation of the International Railway, directed the movement of traffic in every section of the down-town district from the time the parade started to move until after the bulk of the riders were being moved toward their homes. Prior to the parade Mr. Brown had a long conference with his assistants and thirty uniformed supervisors. Each of these men was assigned to a position during the progress of the parade and was in constant communication with Mr. Brown by telephone. In his lofty position eight stories above the street Mr. Brown watched the progress of the parade, directed the movement of cars and received reports from supervisors whom he could not see and who were stationed at distant points along the line of march. Cars were kept moving in the down-town district until a few minutes before the parade reached the section and sixty cars were held in South Main Street bound from points in the north end and forty cars were held in the northerly terminus of the parade, bound for points in the south end of the city. East and west side car lines were connected as through routes whenever possible, and inter-urban cars made their terminus just north of the northerly end of the parade route. Other cars were stored in side streets and at no time was service on east side lines interrupted.

Warning of the immense throngs expected was posted in all carhouses and no platform men were allowed special time off during the week. On the night of the big parade day-run men who are usually relieved between 5.30 and 6 p. m. were not relieved until 3.30 the following morning. Every man was employed on this night and every type of car was pressed into service.

T. W. Connette, superintendent of the Buffalo City lines, and Edward Slant, assistant superintendent, were kept occupied in the street directing the routing of cars on side streets so that there would be a sufficient number of cars on each line.

Figures compiled by Mr. Brown show that during the week a total of 4,265,311 passengers was carried as compared with 3,695,631 for an average during a week in the summer. There were no delays, no congestion before or after the parade and no serious accidents.

NEW YORK TRAFFIC QUICKLY TAXES NEW FACILITIES

Express service on the new third tracks of the elevated railway in New York controlled by the Interborough Rapid Transit Company was established on Jan. 17. The number of passengers carried for six years prior to that time was 294,000,000 in 1910, 301,000,000 in 1911, 304,000,000 in 1912, 307,000,000 in 1913, 311,000,000 in 1914, and 302,000,000 in the year ended June 30, 1915, an average of 303,000,000 a year. In February, 1916, the first full month the new elevated lines were in operation, there was an immediate jump in traffic, which resulted in an increase in passenger receipts over February, 1915, of 7.96 per cent; March had an increase of 8.75 per cent, April 8.23 per cent, May 10.36 per cent and June 7.04 per cent.

Interest on the cost of the new elevated lines was charged to construction until they were put into operation; after that this rent was charged to operating expenses. The amount of the company's 5 per cent bonds issued to provide for the third-tracking improvements placed in service Jan. 17, and for the improvements in the power station and substations of the elevated lines, was \$14,758,000, the interest on which is \$61,491 a month. The increase in operating revenue for February, 1916, was \$136,350; March, \$152,413; April, \$141,536; May, \$165,022, and June, \$11,897.

The significant feature of this increase in traffic on the elevated is that it was not taken from the subway. For the year ended on June 30, during five and one-half months of which the new service was in operation, passenger earnings of the elevated increased \$521,525, or about 3½ per cent over the previous year, while the subway showed an increase of \$1,293,876, or approximately 7½ per cent. Every additional transit facility in New York appears to develop new traffic, while the old lines soon regain what is lost by competition with the new lines and continue to carry a

constantly increasing number of people. This was true when the elevated lines were largely extended in the late seventies; it was true when the subway was opened in 1904, and again when the third tracks on the elevated were brought into service early this year.

Records of the street railways show that in 1904 the receipts from passengers were \$19,415,750, while in 1905, the first full year the subway was in operation, receipts from passengers were \$18,663,605, a decrease of about \$750,000. In just one year, however, the street car lines showed passenger revenues of \$19,530,533, an actual increase of \$100,000 over 1904, before the subway had been opened.

The compilation also shows that during the year ended June 30, 1905, when the subway was first opened, the traffic on the elevated lines fell from 286,000,000 in 1904 to 266,000,000. In 1906 it was 257,000,000; in 1907, 283,000,000; in 1908, 283,000,000, and in 1909, 276,000,000, and in 1910, 294,000,000 passengers, exceeding the traffic carried before the opening of the subway lines.

EFFECT OF RAISING FARES ON MASSACHUSETTS STREET RAILWAYS

In the presentation of evidence in the Bay State Street Railway fare case before the Massachusetts Public Service Commission, the company recently filed an exhibit showing the effect of fare increases on four systems within the State whose rates were permitted to be raised after investigation by the board. On the lines of the Middlesex & Boston Street Railway affected by the increase from a 5-cent to a 6-cent fare, the number of revenue passengers carried decreased 10.6 per cent and the revenue increased 3.1 per cent in the first twelve months following the new rate application, compared with the last twelve months under the old rates. On the Blue Hill Street Railway the passengers carried in ten months increased 19 per cent and the revenue increased 3.0 per cent; on the New Bedford & Onset Street Railway, the number of passengers in eight months fell off 9.4 per cent and the revenue increased 3.3 per cent; and on the Norfolk & Bristol the traffic in 8.5 months decreased 6 per cent and the revenue increased 9.2 per cent. A summary of the exhibit is given in the accompanying table.

RESULTS OF FARE INCREASE, MASSACHUSETTS

	Middlesex & Boston Ry.	Blue Hill St. Ry.	New Bedford & Onset Ry.	Norfolk & Bristol Ry.
Date of increase.....	10/28/14	7/31/15	9/8/15	9/18/15
Period, months.....	12*	10	8	8.5
Revenue passengers:				
Before.....	9,463,093	1,141,868	1,424,046	1,257,720
Since.....	8,454,506	1,358,317	1,290,240	1,182,828
Passenger revenue::				
Before.....	\$475,723.44	\$66,891.90	\$65,552.65	\$58,211.50
Since.....	\$490,679.85	\$68,901.36	\$67,739.90	\$63,596.69
Passenger increase.....	216,449			
Passenger per cent increase.....		19.0		
Passenger decrease.....	1,008,587		133,806	74,892
Passenger per cent decrease.....	10.6		9.4	6.0
Revenue increase.....	\$14,956.41	\$2,009.46	\$2,187.25	\$5,385.19
Revenue per cent increase.....	3.1	3.0	3.3	9.2

*Lines affected by fare increase only: Newton St. Ry. 5 months only.

General increase, 5 cents to 6 cents fare, by authority Massachusetts Public Service Commission.

Car Tax in Kansas City.—The Kansas City (Mo.) Railways and the finance committee of the upper house of the City Council have agreed on a tax of \$50 on each street car used in Kansas City, Mo. The Council had considered an ordinance imposing a tax of \$100. It is said that 560 cars will be taxed this year.

Serious Accident on Queensboro Bridge.—Eighteen persons, three of them women, were injured when two heavy steel cars of the Manhattan & Queens Traction Corporation demolished a small wooden car on the incline of the Long Island approach of the Queensboro Bridge at the beginning of the evening rush hour on Aug. 1.

Suggestions for New Kansas City Director.—Mayor Edwards of Kansas City, Mo., has submitted to the Kansas City Court of Appeals the following names, from among which the court will appoint the city member of the board of directors of the Kansas City Railways, to succeed F. C. Niles: Frederick D. Whiting, vice-president and general manager of the City Ice & Storage Company; Charles L.

Merry, president of the Merry Optical Company; Frank J. Moss, president of the American Sash & Door Company.

Coatless Trainmen in St. Louis.—Bruce Cameron, superintendent of transportation of the United Railways, St. Louis, Mo., announced recently that motormen and conductors of the company would be permitted to abandon their coats for comfort during August. He explained that before the opening of the summer season, the United Railways had contemplated substituting for the coat a uniform shirtwaist to be worn by the carmen, but had been unable to obtain enough material of any one kind because of the war. The present "drive" of summer convinced officers of the company that coats were all but intolerable.

Service Complaint in St. Louis.—Members of the Civic League of St. Louis, Mo., have filed a new complaint with the Public Service Commission of Missouri in the matter of alleged overcrowding of cars of the United Railways. The commission in the new complaint is asked to check up the number of passengers carried and to take steps to enforce its order issued about a year ago. Richard McCulloch, president and general manager of the company, says the company is complying with the order of the commission, and should it be found that the service is not what it should be, it is for the commission to change the order.

Birmingham's Attractions Advertised.—The Birmingham Railway, Light & Power Company, Birmingham, Ala., has issued an attractive folder of Birmingham, which it describes as "The City of Natural Beauty, Good Climate, Healthful Conditions, Hospitable People, and a Pay Roll of \$1,000,000 a Week." The folder contains a map of the lines of the company, and points out that these lines serve 220,000 people in the Birmingham and Bessemer districts. Many photographs of interesting spots in Birmingham, including the skyline, East Lake, West Lake, Avondale and several of the local clubs are reproduced in the folder. A list of places of interest along the railway lines operated by the company also is given.

Statistics of Surface Car Delays in New York.—According to a report just compiled by the New York (N. Y.) Railways, vehicles getting in the way of street cars, fires and other obstructions beyond the control of the company, delayed street cars 15,349 times for five minutes or more during the year ended June 30, 1916. This was 64 per cent of all detentions. During the year street cars were delayed 23,824 times for five minutes or longer. These detentions, many of which held up long lines of cars, cost 197,106 minutes, or 137 days. Vehicles blocked the cars 7495 times, when the detention lasted five minutes or more. In actual time these delays consumed 62,727 minutes, or about forty-four days. Two thousand seven hundred and fifty-seven detentions were due to accidents of various kinds, 3365 to car troubles, 1075 to track conditions, and 372 to power trouble. The cars of the New York Railways covered altogether 24,360,986 miles, so that for every delay for which the company was in any way responsible, the cars of the city covered 4500 miles.

Committee to Investigate Seattle Jitneys.—A committee of forty citizens of Seattle, Wash., consisting of presidents of the improvement clubs of the city, has been appointed to consider thoroughly the transportation problem of the city, and a smaller committee of five has been delegated to confer with the City Council at a meeting of representatives of the improvement clubs of the city at the Chamber of Commerce rooms in the Central Building. Those who will present the matter of jitney and street railway transportation to the City Council and urge a postponement of a final decision relative to jitney traffic in the city until investigations may be made are A. V. Pouillion, L. Frank Brown, D. M. Taggart, J. Payne and E. J. Wright. L. Frank Brown said: "The traffic situation is the most important matter facing the city body politic. It is more important than the situation on the water front, for it concerns more persons. The irresponsibility of the jitney service and its irregularity are considerations that must be faced at once. The resolution which the committee of five was to present to the City Council is as follows: Resolved, That transportation under just and adequate regulation is essential to the properly developed community, and therefore we urge the City Council to regulate the jitney service of Seattle, after deliberate consideration."

Personal Mention

James S. Clark, auditor of the Marion & Bluffton Traction Company, Bluffton, Ind., has been elected secretary and acting general manager of the Marion & Bluffton Traction Company, to succeed W. A. Patton, resigned.

J. H. Leary, who has been superintendent of transportation for the Oakland, Antioch & Eastern Railroad, Oakland, Cal., for the last three years, has resigned to become assistant superintendent of transportation of the Western Pacific Railroad, with headquarters at Oakland.

George A. Chapman has been appointed assistant general claim attorney of the Detroit (Mich.) United Lines with office in Detroit. Mr. Chapman has been claim agent for the Pere Marquette Railroad for the last eight years with headquarters at Saginaw, Mich. Prior to that time he was connected with the claim department of the Cincinnati, Hamilton & Dayton Railroad at Dayton, Ohio.

W. R. McCann, after serving for a year as private secretary to Commissioner Walter A. Shaw, has been appointed by the State Public Utilities Commission of Illinois as its valuation engineer. Prior to going with the Illinois Commission, Mr. McCann spent several years on the Panama canal work, in charge of electrical design and construction, reporting to Edward Schildhauer, electrical and mechanical engineer.

W. C. Callaghan has been appointed general manager with offices at Norwich, Conn., for the J. G. White Management Corporation, which has taken over the management of the operating department of the Shore Line Electric Railway. Since 1913 Mr. Callaghan has been superintendent of the Helena Light & Railway Company, Helena, Mont. Before that he was superintendent of transportation of the city lines of the New York State Railways (Rochester Lines).

John I. Mange has been elected vice-president of the J. G. White Management Corporation, New York, N. Y. Mr. Mange has been associated with the J. G. White Management Corporation since 1912, at which time he was elected vice-president of the Associated Gas & Electric Company, a holding company of electric and gas properties in New York, Kentucky, Ohio and Tennessee, managed by the J. G. White Management Corporation. Mr. Mange was born in Pembroke, Me., in 1876. He attended the public schools in Pembroke and in Kingston, Mass., and was graduated in 1899 from Tufts College, with the degree of Bachelor of Science. He has been connected at various times with the following companies: Charleston Consolidated Railway, Gas & Electric Company, at Charleston, S. C., as chief electrician; General Electric Company, Switchboard Department, at Schenectady, N. Y.; Lachine Rapids Hydraulic & Land Company, at Montreal, as electrical engineer; Oneonta, Cooperstown & Richfield Springs Railway, at Hartwick, N. Y., as electrical engineer and superintendent; Plattsburgh Light, Heat & Power Company, at Plattsburgh, N. Y., as secretary and superintendent; Watertown Light, Heat & Power Company, at Watertown, N. Y., as general manager.



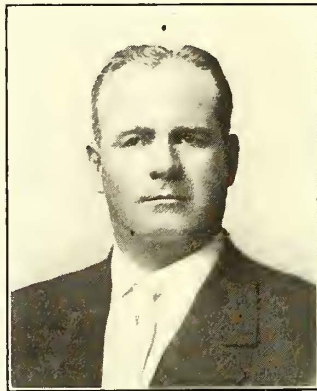
J. I. MANGE

T. G. Kelly, who has been appointed superintendent of transportation of the Fort Smith Light & Traction Company, Fort Smith, Ark., entered electric railway work with the United Railroads, San Francisco, Cal., in April, 1908. He worked for the company for some time as a motorman and then went to Fort Smith, where he entered the service of the

Fort Smith Light & Traction Company as a motorman. On July 10, 1911, he was promoted to inspector. He also acted as trainmaster and assistant claim agent of the company.

Samuel Anderson, who has been general manager of the Shore Line Electric Railway, Norwich, Conn., has been appointed assistant to the president of the company. Mr. Anderson entered railroad work in 1883 with the New England Car Service Association. At one time he was superintendent of the electric railway through Worcester, Mass., from Connecticut and of the Worcester & South-bridge line. He was also for a time superintendent of the Connecticut Company's lines between Central Village and the Massachusetts line. Later he was made superintendent of the Connecticut Company's lines in New London and Norwich and to Central Village. These properties are now part of the Shore Line Electric Railway system.

W. R. Armstrong, general manager and chief engineer of the Salt Lake & Utah Railroad, Salt Lake City, Utah, has accepted the position of maintenance engineer on the Union Pacific Railroad, in



W. R. ARMSTRONG

charge of the maintenance of roadway and structures of all operated lines of the company. Mr. Armstrong has held the position of general manager and chief engineer of the Salt Lake & Utah Railroad since May, 1913, at which time that company was just inaugurating the construction of its line. He was graduated from the University of Kansas in 1890, and started as chainman on an engineering corps of the Kansas City Southern Railroad in June, 1892, and worked through various positions in the engineering department of that company to that of superintendent of construction in 1895. On Jan. 1, 1898, he was made division superintendent in the operating department of the same line, which place he held until February, 1900, when he went with the newly-organized Kansas City, Mexico & Orient Railroad as locating engineer. In 1905 he took employment with the Oregon Short Line Railroad, and was assigned by that company to build the Yellowstone Park branch from St. Anthony, Idaho, to the park, and later he constructed a branch for the Northwestern Railway from Huntington, Ore., down Snake River Canyon to Homestead. In November, 1908, he was made superintendent in the operating department of the Montana division of the Oregon Short Line Railroad, which position he resigned to go with the Salt Lake & Utah Railroad. A farewell luncheon was tendered to Mr. Armstrong by the Utah Electric Club at the Newhouse Hotel on July 27. Julian Bamberger, president of the Salt Lake & Oregon Railroad, presented Mr. Armstrong, on behalf of the club, a set of gold cuff links. W. C. Orem, president of the Salt Lake & Utah Railroad, expressed his appreciation of the faithful and efficient service which Mr. Armstrong had rendered his company. He announces that for the present no successor to Mr. Armstrong as manager will be appointed. F. D. Nauman, division engineer of the Southern Pacific Railroad, with headquarters at San Francisco, has been appointed superintendent and chief engineer. The duties of general manager will be assumed by Mr. Orem.

OBITUARY

H. S. Manning, connected with the sales department of the Puget Sound Traction, Light & Power Company, Seattle, Wash., for thirteen years, died at his home in that city on July, 15 at the age of fifty-one years, from cerebrospinal meningitis. Mr. Manning was born in Salem, Mass., and was graduated from the Massachusetts Institute of Technology. He was with the General Electric Company in Chicago for several years, but in 1897 participated in the Klondike rush and remained in Alaska for five years before returning to Seattle.

Construction News

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

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

RECENT INCORPORATIONS

Womelsdorf, Richland & Myerstown Street Railway, Womelsdorf, Pa.—Chartered to construct a line between Womelsdorf and Myerstown, via Newmanstown, Sheridan and Richland, 8 miles, connecting at both ends with the lines of the Reading Transit & Light Company. Incorporators: L. R. Valentine and J. H. Mays, Womelsdorf; A. C. Klopp, Sheridan; John L. Shultz and Frank Rader, Newmanstown. [May 13, '16.]

FRANCHISES

Newport, Ky.—The South Covington & Cincinnati Traction Company has received a twenty-year franchise in Newport. The company will pay the city \$6,000 a year as rental for use of the city streets, and proposes to put an additional number of cars on its lines. The company agrees to pave between the tracks and 18 in. on the outside.

Buffalo, N. Y.—Practically no opposition developed at the hearing before the City Council on the application of the International Railway for a franchise to lay tracks and operate cars through Franklin Street from Chippewa to Allen Streets, ½ mile. Porter Norton, of counsel for the railway, submitted a model franchise whereby the company will start work on the improvement within a year and have the line in operation in three years. The franchise will be submitted at the next general election.

Tonawanda, N. Y.—The International Railway has received a one-year's extension of time on its franchise in which to complete its new fast service line between Buffalo and Niagara Falls through the city of Tonawanda. Under the amendment granted by the Tonawanda City Council the line must be in operation by Dec. 31, 1917.

Cleveland, Ohio.—The Cleveland Railway has received a franchise from the Cuyahoga County Commissioners for a single-track extension on Pearl Road from the city limits to Parma Road. Permission for double track will be given after the completion of the sewers. The extension must be completed within one year.

Blackwell, Okla.—The Oklahoma Railway has asked the Council of Blackwell for a franchise to construct a line from the American Metal Company's smelter to the business district and thence to the oil field northeast.

TRACK AND ROADWAY

Gadsden, Bellevue & Lookout Mountain Railway, Gadsden, Ala.—Work has been begun by this company on the reconstruction of its tracks on Tuscaloosa Avenue to conform to the street grade.

Visalia Electric Railroad, Exeter, Cal.—Application has been made to Commissioner Thelan of the Railroad Commission of California by the Visalia Electric Railroad to build a line from Visalia to Porterville, Strathmore, Lindsey, El Mirado and Ducor, 46 miles. The first construction will be to Porterville. The application asks permission to change the articles of incorporation and to release about \$50,000 worth of stock from the \$1,000,000 stock already authorized by the Commission. This \$50,000 is for the purpose of paying the preliminary expenses.

Pacific Electric Railway, Los Angeles, Cal.—Work has been begun by this company reconstructing its track on Garey Avenue from Bertle to Orange Grove Avenue, Pomona. Standard weight rails will be laid on creosoted ties. The work will cost about \$20,000.

Martinez & Concord Interurban Railway, Martinez, Cal.—The Railroad Commission of California has approved a trust deed by the Martinez & Concord Interurban Railway to secure an issue of \$200,000 of first mortgage 6 per cent twenty-five-year bonds. The permission to issue these securities was given by the Commission May 13. [July 22, '16.]

Pekin (Ill.) Railway.—Repairs are being made to this company's tracks on Washington Avenue to the end of the line in the Rosedale Addition.

Bay State Street Railway, Boston, Mass.—The Cedar Street line of this company has been abandoned from Eleventh Avenue to White Street.

Boston (Mass.) Elevated Railway.—The Public Service Commission of Massachusetts has authorized the construction of a new bridge over the tracks of the Boston & Albany Railroad at Brookline Avenue, near Fenway Park. The city of Boston, the Boston & Albany Railroad and the Boston Elevated Railway will pay a part of the cost and work will be begun as soon as the proportionate amount is determined.

Springfield (Mass.) Street Railway.—Work has been begun by the Springfield Street Railway on the construction of 3100 ft. of double track on Park, River and Baldwin Streets, West Springfield. The engineering department of the company has been instructed to prepare plans and descriptions immediately for the Carew Street extension and a petition for a franchise will soon be submitted to the City Council. The extension will be built next year.

Kansas City (Mo.) Railways.—Plans for the Troost Avenue bridge over Brush Creek have been completed by the city engineer and the contract may be let as soon as a decision is reached as to how the expense will be proportioned between the city and the railway company.

Interborough Rapid Transit Company, New York, N. Y.—Inquiries have been sent out by the Interborough Rapid Transit Company for 21,000 rail bonds, including a large quantity of contact rail bonds for use on 150-lb. rail, and a number of track bonds.

New York & Queens County Railway, New York, N. Y.—Borough President Connelly of Queens, at a hearing before the Public Service Commission for the First District of New York on July 26, opposed the application of the New York & Queens County Railway for an extension of time to discontinue its service between Corona and Flushing. This service, under a permit issued by the commission, was stopped over a year ago on account of the filling in of the meadows through which the cars were operated on a trestle, an undertaking which is still in progress, and which, according to the company, cannot be completed for another twelve months. Meanwhile the new tracks cannot be laid down. The commission ordered the company to construct a temporary detour road, provided it could secure a permit from the Board of Estimate.

Piedmont & Northern Railway, Charlotte, N. C.—This Company will reconstruct its bridges damaged by the recent flood.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—A new right-of-way has been secured in and near Berea by the Cleveland, Southwestern & Columbus Railway that will enable it to reduce its running time to all points south of that town ten minutes. By practically skirting the town several stops will be eliminated. Its franchise through the town expires in December and the plans provide for the completion of the new tracks by that date.

Columbus, Urbana & Western Electric Railway, Columbus, Ohio.—This company reports that it is opening a new park at Fishingers' Bridge, north of Storage Dam.

***Blackwell, Okla.**—Plans are being considered by a Chicago concern headed by George W. Knox, general manager of the Oklahoma Railway, for the construction of an electric line in Blackwell.

London & Port Stanley Railway, London, Ont.—The London Railway Commission plans to double-track its electric railway to Port Stanley, 30 miles, and install new equipment to cost about \$500,000.

Canadian Northern Railway, Toronto, Ont.—It is reported that plans are being considered to electrify the Grand Beach line of this company.

Roseburg & Eastern Railroad, Roseburg, Ore.—R. L. Whipple, City Recorder of Roseburg, reports that the proposed line to be built by the municipality will be operated by steam. [July 22, '16.]

Beaver Valley Traction Company, New Brighton, Pa.—This company reports that it expects to reconstruct 3800 ft. of track.

Womelsdorf, Richland & Myerstown Street Railway, Womelsdorf, Pa.—Work will be begun by this company within the next month on the construction of its proposed line between Womelsdorf and Myerstown, and it is expected that the line will be completed in about a year at a cost of about \$200,000. It will be a high-speed line and will be constructed mostly through private right-of-way. L. R. Valentine, Womelsdorf, president. [May 13, '16.]

Saskatoon (Sask.) Municipal Railway.—Bids will be received by the Board of Highway Commissioners, Regina, Sask., until Aug. 7, for the paving of the concrete traffic bridge over the Saskatchewan River at Twenty-fifth Street, Saskatoon. In conjunction with the paving of the bridge, separate bids will be received on behalf of the City of Saskatoon for the construction of street car tracks and the erection of trolley standards for the car line.

Nashville & Eastern Electric Railway, Smithville, Tenn.—A proposed bond issue of \$150,000 to aid in the construction of the proposed Nashville & Eastern Electric Railway is to be voted on in Wilson County on Aug. 24. Charles Edwards, Smithville, is interested. [April 1, '16.]

Cleburne (Tex.) Traction Company.—Operation has been resumed by this company in Cleburne.

San Antonio (Tex.) Traction Company.—This company has begun track improvements and paving to cost about \$100,000.

Tacoma Railway & Power Company, Tacoma, Wash.—L. H. Bean, manager of the Tacoma Railway & Power Company, reports the old Steilacoom carline, which has been operated by the Tacoma Railway & Power Company between Tacoma and Steilacoom for twenty-five years, was abandoned on July 26. Communication with Steilacoom will be had by means of a new line running from the hospital at Fort Steilacoom to the Sound. Since July 26 the Steilacoom cars, which formerly ran from Eleventh and K Streets, have been operated over the American Lake line to the Steilacoom Junction, and from there to Steilacoom over the new line. Mr. Bean states the town of Steilacoom can be better served by the new line, which avoids a steep hill just east of the town, and which operates through a more thickly settled territory. The old Steilacoom line was constructed in 1889. The portion abandoned by the Tacoma Railway & Power Company is approximately 6½ miles long.

SHOPS AND BUILDINGS

International Railway, Buffalo, N. Y.—This company's carhouse at Cold Springs was recently damaged by fire, in which sixteen cars were destroyed. Work of repairing the carhouse is being handled by the company. Further reference to the loss is made on page 246 of this issue.

Paris (Tex.) Transit Company.—It is reported that this company will construct a steel carhouse at Warlick Park.

POWER HOUSES AND SUBSTATIONS

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—This company is building a new 7500-kw. plant in Canon City. Orders have been placed for all material.

Louisville (Ky.) Railway.—The storage battery at the old Campbell Street power plant of the Louisville Railway is being dismantled. Before the new High Street power house of the company was put into service the storage battery was utilized for peak loads and in emergencies.

Omaha & Lincoln Railway & Light Company, Omaha, Neb.—This company has purchased the electric transmission line extending from Louisville to Plattsmouth, where a line crosses the Missouri River, joining with the Mills County Company, enabling the Omaha & Lincoln Railway & Light Company to transmit energy to Glenwood, Iowa, via Plattsmouth.

Ohio Electric Railway, Springfield, Ohio.—This company has been awarded the contract for street lighting in South Zanesville.

Beaver Valley Traction Company, New Brighton, Pa.—A report from this company states that it expects to construct two substations.

Appalachian Power Company, Bluefield, W. Va.—This company reports that it expects to place an order this fall for one 500-kw. motor generator set.

Manufactures and Supplies

REPAIR SHOP APPLIANCES IN GREAT DEMAND

The reports from various manufacturers of repair shop equipment indicate that electric railway repair shops are exceedingly busy and that electric railways are now preparing for future needs in this department. As is the case with most manufacturers, these companies are hindered in making deliveries by the scarcity of raw material. Many companies advise that they are unable to secure enough raw material to complete orders received by them. One manufacturer reports that when he does receive shipments of steel, it is in lengths double that received in normal times before the war, and as is apparent, the cost of handling is greatly increased.

One of the leading manufacturers of repair shop equipment and carhouse supplies, in a recent interview, stated that business had increased 50 per cent over the corresponding period of last year, although this company found it necessary to raise prices 20 per cent, due to the increased cost of raw material and labor. It is expected that this increased business will continue until the end of the year and possibly may extend into 1917.

ROLLING STOCK

Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa., will build one line car during the next six months.

Appalachian Power Company, Railway Department, Bluefield, W. Va., is in the market for one all-steel single-truck pay-as-you-enter car.

Beaver Valley Traction Company, New Brighton, Pa., is in the market for twelve double-truck side entrance cars of the Pittsburgh type.

Anaconda Copper Mining Company, Electric Light and Railway Department, Anaconda, Mont., is in the market for two motor cars and one trail car.

Nashville Railway & Light Company, Nashville, Tenn., is building nine double-truck cars which it expects to place in service about the middle of October.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has ordered one 36 ft. overhead line construction car from the Niles Car & Manufacturing Company.

International Railway, Buffalo, N. Y., lost sixteen cars in a fire which swept the north wing of the Cold Springs carhouse. The loss is estimated at \$106,000. Thirteen of the cars destroyed were near-side, pay-as-you-enter type, valued at approximately \$6,000 each; two funeral cars, valued at \$10,000 each, and a private car, "Tatanka," used by President E. G. Connette, valued at \$9,000. The order for the replacement of the funeral cars has been placed with The J. G. Brill Company. The order for new near-side cars has not been late.

TRADE NOTES

Roller-Smith Company, New York, N. Y., has appointed Eugene F. Lenoir, Franklin Bank Building, Philadelphia, Pa., to handle its products in the Philadelphia territory.

Railway Improvement Company, New York, N. Y., has received an order for 208 type No. 2 straps for the thirteen cars of the Toronto Civic Railway being built by the Preston Car & Coach Company.

Pyrene Manufacturing Company, New York, N. Y., has appointed T. F. Flanagan as general sales and advertising manager. Mr. Flanagan was assistant to C. Louis Allen, who held this position until a few months ago, when he was elected president of the company.

Drew Electric & Manufacturing Company, Indianapolis, Ind., has appointed R. S. Wakefield, 1312 Busch Bldg., Dallas, Texas, as selling agent for its electric railway, light, power and gas materials in the state of Texas. C. E. A. Carr, Toronto, Ont., has been appointed in like capacity to cover the provinces of Toronto and Quebec.

General Electric Company, Schenectady, N. Y., on Aug. 1, paid out more than \$550,000 as the first wage dividend to 19,000 employees who had worked for the company for at least five years and who received a sum equivalent to 5 per cent of their earnings for the six months ending June 30. The second dividend covering the last six months of 1916 will be paid on or before Feb. 1, 1917.

Curtain Supply Company, Chicago, Ill., reports the receipt of orders for curtains with ring 88 fixtures and Rex rollers for six interurban and ten city cars of the Schenectady Railway and sixteen city cars of the Binghamton Railway which are being built by the Cincinnati Car Company, and ring 89 fixtures for eight cars of the Pottstown & Phoenixville Railway being built by The J. G. Brill Company.

Halsey, Stuart & Company, Chicago, Ill., have succeeded N. W. Halsey & Company in conducting the investment banking business of the Halsey organization in the Central West. The business under the new name will be conducted under the same management and with the same organization as heretofore. The Chicago business was founded by the late N. W. Halsey in 1903 and for several years has been conducted by H. L. Stuart, who is president of Halsey, Stuart & Company. The New York house of N. W. Halsey & Company, which previously has been a separate organization, will continue to operate under the old name.

SIGNAL COMPANIES MAKE CROSS-LICENSING AGREEMENT

The Union Switch & Signal Company, General Railway Signal Company, Federal Signal Company and Hall Switch & Signal Company have entered into a cross-licensing agreement under the several patents, applications for patents and inventions owned by them respectively, copies of which agreement have been filed with the Department of Justice and the Federal Trade Commission. The purpose of the agreement is to end all patent litigation between the several companies and to put each in a position to make the safest and most effective types of signaling and interlocking systems and apparatus. By the production of such systems and apparatus the interests of the manufacturers, railroads and the traveling public will be promoted.

ELECTRIC HEATER ORDERS OF THE PETER SMITH HEATER COMPANY

Within the past few months the Peter Smith Heater Company, Detroit, Mich., has sold an extraordinary number of its new electric heaters. The New York Municipal Railway heads the list with 6000 two-coil panel type heaters for rapid transit cars. The Bay State Street Railway, Boston, Mass., has ordered 3200 truss plank heaters, 1600 panel heaters, 800 cab heaters and 200 automatic switches with thermostats for 200 cars to go into combined city and cross-country service. The Boston Elevated Railway has ordered 200 double coil panel heaters for the vestibules of fifty additional articulated cars and 2800 cross-seat and 400 panel heaters for 100 new surface cars. The Connecticut Company has ordered 1200 cross-seat heaters, 400 truss plank heaters, 100 automatic switches and thermostats for its latest 100 cars.

Other orders follow: Tri-City Railway, 380 cross-seat and fifty-two panel heaters for twenty present and three new cars, together with a separate order for fifty-eight platform heaters, five of which are to operate in 1200-volt service; Philadelphia & Wilmington Electric Railway, 496 truss plank heaters for thirty-one cars; Mahoning & Shenango Railway & Light Company, 340 double-coil truss plank heaters, ten automatic switches and thermostats for ten new trail cars; Hershey Transit Company, thirty-two cross-seat heaters for two cars; Iowa & Illinois Railway, thirty-two cross-seat heaters, eight panel heaters, four automatic switches and thermostats for four cars; Pottstown & Phoenixville Railway, sixty-four truss plank heaters and sixteen platform heaters for eight cars; Jersey Central Traction Company, seventy-eight truss plank heaters and twelve platform heaters for six cars; Chambersburg, Greencastle & Waynesboro Electric Railway, forty-four cross-seat heaters for two cars; Westchester Street Railway, thirty-two cross-seat and four platform heaters for two cars; Monongahela Valley Traction Company, sixty-four panel heaters for eight cars; Rutland Railway & Light Company, sixteen cross-seat heaters for one car.