

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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Cleveland Keeps Down Cost of Track Construction

IN THE issue of this paper for Jan. 8, 1920, the news columns carried an announcement of a 20 per cent cut on Jan. 1 in the wages of track laborers in Cleveland, together with a 15 per cent cut for shopmen to be made on Feb. 1. These are among the first, if not the first, substantial cuts in wages of track and shop men to be made in the electric railway industry. Other industries recently have been forced to cut wages or shut up shops, and in numerous instances employees of late have asked for wage cuts in preference to idleness.

Were it not for the gains in cost reductions incidental to the introduction of machinery in the track construction field it is doubtful whether the street railways could have borne even as well as they have the remarkable wage rise in track labor, not to speak of other labor. Something would have happened long ago. Reference need only be made to C. H. Clark's article in the issue of this paper for Feb. 21, 1920, in order to get a clear idea of the value of "machine-made" track as a means of keeping down costs.

The Cleveland wage cut may be taken as indicative of the arrival of the time when electric railways must fall in line with other industries and get back toward pre-war "normalcy" in their payroll costs if they expect to enter upon the road to financial recovery. Cleveland has also shown the way heretofore in adopting machinery to offset rising costs of track construction. With renewed efforts there may be expected still greater cost reductions through the use of more and better machinery, and the latter, combined with wage reductions, introduced as conditions warrant, should go a long way toward putting our utilities upon their feet.

Electric Railway Work Ought to Appeal to Young Engineers

WHILE construction is at a low ebb on electric railway properties at the moment, there is still presented a wealth of interesting problems of an engineering character. Assuming for the purpose of argument (and only for this purpose, mind you, for it isn't so) that the pay of engineers in this field is what it ought to be, it will be worth while to consider the attractions other than financial of the electric railway field for this class of trained men. Electric railway transportation will always rest on a civil-mechanical-electrical engineering foundation. It must do so as long as rolling-stock moves over track structure, impelled by power mechanically produced and electrically transmitted.

One might conclude that by this time all of the essential electric railway engineering problems had been solved. Far from it! New ideas in car design, track structure, paving, shop practice, power generation, power transmission, etc., are being evolved now as vigorously as ever, although not in such sensational fashion as of yore. This means that fresh engineering talent

must be enlisted. Money is scarce in this field, of course, but this fact is in itself a challenge to the real engineer, whose function and joy it is to produce results promptly with the facilities that he can get. Any fool can get results if he has funds and time enough.

Finally, engineering can be the stepping stone to administrative position, if the engineer is gifted with the proper qualities. An increasing number of superintendents, managers and better are fundamentally engineers. May their tribe increase!

Swat the Swindler and Save the People's Money

THE week that concludes today has been called Franklin week because it was hoped thereby to revive interest in the homely but wise maxims on the desirability of thrift, long associated with the name of Benjamin Franklin. The proverbs of Poor Richard are especially worth remembering today when the world is endeavoring to recover from the most severe upset in its history and when on each member of society there rests the duty of repairing so far as he can the havoc wrought by war.

But the thrift movement means more than simply to save money. It includes also the wise investment of the amounts saved, and the need for intelligence in investment is shown by the recent estimate that \$250,000,000 is lost by the public each year in bogus stock schemes. By a coincidence this sum just about equals the requirements of the electric roads in 1921 for refunding their maturing obligations.

It is a sad commentary on the gullibility of human nature that fraudulent schemers can get money where legitimate enterprises cannot secure it, or can secure it only with great difficulty. This leads up to the questions (1) how can this stream of investment be turned into legitimate channels and (2) how much of it could be attracted to investment in utilities. If the present thrift movement is at all extended the sum thus to be protected from fraudulent promoters will be considerably more than \$250,000,000.

As for the first question, education and more rigorous prosecution of the swindlers are the best answers. Most states now have blue sky laws as a basis for prosecution. Education on the fundamental principles of investment should also be conducted, and here the local banks and such organizations as the Y. M. C. A. and even the public schools could help. In such national movements no particular form of permanent investment could be singled out as being preferable. Nevertheless, while the utilities would indirectly profit by any increase in investment funds, their securities would probably often be chosen for investments of the kind under consideration. For this purpose they have the advantage that they are a well-known form of corporation whose property is visible, that they supply a necessity and that their finances and capitalization are supervised to a con-

siderable extent by the state. Moreover, at present interest rates their securities can be offered at very attractive prices. The return may not be as high as that promised by fraudulent promoters who have no intention of paying back anything, but it is sufficient, especially in view of the probability of increases in security prices, to constitute a "real bargain."

Some utilities, especially among the lighting companies, have been successful in selling stock, usually preferred stock, over the counter, and it is hoped that others will do the same. Such securities will have to be well advertised and put out in such denominations as will appeal to the small investor. Some electric railways may think that a plan of this kind for selling securities is not dignified, but they must bear in mind that they are endeavoring to reach a different class of security holder than in the past. They have a good thing, and they ought to know how to sell it.

Indiana Utilities Unite for Common Task

REPRESENTATIVES from all classes of public utilities in Indiana gathered in Indianapolis on Jan. 13 for the first annual meeting of the Indiana Public Utilities Association. This association was formed a year ago to finance and sponsor the Indiana Committee on Public Utility Information as a means of promoting better public relations. The meeting just held was simply an expansion of this original object, for it has been realized that much remains to be done in educating the utility operators themselves in the necessity for educating the public, and in how to go about it.

Planned with this object in view, the first meeting proved to be a splendid success. The attendance was large and the addresses pertinent and very interesting. Many utility operators went back home with a new conception of their obligations to the public, a fuller realization of why the public has not understood them and a better understanding of what activities and policies hold promise of restoring lost confidence. The result of this awakening of all classes of utilities to their common task should be a considerable uplifting of the public relations situation in Indiana during the next year.

One of the outstanding addresses of the meeting was that by E. K. Hall, a prominent telephone man. It appears in part elsewhere in this issue. Significant among his thoughts were these:

The utilities have only recently come to realize that it is service they are selling and not telephone instruments, lamps, etc. The mistakes made during the development of the art have been corrected and fully atoned for. With this done, the public should be interested now in making and keeping the utilities strong enough to do their job; in other words, we are ready to enter the second era of regulation. The only thing against which the public now needs to guard is too low rates. Within the fraternity it is the duty of the utilities to take to task any utility company not playing fair and square with the public. Every company must first be deserving of sympathetic consideration before seeking favorable public opinion. But deserving this, it is the duty of the utilities to expose crank politicians who do not represent the will of the people when they deride the utilities. And finally, utility men should stop sobbing and apologizing and should actively take the offensive.

A Cheering Example of Co-operation in New Jersey

THE action of the platform men of the Public Service Railway in initiating a proposition to help the company in meeting the present crisis is worthy of more than passing notice. What the men did was explained briefly in last week's issue of this paper. In a word, they proposed that their basic day be ten hours with relief for meals, in place of nine hours without relief, and that the schedules be so arranged as to minimize idle time. The net result to the company is that more employees are available to man cars during the rush hours when they are most needed and that overtime pay is minimized. As for the men, a few of them receive less overtime wages, but the pay is more uniform for actual platform work. Incidentally but very important is the fact that by their voluntary action, taken as a union local, the men showed a fine desire to help the company management solve the jitney and other pressing problems now confronting it.

An understanding of the background of the Public Service Railway labor situation is necessary to a proper appraisal of the present pleasant incident. To go way back before the war, it will be remembered that the relations of men and management on this property were then very satisfactory. There was a large proportion of "veterans" among the men and the whole force was on amicable terms with the men higher up.

Then came the cataclysm of 1917 with its demand on the country's citizenry for men for war service. This demand took 75 per cent of the Public Service platform men, naturally those most virile and vigorous. The men who remained were loyal but, by virtue of their age, less aggressive. New recruits were secured, but many were irresponsible and transient; the annual turnover reached 200 per cent or more. The new men were naturally not acquainted with the traditions of the company and included some agitators. Together they overwhelmed the veterans; they secured the backing of the National War Labor Board in unionizing the property and there was a short strike.

But that was nearly three years ago and largely the outcome of conditions brought about by the war. The time intervening since the signing of the armistice has been employed by men and managers in developing a mutual understanding. The older men held the leadership in the union from the start, but for a time they were outvoted by the newcomers, who had no conception of the job of railroading. Gradually the more experienced men came into their rightful control and the newcomers settled down really to learning the business.

In the meantime the jitney menace became a reality. The men came to realize that their occupation, the duties of which they like and the stability of which they appreciate, was threatened by this competition. This conviction plus the gradual restoration of normal working conditions on the property impelled the recent action. And the other employees of the company have shown the same spirit. The shopmen voluntarily reduced their piecework rates some weeks ago and the supervisors added an hour to their day's work without compulsion.

The crux of this whole matter of intra-company relations is a mutual spirit of sympathy. Companies as such cannot be sympathetic, but managers and men can. It is only by honest regard by each for the other's welfare that collective bargaining can succeed. Before the war Public Service was a property where informal bargaining was the means of settling impending disagreements.

Superintendents and managers were in close touch with the men and appreciated their point of view. Such relations take time for development; as was previously explained, the war completely upset them in this case. They are now happily being restored, and the union local is taking a lot of the responsibility for restoring them.

Chicago's \$180,000 Traction Report a Political Document

ANOTHER commission report on Chicago's local transportation problem is a matter of history. For an expenditure of \$180,000, the people of Chicago have received a fifty-page report which assures his Honor the Mayor that his plan for "people's ownership and 5-cent fares" is not only feasible and practical but necessary as the only solution of the tangle, and contains a draft of the enabling legislation necessary before people's ownership can be had. The writing of this proposed law probably would require two or three days' time of an able lawyer, but aside from that the report as presented to the City Council could have been written with equal value in a half day's time by any good newspaper reporter who knew the Mayor's wishes and was willing to give him *carte blanche*. True, an engineering staff was organized and it accumulated a great mass of information, plans and data, but its value is doubtful, for the commissioners decided (after spending a good portion of the \$180,000 total for engineering expense) that they would omit from their report "this non-essential mass of detail." And in another place the report informs the reader that the commissioners "have borne in mind that the building of a new system of transportation . . . will of necessity be an evolution in practice rather than a theoretical creation," and furthermore that "it will be for the trustees [of the proposed Transportation District] to determine what is the best at that time and to build their system accordingly."

Having thus disposed of the work done by the large engineering staff as of no consequence now and of no value in future to the new trustees, who must be left free to work out their own system, the earlier statement that the report could have been written in a few hours and for a few dollars is explained.

While the commission seems very ready to tell the Mayor that a 5-cent fare will pay operating expenses and all charges, the proposed act gives the Transportation District power to levy taxes to pay interest and maturities on bonds and any deficit between earnings and operating expenses. The assistant office boy in the Mayor's outer office could have told the Mayor that he can have 5-cent fares if he will pay the deficit out of taxes, and it wouldn't cost \$180,000 to get this information. Other interesting provisions of the proposed act are that all property, real and personal, of the district would be free from taxation and that the acts of the trustees shall not be subject to review by any agency of the State government. Of course the elimination of taxes, which amount now

to 0.256 cent for each fare collected, would help a very little toward the 5-cent fare, but the same little scheme would deprive the city of the tax income from one of its largest contributors. But even with taxes removed and the other vast economies which the commission's engineer suggests, we wonder if the people will not understand that the plan must mean a considerable jump in taxes, not only to make up the tax income lost from the traction properties, but to make up the deficit in cost of a ride above 5 cents, when it is known that wages and materials alone now cost 5.78 cents per passenger carried.

Nevertheless the new Governor of Illinois, true to his election pledges, has recommended in his inaugural address that the State Public Utilities Commission be abolished, that the enabling legislation for Mayor Thompson's plan be passed and that "home rule" be reverted to in all cities. It remains to be seen if the success of the Thompson machine can be made to include control of the State legislature.

Service Below Cost Is Injurious to City in Long Run

MOST cities in this country have reached the conclusion that one of the essential factors in civic prosperity and the comfort of the public is a transportation system which is in good operating and financial condition. Unfortunately for the city of New York, it is not one of these, and the facts in the case do not seem to be understood even by all those who should realize them. The two arguments against an increase in fare most frequently heard in New York are, first, that prices are now falling and the present fare will be adequate before long if not now. The second is that the present fare is specified in the franchise of certain companies, notably the rapid transit companies, and "a contract is a contract" and should be lived up to by the companies.

President Hedley of the Interborough Rapid Transit Company effectually disposes of both of these arguments in a letter recently addressed to the New York *Tribune*, to which these arguments seemed to appeal. This reply points out, in regard to the first point, that there is no immediate opportunity for the company to make any material reduction in either wages, which amount to more than 67 per cent of the company's expenses, or in the cost of coal, which accounts for 15 per cent of the expenses. As to the second point, the fact is clearly brought out that the existing crisis in transportation affairs is clearly one in which the city is or should be as keenly concerned as the company. This is true not only because the city has \$250,000,000 invested in the present subways, but it needs now and will need still

more in the early future increased rapid transit facilities. Based then purely on the ground of self-interest, the city is or ought to be anxious to have its local transportation system conducted on a business basis, and by solvent companies. The announcement by the company that it will accept a flexible fare based on the cost of service ought to make relief by the city easy.

Quotation from the Federal Electric Railways Commission Report

No. 4

THE necessity for scientific and successful regulation of systems, whether large or small, and especially those which operate through several cities and villages and in rural territory, leads to the conclusion that local regulation should generally be subject to the superior authority of the state, whether as a matter of original jurisdiction or through the medium of appeal.

Two-Car Trains in Washington

Old Open Cars Are Being Converted Into Trailers for Train Operation—Extensive Power Consumption Studies Indicate a Low Cost of Trailer Operation—To Adapt Two-Car Train to Operate on Stub-End Lines, Trailer Is Equipped with Controller and Plow—Fifty Trailers Now Being Converted for This Purpose



NEWLY CONSTRUCTED TRAILER COUPLED TO MOTOR CAR IN OPERATION

WITH a view to taking advantage of any economies of operation which might accrue from two-car train operation, the Washington Railway & Electric Company is now converting some fifty old open car bodies into closed cars for use as trailers. Before the reconstruction program had progressed very far full studies were made of the comparative power consumption of operating a motor car alone and a motor car with trailer to see what economies actually would be realized.

The reconstruction job is proving extremely satisfactory. Four of the cars have been converted at the present time and are now being used as trailers. The construction has been so arranged, however, that these converted cars can be used as motor cars when necessary equipment has been added. The original equipment of these open cars was removed a few years ago and transferred to closed cars during the winter season, for when these cars were used in service the company did not have a complete equipment for both summer and winter operation and was in the habit of exchanging equipment between cars. These open cars have not, therefore, been in service for several years.

In the reconstruction work the car bodies are stripped of seats, steps, grab handles, vestibule hoods and dashes. The center sills are cut back to the bulkhead posts and the side sills are cut off at the corner posts. New end sills reinforced by steel plates are mortised in and tiebars are installed to distribute the drawbar strains and add strength to the corners of the body. The side sill is further strengthened by an overtruss, which ex-

tends at each end through the steel side sill and is supported by two queen posts, which rest on the ends of bolsters.

In order to provide for side sash and to support the letterboard the lower portion of the side sills where the old seat ends were fastened is filled up with a yellow pine furring strip. On the outside of the post a false post 1½ in. thick, also of yellow pine, is bolted so as to extend up over the old letterboard. This post is cut to receive an ash beltrail, the posts extending over the letterboard form pockets, into which the side sash can be raised. The new letterboard is fastened to the upper portion of the post and the lower deck is extended out to meet it. The whole is covered with No. 8 duck. The old car bodies had a stationary seat at each end and there was a wide opening at these points. In order to make all sash the same size an extra post is installed and the narrow space which is left is paneled with sheet steel. The new platforms are of different lengths and the contour of the car body roof has been changed, so it is not possible to use the old hood.

A new car floor was laid over the old one under the seats, and in the center aisle maple floor strips were screwed to the old floor. New maple flooring was installed in the vestibules, with Mason safety treads on the steps and end sill.

The car has two door openings at diagonally opposite corners. Each opening is equipped with double folding doors and folding steps operated by pneumatic door engines mounted overhead. In operation the leading

end is used for both entrance and exit. The reconstructed cars have a seating capacity of forty-four. The cars are equipped with Heywood Brothers & Wakefield seats, Holden & White-Cutler-Hammer type car heaters, O. M. Edwards sash locks, Brill ventilator openers, Brill vertical wheel hand brakes with Peacock drums, Electric Service Supply Company's light fixtures with opalescent shades, Pantasote curtains, Tomlinson couplers with air connection, Westinghouse Traction Brake Company's type S. M. E. air equipment and National Pneumatic motorman's signal door lights and conductor's single stroke bell.

The car body is painted on the outside with the company's standard green with aluminum stripes and letters and the inside in cherry. The headlining is of agasote.

This reconstruction work is being done in the shops of the company under the direct supervision of R. D. Voshall, master mechanic.

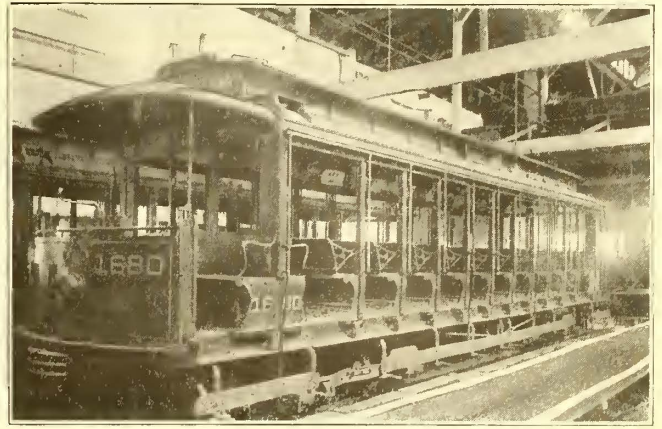
One of these reconstructed cars, No. 1071, ready to use as a trailer, was used with motor car No. 749 as a train. The motor car was equipped with an Economy electric meter and the power consumption measured for each trip both with trailer and without, the motor car or train, as the case may have been, being operated in regular service.

Previous to June 29, 1920, the train was operated on a schedule calling for two morning and two afternoon trips, arranged as follows:

Leave East Capitol barn,	7:28 a.m.	Leave Fourteenth and F,	7:49 a.m.
Leave East Capitol barn,	8:17 a.m.	Leave Fourteenth and F,	8:37 a.m.
Leave East Capitol barn,	2:44 p.m.	Leave Georgetown,	3:25 p.m.
Leave East Capitol barn,	4:28 p.m.	Leave Georgetown,	5:11 p.m.
Saturday:			
Leave East Capitol barn,	7:28 a.m.	Leave Fourteenth and F,	7:49 a.m.
Leave East Capitol barn,	8:17 a.m.	Leave Fourteenth and F,	8:37 a.m.
Leave East Capitol barn,	1:02 p.m.	Leave Georgetown,	1:46 p.m.

Beginning June 30 a new schedule was put into effect, as follows:

Leave East Capitol barn,	7:48 a.m.	Leave Georgetown,	8:30 a.m.
Leave East Capitol barn,	3:36 p.m.	Leave Georgetown,	4:20 p.m.
Leave East Capitol barn,	5:16 p.m.	Leave Georgetown,	6:00 p.m.
Saturday:			
Leave East Capitol barn,	7:48 a.m.	Leave Georgetown,	8:30 a.m.
Leave East Capitol barn,	1:05 p.m.	Leave Georgetown,	1:46 p.m.



OLD OPEN FIFTEEN-BENCH CAR

Beginning July 15 a new schedule was put into effect, as follows:

Leave East Capitol barn,	7:40 a.m.	Leave Georgetown,	8:23 a.m.
Leave East Capitol barn,	3:11 p.m.	Leave Georgetown,	3:52 p.m.
Leave East Capitol barn,	4:52 p.m.	Leave Georgetown,	5:40 p.m.
Saturday:			
Leave East Capitol barn,	7:40 a.m.	Leave Georgetown,	8:23 a.m.
Leave East Capitol barn,	12:22 p.m.	Leave Georgetown,	1:04 p.m.

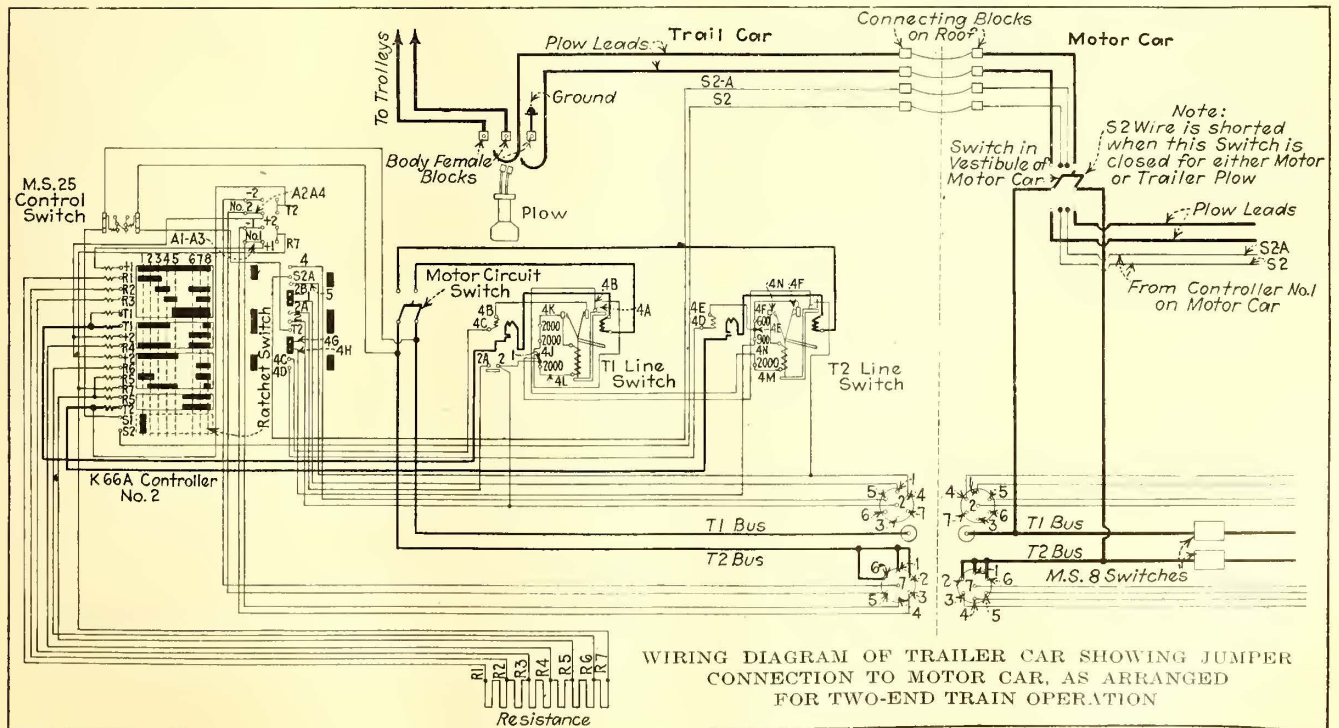
The train does not run Sundays or holidays.

From the manifests for the dates corresponding to the days on which energy measurements were made the number of passengers carried and the cash value of receipts were calculated for each trip and each day. The number of platform-hours with the corresponding cash value was also computed for each trip and day.

The cost of power consumption in the following analysis was based on a unit price of \$.00666 per kilowatt-hour.* From costs of maintenance of equipment of motor cars and trailers, taken from company records, a ratio of maintenance of trailers to motor cars of 25 per cent was used. The cost of maintenance of equipment of motor cars was figured at \$.0475 per car-mile.

From the power measurements and the calculations based on the figures given, the analysis of power con-

*The present cost is more nearly \$.008 per kilowatt-hour.



sumption and costs was obtained as shown in the accompanying table.

Reduced to a percentage basis, it is thus found that the cost of operating the trailer is 42 per cent of the cost of operating the motor, and of the total cost of the train operation 30 per cent only is chargeable to the

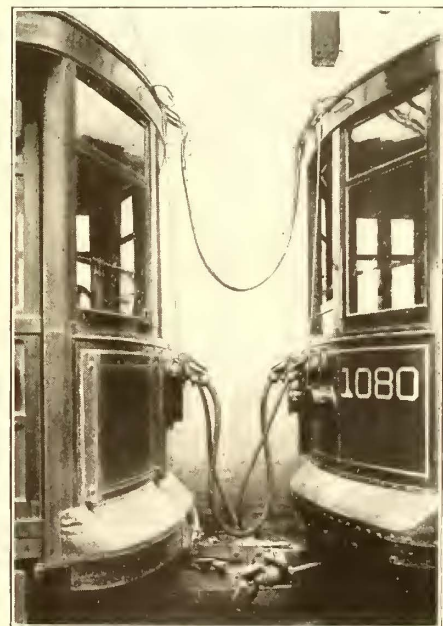
Kilowatt-hour per car-mile:						
Morning trip.....	motor	4.65	trailer	0.95	train	5.60
Afternoon trips.....	motor	3.50	trailer	1.15	train	4.65
Platform expense per car-mile operated:						
Morning trip.....	motor	\$0.184	trailer	\$0.092	train	\$0.276
Afternoon trip.....	motor	.20	trailer	.10	train	.30
Maintenance of equipment expense per mile operated:						
Morning trip.....	motor	\$0.0475	trailer	\$0.012	train	\$0.0595
Afternoon trip.....	motor	.0475	trailer	.012	train	.0595
Cost of the trips as operated, divided into:						
Power—Morning.....	motor	\$0.38	trailer	\$0.08	train	\$0.46
Afternoon.....	motor	.29	trailer	.09	train	.38
Platform—Morning.....	motor	2.25	trailer	1.13	train	3.38
Afternoon.....	motor	2.43	trailer	1.22	train	3.65
Equipment—Morning.....	motor	.58	trailer	.15	train	.73
Afternoon.....	motor	.58	trailer	.15	train	.73
Total cost of operation:						
Morning trips.....	motor	\$3.21	trailer	\$1.36	train	\$4.57
Afternoon trips.....	motor	3.30	trailer	1.46	train	4.76

trailer. These figures bring the cost of transportation by trailer approximately equal to that of a light one-man safety car.

The cost per car-mile of maintenance of way and structures and general overhead expense was not considered in the analysis, as these figures would not be affected by the operation of a limited number of trains.

An analysis was also made of revenue by trips and by days and also the number of passengers carried, and from this it was

found that some of the trips prior to June 30 were not earning operating expenses, but that after the change in schedule on June 30 the train was much better placed with regard to traffic and made a better showing on the relation of revenue to operating expense. Specifications of the motor car and trailer, as to weight and dimensions, are given in a table in order that the energy require-

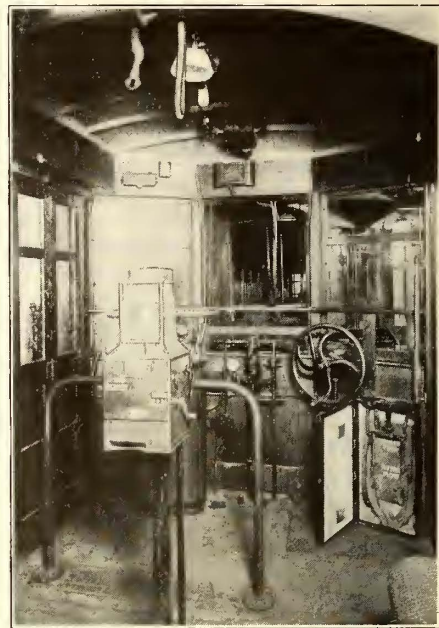


JUMPERS ON TRAIN ARRANGED FOR TWO-END OPERATION

ments may be better analyzed. As a result of these energy measurements it was recommended to the management that the most economical method of handling rush hour traffic is by train and that the train should be composed of but one motor car and one trailer, rather than two motor cars. It was emphasized that a very important point is the placing of the trains on the right schedules to obtain the best results and that each trip should be analyzed to see that that particular trip on the schedule is accomplishing desired results.

These energy studies were made by M. G. Stratton, former efficiency engineer of the company, now general manager Washington-Virginia Railway.

There were also some lines of the company on which the operation of a two-car train seemed justified, from the traffic standpoint, but which were stub end and therefore not conveniently arranged for train operation. It occurred to some of those interested in the studies that the trailer might be equipped with a controller and plow so that the train could be operated from either end. This equipment has been placed on one of the trains and this train has been under operation for the purpose of making a study as to its practicability or desirability. It was found necessary to equip the trailer with a plow rather than to use the plow of the motor car on account of the obvious difficulties which would otherwise be encountered in the operation of electric track switches. This also made necessary an arrangement for switching from one plow to the other, depending on which controller was to be used.



VIEW SHOWING LOCATION OF SWITCH TO CUT FROM ONE PLOW TO THE OTHER

SPECIFICATIONS OF MOTOR CAR NO. 749, PAY WITHIN, KUHLMAN CAR COMPANY

Over-all length.....	43 ft. 11 1/2 in.
Width.....	8 ft. 7 1/2 in.
Height.....	11 ft. 11 1/2 in.
Inside length.....	42 ft.
Inside height.....	8 ft. 1/2 in.
Seating capacity.....	48
Motor equipment.....	4 G. E., 200 K motors
Control equipment.....	K 66 A
Truck.....	Brill 76 E
Wheelbase.....	4 ft. 10 in.
Truck centers.....	20 ft. 2 1/2 in.
Wheel diameter.....	31 in.
Gear ratio.....	14 to 67
Weight of two trucks.....	12,300 lb.
Weight of four motors.....	8,960 lb.
Weight of car body.....	24,540 lb.
Total weight.....	45,800 lb.

SPECIFICATIONS OF TRAILER NO. 1071, PAY WITHIN, RECONSTRUCTED FROM NARRAGANSETT TYPE FIFTEEN-BENCH OPEN CAR

Over-all length.....	44 ft. 1 in.
Width.....	8 ft. 4 in.
Height.....	11 ft. 6 1/2 in.
Inside length.....	42 ft. 4 in.
Inside height.....	8 ft. 2 in.
Seating capacity.....	44
Truck.....	Peckham 14B3
Wheelbase.....	4 ft. 6 in.
Wheel diameter.....	30 in.
Weight of two trucks.....	12,000
Weight car body.....	Approximately 22,000
Weight of one motor*.....	2,850
Total weight.....	Approximately 36,850

* One Westinghouse motor No. 306 was left on these open cars for moving it around the carhouse.

An accompanying diagram shows the wiring layout to accomplish the switching from one plow to another. This cut-over switch is placed on the rear platform of the motor car, as shown in an accompanying photograph.

The entire program, involving the rebuilding of the cars and the train operation on the system, is under the general direction of J. H. Stephens, superintendent of the company.

This Is the First of a Series of Articles on the Report of the Federal Electric Railways Commission, Written by a Commissioner

Underlying Principles of Public Service

This Is Best Obtained Under the Service-at-Cost Plan, Whose Natural Result Is to Establish Co-operation and Remove Antagonism Between the City and Operating Company—It Also Permits Utilities Safely to Become Monopolies and Reduces the Reasons for Labor Difficulties, Thus Making Continuous Service More Certain

By EDWIN F. SWEET

Assistant Secretary Department of Commerce, Washington, D. C.,
and Member Federal Electric Railways Commission

THE investigation of the street railway situation made by the Federal Electric Railways Commission brought out many interesting facts concerning the industry and its relations to the public.

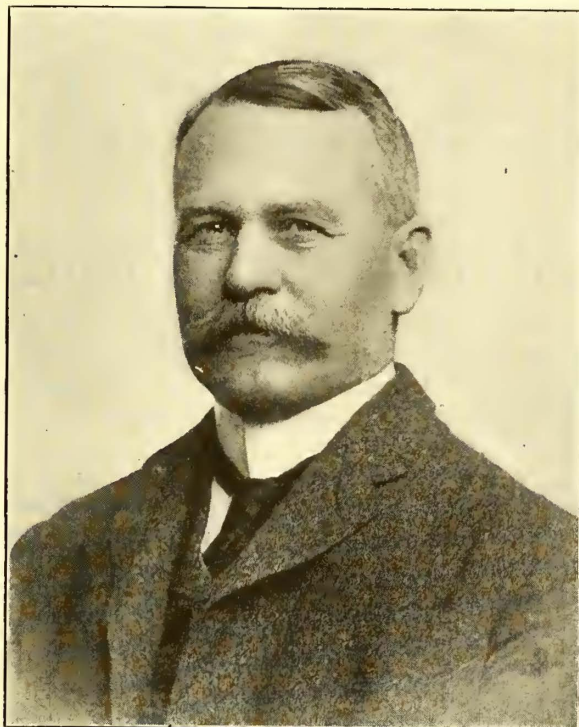
The commission was composed of eight men of divergent interests, and the fact that they were able to reach a unanimous agreement after considering testimony covering more than 6,000 pages of typewritten matter is not only noteworthy in itself but is gratifying evidence of their own fair-mindedness and the probable correctness of their conclusions.

Their report, covering about thirty pages of ordinary book size, can be read in an hour. Any one can obtain a copy of it at nominal cost by addressing a letter to the Superintendent of Documents, Government Printing Office, Washington, D. C. It is to be hoped that the desire expressed by the President for its wide circulation may be fully realized.

PUBLIC SERVICE—NOT PRIVATE PROFIT—THE AIM

The features of the investigation which impressed me as the most important are, first, that the principle underlying the street railway industry and all other public utilities should be public service and not private profit. This sounds like a truism. Almost any one would say, "Of course," yet it is an astounding fact that heretofore and for the most part at the present time service to the public has been and is subordinated to the pecuniary interests of the corporations owning and operating the street railways.

The service-at-cost plan recommended by the commission permits a fair return to invested capital and



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just compensation to labor, but provides for public regulation and stresses the point that the primary purpose is to serve the public.

The second feature of the committee's report which impresses me is the absurdity of the uniform 5-cent franchise or any other fixed fare which takes no account of the varying costs of labor and material or the changing financial conditions affecting credits and the acquisition of funds for extensions and improvements. Manifestly no industry can thrive without freedom to adjust the price of the commodity it sells to the cost of production.

The evidence also shows that the cost of operating a street railway is not exactly the same in any two cities; in fact there are differences so wide that it costs nearly twice as much in some cities as in others. This is a further impeachment of the universal 5-cent franchise.

The establishment of co-operation and the removal of antagonism between the city and the operating company, bred by the obsolete private profit plan, seem to me of especial importance and to be the natural outgrowth of the service-at-cost method of operating street railways in the public interest.

Another point of importance which has apparently escaped observation in the past is the fact that paving between the tracks and all other burdens imposed upon the street railway companies can only be paid for out of the fares received from car riders, and in the final analysis, under proper public regulation, these burdens are borne by the car rider while the general public and especially automobile riders are the chief beneficiaries. Broadly speaking, it is a tax upon the poor for the benefit

of the rich and ignores the plain principle that sound public policy demands the efficient operation of street railways at the lowest possible cost to those who cannot afford conveyances of their own and must depend upon the street cars to get from place to place.

Another feature of the report which deserves especial attention is the importance of the square deal to labor, not only because it is right but because it makes for courteous treatment, safety and satisfactory service.

MONOPOLIES MAY BE MADE SAFE

The report of the commission makes no mention of the importance of restricting the street railway service of a city to a single company. With the public regulation contemplated in the service-at-cost plan, every public utility may safely be a monopoly. One street railway company, one telephone company, one

lighting company and a single water supply can render better service at less cost than two or more competing companies. Testimony respecting the city of Washington clearly demonstrated this fact. One of the Washington companies appeared to be doing very well on a 5-cent fare, the other urged and probably needed an increase. This presented a practical difficulty which was solved by granting an increase to both. One of the chief reasons given for the financial straits of the less prosperous company was the extension of its lines into unprofitable suburban territory.

This brought to the attention of the commission the fact that in many cities the car rider is penalized by having to pay a somewhat higher

fare because of non-paying extensions made at the instance of comparatively few suburbanites or speculators in real estate, and in all such cases it is the opinion of the commission that the expense should be borne by those who profit by it in proportion to the benefits received and not added to the valuation of the property upon which a return is to be allowed, which must come out of the pockets of car riders.

SERVICE SHOULD BE CONTINUOUS

The last point in the report of the commission to which I call attention as especially important is the opinion expressed with regard to strikes and lockouts.

It is of vital importance to the en-

tire community that street railway service should be continuous. As the report puts it, "It is intolerable that the transportation service of a city should be subject to occasional paralysis." If labor disputes cannot be settled by conferences between the managers of the street railway company and the employees, there should be resort to arbitration, and the decision of the arbitrators should be final and binding upon both of these parties.

This recognizes the principle that the primary purpose of street railways is not to afford opportunity for the investment of capital and not to provide work for employees, but for the benefit of the public, whose interest is paramount.

President Gadsden Sounds Optimistic Note

In a Statement Issued to the Daily Press, Association President Shows that the Electric Railway Industry Is Making Steady Approach to a Stable Basis—Shows that the Public, Both Car Riders and Official Regulatory Commissions, Are Taking Real Interest in Rehabilitation

RIGHT in line with the statistical information given, and the general trend and outlook of the industry interpreted and portrayed in the Jan. 1 issue of the ELECTRIC RAILWAY JOURNAL, President Gadsden of the American Electric Railway Association has just issued, for publication in the daily press, an official statement of the national condition of the Electric Railway industry, which shows the industry to be returning to stable conditions. This word of optimism coming from the leading figure in the electric railway field today is an encouraging sign.

His statement follows:

An official report on the national condition of the electric railway industry for the year ending January 1, 1921, just compiled by the American Electric Railway Association indicates a gradual and steady approach to a stable basis.

This situation is largely due to the fact that regulatory bodies, recognizing that granting of the claims of electric railways for fair rates of return is essential to the maintenance of good service, have steadily ordered relief throughout the country.

These regulatory bodies also seem to be cognizant of the fact that rehabilitation of lines will be a slow process and that at least the present advanced rates must be maintained for some time even if falling costs, anticipated but not realized as yet, should come. A large majority of the companies in the last four years have strained their financial

resources to the limit, or created actual deficits, by merely meeting current expenses and making absolutely unavoidable emergency improvements. Many badly needed improvements have been deferred by virtually every company on account of a lack of funds. It is necessary, therefore, now that fares are beginning to be commensurate with costs, that the present increased rates be continued until lines are fully rehabilitated. Unless present fares are maintained, indefinite suspension of extensions and betterments will result, and this would be almost fatal to many properties.

The report just completed shows that 548 cities in the United States, representing more than 90 per cent of the riding public, are paying fares ranging from 5 cents with a 1 cent transfer charge to a flat rate of 10 cents.



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The largest groups are: Cities paying a 10 cent fare, 112; 8 cent fare, 6; 7 cent fare, 174; and 6 cent fare, 124.

Other groups follow: Cities paying a 9 cent cash fare, 6; 7 cent fare, 1 cent transfer, 26; 7 cent zone fare, 8; 6 cent city and outside zone fare with 2 cent transfer charge, 10; 6 cent zones, 5; two 5 cent zones, 2; 5 cent city zone, 5 cent outside, 10; 5 cent city zone, 1 cent charge for rides outside city zone, 1; 5 cent fare, with additional charge for transfers, 4.

The immediate result of the widespread inclination to adjust rates upward to the requirements of good service is found in the low number of electric railway receiverships for the year 1920.

There were only 16, representing a total capital stock of \$25,313,655, as compared with 48 receiverships, representing a capital stock of \$221,259,354, in 1919. During the year 450 miles of track were dismantled and 308 miles of track abandoned.

Another encouraging sign is found in the general public interest in the welfare of electric railways. From every part of the United States reports have reached the association that not only are regulatory bodies but car riders generally taking the greatest interest in the restoration of companies to a healthy state. In practically every community there appears to be a desire on the part of the car riders to cooperate in an effort to make the lines self-sustaining and to encourage a flow of new money into the industry. Certainly the inclination to prevent companies from receiving sufficient return to maintain good service is confined to a small number of persons.

A.I.E.E. and W.S.E. Discuss Safety Cars

Three-Truck Trains Constructed in Milwaukee from Old Equipment Were Described and Their Advantages and Disadvantages Pointed Out—Results of Safety Car Operation in Waukegan, Ill., Shown to Be Very Gratifying—Automatic Substations Briefly Treated

AT A joint meeting of the Chicago Section, American Institute of Electrical Engineers, and the electrical section of the Western Society of Engineers in Chicago on Dec. 17 more than two hundred were present to hear a program on "Present Tendencies in Electric Railway Development and Available Means for Improvement." Papers were presented on the development of the design and use of the safety car by Harry L. Brown, on the results of safety car operation on the Waukegan city lines of the Chicago, North Shore & Milwaukee Railroad by H. A. Johnson, on train operation on urban railways by S. B. Way and on automatic railway substations by Charles H. Jones. Lieut.-Col. E. J. Blair, assistant to the president Chicago Elevated Railways, was chairman of the meeting.

All four papers were read and then simultaneously discussed. The paper by Mr. Way was published in abstract last week. The others appear elsewhere in this issue. In introducing the discussion, Colonel Blair commented that after hearing these papers it must be evident to those present that the electric railway managements have been very active in devising ways and means to cope with the ever-increasing operating costs.

MR. ADAMS DESCRIBES MODIFIED CAR

H. H. Adams, superintendent of equipment Chicago Surface Lines, in discussing the safety car papers, spoke briefly of the consideration being given to the use of safety cars on certain semi-congested lines in Chicago. He made the point that for such service it seemed highly desirable that there should be a separate exit and entrance for passengers, in order to avoid the necessity to make boarding passengers wait until all leaving passengers have got off the car. He said that a detailed study is now being made looking toward the development of a safety car for Chicago having this feature and a little more generous dimensioning in other respects, without materially increasing the weight of the standard car. From the present state of the study he said it appeared that a design of car could be built with a 24½-in. aisle instead of 21½ in., a seat width of 35 in. instead of 34½ in., an over-all width of 8 ft. instead of 7 ft. 8 in., an over-all length 16 in. greater than the standard car, and a seating capacity of thirty-six instead of thirty-two, without having the weight exceed 17,000 lb. This would give a weight of 472 lb. per seat as compared with 519 lb. per seat on the present standard double-end car, or a reduction of nearly 10 per cent. It is also planned to install some kind of barrier to prevent passengers from entering on the exit side for the purpose of evading payment of fare.

Mr. Adams also commented on the reference in Mr. Brown's paper to the saving in first cost to purchasers of safety cars resulting from their standardization. He said that he had not seen a great deal of evidence of this saving. He pointed out that the standard safety car weighing 16,600 lb. and bought for \$7,300

was a cost of 44 cents per pound. The new double-truck cars which the Chicago companies are about to purchase will weigh 46,000 lb. and cost \$15,000, or a cost per pound of 32.6 cents, a difference in the favor of the non-standard double-truck car of 11.4 cents per pound.

Referring to the plan to use trailers in Chicago, Mr. Adams said that within six months it is probable there will be available fifty new motor cars equipped for hauling the fifty trailers now under construction in the company's shops. He said that one of the great advantages of train operation is that it requires only 20 per cent more time for a two-car train to pass an intersection than it does for a single-car unit with one-half the capacity.

AUTOMATIC SUBSTATIONS CONSIDERED

Col. Bion J. Arnold reviewed briefly the history of the development of the automatic substation as it was worked out in the original installation on the Elgin & Belvidere Electric Railway, which he owns. This discussion was given in connection with the paper on automatic substations read by Mr. Jones.

A great deal of interest was manifest in the three-truck train discussed by Mr. Way. His description of this unique equipment and pictures of the train appeared in last week's issue of this paper.

THE FIELDS OF TRAINS AND SAFETY CARS ARE COMPARED

Wray T. Thorne said that the development of modern couplers and cars provided with doors closing up all openings while the cars are in motion eliminate the early objections to trailers. The economies of train operation in dealing with mass transportation are now available and where the traffic density warrants, and other operating conditions are favorable, service can be given at less expense than formerly, or much improved service can be rendered at relatively small increase in operating cost.

In the safety car we have a new transportation tool, but as in tooling a plant, a study and analysis of the conditions are necessary to insure a successful application. Where this elementary precaution has been most carefully observed these cars seem to have been the most successful.

It is evident that there are service conditions where such cars will not meet the requirements. Such, for example, are streets or routes whereon the headway with cars of large carrying capacity is now so close as adversely to affect schedule possibilities.

The one-man safety car apparently has demonstrated to many operators the old transportation law that frequency of service stimulates traffic. Most operators, however, have known of this law for years, but the cost of providing such additional service with available equipment has been prohibitory.

Results of Safety Car Operation in Waukegan, Ill.*

BY H. A. JOHNSON

Organization Engineer Chicago, North Shore & Milwaukee Railroad, Chicago

THE rapid growth in the popularity and use of safety cars is due, in my judgment, to the fact that railway properties operating under certain conditions have been able to make a substantial saving in operating expenses and at the same time give more frequent service. The more frequent service has attracted new business which the railway company did not previously enjoy.

The saving in operating expenses has been chiefly due to, first, a large reduction in platform expense due to this car being operated by one man instead of two men; second, a considerable reduction in the amount of power required to operate this car on account of its light weight, and, third, a reduction in the cost of maintenance.

While the foregoing statements apply in a general way to the operation of light-weight safety cars, it is impossible to work out any formula or standard set of conditions which will apply generally. Because safety cars have been a success on one property does not mean that every street railway should replace its present equipment with them. To determine whether this type of car would be economical and serviceable requires a detailed study of the operating conditions on the particular property. Accordingly I will confine myself to a discussion of the results of installing one-man safety cars on the Waukegan city lines of the property with which I am connected, rather than try to discuss the economic aspects in a general way.

These lines furnish the street car service for the adjacent communities of Waukegan, North Chicago and Great Lakes Naval Training Station. The city of Waukegan lies approximately 38 miles north of Chicago, extends along the west shore of Lake Michigan and has a population of 20,000. The town of North Chicago adjoins Waukegan on the south and has a population of about 5,000. The Great Lakes Naval Training Station, located on the shore of Lake Michigan, adjoins North Chicago on the south. During the war there were as many as 45,000 men in training at this station, but at the present time this number has been reduced to approximately 10,000.

The Waukegan city line is composed of two branches: One branch, which we shall call the North and South Line, extends north from the Great Lakes Naval Training Station through the town of North Chicago to the center of the city of Waukegan, a distance of 3.65 miles, and then continues north to the north city limits of Waukegan, an additional distance of 1.62 miles, making a total length of 5.27 miles. The other branch, which we may call the East and West Line, connects with the North and South Line at the center of the city of Waukegan and runs straight west to the west city limits, a distance of 1.03 miles.

The traffic on this local system is very similar to the traffic in larger cities in that there are heavy rush-hour periods night and morning, with comparatively light traffic outside of these hours. This is occasioned by the comparatively large number of industries depending upon these lines for transportation of their employees. There are nine of these factories, each employing 100 or more men. Two employ 1,000 men each, one employs

500 men, one employs 250 men, two employ 200 men each, one employs 150 men and two employ 100 men each.

During the year 1919 the service was performed by double-truck cars operated by two men and weighing approximately 25 tons each. These cars have a seating capacity of fifty, are 48 ft. long over all, equipped with four motors and multiple-unit control. On the North and South Line, cars were operated on a fifteen-minute headway, both during the rush hours and during the non-rush hours. During the rush hours, however, a second car was added, making a two-car train. On the East and West Line one car was operated during non-rush hours, making a round trip every twenty minutes. During the rush hours another car was added so that the interval was reduced to ten minutes.

TEN SAFETIES PUT IN SERVICE

In February of 1920 ten light-weight safety cars were put in service on the North and South Line. They are the standard safety car with certain modifications in construction and with certain additions in the nature of added insulation and heating equipment on account of the cold climate in this part of the country. They weigh 8½ tons.

The safety cars were put in service on the North and South line, which serves the industries and carries most of the traffic. They take care of the basic schedule and are supplemented during the rush hours by part of the old double-truck cars. The East and West Line is still operated with the double-truck cars. Before the safety cars were put in service the city authorities and the public were carefully prepared for the change by publicity work which included moving pictures in the theaters and there has been no criticism of the cars or their operation since the day they began to run. In fact, just the opposite is true. The public seems to like the safety cars better than the old double-truck cars because they are new, of more cheerful appearance, and the step and platform arrangement permits of more comfortable and easier entrance and exit.

Coincident with the placing of the safety cars in operation the schedules were changed to provide more frequent service. The interval on the North and South Line was reduced from fifteen minutes to eight minutes during both rush hours and non-rush hours. On the East and West Line the interval was made ten minutes all day and evening in place of ten minutes for rush hours and twenty minutes for non-rush hours.

Immediately after the safety cars were placed in service and the schedules changed, the traffic, which had remained practically constant for a long time, increased very decidedly. This increase has been maintained up to the present time. The increase in traffic and more frequent service has resulted in an increase in the number of car-miles operated. During the eight months following the change 493,856 car-miles were operated as compared with 314,535 car-miles during the corresponding eight months of the previous year or an increase of 57 per cent. The operating revenue for the same period increased 42.52 per cent. The operating expenses increased 34.16 per cent. The operating expenses per car-mile, however, decreased 14.8 per cent. This decrease was effected in spite of a general increase in wages in all departments of approximately 20 per cent and the payment to safety car operators of 5 cents per hour more than the rate paid motormen and conductors on cars operated by two men.

*Abstract of paper read before joint meeting of A. I. E. E. and W. S. E., Chicago, Dec. 17, 1920.

On the double-truck cars the platform expense is two men at 60 cents per hour or a total of \$1.20 per hour, while on the safety car it is one man at 65 cents per hour, indicating a saving of 45.8 per cent in platform expense for every car-hour operated with safety cars. The double-truck car operating on the North and South Line consumes electric energy at an average rate of 2.90 kw.-hr. per car-mile for traction, while the safety car requires 1.07 kw.-hr. per car-mile, which is 63 per cent less than the energy used by the double-truck car.

After paying all operating expenses and taxes, the income from operation for the Waukegan city lines covering the period of eight months following the introduction of safety cars shows an increase of 342.39 per cent. The addition of the ten safety cars has, of course, increased the capital account and the annual interest charges. If the trainmen's wages during the period following the introduction of the safety cars had remained on the same level as during the corresponding period of the previous year, and if the amount of the additional interest on the investment in safety cars is charged against the operating revenue, the income from operation after introducing the safety cars would show an increase of 441 per cent for the same periods as previously considered.

The results described have been brought about by a partial change to light-weight safety cars. If a complete change had been made and all of the double-truck cars disposed of, the economies would have been greater. The public has been satisfied with the introduction of the safety cars because it has received more frequent service with clean, fast cars. The railway company has been satisfied because the passenger traffic has increased, the income from operation has materially increased, jitney competition has been eliminated and it has the satisfaction of giving better service to the communities served.

Advantages of Automatic Railway Substations*

BY CHARLES H. JONES

Electrical Engineer Chicago, North Shore & Milwaukee Railroad, Chicago

INSTALLATIONS of automatic railway substations have been made on light and heavy interurban service, light city service, heavy trunk-line service through the Detroit Tunnel of the Michigan Central Railroad, and recently an installation has been made for the heavy city service at Cleveland, Ohio. This last installation will be watched with considerable interest by engineers on account of its being the first extensive application in this class of service. These installations have been on equipments varying in size from 300 to 2,000 kw. From the foregoing it is apparent that trials have been made in all classes of railway service, yet the development of this equipment is only in its infancy, and the extent to which it will be used is limited only by the economical results which can be obtained.

The advantages of automatic over manually operated substations are as follows:

1. Reduction in cost of substation operating labor. This benefit will be felt in every field of application of the equipment and is probably the greatest single saving that can be made.

2. Reduction in power loss due to elimination of idle running time. This saving will be of considerable value

to the property on which the service is infrequent and where it is impractical to follow the load in a hand-operated station by shutting down and starting up the station frequently, which the automatic equipment will do. This will be of no practical benefit on a system which has a fairly steady load throughout the normal hours of the day, but it will at least be an insurance that there are no idle running losses.

3. On account of the increased number of substations in an automatic system, there results a considerable reduction in the size and length of feeders, and a saving that will go a long way toward paying the investment cost in automatic equipment. This reduction in the magnitude of the feeder system accomplishes considerable saving in line losses.

4. On city properties the automatic substation will have a very favorable effect on electrolysis conditions because of the increased number of substations and reduction in length of feeds.

5. A substantial saving per substation can be made in the building cost because it is practical to erect a cheaper building if the conveniences necessary for a hand-operated station are omitted. The small size of the building will make it possible to put it in places that are beyond consideration for a multi-unit hand-controlled substation.

6. By the use of automatic equipment it is possible to raise the load factor on machines, thereby making use of smaller units than is possible in the manually operated station. This is of considerable importance on interurban lines having a high starting peak and low average load.

The limit to which this equipment can be economically installed is reached when the carrying charges on an automatic substation installation, together with its feeder system, equal the operating and carrying charges on a manually operated substation plus its feeder system. Although there is no question about the applicability of the automatic station to interurban and small city properties, the advisability at its introduction is debatable on a heavy city property which has a dense load per square mile, such as exists in the Loop and densely populated residential district of Chicago. This problem can only be answered by a very careful analysis of the situation at hand.

Probably one of the most extensive fields for the automatic stations is in steam railroad electrification work, where the conditions are ideal for its application, namely, heavy peak service and comparatively long train interval. The limitations of both a.c. and d.c. power systems of steam roads have been fairly well known for some time, but the advent of automatic substations has extended the possibility of the d.c. system to limits far beyond those previously set, and it will undoubtedly receive very careful consideration in future electrifications.

RESULTS ON NORTH SHORE ROAD

The history, condition and general results of automatic substation on the Chicago, North Shore & Milwaukee Railroad are as follows:

In 1916 manually operated substations were located approximately 13 miles apart. On account of the purchase of new car equipment it was necessary to increase the power facilities. Consideration was given to three methods; namely, addition of feeder copper, increase of line voltage and the installation of automatic substations. The two first were prohibitive on account of the great cost, and it was decided to install automatic

*Abstract of paper read before joint meeting of A. I. E. E. and W. S. E. E., Chicago, Dec. 17, 1920.

stations located approximately half way between the manually operated stations. Two of these were installed in 1917, a third in 1918 and a fourth in the spring of 1919. One of the hand-operated stations was changed to automatic in the spring of 1920 and a fifth station is now being installed.

These equipments, which have been in service from one to three years, have been subjected to very heavy service and have given excellent operating results. In several instances we have run into the usual operating difficulties that are encountered in substation work, and the automatic equipment has taken care of these cases in a manner just as satisfactory, if not more so, than in hand-operated stations.

It has been our practice to make a daily inspection of stations, and by means of recording devices mounted on certain pieces of apparatus we have been able to follow

the operation very closely, so that I have no hesitancy in saying that there is no reason why a system such as ours could not be operated practically automatic throughout, with the exception of the necessary high-tension line switching. I feel that within a very short time we shall see very extensive installations made.

Automatic Railway Substations

BELOW appears a list of the automatic substations recently installed or on order by the General Electric and Westinghouse companies, which supplements a similar table published in the JOURNAL for Jan. 4, 1919. Those installations which, at the time the other table was published, had not been placed in commission, or regarding which full information was not available, are included in the present tabulation.

AUTOMATIC SUBSTATIONS INSTALLED BY OR ON ORDER WITH GENERAL ELECTRIC AND WESTINGHOUSE COMPANIES

Company	No. of Stations	No. of Machines	Kilo-watt Rating	Type of Machine	Direct Current Voltage	High-Tension Voltage	Frequency	Remarks	Placed in Operation
Ohio Electric Railway	1	1	500	Synchronous converter	600	33,000	25		May, 1918
Conestoga Traction Company	1	1	300	Synchronous converter	600	11,000	25	Motor started	September, 1918
New York State Railways	1	1	250	Synchronous converter	600	11,000	25		February, 1919
Conestoga Traction Company	1	1	500	Synchronous converter	600	11,000	25		March, 1919
Des Moines City Railway	1	1	500	Synchronous converter	600	2,250, 4,500	25		March, 1919
Cincinnati, Lawrenceburg & Aurora Electric Street Railway	2	2	200	Synchronous converter	600	33,000	60		March, 1919
New York State Railways	1	1	300	Synchronous converter	600	60,000	40		April, 1919
Northern Ohio Traction & Light Company	2	2	500	Synchronous converter	600	22,000	60		May, 1919
Joplin & Pittsburg Railway	1	1	300	Synchronous converter	600	22,000	60		May, 1919
The Sheffield Company	1	1	500	Synchronous converter	600	2,200	60		June, 1919
Kansas City Railways	1	1	1,000	Synchronous converter	600	6,600	25		June, 1919
Chicago, North Shore & Milwaukee Railroad	1	1	1,000	Synchronous converter	600	13,200, 33,000	25		June, 1919
Duluth Street Railway	1	1	500	Synchronous converter	600	13,200	25		June, 1919
Transit Supply Company	1	1	1,500	Synchronous converter	600	12,500	35		July, 1919
Omaha & Council Bluffs Street Railway	1	1	1,000	Synchronous converter	600	13,200	25		July, 1919
Pacific Electric Railway	1	1	1,000	Synchronous converter	600	15,000	50	Slauson Junction	July, 1919
Salt Lake, Garfield & Western Railway	2	2	600	M-G set	1,500	44,000	60	One-remote control	August, 1919
Duluth Street Railway	1	1	1,000	Synchronous converter	600	13,200	25		August, 1919
Pacific Electric Railway	1	1	1,000	M-G set	600	15,000	50	Wilmington	August, 1919
Pacific Electric Railway	1	1	1,000	Synchronous converter	600	16,500	50		August, 1919
Joplin & Pittsburg Railway	2	2	300	Synchronous converter	600	33,000	25	Motor started	August, 1919
Kansas City Railways	1	1	750	Synchronous converter	600	6,600	25		October, 1919
New South Wales Government Railways	1	1	200	Synchronous converter	600	6,600	25	Remote control	November, 1919
Chicago, North Shore & Milwaukee Railroad	1	1	500	Synchronous converter	600	13,200/23,000	25	Libertyville	November, 1919
Pacific Electric Railway	1	1	1,000	Synchronous converter	600	16,500	50	Hermosa	November, 1919
Oklahoma Union Railway	1	1	300	Synchronous converter	600	6,600	60		January, 1920
Wisconsin Light, Heat & Power Company	1	1	300	M-G set	600	66,000	60		January, 1920
Interurban Railway, Des Moines	1	1	500	Synchronous converter	600	22,500	25	Moran	January, 1920
Interurban Railway, Des Moines	1	1	300	Synchronous converter	600	22,500	25	Granger	January, 1920
Sacramento Northern Railway	1	1	300	Synchronous converter	600	2,300	60	Portable	January, 1920
Kansas City Railways	1	1	750	Synchronous converter	600	6,600	25		March, 1920
Iowa Railway & Light Company	1	1	500	Synchronous converter	600	16,500	60		April, 1920
Pacific Electric Railway	1	1	1,500	Synchronous converter	600	16,500	50	Maple Avenue	April, 1920
Michigan Central Railroad	1	1	2,000	M-G set	650	4,400	60	Remote control	May, 1920
Missouri & Kansas Interurban Railway	2	2	300	Synchronous converter	600	33,000	60		June, 1920
Cleveland Railway	1	2	1,500	Synchronous converter	600	11,000	60		August, 1920
Lehigh Valley Traction Company	1	1	500	Synchronous converter	600	13,200	25		September, 1920
St. Joseph Railway, Light, Heat & Power Co.	1	1	300	M-G set	300	23,000	60		October, 1920
Iowa Railway & Light Company, for Cedar Rapids & Iowa Railway	1	1	300	Synchronous converter	600	33,000	60		December, 1920
Grand Rapids, Grand Haven & Muskegon Railway	1	1	350	Synchronous converter	600	13,500	30	Motor started	December, 1920
Chicago, North Shore & Milwaukee Railroad	1	1	1,000	Synchronous converter	600	23,000, 33,000	60	Ravinia Park	January, 1921
Indianapolis & Louisville Traction Company	1	1	500	Synchronous converter	600	33,000	60		January, 1921
Christ Church Tramway, New Zealand	1	1	300	Synchronous converter	600	11,000	50		*1920
New South Wales Government Railways	1	1	450	Synchronous converter	600	6,600	25	Narrabeen-remote control	*1920
New South Wales Government Railways	1	1	450	Synchronous converter	600	6,600	25	Abbot-ford-remote control	*1920
Chicago & Joliet Electric Railway	1	1	300	Synchronous converter	600	13,200	60		
Ironwood & Pessemer Railway & Light Co.	1	1	300	M-G set	600	2,300	60		
Iowa Railway & Light Company	1	1	500	Synchronous converter	600	33,000	60		
Sacramento Northern Railway	1	1	300	Synchronous converter	600	2,300	60		
United Railways of St. Louis	1	1	300	Synchronous converter	600	13,200	25		
Hershey Cuban Railway	1	1	300	Synchronous converter	600	22,000	60		
Niagara, St. Catharines Railway	1	1	500	Synchronous converter	600	12,500	25		
Christ Church Tramway, New Zealand	2	2	300	Synchronous converter	600	10,500	50		
City Railway, Los Angeles	1	1	1,000	Synchronous converter	600	17,000	50		
Pacific Electric Railway	1	1	750	Synchronous converter	600	16,500	50		
Dayton & Western Traction Company	3	3	500	Synchronous converter	600	33,000	60		
Victorian Railways, Melbourne	8	8	1,000	Synchronous converter	1,500	2,000	25		
Interurban Railway, Des Moines	1	1	750	Synchronous converter	600	22,500	25		
Dayton & Troy Electric Railway	1	2	300	Synchronous converter	600	6,600	60	Operate in parallel	
Hershey Cuban Railway	2	2	1,000	Synchronous converter	1,200	33,000	60	Two units in series	
Fort Wayne & Decatur Traction Company	1	1	400	Synchronous converter	1,200	33,000	60	Two units in series	
Cleveland Railway	2	4	1,500	Synchronous converter	600	11,000	60	Two units in parallel	
Cleveland Railway	1	2	1,500	Synchronous converter	600	11,000	60	Two units in parallel	
Pacific Northwest Traction Company	1	1	500	Synchronous converter	600	13,200	60		
Milwaukee Electric Railway & Light Company	1	1	1,000	Synchronous converter	250	13,200	60	Three-wire service	
Toronto Hydro-Electric Company	1	1	1,000	Synchronous converter	600	13,200	25		
York Railway	2	2	500	Synchronous converter	600	13,200	60		
Petaluma & Santa Rosa Railroad	1	1	300	Synchronous converter	600	45,000	60		
Steuenville, East Liverpool & Beaver Valley Traction Company	1	1	300	Synchronous converter	600	13,200	60	Motor started	
Milwaukee Electric Railway & Light Co.	1	2	500	Synchronous converter	600	66,000	25	Two units in parallel	
Northern Texas Traction Company	1	1	500	Synchronous converter	600	13,200	25		
United Railways of St. Louis	1	1	300	Synchronous converter	600	13,200	25		
Boston & Maine Railroad	1	1	300	M-G set	600	2,200	60	Synchronous motor	
Chicago, South Bend & Northern Indiana Railway	1	1	300	Synchronous converter	600	25,000	60		
Los Angeles Railway	1	1	1,000	Synchronous converter	600	15,000	50		
Salt Lake & Utah Railroad	1	1	500	M-G set	1,500	2,300	60		

* These stations are probably in operation, though exact date is not yet available.

Progress of the One-Man Safety Car*

This General Treatise Reviews the Advent of the Light-Weight One-Man Safety Car, Points Out the Present Status and the Future Prospects of Design and Utilization and Cites the Economic and Service Results Which Have Been Obtained

BY HARRY L. BROWN
Western Editor ELECTRIC RAILWAY JOURNAL

HIGHER schedule speeds, platform expense cut in half and energy cost greatly reduced are the qualities of the safety car which make it possible to give greatly improved transportation service and meet competition of automotive vehicles—private automobiles and jitneys.

Until recently very little information on the energy consumption of this type of car was available. Some interesting data are now coming to hand, however, from companies whose cars have been equipped with Sangamo Economy watt-hour meters. In El Paso, Tex., where the topography is flat, the energy consumption per car-mile at the car, averaged over a three-month period, was found to be 2.44 kw.-hr. for double-truck cars, 1.45 kw.-hr. for single-truck cars and 0.95 kw.-hr. for safety cars. These figures and those following cover only the energy consumption of the main motors. In Kansas City on the Westport-Sunset Hill line, operated exclusively with safety cars under service conditions considered most severe, the energy consumption averages 1.2 kw.-hr. per car-mile. At Gary, Ind., the consumption has been found to be 1.1 kw.-hr. per car-mile. In Seattle, under extremely hilly conditions, the average energy consumption over an eight-month period was 1.38 kw.-hr. per car-mile for safety cars and 3.37 kw.-hr. per car-mile for double-truck cars, the data covering fifty safety cars and 350 double-truck cars. In Quincy, Ill., the average energy consumption for safety cars for all lines on the system was found to be 0.95 kw.-hr. per car-mile with a system average schedule speed of nearly 10 m.p.h. At the station buses this energy consumption measured 1.78 kw.-hr. per car-mile. In Vincennes, Ind., during a thirty-day period with average loading throughout the period of 4.7 passengers per car-mile, the energy consumption was 0.75 kw.-hr. per car-mile.

An interesting side-light on this subject of energy consumption is that on the average, for various systems, there is a difference of about 1 kw.-hr. per car-mile between the meter readings on the car and those at the station switchboard, representing energy consumed in line losses and negative return losses, and in running the air compressor, heaters, lights, electric buzzers, signals, etc.

RESULTS FROM SOME INSTALLATIONS

One of the most interesting installations of safety cars that I recall gives a good idea of the many ways in which these little cars serve to improve the situation faced by the street railway companies. On the Arlington Heights line, Fort Worth, Tex., which is 4.88 miles long one way, four 7-ton one-man safety cars replaced five 12-ton two-man single-truck cars for the base service. With an increase in the schedule speed

from 9 to 11 m.p.h., the same headway of twelve minutes was maintained, this being ample in view of a diminishing traffic following the abandonment of a small army camp served by the line. The service, measured in seats per hour, remained practically the same. The track, much of which was open, was in bad condition, and while the old single-truck cars rode so roughly as to be dangerous, the safety cars, operating at higher speed, negotiated the rough track with no discomfort to passengers. Furthermore, the voltage drop on the line with the old cars was excessive, but with the new cars, fewer in number and each pulling less current, the voltage drop was not unsatisfactory. Thus the installation of safety cars enabled the company safely to defer track repair expense and avoid more investment in overhead copper.

The table below gives a comparison of the cost of operation of these lines for the two weeks just prior to the safety-car installation, with that for the first two weeks of safety-car operation. Including the tripper and extra service in this summary, there were operated in the second two-week period eighteen fewer car-hours but 157 more car-miles.

Daily saving in cost of energy.....	\$4 18
Daily saving in cost of maintenance.....	7 75
Daily saving in platform expense.....	55.66
Total daily saving in operating expenses.....	\$67.59
Total annual saving in operating expenses.....	\$24,670 35

This case illustrates only the economical aspect of safety cars, for on this line the twelve-minute headway was all that was warranted by the traffic that could be secured.

Table I gives interesting information from other cities.

TABLE I—RELATION BETWEEN INCREASE IN CAR-MILES AND IN GROSS REVENUE, VARIOUS CITIES

City	Line	Increase in Car-Miles, Per Cent	Increase in Gross Receipts, Per Cent
Kansas City, Mo.....	Sunset Hill.....	47	19
Richmond, Va.....	Belmont Ave.....	55	23
Richmond, Va.....	Laurel St.....	40	20
Houston, Tex.....	Woodland LaBranch.....	45	60
El Paso, Tex.....	1.....	47.5	50
El Paso, Tex.....	2.....	59	36.7
Tacoma, Wash.....	1.....	75	42
Tacoma, Wash.....	2.....	20.9	43.8
Tacoma, Wash.....	3.....	3.4	17.31
Tampa, Fla.....	Woodlawn.....	60	62
Tampa, Fla.....	Nebraska.....	52	51.4
Tampa, Fla.....	West Tampa.....	70	61

The car about which we are talking has been called the "safety" car. The name was derived from the effort made so to equip it with automatic safety devices that the use of a one-man crew would entail no extra hazard to passengers. Table II on page 178 gives some detail evidence of how well it has lived up to its name in Terre Haute compared with the two-man cars.

The substance of this study is that the number

*Abstract of paper read before joint meeting of A. I. E. E. and W. S. E., Chicago, Dec. 17, 1920.

of accidents of all kinds per 100,000 car-miles is slightly higher for safety cars than it is for two-man cars, but, due probably to the light weight of the safety cars, the number of accidents involving expense is substantially less. Also, the cost of accidents per 1,000 car-miles is only about one-half as much for safety cars as for two-man cars. Here, again, the relative weight of the cars is probably the most important factor in the difference.

THE STANDARD CAR AND TENDENCIES IN DESIGN

In designing the one-man safety car the builders conceived the idea of developing a standard car that could be produced on a quantity basis with resultant lower cost to the consumer and better profit to the car builder. Standardization of electric railway equipment had been a constant topic of association discussion for years, but little real progress along this line had been accomplished. With the advent of this new type of car, however, embodying a radical departure from all previous practices, there seemed to be a good opportunity to start standardization in earnest. By tenaciously holding to the fundamentals of the design, the original designers have succeeded to a remarkable

approximately 16,000 lb. or 500 lb. per seat, and the standard double-end safety car weighs 16,600 lb. or 519 lb. per seat.

In addition to these vital questions of weight and strength in safety-car design, there have been numerous other less important tendencies away from the exact standard safety car. For the more northern cities it has been necessary to use interior side sheathing and headlining to make the car warmer, and in some cases extra heating elements have been specified. Double flooring has been required for the same reason in the north, and in other cities managements have insisted on this to reduce the noise within the car. Some railway managements have insisted on spring-cushion seats, and others have required that the interior of the car be better finished for sake of appearance. In a few cases, the arrangement of seats has been changed, the end cross-seats being turned longitudinally to provide a larger well for standing passengers. There has also been some demand for a wider aisle, seats a little wider, and in general that the car should be a little more generously dimensioned.

There is a more important change in the body design than those just mentioned, which is being advocated by operating men in increasing numbers, despite strong opposition. It is urged that there ought to be a separate passageway for the ingress and egress of passengers so that two opposing streams of passengers can be moving simultaneously while the car is standing. At present, with the single doorway for both entrance and exit, it is necessary for boarding passengers to wait until all the leaving passengers have got off before they can get on. This is an annoyance to patrons and lengthens the stopping time of the car. Whether separate exit and entrance are desirable or not, the sentiment for them has been steadily gaining ground. This applies to small and large city users alike, and double-door cars have already actually been built for Mason City, Iowa; Madison, Wis.; Fort Wayne, Ind., and two or three other cities. In Madison single-door safety cars were replaced with new and rebuilt safety cars equipped with double doors.

The desirability for this change to double doors and more generous dimensioning is also closely associated with the idea of using safety cars on many of the lines of the largest city systems. It is felt by many that these slight changes would greatly extend the field of adaptability of the standard cars.

There are numerous lines in Chicago as in other big cities where safety cars could be installed with resulting improvement in service, better earnings, gross and net, and a better pleased public. Where these cars are used they should not be permitted to be overloaded unduly, for the inherent skip-stop feature of the small load, and the slow ingress and egress of passengers in a jam, would slow up the speed and defeat the advantages which otherwise accrue.

When safety cars are used on these heavier city lines, several things can be done to aid their success or enhance the economies and increased earning power they afford. One of these is a slight change in the design of the car body, which has already been discussed. Another is the use of a street collector at heavy loading points to aid the operator. He should be placed either at the rear emergency door, as is done in Kansas City, or at the regular entrance, simply to make change, sell tickets, etc. Still another thing that might

TABLE II—ACCIDENT RECORDS IN TERRE HAUTE FOR SAFETY CARS AND TWO-MAN CARS
Twenty-three Months, Dec. 1, 1918, to Oct. 31, 1920

	Safety Cars	Two-Man Cars
Total accidents reported.....	786	270
Deduct accidents causing no damage to persons or property.....	553	107
Accidents involving expense.....	233	163
Total cost, all accidents.....	\$32,259.32	\$22,253.73
Average cost per accident (those involving expense).....	\$138.45	\$136.52
Average cost per accident (all reported)....	\$81.04	\$82.42
Total car-miles (thousands).....	708.1	1,376.0
Number of accidents, all kinds, in each 100,000 miles.....	21.1	20.0
Number of accidents, involving expense, in each 100,000 miles.....	6.28	11.8
Or, one in every.....	15,923 miles	8,478 miles
Average cost accidents per 1,000 car-miles.....	\$8.69	\$16.17
Number of cars operated, beginning of period.....	15	16
Number of cars operated, end of period....	49	1

degree in preserving their aim in this direction, and hence of being able to build cars for stock regardless of the city in which they would ultimately be used. In fact, it is now actually possible to order street cars from stock almost as one does an automobile.

The original standard safety car had a practically all-steel, arch-proof, single-end body with a 30-in. single door at the front end for entrance and exit. It was equipped with fourteen cross-seats and an end seat, affording capacity for thirty-two passengers. It was mounted on a single truck with a 9-ft. wheelbase and equipped with two 25-hp. motors and 24-in. wheels. The motors, air-brake system, air compressor, control and other equipment were all of a special type, newly designed for the innovation in the urban transportation world. These first cars, completely equipped, weighed but 12,500 lb. or 390 lb. per seat—a new low record in the industry.

Desirable as this light weight was from an energy-economy standpoint, it soon developed, after the first cars were in service, that they were too frail and would have to be strengthened. The demands of the industry in this connection, based on experience in using the cars, have been so insistent that the manufacturers have been forced to strengthen the car from time to time in one member and another, both body and truck, until now the standard single-end safety car weighs

serve to speed up the little cars would be to make use of a combination pay-enter, pay-leave, fare collection system. On runs where there is a scattered loading and a concentrated unloading, passengers would pay as they enter. On runs with heavy loading concentrated in a small district and a scattered unloading, passengers would pay as they leave. On many lines this should result in materially speeding up the service.

Real Service in a City of 30,000

Indiana Railways & Light Company, Which Operates In and Around Kokomo, Has Found that the Safety Car Pays—Some Construction and Operating Data Are Given

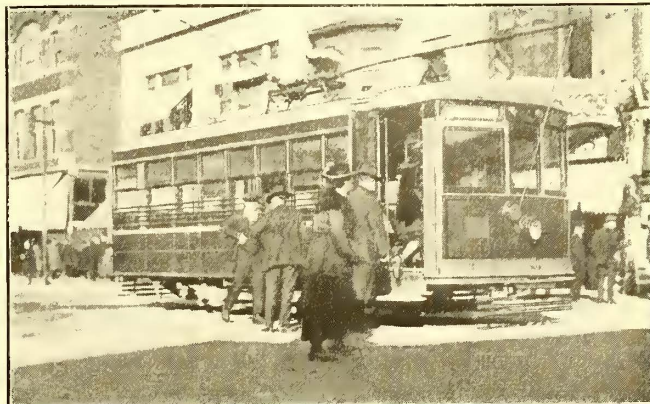
By C. T. DEHORE

General Electric Company, Cincinnati, Ohio

IT IS a real problem to give electric railway service in a city of 30,000 population and come anywhere near breaking even. Kokomo appears to be doing it with the aid of safety cars. Up to July 1, 1920, the service on the main city line in the city was on a ten-minute headway, requiring four double-truck cars, seating about forty-four people and weighing 16 tons. Three or four

Platform expense has increased slightly, due to an increase in rate of pay. The old rate was 34 to 39 cents; the new is 40 to 45 cents.

The inspection of equipment is very rigid and the cars are kept scrupulously clean. Immediately upon the development of any defect or irregularity, such as leaks



THE KOKOMO SAFETY CAR IS POPULAR

in any of the air valves or equipment, etc., the inspector sends the car to the shop. The same shop force handles the eight safety cars as previously looked after the four double-truck cars. One car cleaner has been added.

The reduction in the schedule speed from 9.6 to 7.5 m.p.h. was made with the idea of reducing the number of

TABLE I—PASSENGER BUSINESS IN KOKOMO BEFORE AND AFTER INSTALLATION OF SAFETY CARS

Month	1919	1920	Increase	Per Cent of Increase
July.....	253,779	314,064	60,285	24
August.....	267,557	321,731	54,174	20
September.....	285,696	334,949	49,253	17
October.....	249,528	315,975	66,447	27
November.....	253,241	313,512	60,271	24

trippers were put on morning and evening. Generally speaking, the service was above the average for cities of this size, and the rolling stock was modern and well maintained.

The management of the company, after a study of the performance of safety cars throughout the country, and particularly in Terre Haute, decided in January, 1920, to purchase ten safety cars. The cars went into service on July 1.

The four large cars referred to were replaced with eight safety cars on a six-minute headway. This

TABLE II—CAR-MILES AS INCREASED BY SAFETY CARS IN KOKOMO

Month	1919	1920	Increase	Per Cent of Increase
July.....	37,535	49,160	11,625	31
August.....	39,845	49,935	10,090	25
September.....	38,288	50,020	11,732	30
October.....	36,875	49,070	12,195	34
November.....	36,184	46,890	10,706	30

reduced the schedule speed from 9.6 to 7.5 m.p.h., and the round trip running time increased from forty to forty-eight minutes.

As a result of the new service numbers of passengers carried increased as shown in Table I and the car-miles were increased as shown in Table II.

COST OF OPERATION AS AFFECTED BY SAFETY CARS

The power consumed by the eight safety cars is approximately the same as before, except that some little additional is required for heating because the new cars are better heated. The cost of power is, therefore, practically only increased due to increase in the cost of coal and other items of production.

The total cost of maintenance of equipment is running about the same as before. Up to date repair material for the maintenance of the new cars has cost less.

TABLE III—DETAILS OF KOKOMO SAFETY CAR

Builder.....	American Car Company
Type.....	Standard Birney Safety
Seats.....	32
Motors.....	GE-264-A
Control.....	K-10 double end
Seats.....	Brill Waylo
Air compressor.....	GE-CP-25, 10 ft.
Governor.....	GE-ML-A-1
Registers.....	International air operated
Signs.....	Keystone

collisions with automobiles and other vehicles. The result in this regard has been gratifying, while boarding and alighting accidents have been eliminated entirely.

SOME OF THE "REACTIONS" PRODUCED

At first the operators were skeptical as to the practicability of the cars, as well as their own ability to operate them. However, this feeling has since worn away and the men are now very enthusiastic over their performance.

The public is pleased with the new cars and the people

TABLE IV—SUMMARY OF KOKOMO SAFETY CAR DATA

	1919	1920	Percentage, Percentage	
			Increase	Decrease
Number of cars operated	4	8	100	...
Number of men required	8	8	...	...
Headway.....	10 min.	6 min.	...	40
Miles per hour.....	9.6	7.5	...	22
Running time.....	40 min.	48 min.	20	...
Car-miles.....	188,727	245,075	30	...
Passengers.....	1,309,801	1,600,231	20	...
Rate per hour.....		1919	1920	
		34 to 39 cents	40 to 45 cents	

of Kokomo feel that they are being given "real service."

The railway management feels that the demands of the public for increased service could not have been met in any other way without a material increase in the rate of fare or the incurring of a large operating loss.

The details of the car are given in Table III.

The Kokomo installation was made under the direction of Phil H. Palmer, general manager Indiana Railways & Light Company, who furnished the above data.

Some Pennsylvania Commission Policies

Chairman Ainey in an Address to the Philadelphia Chamber of Commerce Outlines the Underlying Laws and Policies of the Pennsylvania Commission—Commission Regulation Supersedes Contractual Relations

IN A recent address to the Philadelphia Chamber of Commerce W. D. B. Ainey, chairman of the Public Service Commission of Pennsylvania, outlined some of the important features of the organization and authority of the Pennsylvania Commission.* He pointed out that with the passage of the public service company law, which went into effect Jan. 1, 1914, there was inaugurated an entirely new method of utility control for Pennsylvania, although commission regulation had existed for many years in other states. The commission, while not strictly a judicial body, as it is an arm of the legislative branch of the government, nevertheless bases its judgment on evidence and not upon private communication or petitions.

REGULATION'S PURPOSE IS TO PRESERVE UTILITIES

Mr. Ainey said that public service regulation would have been comparatively simple when the commission started to work, "if all public service corporations could have been, on that day, re-created and the program and policy of the commission directed solely to the future, but nearly all of these corporations came into existence under general laws or special statutes passed many years before. There had been created under them situations which after Jan. 1 would not have been permitted, but which under the law theretofore existing were, in most instances, perfectly legal." He further pointed out that the enactment of the law was in recognition of the fact that utility service was important to the Commonwealth and that the preservation, not destruction, of the companies was essential to public welfare and convenience.

One necessary purpose was to get rid of discriminatory or preferential contracts where these existed under contract or contract and the Legislature made certain prohibitions with reference to rates and practices. "This brings us to a differentiation which, in considering the public service company law, we must make between those policies which have been (a) legislatively adopted by the state and therefore are as binding on the commission as they are upon utility companies and their patrons and (b) those which are adopted by the commission under the broad discretionary powers lodged with it."

The law impressed upon utility companies the character of public servants and almost entirely removed them from the realm of corporations, but emphasized in so doing that "their services were required by the public and their preservation was essential for the public good." In line with this, limitations were imposed upon revenues, limiting them to a fair return, and thus rates and service devolved upon the commission. In the exercise of this power comes the application of the principle that the government might interfere with charter powers and privileges theretofore granted, if the general public welfare is involved, and thus "contracts are no longer inviolate when they stand in the way of an important public policy."

Another point related to this is that any regulatory

policy of the state directed toward the companies must likewise regulate their patrons and the public itself, if it is to be effective. Thus municipal and private contracts fixing rates and determining revenues and service must also give way whenever they are in conflict with the aims desired. On this point he said:

"I have in mind a street railway operating through several municipalities; in one there was a 3-cent fare fixed in an ordinance, in another a 5-cent fare, and in some others no rates of fare were prescribed. The increased labor and material costs were such that the operating expense exhausted the revenues. It became necessary to increase the fares, if service was to be continued. If the legislative hands were tied and these contract rates were continued the entire burden of the increase would have had to be placed upon the riders in the municipalities having no contracts, and the others would be relieved. Admittedly no more unjust, inequitable or discriminatory situation could arise. The public service company law was intended to correct such injustices. Private contracts afforded opportunity for the best or more influential trader to secure better rates than others not so aggressive or powerful."

Likewise if there are standards of service and limitations of revenues, then any unusual burden "contractual or otherwise" which prevents the preservation of the utilities and the rendition of adequate service at reasonable rates cannot, and ought not, to be continued, in the interests of the public itself.

Mr. Ainey showed that the power thus exercised by the state is not unique and he found similarity in the eminent domain laws, health laws and tax laws. "Public service and private rate contracts," he said, "are incongruous when they conflict. Rates themselves cannot be based, if they are to be equitably apportioned among patrons, upon private contracts any more than taxes can be fixed by agreement between tax collectors and property owners. There is a striking similarity between taxes and public service rates in so far as the bases upon which they are imposed is concerned."

LAW, NOT COMMISSION, INVALIDATES CONTRACTS

Again adverting to distinction between legislative policies and discretionary policies which are prescribed by the commission, Mr. Ainey pointed out that the former have become the settled law of the Commonwealth, equally binding upon commission and public. The commission determines reasonable and just rates in service, but when the rates are determined, "the law and not the commission declares any conflicting contract rates invalid. . . . The whole duty of the commission under the statute is to ascertain what are the just and reasonable rates, and automatically the statute is applied as against any other rates arising on contracts."

Mr. Ainey then showed that the commission had within its discretion adopted the "non-competitive rule" as a policy, but said that "when the reason for the rule fails, the rule itself must fail." The theory of this rule is that duplication of facilities requires a duplication of investment and capital, and there is thus imposed a double burden upon the rate payers. All that competition does is to hold rates to a reasonable basis, and this is done by the commission.

In closing Mr. Ainey said that these public utility questions are but a part of the great economic questions which confront the country today and which demand of all the most thoughtful consideration. "There is no more patriotic service to which we may give our attention. The times stress them upon us. We must approach them with disinterested and highest motives, but fearlessly and forcefully."

*A subsequent article, now in preparation, will describe in detail the organization and methods of the Pennsylvania commission.

Indiana Utilities Join in Meeting Devoted to Public Relations

Presidents Gadsden, Insull and Munroe of American Electric Railway, Electric Light and Gas Associations Were Speakers at the First Annual Meeting, Which Was Attended by More than 250—Addresses Given by Commissioner Paul P. Haynes and E. K. Hall, American Telephone & Telegraph Company—Charles L. Henry Presided

THE first annual meeting of the Indiana Public Utility Association, formed about a year ago to sponsor the Indiana Committee on Public Utility Information, proved to be a conspicuous success and of far-reaching value. The meeting, with an attendance of more than 250, began at a 12:30 luncheon in Indianapolis, Jan. 13, and extended through the afternoon and a dinner in the evening. It was devoted entirely to the consideration of improving the relations of the utilities with the public. Charles L. Henry, president Indianapolis & Cincinnati Traction Company, as first and re-elected president of the new association, presided at the luncheon, afternoon and dinner sessions. The program included addresses by the presidents of the American Electric Railway Association, the National Electric Light Association and the American Gas Association and by a prominent telephone man, a member of the Indiana Public Service Commission and the Mayor of Indianapolis. Harry Reid, president Interstate Public Service Company, Louisville, Ky., and vice-president of the Indiana Association, was largely responsible for the excellent program of timely papers.

Mr. Henry spoke briefly of the organization of the Indiana Public Utility Association to include all classes of utilities into a compact organization for the purpose of providing a more effective machinery with which to deal with the common problem of public relations. He said there will be no attempt to revolutionize things in Indiana, but that the association will function to bring to the citizens of the State the things they ought to know about their public utilities.

To correct any possible misapprehension Mr. Henry pointed out that there was no desire to endeavor to dominate governmental agencies or legislation in any way. He called particular attention to Article II of the con-

stitution of the association, adopted at this meeting, as the best expression of the object of the association. This article reads as follows:

The object of this association shall be the collection and dissemination of information relating to the operating, technical and commercial conditions and problems affecting public utilities, and upon those questions affecting the relations between public service companies and the communities which they serve, so as to assist the companies in the management of their affairs in serving their communities and in promoting cordial relations between the public and themselves, and to cultivate friendly and social relations between the officers and employees of the several companies.

Mr. Henry also laid particular emphasis on the point that the utilities are on trial every day in the year, and that while this circumstance places them in a position which is very difficult and trying men occupied in this work ought to be very proud of their positions.

Paul P. Haynes, member of the Indiana Public Service Commission, then addressed the association, making statements to which repeated references were made by later speakers representing the utilities. He said that it is the usual contention

that there are two sides to the utility business, but that he was of the opinion that there is but one side. The interests of the public utilities and of the public are so inextricably associated that what is good for the public is good for the utility, and vice versa; that when one prospers or suffers, the other does likewise. Referring to the work of the newly formed association, he said that to the extent that the association approaches the utility problems as public problems, to that extent will the association's work be successful.

The commissioner then explained how utility rate increases have lagged far behind the increases in prices of commodities generally. In other words, the orders of the utilities commissions have not been prompt enough to keep the utilities in sound financial condi-

Six Points Made by Commissioner Paul P. Haynes at Indianapolis Meeting

1. The average increase in utility rates during the last four years has been substantially less than the increase in the price of other necessities.
2. The utilities generally have earned less than a fair return on their sound valuation and they should now be permitted to recoup reasonable losses.
3. Existing rates are not based on peak war costs and therefore considerable reduction in prices of commodities will have to be experienced before these prices reach the present basis of present rates.
4. During these four lean years there has been an immense accumulation of deferred maintenance which must be taken care of.
5. The sum of \$100,000,000 should be expended in the next two years in Indiana to provide needed extensions and improvements, and the public should know that this money cannot be had unless the credit of the utilities is restored through better revenue.
6. The situation demands a sympathetic understanding of these facts on the part of the public.

tion. He said that we are now reaching a turning point, that prices are very generally on the decline. This fact, he said, bids fair to react very unfavorably upon the utilities unless the public is brought to understand that it would be to the public's own serious detriment to insist upon rate reductions immediately. Rate reductions must be made in time, but they must be made intelligently and with full consideration for the deficits which the utilities have accumulated as the result of the slowness with which increased rates came. In this consideration, the commissioner mentioned six things which, he said, must be brought home to the public:

(1) That the average increase in utility rates during the last four years has been substantially less than the increase in the price of other necessities; (2) that the utilities generally have earned less than a fair return on their sound valuation and that they should now be permitted to recoup reasonable losses; (3) that existing rates are not based on peak war costs and therefore that considerable reduction in prices of commodities will have to be experienced before these prices reach the present basis of present rates; (4) that during these four lean years there has been an immense accumulation of deferred maintenance which must be taken care of; (5) that \$100,000,000 should be expended in the next two years in Indiana to provide needed extensions and improvements, and the public should know that this money cannot be had unless the credit of the utilities is restored through better revenue; (6) that the situation demands a sympathetic understanding of these facts on the part of the public.

Mr. Haynes said that rates must come down after a while to a level corresponding with what shall be considered normal prices of commodities, but that reduction in rates cannot be expected simply because some one reads in the morning paper that prices are coming down and hastens to demand that utility rates be adjusted accordingly. Even if the selfish interests of the utilities are eliminated altogether, still, in the best interests of the people, rates should not be reduced immediately. He contended that it is the duty of a commission to see that the utilities are not only solvent but that they are maintained in a healthy condition, with good credit and able to give good service. He also said that the utility that renders better service and has a high regard for the public served should be rewarded liberally. Service is the primary obligation of the utility, and it must precede every other consideration. The commission cannot do its part unless the utility does its part in giving service, with open and aboveboard practices. He contended that service first should be the watchword of the utilities and thought that the public would respond to the needs of a company if it is thought that this company is doing its best and really striving to meet the needs of the public and be a real public servant.

ADDRESS OF MARTIN J. INSULL

Martin J. Insull, president of the National Electric Light Association, spoke at length with the primary object of telling the utility operators what they ought to do and say to the public. Speaking of the attitude of mind of utility men and the public, Mr. Insull said that most of us think that running the utility is our business and the public thinks that it is none of its. Both are wrong, he contended, and he then endeavored to urge upon the utility man the idea that he must

make it a part of his duty to spread information about the utilities to the public and make the public understand that it has a real interest in the utility business. He took issue with Commissioner Haynes that service must be the first and foremost consideration. It was his opinion that service and rates must go together, for it is impossible to give service unless reasonable rates can be charged. He made the point that people do not think much about the service received until it becomes poor service. The public is so accustomed to good service that it has no thought of this matter until the time comes when it receives poor service, when it is prompt to voice its discoveries.

Mr. Insull then brought up the question of what it would mean if the utilities should shut down, and discussed what the utilities mean in modern business and domestic life. He made the observation that if the utilities in a community are all run down it is safe to say that the community itself is going backward and there is something decidedly wrong with it. The growth of a community and of its utilities go together; in fact, the utility growth should be a little ahead of that of the community.

He said that now is the psychological time to educate the public, and emphasized that not all of this work can be done through the printed word, but that a lot of it must be done by word of mouth. He referred to the treatment received by the railroads and pointed out how disastrous and costly to the people, as well as the railroads, this policy had been. He thought if the utilities are to receive a similar treatment the cost to the public will be even greater. He reiterated the statement of Commissioner Haynes that the utilities should be allowed to carry present rates for a while in order to offset the long period during which they were using up working capital, or living off their fat, so to speak. In their effort to take care of public demands, they used up all of their reserves and rapidly reached the point of losing their credit.

He compared the rapidity with which money is turned over in an ordinary merchandising business with the slow process which takes place in the utility field, and contended that as a result of this there is no real profit in the utility business. There is no surplus to be put aside and all new extensions of service must be financed out of new money brought into the business from outside. But in the money market, which is very highly competitive, the utility finds it necessary to compete against the highly profitable merchandising and industrial businesses.

Mr. Insull said that the National Electric Light Association is now launching a national campaign of goodwill advertising in an endeavor to educate the public that the utility business is their business. The public controls the rates, the service, the security issues and the valuation of the property, and is either directly or indirectly an investor in the utility. Then he asked in closing: Is the utility business not the public business?

ADDRESS OF E. K. HALL

E. K. Hall, vice-president American Telephone & Telegraph Company, then addressed the assembly in a speech that was replete with humor and able suggestions on how to make the public understand the true situation in the utility field. In describing how completely the life and business of every community is built around its utility service, Mr. Hall compared the utilities to

the elevator service in the famous Woolworth Building in New York. He spoke of the beautiful architecture of this wonderful structure, but said that the value of the building as a business enterprise rested entirely upon the elevator service, and that without this it would be just a monument. Most communities do not realize how badly they need utility expansion and improvement, and practically all utility companies are now without the money to give the service the public wants in its own interests. This means that the utilities need more revenue in order to get more capital, and the only way this can be had is through better rates. But higher rates are hard to get. Why? Because the public says the service is not good enough to warrant increase in rates. The utility then determines to boost up the service and tells the public that it will, but finds that it cannot do so because it cannot get the money necessary. Hence the company is back where it started at the beginning of another form of vicious circle.

Mr. Hall then raised the question of what is the key to the situation, and said that the answer was easy. If the utility operators could wave a magic wand to solve their greatest need, they would have it produce a unanimous understanding on the part of the public, for if this were had it would immediately say to take care of the utility companies. But how can the public be made to understand? This is the key, and we have the knowledge and information to do it, and in fact have been trying to tell the public for some time, but the public does not understand because it does not believe us. In the case of the railroads, he said, they had to wait until the whole transportation system broke down before the public would believe there was not a "nigger in the woodpile."

Raising the question, then, of why the public does not believe us, Mr. Hall pointed out that the public viewpoint is entirely different from ours. He said that we did not get wise ourselves to what our job really is until the last four or five years. Prior to that time we thought that our job was to sell telephone instruments and electric light bulbs, but now we know that what we are really selling is service. He said that the manufacturers were partners in this lack of understanding, for they were pushing the business in order to sell more instruments and supplies. They wanted to make dynamos and sell them, but did not care whether they were used in giving service to the public afterward or not.

Furthermore, he said, the art of all of the public utility businesses is very young. No one visualized the field ahead very clearly. And through the development of the art mistakes were made. Many of the utilities put things over on the public and got themselves and the honest utilities as well in wrong. We have been paying

the bills resulting from these mistakes ever since. Consequently, when regulation came it started with a hostile attitude. The public conception of regulation at the time it went into effect was (1) to see that no rates were excessive (and the public thought that all rates were excessive and we were not wise enough to explain they were not), (2) to prevent unjust discrimination, and (3) to prevent the waste, unsightliness and inconvenience of competitive utility systems.

Mr. Hall compared the position of the utilities when regulation thus came to what a similar situation would mean to a merchant if told that three of his customers were going to begin tomorrow to fix prices on all his goods for the rest of his life. Mr. Hall said this merchant would have a fit; in fact, he was not sure but it would kill him. Yet this is what the utilities have had to submit to.

Whatever reason there was to regulate the utilities downward and restrict their operations, he said, was taken care of in a few years, and completed a long time before the war. Then we had to stand by during the war and permit the very life-blood of these businesses to be sapped. Profiteers were plentiful in every other line of business and the public had to put up with exorbitant prices all around without recourse, but not without resentment. Then when the utility companies asked for higher rates, the public immediately took the attitude that at least here is one fellow that won't get a chance to profiteer. In other words, the resentment at the real profiteers was taken out on the utilities, who were farthest from being profiteers.

Mr. Hall said that it takes a long time to change a lifetime of opinion, and this is the problem the utilities now face in changing the general public impression of the utility operators. He said we must patiently, intelligently and tactfully get the facts before these people during the next five years, and then forever keep the facts before them. It must be brought home to the public that it is through with its job of "spanking the utilities." They have been made to suffer in full for whatever transgressions they were guilty of. He commented that at last the public utilities in one state have awakened to their jobs. In Indiana, at least, they have all got together to talk a common language and to work together in this common problem of public relations.

If there is any utility company that is not now ready to play fair and square with the public, it is the job of the honest utilities to bring this one into line summarily. If we do not, the public will, and will punish the rest of us at the same time.

One of the problems of the utilities is to make the public see that the whole idea of regulation is moving into the second era. The punitive era, the era of

Four Fundamentals According to E. K. Hall

1. The interests of the public and utility companies are identical. Few people understand this. It means co-operation.
2. The business of the utilities is entirely different from that of unregulated corporations. There is no such thing in the public utility business as profits in the ordinary sense.
3. The only possible danger as to rates from the public point of view is that they may be made too low. If too high, the fact is easily seen, but if too low it reacts against the public interests. If there is any doubt about the rate, let the decision be made on the safe side.
4. The utilities must have good credit if they are to keep ahead of the growth of any community. Good credit is the result of a fair return on the investment, plus a margin for safety in case of adversity.

teaching the utilities to be good, has gone by and few companies are using any unfair practices now. The second era, or that of making and keeping the utility companies strong enough to do their work, is now here. This must be the era of co-operation between companies and public, the era of understanding with the removal of distrust. This is the era that we are coming into and there are many ways to hasten it as a reality.

To better public relations means to better public opinion of the utilities. This public opinion is the court of last resort, and we want it to know our problems and believe in us. The right conception of our job is to give service of the kind the public wants. But in trying to mold public opinion, Mr. Hall thought that we have not started near enough to the bottom of the situation, that we need to talk fundamentals and then the details will come easy. He considered that there were four fundamentals, upon which, if agreement between public and utilities could be secured, there would be the basis of rapid progress in the understanding of the public. His ideas of these fundamentals were as follows:

1. The interests of the public and utility companies are identical. Few people understand this. It means co-operation.

2. The business of the utilities is entirely different from that of unregulated corporations. There is no such thing in the public utility business as profits in the ordinary sense.

3. As to rates, the only possible danger there is from the public point of view is that they may be made too low. If they are too high this fact is easily seen, but if they are too low it takes the heart and flesh out of the business and reacts against the public interests. In any event the chance of crippling the utilities should not be taken, because this is against the public's own interests. If there is any doubt about the rate, let the decision be made on the safe side.

4. The utilities must have good credit if they are to keep ahead of the growth of any community. Good credit is the result of a fair return on the investment, plus margin enough so that people not already investors in the business, in looking over the company's securities with a view to investing, will see that the companies can stand a little adversity, that there is a little something over for safety.

HOW TO BETTER PUBLIC RELATIONS

Before making some suggestions as to how best to handle the problem of educating the public, Mr. Hall pointed out a few suggestions on how not to do it. Do not wait, he said, until you are up against it, until the only story you have to tell is a sad story, for this breeds suspicion. Do not try to get favorable public opinion until you have cleaned house and deserve it. Do not try to assign the task of informing the public to one man with that as his special job. No one man alone can accomplish much, and it is essential that every officer and every employee do a part. Do not leave the task to publicity alone. This is good if rightly conducted, but it must be supplemented by word of mouth and other means of education.

The place to begin the big task of inducing favorable public opinion is at home. It is impossible to accomplish much unless the whole organization family thoroughly understands and is ready by training and willing in mind to spread the truth. Another very important point is to study and proceed from the public point of view. We have not told the public what a task

it is to give service, and it has no conception of the magnitude and intricacy of the work behind this service. It thinks that "it is a cinch."

Mr. Hall said that the public thinks the rates are too high because (and this is a commentary on the public) individuals think that if they were in the business they would make the rates too high. A difference of opinion also arises because the public thinks in terms of today, while the utility operators must think in terms of the future. The public will seek an advantage for today without regard for the result in the future. The problem of good relations is largely a question of mutual confidence. Mr. Hall contended that the public is 90 per cent on the square if it has the facts. The crank politician does not represent the public and it is part of our job to bring this fact into the public light. The public must also be taught to distinguish between the companies that are doing the fair thing and those that are not. The public does not have time to learn all of the details of our business, but good treatment and thoughtful consideration will go a long way toward making up for what lack of knowledge there will be.

There is a hazard in every business, continued Mr. Hall, which measures the amount that that business has to pay for money. The utility business is not subject to many of the hazards common in other lines. The principal hazard in the utility business is that it is run on such a small margin that an increase in operating expenses may wipe out the margin and put the company in difficulty before the machinery for changing the rate can be made to function.

Mr. Hall's final message to the utility men was to stop sobbing and apologizing. He said it is time to take the aggressive, that we are in a great service, that we have a real story to tell, and that we should tell it to employees and to the public and tell it now.

SPEAKERS AT THE EVENING SESSION

At the dinner in the evening Mayor Charles W. Jewett of Indianapolis spoke briefly. He said that the time had gone by when a man can stand on a dry goods box and deride the public utilities. Such a critic fails to appreciate how fundamentally necessary the service of the utilities is and he does not see that they cannot serve if they are financially crippled. The appreciation of the user of utility service will be advanced as he is brought to understand the significance of this service. He congratulated the utility men upon the organization of the Indiana association to work along this line, and he believed that it would result in great good to the people of the State as well as the utilities. He said that the public authorities and the utilities must work hand in hand for the development and progress of the communities.

Charles A. Munroe, president American Gas Association, spoke briefly on the fundamental necessity for understanding between public and companies. He said that in the beginning of regulation the reduced prices which were ordered enabled the companies to sell more of their product, and while it worked out in favor of the customer, it also was not altogether detrimental to the companies until the time came when operating costs began greatly to increase. People do not understand the fundamental factors of the utility business, and they do not believe that a utility is content to earn only 8 per cent; that in reality it must be earning more than this. This distrust must be overcome, for the welfare of cities and states is dependent on the financial welfare

of their utilities. The utility services which were the luxuries of yesterday are the necessities of today. These companies cannot charge rates which will yield in excess of 8 per cent. On such rates they cannot develop the property out of earnings. The development of a utility must come from new money derived from the sale of securities, and this means that good credit must be assured.

Philip H. Gadsden, president American Electric Railway Association, then made the closing address of the meeting. This was published in abstract in the Jan. 15 issue of this paper, page 137.

ELECTION OF OFFICERS

During the afternoon a short business session was held, at which Thomas Donohue, secretary of the association, reported briefly on the work of the Indiana Committee on Public Utility Information, which has been the principal activity of the association during the past year. The reports of the committees on constitution and nomination of officers were also read and adopted. The following officers and members of the executive committee were elected for the following year:

President, Charles L. Henry, president Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.; first vice-president, S. E. Mulholland, vice-president Northern Indiana Gas & Electric Company, Ft. Wayne; second vice-president, F. J. Haas, vice-president and general manager Public Utilities Company, Evansville, Ind.; secretary, Marshall V. Robb, treasurer Wabash Valley Electric Company, Clinton; treasurer, Charles C. Perry, president Indianapolis Light & Heat Company. In addition to these officers the other members of the executive committee are Harry Reid, Louisville, Ky.; Frank O. Cuppy, Lafayette; Thomas Donohue, Lafayette; Fred Bryan, South Bend; Frank Wampler, Indianapolis, and C. L. Kirk, Indianapolis.

Two New Buses for San Francisco Municipal System

TWO new buses have just been received by the San Francisco Municipal Railway to supplement and serve as spares in connection with the bus service maintained by that system. The new cars, which were built by the Meister Machine Shop of Sacramento, are mounted on White automobile chassis provided with a 45-hp. motor. They have a seating capacity of eighteen and driver, and when ready for service weigh about 8,000 lb.

In general, the design and arrangement of the new buses is very similar to those which have been in service for some time and which were described in the **ELECTRIC RAILWAY JOURNAL** for Feb. 16, 1918. However, a number of minor improvements have been introduced in the new cars which are expected to make for somewhat better economy and service.

As the buses were found to average only about 5 to 6 miles per gallon of gasoline, the 24-gal. tank, provided on the earlier model buses, was considered too small and 35-gal. tanks were installed on the new buses, these being expected to serve for the entire day's run. The lamp hangers mounted on the rear of the old buses are replaced in the new design by lamps set flush with the body. This eliminates the danger and breakage resulting from boys on bicycles hanging on to the buses. The headlights have been moved back to the dashboard as a means of reducing maintenance.

No tire racks are provided on the new cars as it has not been found worth while to carry spares. The driver of the bus, working alone, requires so much time to change one of these large tires that it has been found more economical to send out a small service truck from the garage to make a change when necessary. However, less tire trouble is expected on the new cars because they are equipped with single 40-in. x 8-in. tires on the rear end, in which the rubber and fabric protection is such that punctures are very infrequent.

On the old plan the cost to equip one wheel with dual tires was as follows:

Two tires, 37 x 5 in. at \$81.59	\$163 18
Two tubes, 37 x 5 in. at \$10.00	20 00
Total	\$183 18

On the new plan, which is expected to be more economical, the cost to equip one wheel with single tire is as follows:

One tire, 40 x 8 in.	\$217 00
One tube, 40 x 8 in.	25 00
Total	\$242 00

Stockholm-Gothenburg Railroad to Be Electrified

THE Swedish Government has decided to electrify the Stockholm-Gothenburg division of the State Railways and has appropriated about \$5,000,000 for the work to be done during 1921. The division is about 300 miles long and its electrification will require a total expenditure of about \$25,000,000. Although the Riksgransen division, which is already electrified, operates at 15,000 volts, single-phase, it has not been definitely decided whether the new electrification will use alternating or direct current. In order to determine this and other factors which are unsettled a royal commission is now studying the railroad electrifications in this country. A. Granholm is director general of the Swedish State Railways, I. Ofverholm is chief electrical engineer and A. Enstrom is director of the Scientific Engineering Academy of Sweden.

Turning Seats on Passenger Trains

SHALL passengers be permitted to turn seats over and place their feet upon seat cushions? This question was one of those affecting the public's comfort brought up at a meeting of the operating staff of the Pennsylvania Railroad. The decision was as follows:

"When there is not a whole seat for every passenger, trainmen should see that seats are not turned over and an undue amount of space monopolized by any one passenger. To go further than this, however, and forbid the turning over of seats, when there is plenty of room, is unnecessary.

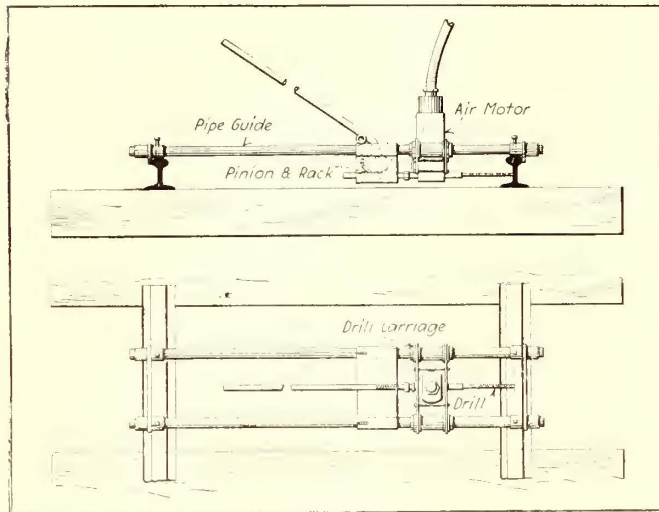
"After all passengers have been provided with seats, conductors will exercise their judgment in permitting the turning over of seats. Passengers should be required to exercise proper care to prevent the soiling of seats in placing their feet thereon."

A recent preliminary report of the Wisconsin Railroad Commission, covering the whole State, states that the electric railways, property and plants accounts in 1910 totaled \$51,148,324 and in 1919 \$84,714,942. The total operating revenues amounted to \$8,823,996 in 1910 and to \$15,784,993 in 1919.

Speeding Up Rail Bonding

Air-Operated Drills Receiving Power from Gas-Engine Driven Compressor and Mounted on Carriage Make Possible Bonding of Eighty Rails per Hour on Chicago, Milwaukee & St. Paul Railway

ON THE Chicago, Milwaukee & St. Paul Railway an expanded terminal type of bond was used which required two $\frac{7}{8}$ -in. holes through the web of the rail for each bond. The drilling was done with two air-operated drills, which received their power from a gas-engine-driven compressor. This compressor was an



PIPE-CONSTRUCTED FRAME FOR DRILLING RAILS

"Imperial" Ingersoll-Rand type on a four-tool compressor car, originally designed for operating tie tampers. Two air tanks, 16 in. x 48 in., were added to this outfit in order to secure a more uniform pressure and better engine operation. While the drills were operating an air pressure of 55 to 60 lb. was maintained at the reservoir of the compressor which furnished power for two drilling motors.

The drilling machines were close-quarter drill motors, mounted on a frame consisting of two $1\frac{1}{2}$ -in. pipe guides extending from rail to rail. These were separated at the ends by two clamp plates of sufficient depth to prevent the frame from slipping over the head of the rail. The drill motor was supported between the guides by two transverse plates separated by sleeves which slide on the pipe guides. The drill feed consisted of a long lever with a gear segment acting on a rack. A downward pressure on the lever forces the whole carriage along as the drill bores through the web of the rail. The whole frame was supported on four set-screws, one in each corner, resting on the head of the rail and furnishing a means of adjustment and leveling the frame.

With an outfit of this type a hole can be bored in an average rail in about twenty-five seconds, but in harder steel it often takes forty to fifty seconds. Some difficulty was experienced with extremely hard steel in the rails. It was found necessary to use care in selecting the drill bits, otherwise there was considerable trouble due to breakage and difficulty in regrinding. One man was retained at the shops for regrinding drills, which operation required careful attention in order to secure bits which would give uniform diameter of holes.

The drill motors were connected to the compressor with a 50-ft. and a 75-ft. section of $\frac{3}{4}$ -in. armored air hose. With this hose each drill could work on two

joints for each movement of the compressor. To clear the track for train movements the air compressor was jacked up and rolled clear on skidways. The average bonding rate was about eighty per hour, and as many as 110 have been placed in an hour. The best record was 629 bonds in seven hours and twenty minutes' drilling time. The actual drilling time averaged about five and one-half hours per day, the lost time being due to going to and from work, clearing the track for trains, etc. This time would vary considerably with other working and traffic conditions. For one compressor the usual bonding crew consisted of twenty-one men, including the foreman, drillers, helpers and others required for the complete bonding operation.

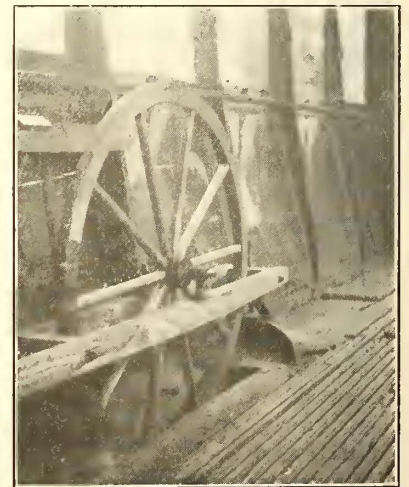
Convenient Track Measuring Device

THE device illustrated herewith was used by an electric railway to check the track mileage of the system. An obsolete single-truck passenger car was used and the cone was turned from the tread of one of the wheels so as to give a flat surface. A wooden wheel mounted as shown in the illustration was fitted with a rubber tire and adjustments were made so that the circumference would measure exactly 10 ft. This wooden wheel was arranged to bear against the car wheel and be driven by it. By this arrangement the distance traveled by the circumference of the wooden wheel would be exactly equal to the track distance. The frame supporting the wooden wheel was weighted in order to increase the friction between the driving and the driven wheel. The axle of the wooden wheel

was connected by a flexible shaft to a counting device taken from an old kilowatt-hour meter. Each revolution of the wooden wheel caused the first dial of the meter to make one revolution and as this represented 10 ft. results could be read directly. In order that there might be no tendency toward slipping between the car wheel and the track, the brushes were removed from the motor on that axle to which the measuring device was attached and the car was operated with one motor.

A check of the results obtained showed that on tangent track these were as close as 1 ft. in 5,000. Curved special work was measured with a tape, measurement being taken at the points of tangency of the layout. With this device it was found that results sufficiently accurate for the purpose desired were obtained.

About 2,000 of the original white cedar ties laid in 1869 by the Chicago, Milwaukee & St. Paul Railway between North Milwaukee and Cedarburg are still in use today. For untreated ties this is an excellent record. For the first thirty-three years of service, or up to 1902, the ties did not have even the protection of tie plates.



CONVENIENT TRACK MEASURING DEVICE

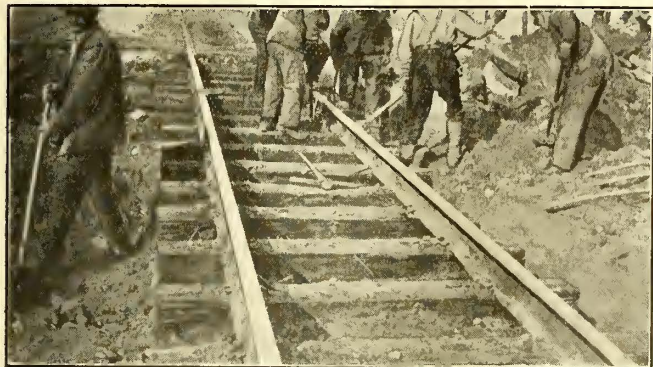
22-Year-Old Track in Good Condition

Track Consisted of 72-Lb. T-Rail Laid on Michigan Hemlock Ties Which Had Been Pressure Treated with Creosote —Rail Also Showed Little Deterioration After This Long Service

By W. L. WHITLOCK

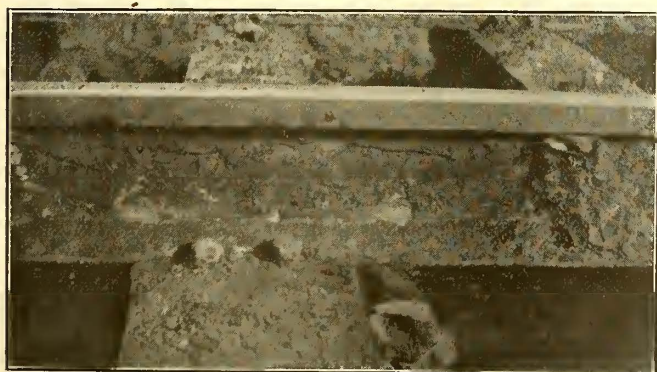
Superintendent of Way the Denver (Col.) Tramway

WE RECENTLY had occasion to open up some track which was built in July, 1898, and were much impressed by the soundness of the ties and condition of the rail after twenty-two years of service. The track in question was a tangent double track, 3-ft. 6-in. gage,



APPEARANCE OF TIES AND RAILS IN TWENTY-TWO-YEAR-OLD TRACK

constructed for a distance of 7,700 ft. on Colfax Avenue, from Broadway to York Streets. It was laid with 5-in. x 8-in. x 6-ft. Michigan hemlock ties which had been pressure treated with creosote oil using 12.5 lb. per cubic foot. They were so soaked with oil that if stood on end the oil would run out. These were laid on 6 in. of pit-run river gravel ballast and concreted in up over the base of the rail. The 72-lb. T-rail, Lorain Section No. 331, was fastened to the ties with $\frac{1}{8}$ -in. by $4\frac{1}{2}$ -in. cut track spikes and the joints completed with six-hole angle bars, 1-in. track bolts and tie plates. When installed the tie plates were pressed into the ties according to a template and the ties transported to the job with the plates in place. The four ridges on the plates



RAIL IN UNUSUALLY GOOD CONDITION CONSIDERING LENGTH OF SERVICE

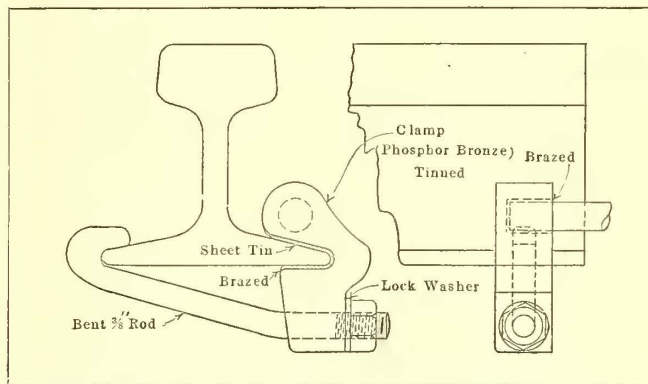
helped to fasten them to the ties. The tie plates and bottom and sides of the rail were coated with asphalt paint as protection against the alkaline soil. The street was paved with asphalt, with basalt blocks on either side of the rails and vitrified brick nose blocks in the flangeway.

Upon removal of the pavement it was found that the ties were soggy on the outside but sound in the heart. The tie plates were in excellent condition and the spikes had to be pulled out with claw bars. The rail was found to be in good condition except that the base had commenced to show signs of deterioration from rust. The head of the rail was measured with a micrometer at several points, $\frac{1}{4}$ in. back on the gage side, and it was found to be uniformly $1\frac{3}{8}$ in. thick, indicating a head wear of $\frac{3}{8}$ in. in twenty-two years.

This track is on one of the heaviest traveled lines of the Denver system. While the soil and climatic conditions in Denver are favorable to long track life, the condition of this work demonstrates that a track made with treated ties, tie plates, heavy rail and good waterproof paving pays in the end. It also brings to our attention the necessity of strict inspection during construction work.

Detachable Rail Bond

A TYPE of detachable rail bond shown in the accompanying illustration is being placed on the market by the National Electric Company, Charleston, W. Va. It consists of a phosphor bronze clamp coated with tin, which is gripped to the rail flange by a bent rod. A strip of block tin insures good contact between the rail and clamp and these latter are connected together with stranded copper cable. Clamps are furnished



DETACHABLE TYPE OF RAIL BOND

either with or without the cable as desired. The special features claimed for this clamp are its ease of installation and removal and the advantageous position afforded for the connecting cable close to the track and free from interference.

Terminal Markings for Electrical Apparatus

THE American Engineering standards committee has under consideration the standardization of terminal marking for electrical apparatus and has designated the Electric Power Club as sponsor for this purpose. At the Brussels meeting of the International Electrotechnical Commission, held in March, 1920, some of the European delegates proposed a method for marking terminals for transformers and, as the American delegates suggested that it would be preferable to treat the more general subject of terminal markings for electrical apparatus consistently, they were requested to propose a systematic plan for the whole subject. It is hoped to secure agreement of all interested bodies on a general plan, which can be worked out to minimize confusion and insure uniformity.

Association News

Notice About the Banquet

THE speakers at the dinner to be held in Chicago on Feb. 10 will be as follows: President Philip H. Gadsden, Hon. John W. Weeks, former United States Senator from Massachusetts; Hon. James H. Wilkerson, former chairman Public Utilities Commission of Illinois, and Charles A. Leedy of the *Youngstown Telegram*. The dinner will be served at 7 p.m., preceded by a reception at 6:30. The tickets are \$10 and the tables will seat ten each.

American Association Committee Appointments

FOLLOWING are the principal American Association committees (with the exception of the Committee of One Hundred) together with their respective memberships:

Committee on Company Membership—F. R. Coates, Toledo Railways & Light Company, Toledo, Ohio, chairman; Benjamin Adams, St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.; J. P. Barnes, Louisville (Ky.) Railway; H. F. Dicke, Utah Light & Traction Company, Salt Lake City, Utah; C. R. Ellicott, Westinghouse Air Brake Company, New York, N. Y.; L. E. Gould, Economy Electric Devices Company, Chicago, Ill.; C. A. Hall, Eastern Pennsylvania Railways, Pottsville, Pa.; E. B. Moore, Monongahela Valley Traction Company, Fairmont, W. Va.; H. H. Norris, *ELECTRIC RAILWAY JOURNAL*, New York, N. Y.; R. T. Sullivan, Tacoma Railway & Power Company, Tacoma, Wash.; E. M. Walker, Terre Haute Traction & Light Company, Terre Haute, Ind.; E. P. Waller, General Electric Company, Schenectady, N. Y.; E. F. Wickwire, Ohio Brass Company, Mansfield, Ohio.

Committee on Company Sections and Individual Membership—Martin Schreiber, Public Service Railway, Camden, N. J., chairman; H. H. Norris, *ELECTRIC RAILWAY JOURNAL*, New York, N. Y.; Charles C. Peirce, General Electric Company, Boston, Mass.

Committee on Constitution and By-Laws—Harlow C. Clark, Public Service Railway, Newark, N. J.; Thomas Casey, National Pneumatic Company, New York, N. Y.; Charles L. Henry, Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.; Lucius S. Storrs, the Connecticut Company, New Haven, Conn.

Committee on Mail Pay—L. H. Palmer, United Railways & Electric Company, Baltimore Md.; Charles L. Henry, Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.; G. K. Jeffries, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; R. A. Leussler, Omaha & Council Bluffs Street Railway, Omaha, Neb.; Louisville (Ky.) Railway; W. S. Rodger, Detroit (Mich.) United Railway; C. L. S. Tingley, American Railways, Philadelphia, Pa.

Committee on National Relations—Charles L. Henry, Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., chairman; H. G. Bradlee, Stone & Webster, Boston, Mass.; A. W. Brady, Union Traction Company of Indiana, Anderson, Ind.; Britton I. Budd, Metropolitan West Side Elevated Railway, Chicago, Ill.; C. D. Cass, Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa; Edwin C. Faber, Aurora, Elgin & Chicago Railroad, Aurora, Ill.; W. S. Rodger, Detroit (Mich.) United Railway; Lucius S. Storrs, the Connecticut Company, New Haven, Conn.; C. L. S. Tingley, American Railways, Philadelphia, Pa.

Committee on Publicity—Barron G. Collier, Barron G. Collier, Inc., New York, N. Y., chairman; C. B. Buchanan, Virginia Railway & Power Company, Richmond, Va.; Britton I. Budd, Metropolitan West Side Elevated Railway, Chicago, Ill.; W. A. Draper, Cincinnati (Ohio) Traction Company; C. D. Emmons, United Railways & Electric Company, Baltimore, Md.; Horace Lowry, Twin City Rapid Transit Company, Minneapolis, Minn.; Lucius S. Storrs, the Connecticut Company, New Haven, Conn.

Committee on Subjects—J. D. Mortimer, the North American Company, New York, N. Y., chairman; W. G. Gove, Brooklyn Rapid Transit Company, Brooklyn, N. Y.; J. J. Landers, York (Pa.) Railways; J. J. Reynolds, Boston (Mass.) Elevated Railway; J. N. Shannahan, Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va.; J. J. Stanley, Cleveland (Ohio) Railway; R. P. Stevens, Republic Engineers, Inc., New York, N. Y.; Calvert Townley, Westinghouse Electric & Manufacturing Company, New York, N. Y.

Committee on Valuation—Martin Schreiber, Public Service Railway, Camden, N. J., chairman; Prof. H. C. Anderson, University of Michigan, Ann Arbor, Mich.; Cecil F. Elmes, Sanderson & Porter, Chicago, Ill.; Williston Fish, Chicago (Ill.) Surface Lines; G. W. Gillespie, Associated Gas & Electric Companies, Ithaca, N. Y.; J. H. Hanna, Capital Traction Company, Washington, D. C.; W. H. Maltbie, United Railways & Electric Company, Baltimore, Md.; W. H. Sawyer, E. W. Clark & Company Management Corporation, Columbus, Ohio.

Transportation Association Committees Commence Work

THE committee work of the Transportation & Traffic Association for 1921 is under way. The committee on personnel and training of transportation employees held the first meeting at association headquarters on Jan. 18. Among those present were J. P. Barnes, chairman, Louisville (Ky.) Railway; J. E. Wayne, York (Pa.) Railways; John Leeming, Chicago (Ill.) Surface Lines; J. F. Trazzare, Georgia Railway & Power Company, Atlanta, and J. K. Punderford, the Connecticut Company.

The report as planned for presentation at the 1921 convention will include a résumé of the recommendations of previous committees, in so far as such recommendations are not obsolete or unworkable according to present-day practice. This will be prepared by J. E. Wayne. Another part of the report will discuss the advantages that accrue to railways having employment bureaus under the jurisdiction of specially trained executives, together with physical tests and specifications for various jobs. J. F. Trazzare is responsible for this section. A syllabus of mental tests as used by some electric railways will also be included. This section is to be prepared under the direction of John Leeming. Another section which will be prepared under the supervision of Martin Schreiber will bear on the value of the company section as a means of educating employees.

Additional T. & T. Association Appointments

SUPPLEMENTING the list of committee appointments of the Transportation & Traffic Association printed in the issue of this paper for Dec. 25, 1920, page 1297, the following list is given, including also the personnel of joint committees on which this association is represented:

Committee on Merchandising of Transportation—Colonel J. H. Alexander, Cleveland (Ohio) Railway, chairman; W. H. Boyce, Beaver Valley Traction Company, New Brighton, Pa.; F. L. Butler, Winnipeg (Man.) Electric Railway; H. C. Clark, Public Service Railway, Newark, N. J.; F. R. Coates, Toledo Railways & Light Company, Toledo, Ohio; A. H. Ferrandou, Washington Railway & Electric Company, Washington, D. C.; B. W. Fraenthal, United Railways of St. Louis (Mo.); A. L. Kempster, New Orleans Railway & Light Company, New Orleans, La.; M. B. Lambert, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; A. Stuart Pratt, Stone & Webster Management Corporation, Boston, Mass.; S. L. Vaughan, Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich.

Committee on Traffic Regulation—H. B. Flowers, United Railways & Electric Company, Baltimore, Md., chairman; F. R. Cogswell, Pittsburgh (Pa.) Railways; R. F. Kelker, Jr.,

Board of Supervising Engineers, Chicago, Ill.; W. H. Matbie, United Railways & Electric Company, Baltimore, Md.; H. B. Potter, Boston (Mass.) Elevated Railway; Fielder Sanders, Street Railroad Commissioner, Cleveland, Ohio; Paul E. Wilson, Cleveland (Ohio) Railway.

Committee on Personnel and Training of Transportation Employees—J. P. Barnes, Louisville (Ky.) Railway, chairman; F. G. Buffe, Kansas City (Mo.) Railways; F. D. Burpee, Ottawa (Ont.) Electric Railway; John Leeming, Chicago (Ill.) Surface Lines; Martin Schreiber, Public Service Railway, Camden, N. J.; R. P. Stevens, Republic Engineers, Inc., New York, N. Y.; J. F. Trazzare, Georgia Railway & Power Company, Atlanta, Ga.; J. E. Wayne, York (Pa.) Railways.

Joint Committee on Economics of Schedules (T. & T. and Accountants)—(T. & T. members) Edward Dana, Boston (Mass.) Elevated Railway, chairman; Donald Goodrich, Twin City Rapid Transit Company, Minneapolis, Minn.; E. H. Ives, Detroit (Mich.) United Railway; H. C. Moser, Fifth Avenue Coach Company, New York, N. Y.; Samuel Riddle, Louisville (Ky.) Railway; J. A. Stoll, United Railways & Electric Company, Baltimore, Md. (Accountant members)—A. G. Neal, Washington Railway & Electric Company, Washington, D. C., co-chairman; C. B. Jackson, Eastern Massachusetts Street Railway, Boston, Mass.; D. J. Strouse, Twin City Rapid Transit Company, Minneapolis, Minn.; J. M. Campbell, Atlantic City & Shore Railroad, Atlantic City, N. J.

Joint Committee on Express and Freight Traffic Promotion and Costs (T. & T. and Accountants)—(T. & T. members) F. W. Coen, Lake Shore Electric Railway, Sandusky, Ohio, chairman; T. G. Brabston, Birmingham Railway, Light & Power Company, Birmingham, Ala.; W. P. Bristol, the Connecticut Company, Hartford, Conn.; J. H. Crall, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; R. D. Hood, Massachusetts Northeastern Street Railway, Haverhill, Mass.; F. D. Norveil, Union Traction Company of Indiana, Anderson, Ind.; W. S. Rodger, Detroit (Mich.) United Railway; T. H. Stoffel, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; C. E. Thompson, Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.; A. F. Van Deirse, Columbus, Delaware & Marion Electric Company, Marion, Ohio. (Accountant members) L. T. Hixon, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; A. R. Baxter, Indianapolis & Cincinnati Traction Company, Rushville, Ind.; L. E. Lippitt, Auburn & Syracuse Electric Railroad Company, Auburn, N. Y.; C. K. Savery, the Connecticut Company, New Haven, Conn.; W. K. Zinmeister, Rochester & Syracuse Railroad, Syracuse, N. Y.

Joint Committee on Safety Work (T. & T. and Claims)—(T. & T. members) E. C. Spring, Lehigh Valley Transit Company, Allentown, Pa., chairman; W. H. Boyce, Beaver Valley Traction Company, New Brighton, Pa.; G. E. Deibert, Georgia Railway & Power Company, Atlanta, Ga.; C. B. Scott, Chicago Edison Company, Chicago, Ill.; E. M. Walker, Terre Haute Traction & Light Company, Terre Haute, Ind. (Claims members) R. E. McDougall, New York & Harlem Railroad, New York, N. Y., co-chairman; H. K. Bennett, Eastern Massachusetts Street Railway, Boston, Mass.; H. V. Drown, Public Service Railway, Newark, N. J.; C. G. Rice, Pittsburgh (Pa.) Railways; W. F. Weh, Cleveland (Ohio) Railway.

Progress in Highway Traffic Regulation

A DECLARATION of principles to serve as a basis for state highway traffic regulation was adopted in Washington Jan. 12 after a conference attended by representatives of nineteen interested national organizations, including the American Electric Railway Association. In addition, a complete uniform traffic bill was drafted. This draft now goes to the individual associations for approval or suggested changes. Neither the act nor the statement of principles conflicts with the code of traffic principles adopted by the American Electric Railway Association in October.

Among the other associations represented were the American Automobile Association, the American Railway Association, the International Association of Chiefs of Police, the National Safety Council, the National Workmen's Compensation Bureau, the Tractor and Thresher Department of the National Implement and Vehicle Association, etc.

Letter to the Editors

The Field of the Trackless Trolley

MOUNT VERNON, N. Y., Jan. 15, 1921.

To the Editors:

As you have pointed out in recent issues, the British and continental operators are far ahead of American operators in the exploitation of the trackless trolley, which J. B. Hamilton, general manager Leeds Corporation Tramways, has felicitously termed "putting down a tramway on the installment plan." Nevertheless, in spite of the more favorable conditions abroad, the trackless trolley has not made any perceptible dent upon the foreign street railway, and up to the sensational post-war advances in motor fuel it had not thrown much of a scare into the gasoline motor bus. In analyzing the causes for this, one must conclude that a primary one is that most of the trackless trolley pioneering was carried on by firms which did not manufacture standard railway motor and control equipment. They offered the electric railway man apparatus which was decidedly different from the head down to the feet, so that the argument of interchangeability, standardization and minimum parts as compared with gasoline buses lost much of its force.

It is in apparent recognition of the equipment factors set forth that one of our large American railway motor and control manufacturers in bidding upon an Asiatic installation, which is already making a success of the trackless trolley in narrow streets, laid out the following arrangement per bus:

One standard 25-hp. or 40-hp. railway motor without gear, pinion or gear case and with the axle-cap brackets cut off, to be suspended on the chassis of the automobile truck with the armature shaft connected to the driving shaft with a universal joint and worm gear reduction.

One rheostatic controller.

One wooden trolley pole with the base mounted in a socket adjacent to the motorman and with two contacts connected by flexible cable to the controller, so designed that the pole can be raised and lowered or swung to one side of the car by a handle of about the same size as those used for hand operation of car doors. Such a pole would be adapted for use on trolley wires carried 14 ft. to 18 ft. above the ground.

Although, as noted, the foregoing was embodied in a bid for a foreign city, there is no reason why the same scheme would not be satisfactory for American conditions if it can be shown that the trackless trolley is more desirable and more economical than either the trackway or gasoline. Let us see where it would fit in.

In his recently completed* studies on "The Place of the Bus" the writer set forth the conditions where motor bus operation was preferable to the electric trackway, whether such operation was intended to be self-sustaining or simply to minimize the losses incident to operating the "suckers" and byways of a co-ordinated system of mass transportation. Emphasis was also placed upon the fact that the gasoline bus can be shifted around from route to route as traffic conditions change and that it can serve also to reinforce the service on standard trolley routes by making use of parallel streets or of short cuts between workplaces and home. For any shifting conditions, consequently, we must grant

*See ELECTRIC RAILWAY JOURNAL for Feb. 28, April 3, April 24, May 29, July 3, July 31, 1920.

that the self-contained power vehicle stands in a class by itself. Of course, there is sometimes a fighting chance for the storage battery bus where power is to be had at extremely low prices and where the question of schedule speed is not a factor in building up or meeting traffic, but on the whole the gas bus is the right bus for fluctuating services.

With regard to extensions of long-established car routes, the choice between gas bus and trolley bus obviously should depend upon the density or rather the thinness of the patronage. Such service might well begin with the gas bus at long intervals, continue with the trackless trolley at shorter intervals and conclude with the orthodox article. It is always well to bear in mind that the absolutely foot-loose character of the self-contained motor bus insures the operator against any heavy loss of investment. There is no track to pull up, no wires to take down nor even a carhouse to remove, because a gas bus does not need a wholly special building for its retiring place. The buses themselves will always find use in some other place.

It will occur to many, in view of the staggering cost of track construction, track upkeep and paving taxation, that the trackless trolley ought to have a large field in future city transportation over paved streets. There is reason to believe that such a service with moderate traffic would cost less than either track or gas, be quicker and safer than gas buses because of the possibility of using the labor-saving and door-step interlocking devices of modern electric cars and be more acceptable to the rider because of cleaner, brighter and cheaper service.

The fly in this ointment is the retention of poles and overhead wires. It having been demonstrated by the motor bus that these permanent obstructions are no longer essential to transportation over city streets, we may expect the same line of objection to operating trackless trolleys through residential, and even business, streets as in the past when there was no other alternative than the prohibitive conduit system. There is logic in the assertion of the civic welfare man that at least a part of a municipal transportation system should be fluid so that the community will not be forever compelled to grow along the routes made to fit conditions now obsolescent. Hence, public sentiment, as well as relative construction cost and fares, is bound to determine the character of additional transport facilities, even if the trackless trolley is cheaper and safer.

But no matter what happens in city practice, any worth-while trackless trolley has a large opportunity in the conversion of existing highway trolleys and a fair chance for any new intertown transportation which does not make use of a railed right-of-way. Now it may sound fantastic to talk of replacing the old, reliable track trolley with the trackless breed, yet consider the change in its status that is being wrought by the development of the private automobile and the motor truck.

Fifteen to twenty years ago thousands of miles of single-track trolley lines were built alongside of dirt highways in New England and the Middle Atlantic States especially, whereas the Central and Western States were enabled, because of cheaper land, to build roads on private right-of-way. In the course of time part of this highway trolley mileage has been converted to suburban and city trackage through the growth of towns. The greater part, of course, is still in open country, but instead of forming part of a quiet and unpaved dirtway, the trolley strip is frequently the only sign left of the old days. The rest of the road is paved

and scores or hundreds of rubber-tired motor vehicles are to be seen for every trolley car.

As the pressure of automotive traffic on these paved highways increases, longing eyes are cast by their users upon the trolley trail, constituting perhaps one-fourth to one-third of the total highway width. In time the voices belonging to those eyes will begin to clamor for more elbow room (to mix the tropes), and if they cannot get it through the costly widening process they will naturally demand that the trolley strip be paved too.

Here is where the highway trolley's cup of troubles, already numerous enough from loss of traffic to private and jitney automobiles, will be filled to overflowing if it attempts to do business in the same old way. Its track upkeep would rise enormously in any case once the track was paved, not to mention the cost of changes in alignment. Even worse would be the later delays due to slow-moving motor trucks settling themselves comfortably between the rails, thereby adding to the schedule losses already suffered in passing through towns and villages and making "meets" on the single-track sections harder than before.

What other way out will there be for the highway trolley so circumstanced than to convert itself to a trackless trolley? At the present selling price of rails and copper, new or old, it may be able to gather almost enough money to buy the necessary buses and to add another wire to the overhead. Its energy consumption will be decreased instead of increased, because a modern bus will weigh wonderfully less than the old-time trolleys found in highway service. Its roadway upkeep tax and a bit added for the multiple overhead should not total more than its track and signal expenses. Yet even if the power and maintenance items should be more, they will be offset many times over by the enormously increased flexibility of the service, for there will be none of the delays and accident possibilities that can be minimized but never entirely eliminated in single-track operation. This same flexibility in passing an opposing trackless trolley bus naturally applies also to going past or around any other vehicle. It follows that trackless trolley schedules can be made faster and more reliable than the single-track line of the past, especially as time will be also gained in passing through intervening communities. Obviously, faster schedules and elimination of waits at sidings will improve public patronage.

A vitally important corollary of such trackless trolley operation is that one-man car operation with approved safety appliances is feasible. Vehicle for vehicle, this would naturally cut down the platform expense. In some cases the wiser policy would be to shorten the headway to build up traffic.

In the case of new transportation facilities over paved country roads the problem is not so clear, because no existing investment or franchise is to be conserved and because the self-contained bus cannot be ignored wherever the amount of traffic to be expected is either small or uncertain. We must figure individually the over-all cost of each kind of service, bearing in mind that it is up to us to determine that critical point of traffic density where the higher operating cost of the gas bus is no longer justified by its unlimited flexibility. And as the same Mr. Hamilton whom I quoted earlier is the proud operator of track, trackless and gasoline transports, I may quote also him at the conclusion of this letter as saying that there is a place for each and every one of these in accordance with the density and permanence of the traffic to be carried.

WALTER JACKSON.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

Transportation Area Planned Massachusetts Commission Is Looking Well Ahead for the Needs of Metropolitan Boston

That the Boston (Mass.) Elevated Railway take over the Revere and Chelsea line of the Eastern Massachusetts Street Railway for the purpose of improving transportation and bringing about a 10-cent fare between Revere and Boston, as well as Boston and Revere Beach, is recommended by the Public Utilities Commission in a report filed with the Legislature. The fare now from Boston to Revere is 15 cents, and from Boston to Chelsea 10 cents, with no transfers at the Boston end.

EXTEND EAST BOSTON TUNNEL

It is also suggested by the commission that the East Boston Tunnel be extended to Maverick Square or possibly to Central Square, East Boston, and that five-car multiple trains be operated through the tunnel. To extend the tunnel to Central Square would cost something like \$2,953,000, it is estimated.

The commission also suggests the possibility of electrifying the line of the Boston, Revere Beach & Lynn Railroad, and by operating trains through the tunnel, under the harbor, secure connection with the rapid transit facilities of Greater Boston.

The work of consolidating the Boston Elevated and Eastern Massachusetts lines, the department believes, could be undertaken through the creation of a transportation district. The investment cost of the Eastern Massachusetts lines in the communities in question was \$2,618,000. It is believed that the Boston Elevated Railway could handle the present business of the Eastern Massachusetts Street Railway in Chelsea and Revere without material loss.

LOOKING TOWARD THE FUTURE

One of the big obstacles to the plan, says the report, is the presence of draw bridges at Meridian Street, East Boston, and over the Mystic and Charles Rivers in Charlestown. The average number of openings a day is fifty-six on the three combined. It is because of this difficulty that the extension of the tunnel to Chelsea was suggested.

Continuing its report, the commission says:

The extension of the East Boston Tunnel would harmonize with the future development of the rapid transit facilities for the district north of Boston and would prepare the way for the next step, which would probably be the further extension of the tunnel under Meridian Street and Chelsea Creek to Broadway in Chelsea, a total extension from Maverick Square of about 1½ miles. An independent tunnel from Boston to Chelsea as suggested would be about a mile longer.

When the capacity of the tunnel as

above extended is reached the electrification and extension of the Boston, Revere Beach & Lynn Railroad under the harbor to a connection with the rapid transit system in Boston would then care for all the traffic from Revere Beach and Boston and would relieve the line through Broadway in Revere and Chelsea by connecting with the lines now operated by the Eastern Massachusetts Street Railway in Revere and Beach Streets and in Winthrop Avenue, Revere, and in Bennington Street, East Boston.

This may appear to be a long look ahead, but it would seem wise to measure any proposed development not only by its probable results in the near future, but also by how it would harmonize with a general plan to deal with the conditions which are likely to arise from the growth and development of communities some years hence.

The report states that the consolidation of the lines of the two companies is the most appropriate method of meeting the situation. In conclusion the report says:

There is no doubt that the orderly development of the Metropolitan street railway system requires that such a consolidation as this should be under the Elevated system and that it is only in this manner that the complaints of the present can be met and the best results can be obtained for the future.

Legislative Relief Sought in California

The Railroad Commission of California will ask the State Legislature, which convened on Jan. 3, to repeal the law requiring electric railways to pave the portions of the streets which they use, according to William Clayton, vice-president and general manager of the San Diego Electric Railway. Mr. Clayton made the statement to the heads of various San Diego civic organizations at a luncheon, at which he explained the problems confronting the electric railways and asked the support of the organizations for the repeal of the law. Should the Legislature pass the bill, electric railways would not be relieved from paving obligations, Mr. Clayton explained, but the municipalities concerned would be enabled to do so by vote of the people.

Mr. Clayton told the business men that the company needed \$3,000,000 to \$4,000,000 for reconstruction during the next four years, but that no profits can be issued. The only money available is the sinking fund and the depreciation fund. Those at the luncheon, representing the chamber of commerce and other organizations, pledged their support to help bring about a solution of the railway's problems.

The present California law requires electric railways to lay and maintain paving between tracks and 2 ft. on each side, and pay to the city a franchise tax of 2 per cent of the gross revenue. Mr. Clayton attacked the franchise tax as unjust, as it is passed on to the persons who ride the cars.

Philadelphia May Reduce

Mr. Mitten, Seeing Wage Cut Coming, Counsels Thrift as Means to Painless Readjustment

"I hope," said Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, in addressing the employees at the annual convention of the Co-operative Welfare Association on Jan. 13, "that as the cost of those things you buy go down, you will reduce your expenses of living proportionately, because we hear that Detroit and Cleveland, which are two of the cities upon which we base our wage rate, are planning reductions, so that in the not far distant future our general committee will have to take that subject up and make such adjustments in reductions as they made in advances, when wages were increased in those cities. If you will only take advantage of the decreasing costs of the things you buy, so that you may cut your living costs down while you are still enjoying the higher wage, it will be a very much easier adjustment to make."

WELFARE ASSOCIATION PROSPERS

At the annual convention C. Edward Hendrickson, department of rolling stock and buildings, was elected president, succeeding William R. Smith. Addresses were made by both gentlemen, as well as by Mrs. Rudolph Blankenburg, W. J. Montgomery, member of the executive committee of the company; President T. E. Mitten and Miss L. M. Roadifer (Miss Safety First).

The records showed that 9,567 employees, or 99.71 per cent, were members of the association. The total subscribers to the saving fund are 7,461 or 79.43 per cent. The annual amount of subscriptions to the saving fund is \$1,116,596. About a year ago the company distributed cards on which the men were requested to furnish helpful suggestions. Of those received 300 were considered valuable and more than 30 per cent of them have been adopted.

In the welfare association 118 death benefits of \$1,000 each have been paid, and during the twenty-eight months since the association was organized the number of benefits so paid has been 302. Of sick benefits there have been 2,984, or \$136,000 in money paid out. There are 114 pensions at \$40 a month, to men who had served twenty-five years or are more than sixty-five years of age and unable to perform service. Under the original arrangement the men contributed \$1 a month as dues to the association and the company the same sum per man. Last year the company doubled its subscription and this year it will pay \$2 per man.

Service at Cost Suggested in Detroit

An Ordinance Along New Lines Will Be Submitted to the Voters at the April Election

Clarence E. Wilcox, Corporation Counsel of Detroit, Mich., has been served by Attorney Stevenson with a copy of an ordinance which the Detroit United Railway proposes to submit to the people at the April election with a view to solving the present railway problem. The ordinance was served as required by the city charter. It embodies parts of plans such as are in effect in Cleveland, and is practically a service-at-cost agreement.

AFTER the ordinance has been approved it will be printed and circulated for signatures. When the requisite number of signatures has been secured the ordinance will go to the Common Council with the request that it be submitted to the voters at the April election for their consideration.

Certain provisions as set forth in the recent proposal to lease the lines to the city are included in the ordinance. The sinking fund clause, which would provide for the accumulation of a sufficient sum to pay for the lines at the end of thirty years and which was opposed by the Mayor and the Street Railway Commission, is included. It provides that 2 per cent shall be taken from the revenues derived from the operation of the cars, to be placed in the sinking fund.

IMPORTANT PROVISIONS OF ORDINANCE

A summary of the important provisions of the ordinance follows:

The city lines are to be operated by a separate company—Detroit Service-At-Cost Railway.

All existing franchises and rights in the city are to be surrendered except for one or two short lines.

As the city limits are extended from time to time within a larger territory defined in the ordinance the railway lines in the annexed territory come under the ordinance and all franchise and rights-of-way therein except those above mentioned are surrendered.

The rates of fare are to continue as they may be on the day on which the ordinance is voted upon until an inventory and appraisal and audit can be completed. The rates are then to be fixed so as to pay all expenses, costs and charges which the Interstate Commerce Commission in its system of accounts for street railways recognizes as proper, and also such expenses, costs and charges as the city under the ordinance may require the company to incur and pay. In addition the company is to receive 6 per cent per annum on the value of its property used or useful in the public service. The maximum value of the property which was proposed to be transferred by the agreement with the city of March 17, 1919, is limited to \$31,500,000. The rates will go up or down from time to time by increments of one-half cent as conditions may require.

The value of the property and other questions are to be determined under a board of arbitrators.

Extensions are to be built and additional cars provided to any extent that may be directed by the Common Council subject to conditions as to purchase if built within the last ten years. If the company fails to proceed with due diligence and faithful endeavor it loses the 6 per cent until it makes the failure good.

Any municipal lines—subways, elevated or surface—may be required by the city to be equipped and operated by the company, or the company may be required to purchase any surface lines, or if the city operates the municipal lines the company may be required to

exchange transfers or cars—that is, cars may be routed over both municipal and company lines. All crossings of company tracks by municipal tracks are to be constructed by the company and the cost paid as determined by the arbitrators.

The routing of cars, frequency of service, heating and ventilation of cars and all similar matters are to be prescribed by the Common Council.

CITY TO HAVE VOICE IN AGREEMENTS

The city is to have a voice in all future agreements with motormen and conductors as to wages and working conditions.

The city has the right to buy the property at the value shown by the inventory and appraisal at the end of any year. The city also has the right at the end of five years, or of any year thereafter, to lease the property at a rental of 6 per cent on the value shown on the inventory and appraisal at the end of such year, the city maintaining the property during the lease, which must run for the balance of the ordi-

nance term—that term being not more than thirty years—but may run for any lawful longer term, at the option of the city, but not exceeding ninety-nine years, and city has right to assign lease or sublet the leased property.

A sinking fund of 2 per cent on the value of the property is to be invested each year by the commissioners in either city or company bonds. If the city purchase the railway payment may be made by converting the sinking fund into cash and turning the cash over to the company and paying the difference.

A budget is required to be submitted by the company to the Board of Street Railway Commissioners early in February of each year.

The City Comptroller and the City Treasurer are to be members of the board of directors of the company.

Mortgages now on the railway cannot be renewed or extended or new mortgages put on without separating the city lines from the lines outside the city nor can all new mortgages on the city lines together exceed 80 per cent of the value fixed by the board of arbitrators, and all mortgages must be payable at any time the city purchases the system.

In 1919 the value of the Detroit United Railway property, then proposed to be purchased by the city, was fixed at \$31,500,000—a figure which the company maintains is well under the actual value of the property. Under the initiative ordinance the price to be paid for the same property cannot exceed this sum, but may be less if the property is found to be worth less.

New York Commission Counsels Care

Regulative Body Thinks Haste Should Be Made Slowly in Enactment of Service-at-Cost Measures

Detailed statements in the body of the report of the Public Service Commission for the Second District of New York taken from its general recommendations to the Legislature indicate that increased rates on nearly all the electric railroads in the State have been required during the past two years. Many of the companies have received more than one increase. The commission thinks that on the whole the public response to the necessities of the railroads for additional revenues has been characterized by fairness and good sense.

NATURALLY, says the commission, serious difficulty has been experienced in those municipalities which have contracts with local traction companies legally limiting the rates of fare to levels which the utilities have found to be unprofitable. Many of the communities have waived such limitations and thus conferred jurisdiction upon the commission. In consequence of the situation so presented the commission again urges that it be clothed with such measure of power over such rates as is still possessed by the Legislature. The commission continues to find embarrassment in requiring a full measure of service from railroads, as to which it lacks the power to regulate rates.

In general the commission finds the financial condition of this class of properties far from satisfactory. In the case particularly of suburban and inter-urban roads the very general use of the

private automobile has been found to be an exceedingly grave factor. While this competition also affects the urban roads, its effect upon that class of traffic is much less marked. The commission says:

Too great generalization should not be indulged in when remedies for existing conditions are sought. It is interesting to note that at its next midyear conference the American Electric Railway Association intends to centralize its attention on electric railway financing, including such features as the proper proportion of capital securities which may be represented by interest bearing debt, and the disadvantage of the present large degree of absentee ownership and control. Individual management, enterprise and efficiency, and the acquisition of the confidence of patrons in the honesty and fairness of business methods, are as important in their results in the public utility field as they are in other channels of commercial endeavor.

Of the service-at-cost plan the commission says:

Some of the cities have given much study to what is termed service-at-cost plans for urban service, the general design being to regulate fares by an agreement between

Cleveland Seeks Way for Improvements

Company Would Sell Stock at a Discount to Raise Funds for the Carrying Out of New Work

Amendment of the Taylor service-at-cost franchise so as to permit financing through the sale of new stock at less than its par value has been asked of City Council by the Cleveland (Ohio) Railway. The request was made by John J. Stanley, president of the company. In a letter transmitted to Council through Fielder Sanders, City Street Railway Commissioner, Mr. Stanley asks that the company be permitted to sell \$3,000,000, par value, of its stock at not less than \$80 a share, with the understanding that the difference between the amount at which each share of stock is sold and its par value shall be amortized out of earnings.

CLEVELAND Railway stock has been selling on the market at Cleveland for around \$92 a share ever since Cleveland voters, in August, refused to ratify an amendment to the franchise that would have permitted the company to pay dividends of 7 per cent instead of 6 per cent. A provision in the present franchise forbids the sale of stock at less than par.

The City Council is going to hold public hearings on the company's request for authorization of this new method of financing. Company directors have already approved the plan. If the stock is sold at \$80, the return to buyers will be $7\frac{1}{2}$ per cent, or $\frac{1}{2}$ per cent in excess of the rate refused the company by the voters in August.

Mr. Stanley says that if the Council permits the amendment the company will immediately purchase fifty new motor cars and fifty new trailers at a cost of about \$930,000, will extend its tracks in several of the outlying sections of the city, will build new terminal loops for a number of lines, and will erect new operation stations for the E. Thirtieth, E. Seventy-ninth, Kinsman Road and Cedar Road lines, and will also construct two additional substations.

A part of Mr. Stanley's letter to the Council follows:

You know as well as I know the present financial condition of this company and of general business. You know that additional tracks, cars, motors, buildings, power equipment and other property are needed. You know that the earnings of the company, at the present rate of fare and at present costs, will not provide a surplus, and that, if there were a surplus, it could not be used for the acquisition of new property.

New property must be paid for by new capital. This means that we must sell more capital stock. Our franchise provides that we must sell it at not less than par and limits the rate of dividend to 6 per cent. You know that we have tried sincerely and earnestly to sell stock in order to raise the money we need—tried in vain.

A year and a half ago I asked the Council to permit us to raise the rate of interest to our stockholders to 7 per cent. The Council declined to do so. The Mayor suggested that the request be submitted to arbitration. A board of arbitration was selected and decided that my request ought to be granted. The Council, it is true, passed an ordinance, but at a referendum on Aug. 10 the amendment was voted down.

It would be useless for us to ask the Council again to amend the franchise so as to permit the payment of 7 per cent or any higher rate on our stock. A rate lower than 7 per cent would not help us.

On many occasions since the referendum you and I have conferred in regard to ways and means of obtaining new capital. No way satisfactory to both of us seemed feasible. Last Saturday (Jan. 8) it was suggested that a franchise amendment be passed that would let us sell some part of our 6 per cent stock at less than par. You seemed to think well of the suggestion and said you would recommend it to the Council.

I promised you that I would call a meeting of the company's directors at once and submit it to them for their consideration and advice. They met on Monday morning (Jan. 11).

Skeleton resolutions explaining the plan more fully than I have explained it in this letter were submitted to the directors. They approved the plan. They said that \$3,000,000 of stock could not be sold at more than 85, possibly it would have to be sold at 80, and that the amendment ought to permit the sale of that amount at 80. A stockholder who buys our 6 per cent stock at 80 will receive $7\frac{1}{2}$ per cent on his investment in the stock so purchased. This is not an unreasonable rate. It is less than the market value of money at this time.

I request, therefore, that you ask the Council to amend the franchise so as to authorize the sale of \$3,000,000 of stock at not less than \$80 per share for the purposes and on the conditions stated in the plan that was approved by the directors. Of course, all sections of the franchise that relate to the sale of stock and to the rate of interest should be amended, if the Council approves the plan.

Please explain to the Council that this is not a proposition to permit a higher rate of interest than 6 per cent on the capital stock now outstanding, nor to sell at less than par more than the \$3,000,000 of stock that should be sold immediately in order to enable the company to get money to pay for the extensions, betterments and other improvements now urgently needed for proper service. Nor does it mean that any stock hereafter sold in excess of the \$3,000,000 shall be sold at less than par or at a higher rate of return than 6 per cent, except with the Council's approval at the time any new offering is made. It is a plan to take us through this time of stress and high money rates. I know of no better one. I know of none so fair to all concerned that has been put into effect by any corporation in any business to raise new capital.

Way Being Paved for New Toledo Grant

Present plans of the Toledo Railways & Light Company, Toledo, Ohio, are to turn over railway property to the Community Traction Company, about Feb. 20, the date of expiration of the ninety-day period allowed by the service-at-cost franchise ordinance for its legal acceptance and preparations for operation.

It had been thought that the company might be ready to operate under the new plan about Feb. 1, but many of the details connected with separating the property have been slow in working out.

At the annual meeting of the stockholders of the Toledo Railways & Light Company on Jan. 20, final action will be taken on the ratification of the new franchise agreement. The Doherty interests of course, control the common stock and they have furnished to the city a written agreement to accept the ordinance.

The board has narrowed down the list of applicants for the post of transportation commissioner to about four.

the utility and the city by virtue of which the rates will be expected to change automatically in agreement with the varying income over and above costs of operation, the correctness of the accounting being attempted to be assured by the participation of the city authorities in the management.

This would mean in large degree at least the substitution of so-called automatic regulation for that which is now administered by the commission. It is understood that legislation designed to enlarge the corporate powers of the municipalities as to permit their participation in such plans will be presented to the coming session of the Legislature and that the railroad corporations whose rights are involved are unanimously in favor of such legislation.

While the commission has no inclination to oppose the exercise by the communities of a large measure of home rule with respect to their local utilities we respectfully suggest that so important a departure from a long established policy of regulation of these utilities as may be involved in the proposed legislation should not be adopted without the most careful scrutiny.

The commission recommends that its powers and functions with reference to auto bus transportation be more clearly stated and defined.

Increased fares and heavier traffic, says the commission, were not sufficient to do more than bring the consolidated income statement of the electric railways for 1919 down to a net loss somewhat smaller than for 1918. Expenses increased in but very little greater proportion than revenues and the actual increase is less, so that net operating revenue was 12.8 per cent greater for 1919 than for 1918. Taxes were 8.2 per cent greater, but operating income shows a 15.3 per cent increase over 1918. The gross income, however, was not sufficient to meet interest charges and for the second time in fourteen years the electric roads as a whole show a net deficit, which for 1919 amounts to nearly \$3,000,000. The car miles decreased to about 98,000,000, the lowest figure since 1912, but the number of passengers carried increased 713,000,000, the greatest number ever reported. On this point the commission says:

Of course the exact meaning of this last figure is rather indefinite as a measure of traffic, since it depends on the method of fare collection to some extent, as well as on the actual number of passengers. For example, the introduction of the zone system where there had previously been a single fare might result in two or more passengers being reported for each passenger traveling two or more zones, where previously only one would have been reported. It is not believed, however, from a general knowledge of the tariffs which have been filed with the commission, that zoning accounts for a very considerable part of the increase shown in passengers carried.

The decrease in electric railway mileage between 1918 and 1919 was principally due to abandonment of operation by the Huntington Railroad, which formerly had about 19 miles of first track. The mileage given is, as in the case of steam railroads, only that within New York State, excluding the New York City Line within the jurisdiction of the first district commission, and should not be compared with the revenues, expenses, traffic statistics, etc., which are for the entire operation for the roads reported. No attempt has been made to segregate accounts by state lines.

Only about 11 per cent of the mileage of electric roads reporting to this commission is outside of the State of New York.

Seattle Outlook Unimproved Mayor Insists Municipal Railway Shall Be Self-Sustaining Out of Operating Revenues

Hugh M. Caldwell, Mayor of Seattle, Wash., in a recent letter to George A. Leibes, accountant in the city comptroller's office, expressed himself as opposed to any plan to draw on the general fund or any other tax source to help finance the municipal railway.

The Mayor declares the \$15,000,000 in bonds issued by the city in payment for the lines "are not worth anything like \$15,000,000," and that immediately the city undertook to pay railway debts out of the tax fund, the bonds "would increase anywhere from \$3,000,000 to \$7,000,000 in value." The explanation for this statement would seem to be found in the fact that the bonds are a lien on the railway only and if the city is required to maintain the railway as a self-supporting institution out of the railway's earnings it would seem now to be a forlorn hope.

The Mayor said:

If the general credit of the city, or any part of it, is to be placed behind these bonds, the amount should be reduced to somewhere near the real value of the lines purchased by us; otherwise, we will make a present of several million dollars to the company by taking some steps not required by the contract, which would enhance the value of these bonds.

My position on this matter, however, is that the city is under neither a legal nor moral obligation to raise funds from any other source than the receipts of the railway to pay the principal and interest, operating and maintenance expenses; that since Stone & Webster made the contract and agreed to look to this source alone for their money, they should continue to look to it, and if the contract is not capable of performance according to its terms, modification thereof must be made by consent of the parties, or a decree of the courts, should the matter become the subject of litigation.

Mayor Caldwell stated that he had completed his investigation of the city's purchase of the lines from Stone & Webster and would be ready, when the Grand Jury met on Jan. 17, to proceed with the inquiry begun last November. The Mayor's report will not be submitted to the City Council until after the Grand Jury convenes.

Wages Advanced in Atlanta

After several weeks of negotiations a satisfactory agreement has been reached between the Georgia Railway & Power Company, Atlanta, Ga., and its employees, by which more than 1,100 men get a higher wage in 1921 than they received in 1920. This increase applies to the motormen, conductors and maintenance-of-way men, shopmen and workers in the carhouses covered by former annual contracts.

It is estimated the increase will cost the company \$75,000 annually. Both sides have announced that the new arrangement is satisfactory to all concerned. The new scale of wages included in the new contract is based upon the number of months of service and is graduated as follows:

The first three months' service, 44 cents an hour.

The next nine months' service, 46 cents an hour.

After one year's service, 48 cents an hour.

This is an increase of 2 cents over the scale of 42 cents, 44 cents, and 46 cents, granted the men in the spring of 1920 by an arbitration board. The scale of 1920 was at first refused by the men, who went out on a four-day strike.

Salaries of Officers to Be Cut

Reductions of approximately 20 per cent in the salaries of all employees of the Cleveland (Ohio) Railway from the president down are expected to be announced about Feb. 1, according to intimations that have come from the executive offices of the company. This follows a 20 per cent reduction made in the wages of track laborers the first of the year, and presages a cut in the wages of the motormen and conductors when the agreement of their union with the company expires on May 1.

John J. Stanley, president of the company, has already announced that he proposes to reduce his own salary, which is \$30,000 a year.

Fear of a strike on May 1 has already been expressed because union officials have indicated that they do not propose to accept any wage reduction without a struggle.

Because of the fact that the 6-cent rate of fare is not bringing in the revenue expected, due to a falling off in the number of riders, directors of the Cleveland Railway at their meeting late this month are expected to reject an ordinance passed by the City Council authorizing a half rate of fare for school children.

Wages Reduced in Rockford

Simultaneously with the order of the Public Utilities Commission of Illinois for a 1-cent increase in fare came the announcement of a reduction of approximately 10 per cent in wages of all employees of the Rockford City Traction Company and the Rockford & Interurban Railway. The cut is to be effective from Jan. 15, according to Manager W. C. Sparks.

The wage reduction, it was said at the local offices, is in line with the company's policy of retrenchment, made possible by lowering cost of living. Employees of the transportation companies have been notified of the new wage scale. It affects shop and trainmen and the office force.

The new wage scale for trainmen on the interurban lines will be from 50 to 53 cents an hour and on regular city runs (two-men cars) from 46 to 50 cents an hour. One-man car operators receive the same scale of pay as interurban trainmen.

The reduction in wages will amount to 7 cents an hour.

According to Mr. Sparks, trainmen on the interurban lines have been paid from \$175 to \$210 a month and city trainmen from \$135 to \$175 a month. The cut will reduce the wages from \$10 to \$12 a month.

News Notes

Inquiry Into California Commission Proposed.—Since the California State Legislature has convened at Sacramento a resolution has been introduced in the Senate authorizing a joint legislative committee to investigate complaints made against the California Railroad Commission. It was announced that a public hearing on this resolution would be held at a joint meeting of the Senate and Assembly public utilities committees on Jan. 18.

\$1,191,000 in Improvement in Indiana.—Interurban lines in Indiana made plant additions and reconstructions costing approximately \$1,191,000 during 1920, according to the annual report of M. D. Atwater, director of service for the Public Service Commission. The total additions and improvements in all public utilities amounted to \$13,189,530 during the year. City railways spent a total of \$2,527,500 during the year, mostly in Indianapolis, Kokomo and Terre Haute.

Utility Commissioners Unconfirmed.—Nominations made by Governor Edwards of New Jersey to compose a new Board of Public Utility Commissioners were not confirmed by the State Senate in special session. In a ten minute executive session, the Senate by a vote of nine to nine, refused to force the Senate judiciary committee to report the nominations to the Senate. The brief session adjourned without date. The nominations, therefore, died with the opening of the 1921 Legislature.

Council Approves Chicago Mayor's Plan.—The City Council of Chicago, Ill., voted sixty to one on Jan. 19 to approve Mayor Thompson's traction plan and submit it to the General Assembly to secure the enabling legislation. Many of the Aldermen objected to features of the plan, particularly the creation of another independent taxing body, but approved the plan because they did not apparently want to be placed in the position of opposing 5-cent fares and because it was understood that approval meant only the placing of the measure before the people for their decision. The so-called Thompson plan was reviewed at length in the ELECTRIC RAILWAY JOURNAL for Jan. 15, page 150.

Program of Meeting

Public Representatives of Urban Transit

A meeting of the Public Representatives of Urban Transit is to be held in Cleveland, Ohio, on Jan. 25. The meeting is called by W. C. Culkins, local street railway director at Cincinnati and president of the association.

Financial and Corporate

Steps Toward Reorganization

Rhode Island Companies Clearing the Way for Foreclosure and Sale Probably by April 1

In the Superior Court at Providence, R. I., on Jan. 5 steps were taken to bring about the foreclosure of the mortgages on the properties of the Pawtuxet Valley Electric Street Railway and the Cumberland Street Railway. The complainant in each case was the Central Union Trust Company, New York, representing the holders of mortgage bonds, and motions were filed by Richard B. Comstock, counsel, to consolidate the proceedings with the receivership of the Rhode Island Suburban Railway, owner of both properties subject to the mortgages.

FURTHER RECEIVERSHIPS

The court issued an order granting a hearing on the motions on Jan. 19, and at that time, if it grants the prayers of the complainants, it will appoint as receivers for the Pawtuxet Valley and Cumberland companies Benjamin A. Jackson and Harold J. Gross, receivers of the Rhode Island Suburban Railway, included in the system of the Rhode Island Company.

This completes the institution of foreclosure proceedings in the cases of all properties now operated by the Rhode Island company and opens the way to speedy transfer of the properties to the United Electric Railways when a plan of reorganization shall have been agreed upon by the security holders.

If the three protective committees representing the holders of bonds agree to accept the jitney ordinance—a measure upon which there has been insistence as an essential to the railway reorganization—and to proceed with the reorganization, copies of this plan will be sent to each set of security holders and they will have thirty days within which to accept or reject it. A little longer period will be allowed within which bondholders and stockholders who have not already deposited their securities with their protective committees may do so.

FORECLOSURE SALE BY APRIL 1

Foreclosure proceedings will then be hastened in the courts and it is expected that the properties will have been put up at public sale and bought in for the United Electric Railways before April 1.

The charter of the United Electric Railways will expire by limitation early in April if the company has not by that time taken over the traction system, or if the time limit shall not have been extended by act of the General Assembly.

The Pawtuxet Valley Electric Street

Railway was incorporated July 23, 1891, with a capital of \$200,000. The charter was amended March 14, 1893, and the capital increased to \$400,000, of which but \$247,200 in bonds have been paid in. The company conveyed all its property, rights, privileges and franchises to the Rhode Island Suburban Railway on Jan. 1, 1900, the latter company guaranteeing the bonds of the Pawtuxet Valley company both as to interest and principal.

The Cumberland Street Railway was incorporated on March 1, 1898, with a capital of \$100,000, and on Jan. 1, 1900, conveyed its property to the Rhode Island Suburban Railway. There are \$43,000 in outstanding bonds which are guaranteed by the Suburban company.

Another Brooklyn Route Abandoned

The operation of the so-called Park Slope line of the Brooklyn (N. Y.) City Railroad, extending from Borough Hall to Coney Island Avenue and Cortelyou Road, has been abandoned. As a result of the receivership of the Brooklyn Rapid Transit Company and later of the independent operation of the Brooklyn City Railroad, a number of routes which had been operated over the tracks of various companies were terminated in October, 1919. These suspensions inconvenienced the public in many sections of Brooklyn, and in an effort to determine whether relief could be found by the operation of cars over tracks of several companies, it was determined to establish the so-called Park Slope line, but it was specified that unless there was sufficient riding to give the companies an income which would pay for the cost of the service the route might be abandoned. The Public Service Commission approved the operation of the line on these conditions.

The operation of the line was commenced on April 12, 1920, and as the result of seven and a half months' service the gross receipts failed by \$9,990 to meet the operating expenses. The commission was thereupon notified that service would be abandoned unless the commission consented to the establishment of a shorter route from Borough Hall to Park Circle. The companies expressed their willingness to operate this route for a period, provided the receipts were sufficient to pay the operating expenses.

Application was made on Dec. 22 to the Public Service Commission for permission to operate on this basis. On Jan. 11, however, the commission denied the application for approval of the proposed agreement with respect to the line from Borough Hall to Park Circle. As a result of commission's refusal the railway has ceased operation.

New Orleans Value Undetermined

Time Approaching When This Matter Must Be Settled if Fare Problem Is to Be Solved

The matter of the valuation of the railway property of the New Orleans Railway & Light Company, New Orleans, La., is one of the things that the knowing ones refuse to discuss. Meanwhile, the time is fast approaching when the question of how much the property is worth must be settled.

The company in one of its revised estimates placed the valuation at \$55,000,000. On the other hand the special masters in chancery announced that they thought the property was worth \$41,500,000. As none of the three masters was versed in utility valuation matters their estimate does not appear to have made a lasting impression upon the Federal Court, for the findings of the masters was not even mentioned in the court's report.

The newly elected Commissioner of Public Utilities has addressed a communication to the receiver to learn what progress, if any, he had made in the railway valuation matter, and to this the receiver has made answer that he is giving the subject due consideration.

COMPROMISE APPEARS LIKELY

The public utilities committee of the Association of Commerce has also directed inquiries to the Commissioner of Public Utilities to learn how soon a conference could be arranged between the Association of Commerce, the Commissioner of Public Utilities and the receiver of the railway. His answer was: "We are waiting on the receiver."

The consensus of opinion is that the valuation of the railway, gas and electric property when the matter is finally determined will be around \$47,000,000 against the company's \$55,000,000 and the masters in chancery \$41,500,000.

Meanwhile, the "referendum" people, failing to secure the signature of the requisite 30 per cent of the registered voters for the repeal of the 8-cent fare, have petitioned the City Council to repeal the ordinance authorizing the increase, and have placarded the city with posters, in which it is pointed out that the real value of the property is only \$27,420,410 while its paper value is represented to be \$70,892,200, leaving a difference of \$42,768,990, which the "referendum people" allege is "water."

One of the reasons assigned by the Commission Council, just expired, for advancing the fare from 6 cents to 8 cents was that the railway should be allowed the increase in order to permit it to meet the increased cost of material and the higher rate of taxation. Under the circumstances much surprise is expressed at the announcement made on Jan. 12 that the company had been notified by the city authorities that its property would be seized for the 1920 city taxes unless it paid its indebtedness forthwith. Its indebtedness to the city for the 1920 taxes is placed at \$567,000.

Dallas Railroad \$635,401 Behind

Directors Explain Deficit in Authorized Return—Credit Must Be Restored So Company Can Function Properly

The Dallas (Tex.) Railway, in response to the request of the City Commissioners, has presented to the members of that body a statement showing the condition of its property. The railway recently asked the City Commission to pass a regulatory ordinance authorizing an advance in rates from a 6-cent fare to a 7-cent fare, in the hope that the company might increase its earnings so as to establish a basis of credit on which it would be possible to meet its franchise obligations, pending the working out of a real service-at-cost franchise. The city has declined to accede to this and has laid the appeal on the table.

THE attitude of the company in its statement is that the railway must be met in a spirit of co-operation by the city's representatives if the traction problem of the city is to be solved. In short, negotiations between the company and the city must be characterized by mutual understanding, where sound business and economic principles prevail, if Dallas is to be adequately served by its railway.

SOME STARTLING FINANCIAL FACTS

The statements of the company, filed monthly with the city, showing its financial status, reveal the fact that the company has earned in the thirty-eight months of operation between Oct. 1, 1917, and Dec. 1, 1919, over and above its actual operating expenses, interest charges and accident reserve, only \$44 51. The accident reserve as of Dec. 1, 1920, amounted to \$25,189. There were suits pending at this time amounting to \$580,588, and in addition many unpaid accident claims.

The company's cash statement shows that the amount of cash in bank at the close of business Dec. 27 was \$22,437, with bills payable and accrued power charges approximating \$125,000. Each month the company has set aside and charged to operating expenses its estimated pro rata part of its ad valorem annual taxes, amounting to \$119,754. This money has been used through the year for capital expenditures, and the account is to be reimbursed by loans which have previously been arranged for when the tax becomes payable the first part of 1921.

NOTHING FOR STOCKHOLDERS

The stockholders of the Dallas Railway have received nothing since the beginning of operations of the company on Oct. 1, 1917, and the company has earned an average rate of return of only 4.58 per cent on its property value, or just about enough to pay its interest charges.

On the matter of credit the directors said:

It is true that the franchise requires the Dallas Railway to pave its portion of streets when ordered to do so by the city; and we, the directors, assert that the company is willing to do so whenever it is able. It can not do so without money, and it can not get money without credit. It can not have credit without adequate earnings to pay for its operations and the cost of new capital.

It can readily be seen how impossible it is to expect investors to become interested in a company whose demonstrated earning power is only 4.58 per cent on the property value.

The directors then discuss the obligation of the General Electric Company

toward the railway and the commitments made by C. W. Hobson. On these points they say:

These statements are facts that can be controverted, and we believe that our fair-minded citizenship will concede that both the General Electric interests and the Dallas Railway have carried out their commitments so far as lay in their power.

On the specific point of the reason for their appeal the directors say:

This communication is presented with the hope that immediate steps may be instituted whereby the railway problem will be approached with the desire for a solution which will be equitable both to the city and the company, and which will permit the immediate extension of the street railway facilities so badly needed.

On the matter of commitments cited as having been obtained from General Electric Company interests in case the franchise was granted to C. W. Hobson, the one calling for the greatest expenditure was the proposal for building two interurbans into Dallas of not less than 30 miles each in length. The committee says these interurban lines have not been built, for the reason that previous to the acceptance of the franchise by C. W. Hobson, the City Commission was notified that as the United States was then at war with Germany, it would be impossible to finance and build the two interurbans within the time first agreed upon. The franchise was thus accepted, with the above understanding, and the commission from time to time extended the time for beginning the construction of the interurban lines. Meanwhile, the citizens of Dallas voted to substitute the Wichita Falls interurban line for the two proposed interurbans. It was found impossible, however, to finance the Wichita Falls project, so that it is now being arranged to cause the two interurbans as first proposed to be built. The time set by the commission for starting the two interurbans is Jan. 15, 1921.

The promise was made that the Oak Cliff street railway lines, either through purchase or lease, would be placed on the same basis and have the same advantages to the citizens of Oak Cliff and to the people of Dallas generally as would pertain to the lines east of Trinity River. The directors point out that the Oak Cliff lines are now held under lease by the Dallas Railway and are operated by the management as a unified system with the lines owned by the company.

The railway has spent, to Dec. 1, 1920, \$1,706,334 of new money on improvements and extensions to the property since the beginning of operations under the franchise, Oct. 1, 1917. The

estimated additional amount to complete improvements in progress as of Dec. 1, 1920, is \$134,637. This is more than the original commitment.

The directors point out that the promise has been kept that the Dallas Railway would be operated under a charter issued by the State of Texas and managed by local executives. The financial condition of the company and its showing as to earnings have, however, been such that the owners of the equity in the property have not been able to refinance it so as to diversify the ownership and place its notes and certificates of indebtedness, as was contemplated.

Pre-election commitments made by C. W. Hobson as to the doing of certain work by the Dallas Railway in case the franchise was granted are also gone into at length by the directors and disposition made one by one of the extent to which the promises have been fulfilled.

The disposition of the return of 4.58 per cent earned on the property value during thirty-eight months of operation, Oct. 1, 1917, to Nov. 30, 1920, is explained as follows:

Amount of return earned.....	\$1,203,436
Disposition of return earned:	
Rent for Oak Cliff lines (three years at \$115,000 a year, two months at \$120,000 a year)....	365,000
Interest on \$1,000,000 7 per cent secured notes.....	134,035
Interest on \$750,000 6 per cent income notes.....	142,500
Interest on \$2,529,868 6 per cent income notes.....	456,217
Interest to Electric Bond & Share Company on short-term loans.....	1,519
Interest to local banks on short-term loans totaling \$250,000....	5,413
Interest to Dallas Electric Company on money borrowed to construct addition to interurban terminal.....	9,416
Interest on lease notes, or car trust certificates, given in connection with the purchase of fifty new cars.....	4,135
Three monthly payments of \$7,666, each on principal, cost of fifty new cars.....	23,000
Monthly payments to Dallas Electric Company on principal of 10 per cent demand notes, as per agreement.....	6,913
Commission and expense in connection with procuring new money.....	55,284
	\$1,203,436

The total of bonds and notes outstanding, as of Dec. 28, 1920, was \$4,892,288. A detailed explanation is included in the statement showing how these obligations are held.

Some facts taken from the company's records for the first thirty-eight months of operation, to Nov. 30, 1920, follow:

Railway earnings.....	\$7,239,404
Railway expenses and accidents and repair reserves.....	6,213,984
Net from railway operation....	\$1,025,419
Interurban terminal net earnings and non-operating income.....	178,016
Available for authorized return	\$1,203,436
Authorized return under franchise, 7 per cent per annum on property value, or amount invested.....	1,838,540
Deficit in authorized return.....	\$635,104
Rate of return earned on property value of investment (per annum), per cent.....	4.58
Percentage of railway gross receipt expended on maintenance (minimum franchise requirement 10 per cent).....	17.80

10,767,876 More Riders; 2,295,995 Fewer Miles

Trustees Report Better Results in Boston—No Prospect of Reducing Ten-Cent Fare—Railway Fulfilling Purpose

Pursuant to the provisions of Chapter 185 of the Special Acts of 1919 the trustees of the Boston (Mass.) Elevated Railway have submitted their second report to the Senate and the House of Representatives. The document covers the proceedings of the trustees for the year ended Dec. 1, 1920. The financial condition on Dec. 1, 1920, and the results of operation during the entire period of public control are set forth in a statement made a part of the report.

THE statement shows that for the twelve months ended Nov. 30, 1920, the cost of service exceeded receipts by \$595,155, while during the twelve months ended Nov. 30, 1919 the cost of service exceeded receipts by \$2,585,137.

The second year of operation under public control closed on June 30, 1920. The revenue in that year exceeded the expense of operation by \$17,079. This surplus does not take into account \$435,348 actually paid in October, 1919, but paid under a retroactive wage award applicable to the previous May and June. This amount would have been included in the assessment in July, 1919, against the cities and towns served by the railway had it been known in season for that assessment. Should this item properly be included in the cost of service for the year ending on June 30, 1920 there would still have been no deficit for that year under the budget system which had been adopted in accordance with a practice which was approved by the Department of Public Utilities.

Under that system the total expenditure for the year for maintenance of way, structures and equipment is estimated at the beginning of the year and charged proportionately to each month. When actual expenditures in any month exceed the allotted amount the excess is carried in reserve account to be offset by the credit arising during any other month in which less than the allotted amount is expended. At the end of the fiscal year the accounts are adjusted and show actual expenditures.

On June 30, 1920, in accordance with this procedure \$418,343 had been charged to equalization and credited to operating expense. This amount coupled with the surplus of \$17,079 would set off the item of \$435,348 for back wages and leave a credit balance on June 30, 1920, of \$75.47.

The actual cost of operation from July 1, 1920, to Dec. 1, 1920, covering the first five months of the third year of operation by the trustees exceeded receipts by \$979,012. The results of operation in December will show a substantial profit. This, taken with the numerous offsetting credits to be made by adjustment in closing the book of the year, will very materially reduce previous losses. Though the exact figures showing the operating deficit on Dec. 31, 1920, are not yet available, it is estimated that it will not exceed an amount which in the judgment of the trustees can be absorbed during the

next six months. In such case there will be no assessment upon tax payers next July.

Operation in 1920 faced extraordinary costs in expenses for removal of snow, advance in wages and higher prices of coal and materials. The abnormal snowfall of last winter cost more than the combined snowfalls of the preceding nine years. The direct expense attributable to removal of snow was \$600,000; the indirect cost of the storms from added expense in maintenance of equipment and from loss of revenue increased this amount to approximately \$1,000,000.

The wage agreement with the carmen's union expired on May 1 and in

in more general use as a substitute for the street car.

Though the arbitration award of last June advanced wages 16½ per cent, a re-arrangement of working hours and conditions was effected which benefited all concerned and secured a large saving in labor costs. "Extra" blue uniform men were assured a full day's pay and all men are thus guaranteed an eight-hour day. Men not having schedule runs are required to be available for duty during eight-hour periods and to perform within their eight-hour periods such work as may be assigned to them.

A substantial economy has also resulted from the elimination of unprofitable mileage without impairment of service. Though 10,767,876 more passengers were carried in 1920 than in 1919 the mileage was less by 2,295,995 miles. The revenue per car-mile increased from 53.74 cents to 64.61 cents and the number of revenue passengers per car-mile from 6.066 to 6.548. An important factor contributing to the net increase in earnings was the operation of additional three-car trains and one-man cars.

The high cost of coal has in a measure been offset by economies in use of power. Coasting recorders have been

COMPARISON SHOWING GROWTH OF TRAVEL SINCE 1915

Year	Average Weekday	Average Saturday	Average Sunday	Average Holiday	Total for Year
1915	992,283	1,140,046	685,726	846,860	352,469,586
1916	1,050,038	1,218,749	718,804	832,962	373,577,908
1917	1,073,943	1,249,588	728,847	857,902	381,017,338
1918	985,384	1,147,809	658,902	775,634	348,664,700
1919	934,918	1,078,635	596,182	706,429	324,758,685
1920	960,737	1,072,319	591,063	703,634	335,526,561

the absence of agreement as to future wages the issue was left to arbitration. The employees were awarded an increase of 16½ per cent. The present schedule is effective until July 1, 1921. Other agreements with craft organizations have expired and have been renewed with some advance in wages.

The abnormal rise in price of coal has been most disturbing. The average cost of coal in 1919 at the power stations in Boston was \$5.90 a ton; in October, 1920, the average cost had risen to \$13.82 a ton; some coal has cost over \$20 a ton.

The item expended for taxes, too, has been larger than that of the preceding year by about \$200,000. The taxes of the coming year will undoubtedly be smaller.

The growth of travel is shown in the accompanying compilation.

Higher fares though increasing revenues cut down riding. The trustees point out, however, that no such reduction has been made in the number of persons using cars as to suggest that the railway is not fulfilling the purpose of its existence in furnishing a cheap method of transportation for the multitude of people. While between 10,000,000 and 11,000,000 more passengers were carried in 1920 than in 1919, 600,000 fewer passengers were carried on Saturdays, Sundays and holidays. The trustees say that the explanation for this is found in the fact that upon the days last named the automobile is

introduced with good results. It is estimated that when the entire system is equipped with these instruments an economy of more than \$100,000 a year will be secured.

The following tabulation shows the number of tons of coal burned in 1920 as compared with that burned in the previous year:

TONS OF COAL BURNED

	1919	1920
January	28,020	33,874
February	24,990	26,045
March	26,440	24,838
April	24,396	21,073
May	22,778	17,999
June	20,775	16,426
July	18,088	16,693
August	20,817	16,617
September	20,609	17,226
October	23,886	18,953
November	26,131	22,955
December	30,740	25,386
Totals	287,670	258,085

The number of pounds of coal consumed to generate one kilowatt in 1920 was 2.346 as compared with 2.835 in 1919.

Seventeen miles of track have been reconstructed; eighty-one one-man cars of the most approved pattern have been purchased and put in commission; 105 additional center entrance cars have been purchased and are to be delivered in the spring; sixty-five new steel cars have been bought to replace cars upon the elevated structure and are to arrive in the summer; four-car trains are now running through the rush hours in the

Cambridge Subway and Dorchester Tunnel; a new carhouse and new lobby have been constructed at Fields Corner; additional rotary converters have been bought for the equipment of substations connected with the power plant; and large preliminary expenditures have been made for the extension of yard facilities at Forest Hills and the construction of much needed repair shops in Everett.

MILEAGE RATES IMPROBABLE

The trustees say there is no prospect of any immediate reduction from 10 cents as the basic flat fare. Experiments have, however, been made with a 5-cent service without transfer on lines where the run is short and where there is little competition with the 10-cent lines.

According to the trustees some modification of the present system of flat fares with a view to a rate more nearly proportionate to the length of ride is not improbable when conditions are such as to warrant it, but it is improbable that the flat fare upon the Boston system will give way in the near future to any radical change through the substitution of mileage rates.

CAMBRIDGE SUBWAY PROCEEDS

The proceeds received from the sale of the Cambridge Subway amounted to \$7,868,000. The disposition of this money was made subject in the statute to the approval of the Department of Public Utilities. The board of trustees petitioned the Department of Public Utilities for authority to spend this sum for the purposes which the trustees cite in detail, but the Department of Public Utilities after a hearing directed the application of the fund to the following purposes:

\$1,500,000	for payment of Boston Elevated Railway Company bonds due March 1, 1920.
\$1,581,000	for payment of West End Railway Company bonds due August 1, 1919.
375,000	for payment of West End Railway Company note due February 1, 1920.
1,581,000	for payment of West End Railway Company bonds due August 1, 1920.
1,561,245	for payment of permanent additions to West End Railway Company property.
269,754	for payment of additions and improvements to Boston Elevated Railway property.
1,000,000	appropriated for Forest Hills Terminal yard and Everett Shops.
<hr/>	
\$7,868,000	

Suggestions of legislation desired by the trustees were duly filed in the office of the Secretary of the Commonwealth and have been printed as House Document 103.

LEGISLATIVE CHANGES SUGGESTED

The trustees also recommend a change in Chapter 185 of the Special Acts of 1919 that will permit them to file their annual report on Feb. 1 so that it may give the result of operations for a full calendar year. To give such a statement it is necessary to make the proper adjustment of numerous credits and debits which it is impossible to estimate and for which figures were not available in season for filing such a report on Jan. 15.

Simplification an Object

One Company, One Mortgage and One Franchise the Aim in Pittsburgh Reorganization

Reorganization of the Pittsburgh (Pa.) Railways is in sight, according to statements of special Counsel Charles K. Robinson to the City Council during the week ended Jan. 15. Mr. Robinson also informed Council that Receivers Charles A. Fagan, S. L. Tone and W. D. George of the railway had decided to do the paving as well as track reconstruction work involved in the improvement of East Ohio Street. This work the city had expected to do as the receivers formerly had maintained they were not in a position to do it. This action will save the city approximately \$94,000. Mr. Robinson credited the present receivers with a desire to cooperate with the city and public.

For the future, outlining a plan in behalf of the city, Mr. Robinson said those interested were aiming at a complete reorganization of the Pittsburgh Railways as one company, with one franchise and one mortgage. At present the railway consists of 200 separate companies, holding 500 franchises on streets, with a result that the chief engineer of the Public Service Commission, after two years' work in Pittsburgh, said the city had the most complicated traction situation in the State.

Joint action with the city of Philadelphia to obtain better traction regulation has been decided upon at Pittsburgh. A resolution which has been adopted urged action before the Public Service Commission for the purpose of "securing justice for the people of the two largest cities in the State on the important matter of street car transportation."

With Philadelphia as the complainant, a case is due to be argued in April before the Supreme Court on the right of the city to attack rentals which the Philadelphia Rapid Transit Company is paying various underlying companies. The Public Service Commission upheld the city's right to inquire into such rentals, but the State Superior Court reversed this decision and an appeal was taken to the Supreme Court.

The Pittsburgh Railways similarly includes a number of underlying companies. The rentals of these, inextricably bound up also in the payment of bond and mortgage interest, which in most cases is guaranteed as part of the rental, total about \$3,250,000 annually. The city's interest in the Philadelphia case is in the principle involved.

Receivers for North Shore Road

William Paul Allen, former assistant district attorney of New York, and John G. Moran, secretary of the New York & North Shore Traction Company, were appointed receivers of the railway on Jan. 19 by Judge Chatfield sitting in the Federal Court in Brooklyn. The receivership resulted from an action in equity by the Citizens Savings & Trust Company, Cleveland, Ohio.

Financial News Notes

Service Resumed.—The Eastern Massachusetts Street Railway has resumed service on the Somerset and Swansea line as far as Swazey's Corner. A temporary permit was issued to the company pending the final decree of the court hearing which takes place in Boston. Service on this line was suspended a year ago.

I. T. S. Subsidiary Financing.—The Bloomington & Normal Railway & Light Company, Bloomington, Ill., included in the Illinois Traction System, has petitioned the Illinois Public Utility Commission for permission to issue \$108,000 of preferred stock and \$165,000 of bonds, of which the sum of \$72,000 will be first and general mortgage bonds.

Protective Committee Formed.—Default having been made in the payment of three installments of interest on the general consolidated 5 per cent gold bonds of the Atlantic Avenue Railroad, Brooklyn, N. Y., dated April 23, 1891, and due in 1931, a protective committee of bondholders has been formed with George E. Warren, vice-president of the Columbia Trust Company, as chairman. The Atlantic Avenue Railroad is included in the system of the Brooklyn Rapid Transit Company.

Subsidiary Elects E. M. Walker President.—E. M. Walker, Terre Haute, has been named president of the Terre Haute & Western Traction Company. Frank T. O'Hair has been named vice-president and John Beasley, Terre Haute, secretary. The directors named are E. M. Walker and John Beasley, Terre Haute; F. T. O'Hair, Fred Baber and James Stewart, Paris. The company is controlled by the Terre Haute Traction & Light Company, which in turn is controlled by the Terre Haute, Indianapolis & Eastern Traction Company. Mr. Walker is local resident manager at Terre Haute.

Permission Asked to Extend Bonds.—The Fitchburg & Leominster Street Railway, Fitchburg, Mass., has petitioned the Department of Public Utilities for permission to extend for five years, from Feb. 1, 1921, maturity of \$300,000 of mortgage bonds and \$100,000 of first mortgage bonds of the Leominster, Shirley & Ayer Street Railway. The company also seeks to increase interest rates on these issues of securities from 4½ per cent and 5 per cent respectively to 7 per cent on both issues because of its inability to market new bonds to meet maturing issues. The Leominster, Shirley & Ayer Street Railway is a subsidiary of the Fitchburg & Leominster Street Railway.

Traffic and Transportation

Syracuse Case Heard

Session at Albany Before Commission in Ten-Cent Appeal Concerned Mostly with Valuation

Corporation Counsel E. H. Lewis, representing the city of Syracuse, cross-examined witnesses for the New York State Railways before Public Service Commissioner J. A. Kellogg on Jan. 7 on the company's application for a 10-cent fare in Syracuse. Messrs. Gannon and Michell of Syracuse appeared for the company.

Mr. Lewis examined Horace D. Campion, Philadelphia, the engineer who made the valuations for the New York State Railways, Syracuse Lines, reproduction cost, new, at present day prices, \$21,012,200; average costs 1915 to 1919, \$16,663,299; and pre-war costs \$12,006,134, going into detail concerning the various cost figures which Mr. Campion employed, particularly in the \$21,012,200 valuation. Mr. Lewis objected to certain testimony by Mr. Campion covering real estate and buildings, the valuation for which had been made by R. T. Fredericks and E. C. Cook and accepted by Mr. Campion in his valuation, but Commissioner Kellogg accepted the testimony for what it was worth and subject to later supporting testimony. Mr. Campion said many of his computations were theoretical, based on facts and experience.

ALLOWANCE FOR WORKING CAPITAL

Mr. Campion told Mr. Lewis, although the company's business was a cash one, that the company should have an allowance for working capital so that it could buy materials on favorable figures and maintain a necessary bank balance.

At the conclusion of the evidence on Jan. 7 the counsel were unable to agree on an adjourned date, Mr. Michell and Mr. Gannon urging that the hearing be continued at an early date.

J. M. Joel, the company's auditor, was questioned by Mr. Lewis about repair and other work at the Wolf Street carhouse for Syracuse suburban lines, the valuation of which, \$450,000, was charged to the Syracuse lines. Mr. Joel said he could not give the company's expenses on the service-at-cost plan at Syracuse, but he promised Mr. Lewis that he would prepare such a statement. Mr. Campion also presented a tabulation showing the weekly and monthly payroll of the Syracuse Lines.

COMMISSIONER OVER-RULES CITY'S PLEA

Mr. Lewis objected to the commission's consideration of the evidence in the Syracuse 6-cent fare case, but Commissioner Kellogg over-ruled the motion. Mr. Lewis said he would wait time in which to examine that record

as another field was opened up and he might want to meet something contained in it.

There were also present at the hearing Walter S. Kernan, Utica, and B. E. Tilton, Utica, vice-president and general manager; Milo R. Maltbie, New York, assisting Mr. Lewis; Ray B. Smith and City Engineer Allen of Syracuse.

Commissioner Kellogg announced Jan. 18 as the next hearing day, with all the evidence to be submitted to the commission at that time.

Fares Lower in Wisconsin than Average in United States

Street car riders in Wisconsin are paying less than the average fare charge throughout the United States, according to a comparison, made by the Wisconsin Public Utilities Bureau, between statistics compiled for the nation by the American Electric Railway As-

Refuses to Reduce Fort Worth Seven-Cent Fare

The Northern Texas Traction Company, which operates the local lines in Fort Worth, Texas, has declined to reduce its fares from 7 cents to 6 cents, as asked recently by the City Commission. The refusal to comply with the request was made known to the commission in a formal communication from George H. Clifford, vice-president and general manager of the company. The city had requested that the fare be reduced to 6 cents pending a hearing on what would be a fair and equitable rate of fare for the traction company.

The City Commissioners held that Mr. Clifford's communication was unsatisfactory as lacking definiteness. Mr. Clifford made the plea that the high cost of fuel oil and other articles used in operation and maintenance of the car lines, and the city communication in reply pointed out that the traction company raised fares from 6 cents to 7 cents largely on the plea that the cost of fuel oil had advanced, but that now the price of fuel oil had declined until it was below the level paid when fares were 6 cents.

Mayor W. D. Davis suggested to the commission at the time the communica-

TABULATION SHOWING FARES IN WISCONSIN CITIES

City	Population	Cash Fare (Cents)	Ticket Fare (Cents)	Became Effective
Appleton.....	19,561	5	.....	2/12/19
Ashland.....	11,334	5	6½	10/16/18
Beloit.....	21,284	7	.....	.....
Chippewa Falls.....	9,130	6	.....	.....
Eau Claire.....	20,880	6	.....	8/1/18
*Fond du Lac.....	23,427	8	7	9/5/20
*Green Bay.....	31,017	10	7	1/1/21
Janesville.....	18,293	10	7 1/7	10/29/20
Kenosha.....	40,472	7	6½	10/30/20
*La Crosse.....	30,363	7	6½	12/8/20
Madison.....	38,378	6	5 5/9	11/16/18
Manitowoc.....	17,563	6	6	8/9/18
Marinette.....	13,610	7	5	8/27/20
Merrill.....	8,068	7	5 5/9	12/23/18
Milwaukee.....	457,147	7	6½	11/2/19
*Oshkosh.....	33,162	8	7	9/17/20
*Sheboygan.....	30,955	8	7	9/11/20
Racine.....	58,593	7	5 5/6	12/1/20
Superior.....	39,624	7	.....	.....

* These cities, Fond du Lac, Green Bay, La Crosse, Oshkosh, Sheboygan, have a family ticket rate of fifty rides for \$3.

sociation and for the State by the Railroad Commission. The association's figures further show that of the 287 cities of the United States having a population of more than 25,000 there is a distinct movement toward a basic charge of 10 cents.

In Wisconsin nearly all the urban population is paying a 7-cent cash fare or less. Of the 19 cities having local service, only two cities have a 10-cent cash fare and their combined population is only 49,310. They are, Green Bay and Janesville. The ticket fare in Green Bay is 7 cents; in Janesville 7 1/7 cents.

Of the cities in Wisconsin which have a combined population in excess of 1,000,000 people, three have a 5-cent cash rate, five a 6-cent rate, six are paying 7 cents, three have an 8-cent rate, and two a 10-cent rate.

A tabulation of present fare charges in various Wisconsin cities and towns is published above.

tion from Mr. Clifford was received that the resolution prohibiting the operation of jitneys be revoked and that the operation of jitneys be encouraged as a means of forcing the traction company to reduce fares.

Railway Asks Accident Damages

Reversing the usual procedure the Municipal Railway of St. Petersburg, Fla., is bringing suit on its own account in a case growing out of a collision between an electric car and an automobile truck. The accident is alleged to have been caused by the reckless driving of the man in charge of the truck. The electric car, of the one-man type, was badly damaged. Charles R. L. Ludwig, who is in charge of the Municipal Railway, says that the city "is going to start and maintain a policy of making the other fellows pay for damage to cars when it is a clear case of being the other fellow's fault."

Outlook Brighter for Louisville Fare Increase

An ordinance has at last been introduced in the General Council of Louisville, Ky., which promises to afford the Louisville Railway financial relief. This measure, which has already been passed by the Board of Aldermen, provides for an increase in the cash fare to 7 cents for a period of two years. The railway is required to sell four tickets for 25 cents and to carry school children for half fare. Free transfers are to be continued. The company is to maintain the pavement between the tracks and for two feet beyond the outer rails in the same state of repair as that in the remainder of the street.

During the life of the agreement the railway is to limit the payment of dividends to the following: Accumulated dividends on its preferred stock; current dividends of 5 per cent per annum on preferred stock; dividends of not more than 2 per cent on its common stock. The company has so far taken no steps to curtail its service in spite of an announcement by James P. Barnes, president, that service would be cut 25 per cent on Jan. 1. However, if relief is not given shortly, the indications are that service will have to be reduced if the railway is to continue to operate.

Eight Cents in Peoria

The Peoria (Ill.) Railway on Jan. 12 raised its fare from 7 cents to 8 cents under authority of an order of the State Public Utilities Commission. Two tickets are being sold for 15 cents. Children between the ages of five and twelve years are carried for 4 cents.

When the company sought relief in the shape of a higher fare last June, to take care of the 25 per cent wage increase granted its employees, it was estimated that an average fare of 7.72 cents a passenger would be required to yield a sufficient revenue for operating expenses and fixed charges. This was on the assumption that there would be no falling off of traffic due to the proposed fare increase or other causes. It was estimated that should there be a 5 per cent decrease in number of passengers carried, an average fare of 8.05 cents a passenger would be needed.

The company therefore sought a 10-cent cash fare, with ticket fares ranging from 8½ cents to 7 cents. The 8-cent fare allowed by the commission means an average fare of 7.5 cents, which, according to company officials, will not entirely afford the added revenue necessary to care for operating expenses. Since last June the railway has been operating on a straight 7-cent fare.

New Rates Effective in Seattle

The increased fare on the lines of the Seattle (Wash.) Municipal Railway became effective on Sunday, Jan. 8, the new schedule of fare being: Cash fare,

10 cents; or three rides for 25 cents, making the token fare 8½ cents. Six tokens are sold for 50 cents, or twelve for \$1. School children continue to ride for 3 cents, or two for 5 cents, with school tokens at the rate of ten for 25 cents. The 6½-cent bronze token is no longer accepted, but purchases may be traded in for the new "silver" token. The new tokens are sold on the cars, and carmen also sell the tokens at important downtown transfer points. The city purchased 2,140,000 of the bronze tokens last July when the first increase in fare became effective, at a cost of \$18,270. More than 1,400,000 had been issued at the time of the second increase.

Riders Approve Increase

An unusual occurrence took place on Jan. 7 in Lakewood, Ohio, a suburb of Cleveland, with a population of 41,732 people, when the car riders voluntarily agreed to an increase in fare to 6 cents.

Because of a separate franchise contract with the Cleveland Railway Lakewood riders, although being hauled a

For the Cleveland rate of fare
and Present Service
TEAR OFF THIS END
.....

LAKWOOD CAR RIDERS

You have better street car service than Cleveland at a less rate of fare and at less than COST. Cleveland car riders are paying YOUR EXTRA COST.

Cleveland asks you to pay your own way or receive less service. You are not asked to change your 3c. fare.

WILL YOU BE FAIR, PAY THE CLEVELAND RATE AND KEEP YOUR SERVICE?

If YES—Tear off the top of the card and hand it to the collector.
If NO—tear off the bottom.
.....

Against the Cleveland rate of fare
TEAR OFF THIS END

"BALLOT" USED IN LAKEWOOD POLL

greater distance than Cleveland patrons, have since the middle of November been riding for 5 cents, although Cleveland car riders have been compelled to pay a 6-cent fare. City Street Railway Commissioner Fielder Sanders has given it as his opinion that the Lakewood car riders cannot be forced to pay a higher rate of fare. However, he appealed to their sense of fairness and asked that the car riders themselves vote on voluntarily paying the same rate as the Cleveland riders. This the Lakewood car users did on Jan. 7, with the result that 6,156 voted in favor of paying the 6-cent rate, while only 2,768 voted against increasing the rate of fare.

In taking the vote on the cars throughout the entire day none of the riders was asked to give his name. The rider merely pulled off a stub, thereby approving or rejecting the proposed increase, and cast it into a ballot box. Now Mr. Sanders is endeavoring to have the Lakewood Council follow the expressed wishes of the car riders by formally authorizing the company to charge 6 cents in Lakewood.

300 per Cent Increase in Auto-Car Collisions

Declaring that collisions with automobiles have increased 300 per cent in the last seven years and now constitute one-half of all accidents that occurred during the year on the Pacific Electric Railway System, S. A. Bishop, general claim agent of the company, has issued an appeal to automobile drivers for greater caution in traveling over public thoroughfares. The number of fatalities reached the peak with seventeen deaths recorded for the month of November, 1920, from accidents in which the Pacific Electric was involved. In not a single instance was it shown that the company or its employees was at fault.

The company's records show that in November, 1920, there was a total of 301 accidents from interference with vehicles, as against 124 during the same month in the year 1913. In step accidents, from falling or alighting from steps, a decrease from the 1913 figures was shown, with ninety-six such accidents reported. The total number of accidents of all kinds for the month was given at 529, the greatest in any one month in the history of the company, and an increase over the 1913 figures of 102 accidents. Mr. Bishop calls attention, however, to the fact that the increase in vehicular accidents of 177 for this period is the most serious and requires earnest thought, attention and co-operation in order that it may be remedied in the interest of the community without loss of time.

Court Approves Double Fares

The Appellate Division of the Supreme Court, State of New York, has decided that the Brooklyn City Railroad has the right to charge two fares on its Flatbush Avenue line, one in the old town of Flatbush and another in the old town of Flatlands. In consequence the company began to collect such fare on Jan. 17.

The town line is at Foster Avenue, and the second fare charge applies to passengers boarding the cars of this line west of Foster Avenue and riding to points east of Foster Avenue, or vice versa.

The enforcement of the collection of this second fare is under the same conditions that prevailed when the company originally endeavored to collect such fare and ceased doing so by order of the Public Service Commission for the First District after vehement protests by car riders.

The Brooklyn City Railroad occupies a very unusual position in that its outstanding bonded debt is probably only from 10 to 15 per cent of the value of its property, and may be said to be approximately equal to the real estate owned by the company. Under these circumstances a condition which would force the average traction property into receivership because of its inability to earn the interest on its bonded debt does not apply to the Brooklyn City Railroad.

Transportation News Notes

Eight Cents in Rockford.—The Illinois Public Utilities Commission has authorized the Rockford City Traction Company, Rockford, to raise its cash fare to 8 cents. The fare has been 6 cents, with five tickets for 30 cents.

Six-Cent Fare in Effect.—The Twin City Rapid Transit Company, Minneapolis, Minn., which operates the electric railway lines in Stillwater, Minn., has raised its fare on its Stillwater lines from 5 cents to 6 cents. The new rate was approved by the Stillwater City Council.

Eight Cents in Each Zone.—The Westchester Street Railroad, White Plains, N. Y., has been authorized by the Public Service Commission for the Second District to charge an 8-cent fare in each zone except in zone 1. The company has also been granted permission to abandon a portion of its line.

Straight Nickel Fare to Continue.—The City Council of Akron, Ohio, has passed an ordinance allowing the Northern Ohio Traction & Light Company to continue to charge a straight 5-cent fare for a period of three months, pending action on the proposed service-at-cost franchise. The company was to have returned to the practice of selling six tickets for 25 cents on Jan. 1.

Eight Cents in Streator.—The Illinois Public Utilities Commission has authorized the Illinois Light & Traction Company, Streator, to charge an 8-cent fare on its lines in Streator. The People's Traction Company, Galesburg, has been ordered by the commission to continue its present rate schedule between Galesburg and Abington. The company had applied for an increase in the interurban rate.

Return to Old System of Fare Collection.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has returned to the old system of collecting fares. Rankin Johnson, president of the company, says that the fare boxes have not facilitated the work of the conductors to the extent anticipated and that the old system of having patrons pay the conductors will probably result in the more rapid handling of crowds.

Ten Cents in Kewanee.—The Illinois Public Utilities Commission has authorized the Galesburg & Kewanee Electric Railway, Kewanee, to charge a 10-cent cash fare on its Kewanee city lines. The company is to sell three tickets for 25 cents. The fare has been 8 cents with five tickets for 35 cents. The commission has authorized the Galesburg Railway, Lighting & Power Company to continue a 10-cent cash fare and to sell three tickets for 25 cents.

Ten Cents in Green Bay.—The Wisconsin Railroad Commission has authorized the Wisconsin Public Service Company to charge a 10-cent fare on its lines in Green Bay. Tickets will be sold in strips of five for 35 cents, with commutation tickets good for fifty rides for \$3. This is not a final order of the commission but will be in effect until a study of the results obtained under these rates can be made by the commission.

Would Charge 10 Cents.—Application has been made to the State Board of Public Utility Commissioners by the Bridgeton & Millville Traction Company, Bridgeton, N. J., for permission to raise its fare to 10 cents and to abandon parts of its line. The lines on which the company seeks to discontinue service are between Newport and Port Norris and Bivalve, the Church Street and Irving Avenue line in Bridgeton and the Tumbling Dam Park. The present fare is 7 cents.

Will Vote on One-Man Cars.—The taxpayers of Saskatoon (Sask.) will vote at the 1921 municipal elections on a proposal to adopt one-man cars on the city-owned electric railway system. The City Council was recently compelled to raise the fares to 10 cents, but a downward revision is promised if one-man cars are permitted. The Brandon (Man.) Municipal Railway has raised its cash fare 2 cents above the old 5-cent rate. Limited tickets are sold at 5 cents and unlimited tickets at 6 cents.

Dime Fare Denied.—The City Commission of Owensboro, Ky., has denied an application of the Owensboro City Railroad for an increase in fare from 7 cents to 10 cents. The commission took the stand that to increase the fare at this time would reduce the number of car riders materially. The company has announced that it will discontinue service to Hickman Park, one of the principal parks of the city, and that it will introduce other economies. The fare was raised from 5 cents to 7 cents about a year ago.

Trolley Rights Not Exclusive.—Holding that the citizens of the State have the right to use of the streets either with their individual conveyances or collectively in conveyances hired by them so long as they do not interfere with the rights of others, Merrit Lane, counsel for the jitney owners in their fight with the Public Service Railway, has filed his brief in the Court of Chancery. Mr. Lane argued that the public was not bound to use railways as a means of conveyance and that the jitanies had as much right to the streets as trolley cars.

Mayor Demands Fare Reduction.—Benjamin Bosse, Mayor of Evansville, Ind., in his annual message to the City Council of that city, has suggested that the Indiana Public Service Commission be requested to reduce the fares in Evansville to 5 cents. The city lines are operated by the Evansville Public Service Company, which also operates from Evansville to Patoka, Ind. The

company now charges 6 cents for city fares, but a patron is permitted to purchase twenty tickets for \$1. The Indiana Public Service Commission is expected to pass upon the matter in the near future.

Ticket Counterfeiting Plot Unearthed.—In the Quincy Division of the Eastern Massachusetts Street Railway a counterfeiting plot of such proportion has been unearthed that it has become necessary to call in and exchange the blue form tickets heretofore used under which twelve rides were sold for \$1. A new form of ticket was put on sale for several days at the same rate in the rooms of the Chamber of Commerce and such blue tickets as were "real" were exchanged. Officials of the railway company have offered a reward of \$1,000 for the apprehension of the counterfeiters and also \$250 for information leading to the arrest and conviction of any one selling the counterfeit tickets.

City Prepares for Fare Appeal.—The City Commission of San Antonio, Tex., has voted to retain Robert J. McMillan as special attorney to prosecute the city's suit against the San Antonio Public Service Company, which operates the local railway system, to compel the company to reduce fares. The case is now pending before the United States Supreme Court on an appeal. The case originated when the company, under authority granted by the Federal Court after a hearing before a special master in chancery who held the former rates were in effect confiscatory, raised its fares from 5 cents to 8 cents. The higher fare was made effective in an arbitrary order by the company when negotiations with the city failed.

Merchants Favor Worcester Increase.—Clark V. Wood, president of the Worcester (Mass.) Consolidated Railway, has notified the city authorities that the company must secure additional revenue if it is to continue to furnish service of the present quality. Mr. Wood states that the 7-cent fare now in effect has proved inadequate and that it will be necessary to raise the rate to 10 cents on the city lines and to 7 cents on the suburban zones. Mr. Wood's plan has been indorsed by the local Chamber of Commerce. Mr. Wood recently stated that for the eleven months ended Dec. 1 the increased revenue under the 7-cent fare was \$384,389, while operating expense for the same period showed \$569,387, and the road had a surplus of but \$2,861 at the end of the eleven months' period. This is only the difference between revenue received and operating expense, not providing for payment of taxes and interest. He gave as an estimate figures for operating expense for the year 1921, based on the 1920 figures, and providing for increased taxes and the wage increase, as \$5,087,290. Citing the estimated revenue of 1920 at \$2,365,540, he maintained the road must have increased revenue sufficient to make up the estimated deficit for 1921 of approximately \$721,000.

Personal Mention

Mr. Butler in Atlanta

Manager Winnipeg Electric Railway
Made Manager of Railways Georgia
Railway & Power Company

Frank L. Butler, manager of the Winnipeg (Man.) Electric Railway, has tendered his resignation to accept a position as manager of the railway department of the Georgia Railway & Power Company, Atlanta, Ga. Mr. Butler will take over the duties until recently performed by W. H. Glenn. Mr. Glenn resigned as vice-president of the Atlanta system on Dec. 1 last to become president of the Shippers Compress Company. Mr. Butler will assume his duties in Atlanta about Feb. 1.

In his new position Mr. Butler will have charge of the operation of one of the most extensive railway properties in the South. The Georgia Railway & Power Company owns and controls more than 230 miles of track and serves Atlanta and nearby cities.

Mr. Butler returns to the United States after an absence of three years, during which time he served with the



F. L. BUTLER

Mr. Crecelius in New Work Superintendent of Power at Cleveland Goes Into Consulting Engineering and Construction for Himself

Lawrence P. Crecelius has resigned as superintendent of power of the Cleveland (Ohio) Railway and will be head of a new engineering firm to engage in consulting engineering, construction and operation of properties.

Mr. Crecelius has been with the Cleveland Railway as power superintendent since 1910. Previous to that he held the same position for two years under the receivers who operated the Cleveland traction lines. From 1900 to 1906 he was electrical engineer for the United Railways, St. Louis, and for a year following that was associated with



L. P. CRECELIUS

the Public Service Corporation of New Jersey. He has become well known to engineers throughout the country for his original work in the design of electrical equipment, in particular 60-cycle rotary converters. He holds a large number of patents covering types of rail bonds and methods of bonding, and has done much original work in the design of boiler settings and the operation of boiler plants.

Mr. Crecelius was one of the first to recognize the desirability of the purchase of coal upon a heat value basis with deductions for excessive amounts of sulphur and ash. The Cleveland Railway's coal contract, which was drawn up by him, has been copied by many other companies through the country. Another innovation in Cleveland during his tenure of office was the extensive use of the reinforced concrete trolley pole designed by Mr. Crecelius and copied in hundreds of different towns and cities. Mr. Crecelius was among the first to make a careful study of the question of electrolysis mitigation, including thorough potential sur-

veys. As a result of his activity the damage to underground structures due to electrolytic corrosion has been much mitigated in Cleveland.

Within the last year the attention of engineers and railway operators has been directed to the new automatic substation of the Cleveland Railway. This is the largest automatic substation so far put into commission and it represents a long step forward in the status of this art. The development of this substation has been carried forward under Mr. Crecelius' direction. Since 1912 the Cleveland Railway has installed altogether six new substations. The design of these substations and the equipment used in them have been discussed from time to time in the **ELECTRIC RAILWAY JOURNAL**.

Mr. Crecelius is a past-president of the American Electric Railway Engineering Association and has for many years been very active on the committees of this association of the American Institute of Electrical Engineers, and of other engineering organizations and societies. His papers and articles have frequently appeared in engineering society transactions and in the technical press.

Until about April 1 Mr. Crecelius' address will be the Leader-News Building, Cleveland. After that date his offices will be located in the new Hanna Building, Cleveland.

S. S. Vandenberg, Safety Manager

Spencer S. Vandenberg has been appointed manager of the newly created Safety Council of Louisville, Ky. Mr. Vandenberg is an electric railway man of many years' experience. Prior to his appointment at Louisville he was assistant engineer in charge of office and field engineering of the Schenectady (N. Y.) Railway. He was born in Schenectady in 1884. He received his early education in the public schools of that city, later completing a scientific course at the Union Classical Institute, and studied at Union College. During his vacations he was employed at various times in machine shops and on the erecting floor of the American Locomotive Company at Schenectady, later entering the drafting department of the General Electric Company.

In 1903 Mr. Vandenberg joined the Schenectady Railway in connection with the construction of the twenty-two-mile interurban line between Schenectady and Saratoga Springs. Two years later he entered the employ of the New York Central Railroad on grade crossing elimination work, and other branches of field and office engineering. In 1906 he returned to the Schenectady Railway.

Winnipeg Electric Railway, first as general superintendent, and more recently as manager. He was born in Terre Haute, Ind., in 1874. At the age of twenty years he entered the employ of the Vandalia Railroad, now a part of the Pennsylvania system. He was employed in various capacities in several towns along the line of the Vandalia Railroad until February, 1909. He then resigned to become superintendent of the Denver & Intermountain Railway, Denver, Col. He subsequently became vice-president of the company.

Mr. Butler resigned on Sept. 1, 1911, to accept the position of general manager of the Alton, Jacksonville & Peoria Railroad, then under construction. Shortly thereafter he was appointed receiver of the company and later completed the line as far as Jerseyville, Ill. In July, 1913, he became general manager of the Chicago & West Towns Railway and of the Suburban Railway, with headquarters in Chicago, and remained in charge of those properties until April 1, 1918. He then resigned to join the Winnipeg Electric Railway.

M. B. Stewart has taken a position as assistant to S. L. Duckett, chief construction engineer of the Southern Public Utilities Company, Charlotte, N. C. Mr. Stewart is a graduate of Berry Industrial School and Berea College. He was connected with the construction department of the Eastman Corporation, at Kingsport, Tenn., before joining the Southern Public Utilities Company a short time ago.

P. B. Sawyer has been elected president of the Lehigh Valley Transit Company, Allentown, Pa., to succeed Harrison R. Fehr. Mr. Sawyer has been a vice-president and director of the Lehigh Valley Transit Company and its subsidiaries for the past three years. He is a vice-president of the Lehigh Power Securities Corporation, which controls the Lehigh Valley Transit Company. He will continue to reside in New York.

Joseph Russell, superintendent of railways of the Eastern Texas Traction Company, Beaumont, Texas, has resigned to become electrical engineer for the Gulf Refining Company with headquarters in Houston. He has been succeeded at Beaumont by W. A. Robertson. Mr. Robertson has for some time been in the employ of the Houston Electric Company and has served as superintendent of transportation of the Galveston-Houston Electric Railway's interurban line.

E. C. Ryder, president of the Bangor Railway & Electric Company, Bangor, Me., for the past five years, has resigned and will devote his time to the practice of law. Mr. Ryder is a well-known Maine attorney. He has been general counsel in that State for the Canadian Pacific Railway and the Eastern Trust & Banking Company. He has been closely associated with the growth and development of the Bangor Railway & Electric Company and its subsidiaries for many years. Mr. Ryder was born in Readfield, Me., in 1854. He attended Colby University and was admitted to the practice of law in 1882. He has lived in Bangor since 1894. Mr. Ryder has served in the State Legislature and as solicitor for the city of Bangor for two terms.

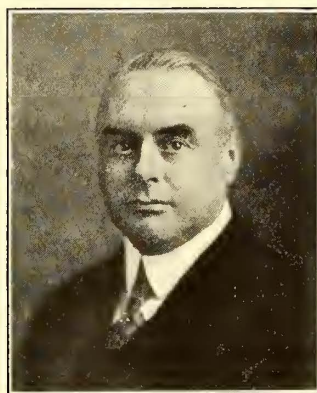
Thomas K. Bell has been appointed Civil Inventory Chief, U. S. Navy, with offices in the Bureau of Supplies and Accounts, Navy Department, Washington, D. C. Mr. Bell is now making a survey of the system of inventory used by the General Electric Company, with a view to its development for use by the Navy. From December, 1919, to January of the present year Mr. Bell served as appraiser for the Fourth Naval District. He was formerly general manager of the St. Petersburg Light & Power Company and the St. Petersburg & Gulf Railway, St. Petersburg, Fla. Prior to that time he was for many years engineer of William Wharton, Jr., & Company, Inc., Philadelphia, Pa., and was connected with the Interstate Railways, Philadelphia, and the Philadelphia Rapid Transit Company.

H. C. Stevenson Advanced

Will Represent President McCarter of the Public Service Railway in Southern New Jersey

Harry C. Stevenson has been appointed assistant to the president of the Public Service Railway of New Jersey. Mr. Stevenson will act as the personal representative of President Thomas N. McCarter in the Southern Division of the company's property. He will serve in a similar capacity with the Public Service Gas Company and the Public Service Electric Company. He will make his headquarters at the railway's offices in Camden.

Mr. Stevenson has been connected with the Public Service Corporation of New Jersey ever since its organization in 1903. He began his career in the public utility field in 1897, when he became secretary to the late Thomas C. Barr, then president of the Worcester Traction Company. Later he served as auditor of the Elizabeth, Plainfield & Central Jersey Railway, which was finally absorbed by the Public Service.



H. C. STEVENSON

After serving in a secretarial capacity under several executive officers. Mr. Stevenson, in June, 1907, was made assistant secretary of the Public Service Corporation and of its underlying companies. In April, 1917, he was made assistant to Vice-President Edmund W. Wakelee of the railway.

Obituary

William H. Sayre, president of the American Abrasive Metals Company, died suddenly at his home in Glen Ridge, N. J., on Jan. 6, from a severe heart attack. Before engaging in manufacturing Mr. Sayre was connected with the construction of railroads and at one time was associated with the late John B. McDonald, who had the contract for the construction of the original subway in New York. Later Mr. Sayre was elected president of the

International Contracting Company, which executed many important dredging contracts. He subsequently organized and became president of the American Abrasive Metals Company.

B. A. Buckheister, superintendent of railways of the South Carolina Light, Power & Railways Company, Spartanburg, S. C., was shot and almost instantly killed on the evening of Dec. 17 by George W. Putnam, a former employee of the railway. Mr. Buckheister, in a dying condition, was rushed to the Spartanburg Hospital in an ambulance, but expired on the way. Mr. Buckheister was one of the best known men in Spartanburg. He was a native of Charleston, S. C. He went to Spartanburg about twenty-five years ago, and with the late F. W. McEowen had a large part in the building of the railway system in that city. He had been superintendent of the lines since the beginning of operations. Mr. Buckheister was fifty years of age.

Alexander J. Hemphill, chairman of the board of directors of the Guaranty Trust Company, New York City, and a director of a number of utility companies, died at his home in New York recently. Mr. Hemphill was recognized in business and banking circles as one of the foremost financiers in the United States. He had been associated with the Guaranty Trust Company for more than fifteen years, first as vice-president, later as president, and finally as chairman of the board. He was a director of the Hudson & Manhattan Railroad, the Interborough Rapid Transit Company, the Interborough Consolidated Corporation, the United Gas & Electric Corporation, the United Railways Investment Company, the Electric Bond & Share Company, the California Railway & Power Company and of other corporations.

William A. Anderson, secretary to Job E. Hedges, receiver of the New York Railways and secretary to H. H. Vreeland, director of welfare of the Interborough Rapid Transit Company, New York, N. Y., died recently following an operation for appendicitis. Mr. Anderson was born in Toronto, Ont., in 1876. He entered the service of the old Metropolitan Street Railway eighteen years ago as a stenographer in the legal department. Two years later he became secretary to Mr. Vreeland, then president of the company, remaining in this position until the receivership in 1907, when he became secretary for the receivers, Messrs. Douglas Robinson and Adrian H. Joline. When the lines were sold under foreclosure in 1912 and reorganized as the New York Railways Mr. Anderson again became secretary to Mr. Vreeland as director of welfare of the Interborough Rapid Transit Company and the New York Railways. When Mr. Hedges was appointed receiver of the latter company, in March, 1919, in addition to acting as secretary of the department of welfare Mr. Anderson also was appointed secretary for the receiver.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,

SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

Light Market for Signal Apparatus

Manufacturers Differ on Effect of Safety Cars on Demand—Prices Steady with Good Deliveries

Despite the recent statement of a representative manufacturer of railway signals that his volume of sales for 1920 exceeded every other year since 1911 a survey of the field does not reveal similar conditions. The producer in question attributed his good sales in part to the development of the safety car within the past year or two, and the realization of operating men that the handling of such cars should be made as nearly automatic as possible, especially where one-man cars are operated on single track or with shortened headway.

Other manufacturers, however, do not state that the growth of safety car operation has favorably affected the signal business. In fact several representative producers state that the year 1920 was considerably below the average for installations of signal apparatus, both on steam and electric railways. This is said to be a result of money stringency and the comparatively small mileage of new track laid. Just now the market for signals remains quiet. Whether the present year will result in good sales or not is rather uncertain. Manufacturers are hoping but not expressing overly much confidence as yet. Prospects for electric railway buying are rather indefinite, but a good volume of orders may develop from steam roads.

Manufacturers are in excellent shape to make prompt deliveries. In a few instances at least, standard equipments are being made on a moderate scale for stock. Prices of signal apparatus have undergone no change and there seems to be little prospect of any material change in price at present. Raw material is plentiful but the cost of malleable castings and of cast-iron remains comparatively high; labor is high and the benefits of mass production are not easily obtained in this field.

Good Demand for Gear Cases

Orders for gear cases were good the past year and electric railways have endeavored to anticipate their needs for the present winter so far as their buying power permits. Stocks have remained low following the extra large number of replacements that were necessary last year. Another factor inducing depleted stocks has been the shortage of sheet steel and malleable iron that prevailed for many months.

Sheet steel is now plentiful but manufacturers are avoiding stocking it on a declining market. The malleable iron supply while better is still not normal. Prices on malleable cases have remained steady following advances made early in the year owing to increased raw material costs but sheet steel gear case prices have shown a slight break. Deliveries of malleable cases the end of the year were quoted at forty-five to ninety days and sheet iron gear cases at thirty to seventy-five days, with no stocks in sight.

Purchasing of Lightning Arresters Only Fair

Relatively Short Deliveries Can Be Made on Car Types—No Change in Price Reported

Demand for railway type lightning arresters was only fair throughout the year and as a result good deliveries prevailed. Expectations that stocks of lightning arresters which had accumulated previous to the spring demand would be quickly wiped out did not materialize. An important factor in this is thought to be the financial situation in which many of the lines found themselves. It is known that traction companies were more willing to take a chance on not providing protection for cars, especially the smaller safety type in large use. Deliveries in general throughout the buying season varied from stock up to six weeks' time.

Present demand is only spasmodic, although scattered orders are being placed. The buying certainly is not up to normal. There are, however, many attractive inquiries and propositions before the manufacturers and these should come to a head before the spring season.

On the more popular types of car arresters shipments can be made from stock, in small quantities, up to about three weeks, depending on the manufacturer. No changes in price have been reported.

Large Power Stations at Durban

Among the most important government construction work in British South Africa to be undertaken during the next year or two, the United States consul at Durban reports, are the equipping the main line of railroad from Durban to Pietermaritzburg and the building of large power stations along the way, particularly the initial one at Durban. Besides the work mentioned above, the city of Durban has under consideration the construction of a new and much larger power plant.

Easier Supply of Paint Materials Available

Prices in General Have Shown Heavy Decreases—Return of Market Expected to Start Upward Trend

Although electric railways were not especially heavy buyers of paint, enamel and varnish, the market for these materials on the whole remained undersupplied throughout the greater part of last year. The story is one of curtailed supplies of raw material and rising costs due to such factors as the coastwise shipping strike that sent the price of turpentine at New York as high as \$2.50 per gallon on April 10. Hence stocks of the finished products remained badly broken, with irregular shipments.

In the last quarter of the year, however, general demand for paint slackened materially, transportation tie-ups eased and the four months' volume of back orders existing in many cases began to be reduced. From that time on deliveries improved, with supplies now available from stock in some cases. Prices have recently been on the down grade, too, under the influence of lowered costs of turpentine and also of linseed oil.

Turpentine is quoted now at 75 cents a gallon, although a couple cents under this price has been taken for some sales. Spot stocks are reported to be not large and it is expected that a good buying movement would soon result in much higher prices. Better buying is looked for soon. White lead in oil in 100-lb. kegs is down to 13 cents a pound in a quiet market. Linseed oil too is holding on a relatively low level, 77 cents a gallon in car-load lots being quoted.

Price reductions on paints of a week or so ago were short lived, and even then there was little activity in the market. Better business is felt to be in prospect in the near future, according to representative paint producers. Higher prices also are looked for in the dry colors, some slight advances already having taken place.

Buying of Car Wheels Has Been Up to Standard

Orders for chilled iron and rolled steel car wheels on the part of electric railways the past year, while not extra heavy, were about up to the standard of other seasons. A distinct tendency is noted, however, to make wheels serve a longer period without making replacements.

Car shortages, which have delayed supplies of fuel and raw material, served to pile up unfilled orders at the

factories as long as sixty days, while deliveries in some cases ranged at times as long as three months. The shortage of scrap iron wheels holding over from the war period also served to curtail the supply of chilled iron wheels. These factors were minimized by the wide distribution of wheel factories over the country, however, and by the policy of producers of maintaining reserve stocks for regular customers. As production conditions improved along with freer transportation and better supplies of material orders for wheels were filled in good time. Demand for the most part, of course, was renewal in character.

Steam railway buying, along with that of the traction companies, is such that present mill capacity is going in good shape, and is being added to in certain instances. Especially on the part of steam roads forward bookings are quite heavy. Orders last fall for new rolling stock have provided winter and spring business so that quick requirements on the part of traction companies might only with difficulty be filled.

Insulation Prices Drop

Treated and Untreated Fabrics and Compounds Off About 25 Per Cent

With the general decline in cotton and silk fabrics, there has just been a drop in price of at least one brand of finished insulations, treated and untreated, and in compounds and varnishes averaging about 25 per cent.

Buying of insulating materials is running along on a level only sufficient to keep up with the demand at present existing in the apparatus field. This is quite light as evidenced by the reduction in orders placed with manufacturers of electrical equipment.

Orders for Repair Seatings Rather than Seats

Manufacturers of car seats report a rather light demand for finished seats from electric traction companies in the year just past, but buying of seating material for repairs was fairly good. Many car builders now make their own seats, and this of course affects the demand there somewhat. Steel was very difficult to obtain and seats with steel underframes consequently were slow in delivery, especially those employing plush, leather or imitation leather. These materials were all very scarce.

Rattan, however, remained in fairly good supply, in some cases fair-sized stocks of repair material being maintained, while in others deliveries ranged as long as six weeks during the summer. The latter delay was partly due to a scarcity of ship bottoms with which to transport rattan from the Far East.

At the same time high freight rates prevailed and the cost of native eastern labor has been on the increase. Manufacturing facilities are now good and an adequate supply of car seats

and seating material is expected to be available to meet the good demand that seems to be anticipated in the spring.

Armature Coil Market Quiet

Some Companies Have Dropped Price 5 to 10 per Cent in the Last Two Months

Activity in the market for armature and field coils represents only the buying for present needs. To date the winter has been pretty free from snow and this has had a big effect on orders for this equipment for maintenance. At this time a year ago the market was quite reversed and deliveries were longer than at present.

Safety-car equipments are becoming rather standardized and some coil manufacturers have wound for stock to take care of rush orders should heavy storms cause burnouts. On the other hand, from other quarters up to four weeks is required to fill orders for safety cars. For coils to fit the larger types of railway motors from four to eight weeks is the quotation for shipments.

Following cotton and copper prices down at a respectful distance December saw about a 10 per cent reduction in price of these coils in some instances, while in other instances no reductions were made until the middle of January, when a 5 per cent cut was made. From still other directions no change is reported.

General Electric Finds Cut in Force Necessary

With a payroll reported to be the highest in its history, and with bookings of new business at a rate of about \$200,000,000 at this time, while early in 1920 they were at the rate of about \$350,000,000, it is not surprising to learn that the General Electric Company finds it expedient to make reductions of about 10 per cent in the working force in the factory departments of its various apparatus and supply plants. At the same time there is a sufficient volume of back orders to keep the plants working for several months.

Rolling Stock

The Cleveland (Ohio) Railway, it is reported, will purchase fifty new motor cars and fifty new trailers at a cost of \$930,000 if the Council permits the amendment to the company's franchise allowing it to dispose of new stock at less than par.

Franchises

Indiana Service Corporation, Fort Wayne, Ind.—An extension of the city lines of the Indiana Service Corporation of Fort Wayne, Ind., will be made in the Bloomingdale section of the city this coming summer, following the recent approval by the Fort Wayne board of public works of a franchise,

giving the corporation the right to lay new tracks on various streets in that city. The franchise calls for the establishment of a line from the present terminus of the Huffman Street line down Franklin Street to Third Street and out Third Street to Runion Avenue. Robert M. Feustel, president of the corporation, expects to begin work on the new tracks within a comparatively short time.

Track and Roadway

Calgary, Alta.—Request for extension of the white car line route in East Calgary from the end of the present line to make a loop round by Twenty-second Street and Seventeenth Avenue will be revived by the East Calgary Ratepayers' Association.

Louisville (Ky.) Railway.—The Louisville Railway plans to take up and relay the curved track at Third and Liberty Streets, Louisville. The work of rearranging the track and shortening the curve will be expedited as far as possible because of traffic congestion and the possibility of accidents resulting from the torn-up condition of pavement.

Louisville (Ky.) Railway.—The Market Street Merchants' Association has placed before the Louisville Railway an offer to build two car tracks a distance of two blocks to connect Third and Jefferson Streets with Third and Main Streets if the railway will route the Indiana interurban cars through Third Street and down Main instead of west on Green Street. No action has been taken on the matter so far.

New York, Westchester & Boston Railway, New York, N. Y.—It is expected that the New York, Westchester & Boston Railway will extend its electric line to Port Chester. This is a step in the project to connect New Rochelle and Larchmont. The route for this line runs parallel to the New York, New Haven & Hartford system and so far the plans include a double-tracking to Larchmont.

Dallas-Terrell Interurban Railway, Terrell, Tex.—Citizens of Terrell, Tex., have taken action looking to insuring the building of the proposed Dallas-Terrell interurban line, which has been considered as one of the lines to be built by the Dallas Railway under its commitments to the city of Dallas. A committee of Terrell citizens has been appointed to secure right-of-way for the line from Forney to Terrell, a distance of about fifteen miles. Citizens of Forney will guarantee right-of-way from Forney to the Dallas County line.

Dallas (Tex.) Southwestern Traction Company.—E. P. Turner, president of the Dallas Southwestern interurban, organized to build from Dallas to Irving, thence to Cleburne and Glenrose, has requested an extension of time from the City Commission of Dallas for building the line. Mr. Turner explained to the commission that he had been unable to complete financial de-

tails, and that he had found it impossible to complete the line within the time set. Eight miles of the line have been graded, but no other work has been done. The extension of time has been granted.

Houston (Tex.) Electric Company.—The Houston Electric Company will agree to remove its tracks from Main Street and lay new double track line on Fannin Street, one block removed, if the public desires such a change, Luke C. Bradley, district manager for Stone & Webster, has told the Houston City Council. Mr. Bradley asked, however, that the tracks be left on Main Street for the time being and that the Fannin Street route be tried as an experiment until the general public had decided if they preferred Fannin Street to Main Street. Mr. Bradley's proposition was accepted by the City Council. The removal of the tracks to Fannin Street will cost about \$200,000.

Peterborough, Ont.—The construction of a suburban car line on Monaghan Road is being urged on the Utilities Commission.

Hydro-Electric Power Commission, Ont., Canada.—A by-law to turn over to the Hydro-Electric Power Commission of Ontario the management and operation of the local street railway in Guelph for a term of fifty years was carried by ratepayers.

Power Houses, Shops and Buildings

United Railways Company, St. Louis, Mo.—Special Master Lamm in the receivership of the United Railways of St. Louis has announced that he will recommend to the United States District Court that Receiver Rolla Wells of the railway company be authorized to spend approximately \$325,000 for the installation of five automatic substations for the distribution of power.

Interstate Public Service Company, Indianapolis, Ind.—The Interstate Public Service Company has notified the Public Service Commission of Indiana that within thirty days the company will begin service over a new high tension, single-phase electric power line from a plant at Monticello toward Logansport. The company will serve Idaville and Burnettsville, in White County, with electric power. This line will be a three-phase eventually.

Interstate Public Service Company, Indianapolis, Ind.—Announcement has been made by officials of the Interstate Public Service Company that in a short time a part of the electric current used on transmission lines in southern and central Indiana will be supplied by the water-power generating station at Keokuk, Iowa. The Interstate Company operates three transmission lines out of Seymour, Ind. One extends to Indianapolis, another to Louisville, and a third to the company's water power station at Williams, in Lawrence County. Before the transmission lines were con-

structed the company maintained a generating plant in each city.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—The Salt Lake & Utah railroad has ordered from the Westinghouse Electric & Manufacturing Company equipment for a 500-kw. automatic substation. The converting equipment consists of an induction motor driving a 500-kw. 1,500-volt direct-current generator.

Trade Notes

The Yale & Towne Manufacturing Company, Stamford, Conn., has made arrangements for increasing the manufacturing facilities of its chain block and electric hoist works at Stamford.

E. A. Palmer has been appointed manager of the railway division of the San Francisco office of the Westinghouse Electric & Manufacturing Company.

H. M. Bylesby & Company, 208 South La Salle Street, Chicago, investment bankers, engineers and managers, are distributing a new booklet describing the scope and services of the organization.

Vinton Smith, who has been connected for several years with the San Francisco office staff of the Standard Underground Cable Company, has been appointed assistant Pacific Coast manager, reporting to Richard G. Harris.

The Allen-Bradley Company, 284 Greenfield Avenue, Milwaukee, Wis., has increased its authorized capitalization from \$186,000 to \$250,000 to provide for expansion to its business. The company manufactures electric control devices.

The Cutler-Hammer Manufacturing Company, Milwaukee, Wis., announces the opening of a St. Louis office in the Railway Exchange Building, in charge of Harold Phillips, formerly of the engineering department of Chicago and later office manager of the Chicago office. This new office is a branch of the Chicago district office.

The James T. Hessel Company, New Haven, Conn., has been appointed distributor for the State of Connecticut for the "National" renewable fuse. This recently established organization, with headquarters at 19 Prout Street, New Haven, has just enlarged its warehouse to accommodate a complete stock of pole-line hardware, crossarms, etc.

National Railway Appliance Company, 50 East Forty-second Street, New York City, with branch offices in Boston and Washington, and the Hegeman-Castle Corporation, Chicago, Ill., announce that the selling agency for the Clapp Fire Resisting Paint Company, Bridgeport, Conn., has been discontinued as of Jan. 14.

The Great Western Contracting Company, Kansas City, Mo., representatives for the Conveyors Corporation of America, Chicago, has changed the name of its organization to the Raw-

lings Industrial Equipment Company. This organization is sales engineer for the manufacturers of power plant machinery. The Rawlings Industrial Equipment Company, besides handling coal and ash conveyors, is also representative of the Springfield Boiler Company and the Cooling Tower Company.

The Foreign Trade Supply Corporation has been organized with its main office at 17 Battery Place, New York City, of which E. C. Morse, former director of sales, War Department, is president, A. LaMar, former assistant director of sales, War Department, is vice-president and Paul Klopstock is chairman of the board of directors. The corporation will engage in a general merchandise brokerage exporting and importing business and in the buying and selling of foreign securities.

International G. E. Moves Headquarters.—The headquarters force of the International General Electric Company, Inc., which has been housed in the main office building of the General Electric Company, has just moved into its new office building erected on what was formerly the Westinghouse property on River Road, Schenectady, N. Y. This change places under one roof about 400 persons in the following departments: Executive, European, the Americas, Far East, merchandising, service and accounting. The building is six stories high with a basement under half of it. The total floor space is approximately 70,000 sq. ft., each floor being about 60 ft. x 220 ft.

Robert E. Horton, Harry Barker, and Robert C. Wheeler have become associated under the firm name of Horton, Barker & Wheeler, to continue their consulting engineering practices formerly carried on under the names of Robert E. Horton, consulting hydraulic engineer, Albany, N. Y., and Harry Barker and Robert C. Wheeler, engineers, New York City. The new company will have its headquarters in Albany, N. Y., with offices in New York, Harrisburg, Pa., and an engineering laboratory at Voorheesville, N. Y. It will specialize in power development and transmission, water supply, sewerage and sewage disposal, public utility rates and valuation.

New Advertising Literature

Industrial Locomotives.—Bulletin No. 44251 of the General Electric Company is on locomotives for "Industrial Haulage."

Car Seats.—Supplement to the reversible-seat bulletin No. 246 gives "Improvements in Brill Winner Seats," published by The J. G. Brill Company, Philadelphia, Pa.

Heavy Oil Engines.—The Dodge Sales & Engineering Company, Mishawaka, Ind., has published a small catalog describing its heavy oil stationary engines, heavy oil marine engines and heavy oil engine-driven electric generating units.