

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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There Is a Good Program for Atlantic City Next Week

ALTHOUGH there will be no exhibits at the convention this year, the program of papers and reports to be presented is so attractive that a good attendance should be assured. A perusal of the reports and papers already issued in advance shows them to be of unusually high character and on subjects which are of the liveliest interest now in electric railway circles. While annual conventions in the past have always been accompanied by exhibits, the association has precedents for gatherings without that accompaniment in the midyear conferences and in the one-day annual meetings which were held during the war. That these meetings have been considered worth while by the membership at large has been attested by the good sized attendance. By so much more should electric railway men consider as worthy of their presence a four-day simultaneous meeting by five electric railway associations. All who can should be at Atlantic City next week.

Electric Railways' Interests in Reducing Unemployment

THE unemployment conference now being held in Washington is of interest to the electric railways in two ways. One is through their gross receipts. The man who is working has to travel to and from his place of occupation and usually uses the street car twice a day to do so. Moreover, he is earning money, and both he and his family are bound to spend some of it each day in electric railway travel. The second interest which the electric railway companies have in the unemployment conference is that they are large employers of labor. Even in present conditions they have many men on their payroll, but in more favorable circumstances—that is to say, if the electric railway industry had returned to normal—they would be the direct employers of many more, not only in transportation on additional cars but in track and car maintenance and to some extent, probably, in new construction. Moreover, they would be large purchasers of equipment and thus indirectly provide work for many more.

Undoubtedly there is much work in this country which was postponed during the war and is needed now to overcome the uncared for depreciation of the past five years and to make up for the work which was suspended while the energies of the nation were devoted to the manufacture of war material. The electric railway industry presents one example only. There are others, as in the steam railroad industry and housing. The problem is how to make this work available to the vast army of unemployed—estimated to number from three to five and one-half millions—and provide the money to remunerate them.

Obviously in commercial industries this work can be begun only if the whole enterprise will show a profit, and this after all will undoubtedly be found to be the reason for the delay in most of the instances cited.

The high prices which are still charged for many materials and for labor have been a stumbling block. General Atterbury's statement which appeared in the daily press on Sept. 27 describes the situation succinctly so far as it concerns the railroads. How far the present unemployment situation will change this condition remains to be determined. The conference begins its work under good auspices, and it is to be hoped that a remedy will be found.

Association Standards and Standardization in General

THE complaint is often heard that association standards are not used as they should be. There is undoubtedly some basis for such a complaint, but it gives no reason for discouragement or reduction in the expenditure of time and effort in this work. The fact is that honest, earnest and intelligent effort directed toward standardization is never lost. It always produces some effect in raising practice to higher and higher levels.

That standardization effort is not lost can be seen from a definition of the term. No matter how the idea is stated the fundamental principle is substantially this: Standardization is the codifying of existing knowledge in such a way as to place within the reach of everybody the results of the best experience and thought of the leaders in practice and analysis. Obviously such work cannot be without result. Isn't this what every association committee is trying to do in its particular field? Isn't this what is needed to improve construction and operation on every electric railway property? Isn't this the principal reason for the existence of the association anyway? Certainly, yes. And even if every railway does not use the association standard rail or standard wheel, it does benefit from the codifying of information gathered and analyzed patiently year after year.

The purpose of standardization in all lines is to reduce effort and cost. Whenever a new installation is to be made or a new procedure inaugurated, the first step is to ascertain the best present practice in connection therewith. If any appropriate standards have been adopted by authoritative bodies, so much the better. The principle applies to even so simple a matter as the layout of a desk. Some desks would stand quite a little standardization. This, however, is a "touchy" matter and the illustration will be pushed no further. In the case of such important matters, however, as electric railway supplies, the advantages to be gained by the use of standards are so great that the latter should be used unless there is overwhelming reason to the contrary. The first advantage is in the assurance that the best known practice is being followed. Another is that the railway will ultimately reap the benefit of lower manufacturing costs. Still another is in securing the interchangeability of parts, and a fourth is that repair parts can be had more promptly than otherwise.

It is quite a job to utilize fully the standardization

work of the association committees as it develops, but the job is worth while. Lack of familiarity with this work is one cause of failure to use it. A pressing problem before the association is to "sell" the standards to the membership. This ought not to be necessary, but unfortunately it is so. After the association has done its duty, it is up to every railway manager, in co-operation with his department heads, to see that the property is benefited to the utmost from the association work.

But even if the greatest possible use is not being made of association standards, great use is being made of them. The committees are building a valuable literature around electric railway practice. And the spirit with which the committees function every year, and in particular have functioned during the past year, shows that their members realize that they are making a real contribution to the good of the industry.

Why Railways Fail— Ordinary Selling Publicity Needed

ALTHOUGH, as a class, electric railways are giving more thought to publicity of their service than in past years, some still fail to realize how imperative such publicity has become since the advent of the jitney or the motor bus. It is in the transportation business now as it is in any other industry where there is competition—the least remissness or dozing is seized upon by the rival claimant to patronage. An account of an actual case will make the point clear.

For possibly fifteen years past it has been customary for the interurban cars of a certain route to run to a loop within a few hundred feet of an important steam railroad station in an Eastern city. Because of the greater frequency of the electric service between this city and the other terminus of the interurban, most strangers have favored the electric railway. These outsiders have always formed a respectable fraction of the total riding, so that one would expect that any radical change in routing would be brought to their attention. This has not been the case. In our innocence, one morning, we went to the loop from which we had taken this car dozens of times in past years and waited, and waited and waited. Every variety of interurban but the one that we wanted came by. Finally, one of a group of nearby jitney drivers asked where did we want to go? On our naming of the town, he hee-hawed and said, "Them intaobans only goes to the city line now. You'll neveh git the nine-fifteen if yuh waits f'r a car, but my bus 'll git the connection O.K." So we foreswore our good resolutions and made the connection.

When one considers that a simple sidewalk sign or a piece of enameled tin suspended from a span wire would have apprised the prospective passenger of this change, it is inexplicable why nothing of the kind was done except to assume that the management expected the stranger to know, by intuition, the changes in service as minutely as itself. We know of one merchant who merely moved three or four numbers up the main street, but nevertheless kept advertising his removal for a year thereafter. Here was a man who knew better than to take chances with his clientele, and he was telling about it in paid newspaper space, too—not in cost-free signs. Better too much than too little publicity is a safe rule for the electric railway in these days when no one can stand at a corner very long without being solicited by taxi or jitney driver.

Beautifying Waste Ground Is a Paying Proposition

HAVE you any possibilities in the way of garden spots around your shops, carhouses, power houses, substations and miscellaneous buildings? If you have, now is a good time to plan and plant for next spring. There is an increasing appreciation of the practical benefits of simple but tasteful planting around electric railway buildings. Visitors to such properties as those in Portland, Ore.; Harrisburg, Pa.; Schenectady, N. Y., and many other cities carry away a pleasant impression of what they have seen, which is greatly enhanced by the surroundings of necessarily prosaic buildings. There are several reasons why these pay in dollars as well as esthetic satisfaction. Here are three of them.

In the first place men work with most satisfaction, and therefore best, in attractive surroundings. There are few who do not enjoy green foliage and bright blossoms, especially those engaged in manual work. Again, vines, shrubbery and flower beds around utilitarian buildings, such as shops and the like, will produce a general effect which could be had only at much greater cost by architectural embellishment. In addition to these considerations, if a shop or substation, for example, is located where it is seen by many patrons, its grounds, however small, offer a wonderful opportunity for some good publicity work. Attractiveness at this point is one of those superficial but important suggestions of good management.

Here, fortunately, is one place on an electric railway where big results can be secured at practically no cost. Plants can be had for little or nothing, and in many cases the men who are employed about the plant will gladly undertake to prepare the soil and tend the garden. All that is needed is some one imbued with the right idea and capable of exerting a little "punch" to put the thing over.

What Is the Answer?

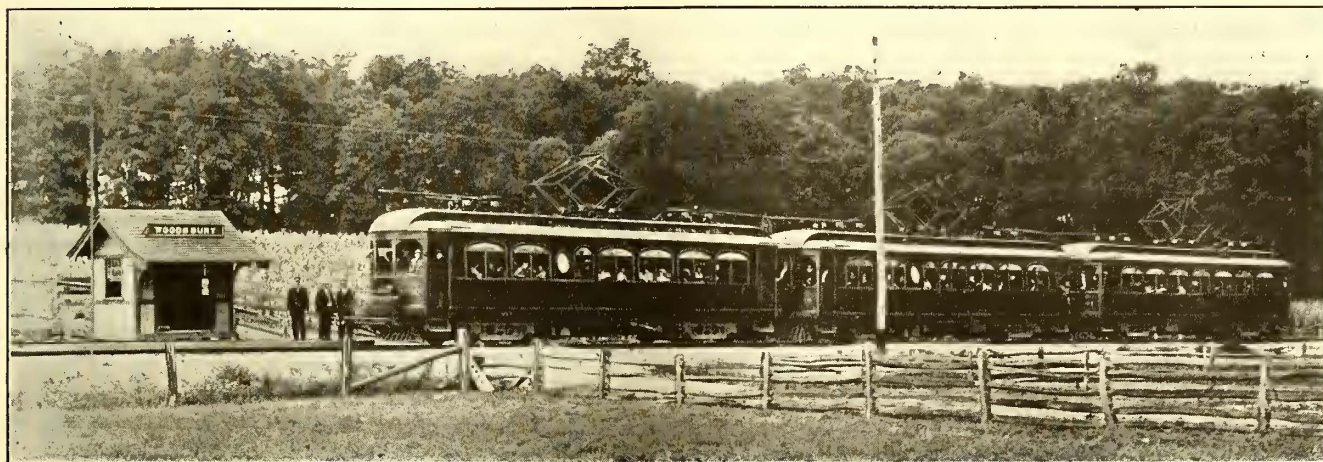
STATISTICS have the reputation of being dry, but the following indicate a problem in concrete form. In 1912 the steam railroads earned a return of about 5 per cent on their property investment; in 1920 they earned less than one-third of 1 per cent. In 1912 operating expenses took 70 cents out of every dollar of operating revenue; in 1920 they took 94 cents. In 1912 labor took 43 cents out of every dollar of operating revenue; in 1920 labor took 60 cents. Yet in 1920 with only 8 per cent more mileage and 30 per cent more investment the railroads were able to produce 58 per cent more ton-miles and 45 per cent more passenger-miles than in 1912. Operating revenue also increased 120 per cent in the same period, yet there was a decrease of 90 per cent in net operating income.

It is said that freight and passenger rates are at the economic peak, that wages must be maintained and that transportation is a necessity, yet these figures show that with splendid operating efficiency the railroads earn no return. Who takes the loss? Thousands of workers, banks and insurance companies who have invested their capital in railroads and who now say "no" to every request for more capital.

The same conditions prevail in general in the electric railway industry, and there are only two things to do to relieve the situation: cut down expenses and sell more transportation.

Single Phase Gives Way to the Automatic Substation

York Railways Discards 6,600-Volt Single Phase on the 18-Mile Hanover Interurban Line for Direct Current from Two 500-Kw. Automatic Substations—New Cars of Same Capacity Are Nearly 16 Tons Lighter than Those Replaced



A TRAIN OF THE OLD INTERURBAN CARS WHICH USED EITHER DIRECT OR ALTERNATING CURRENT

THAT portion of the York Railways high-speed interurban line between the York city limits and Hanover, Pa., after thirteen years operation at 6,600 volts single phase, has been converted to a direct-current system. The total length of the line from the center of York to its terminus in Hanover is 18.58 miles, 3 miles of which is within the city limits of York and Hanover, and, of course, was operated at 600 volts direct current. Two 500-kw. automatic substations now furnish the power to this newly changed-over section of the line which has been left insulated for the high potential. A much more satisfactory service is now being furnished with a type of car of the same seating capacity as the former car but weighing almost 16 tons less and having a total motor rating smaller by 40 hp.

There were many considerations which influenced the redesign of the line for entire direct-current operation. Needless to say, when direct current can be fed into the trolley with all the advantages of alternating-current transmission through the medium of the automatic substation, and when such a system allows an added flexibility in operating methods and a decreased complexity of equipment, high voltage single phase is placed at a distinct disadvantage. Particularly is this condition true when with a.c. operation the rolling stock must also be equipped to use current in either form.

All five of the original cars were each equipped with four Westinghouse 75-hp. 135-A motors, connected for multiple operation with the unit-switch pole system. The passenger cars, capable of seating fifty-two people, weighed 86,600 lb. They had a free running speed of about 45 m.p.h. As one of the illustration shows, the cars were equipped both with two trolleys and with a pantograph.

A weighty factor influencing the change was the high maintenance cost of these cars.

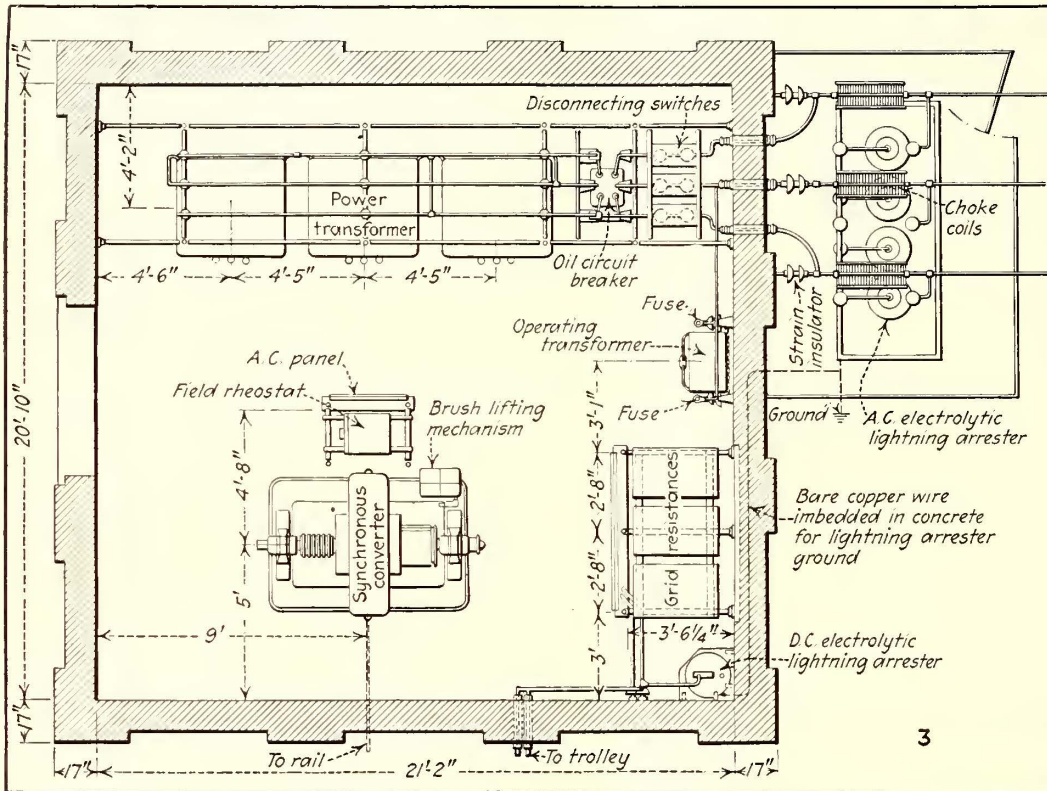
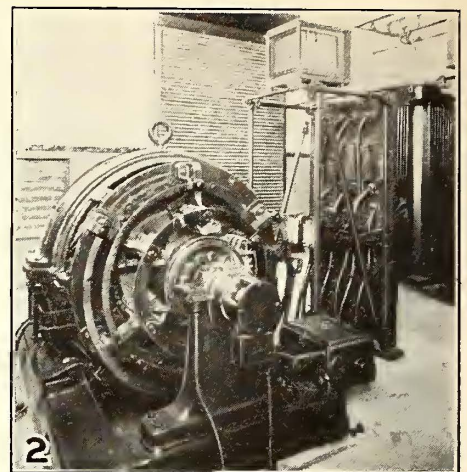
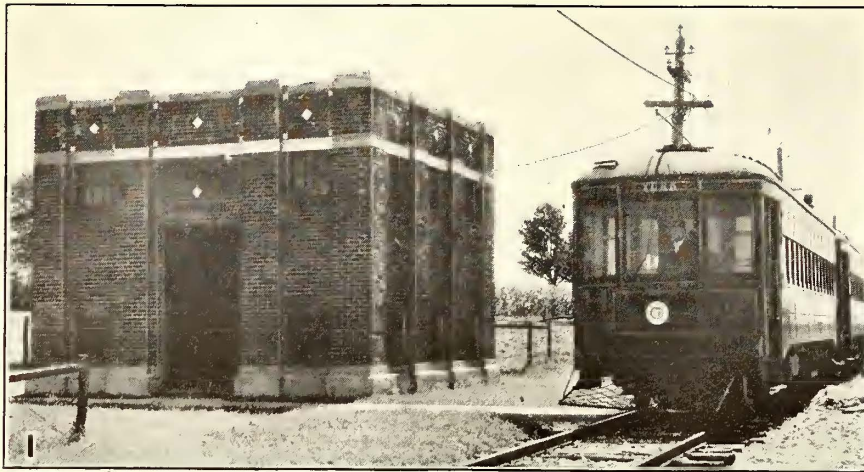
An added disadvantage that prompted the change was that the direct-current equipment on several other of the shorter interurban lines could not be used on this line. This meant a very severe handicap in the

way of flexibility with the result that a larger number of cars must be kept available in operating condition for a given amount of service. The quality of service under these conditions was not up to the standard that the company wished to furnish.

Six steel fifty-two passenger Brill cars now furnish transportation between York and Hanover. The two extra cars are available for service not only on this line, but on the other interurban lines. These cars weigh 55,200 lb. each. They are equipped with Brill MCB trucks and four Westinghouse 65-hp. CV-4 field-control motors using Westinghouse HL control. The brake equipments, together with the CP27-B air compressors, were furnished by the General Electric Company. These cars have a maximum speed of 45 m.p.h. and are run in two- or three-car trains, according to the volume of traffic. Hourly service is furnished in both directions, while there are two trips of the freight car per day. The actual running time is but fifty minutes.

Two 500-kw. substations were installed to furnish direct current to the old alternating-current section. One of these is 8 miles from York at Martin's Siding, and the other is 15.7 miles from York at Gitt's Run near the end of the line. Both of these stations, together with the automatic control equipment, were installed by the Westinghouse Electric & Manufacturing Company. How compact and attractive they are can be observed from the photographs reproduced. Operating results from these stations have been entirely satisfactory. Experiment has shown that the Martin's station is out twenty-eight minutes of every hour with normal service. Both stations have low direct-current output relays with a time setting of ten minutes, which is used because this is the interval of layover at the end of the line, thus eliminating an unnecessary shut down, followed immediately by a demand for power. Power is furnished to these stations through a new three-phase, 60-cycle, 11,000-volt line.

The question as to what to do with the overhead line was another problem. The overhead, as used for 6,600-volt operation, consisted of the Westinghouse



Views of the Revamped Hanover Line Installation of the York (Pa.) Railway

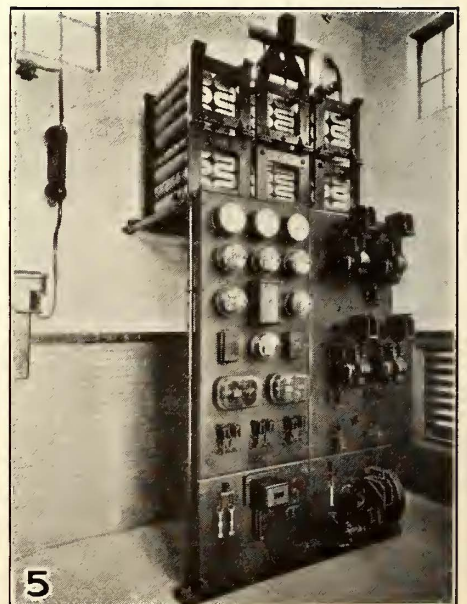
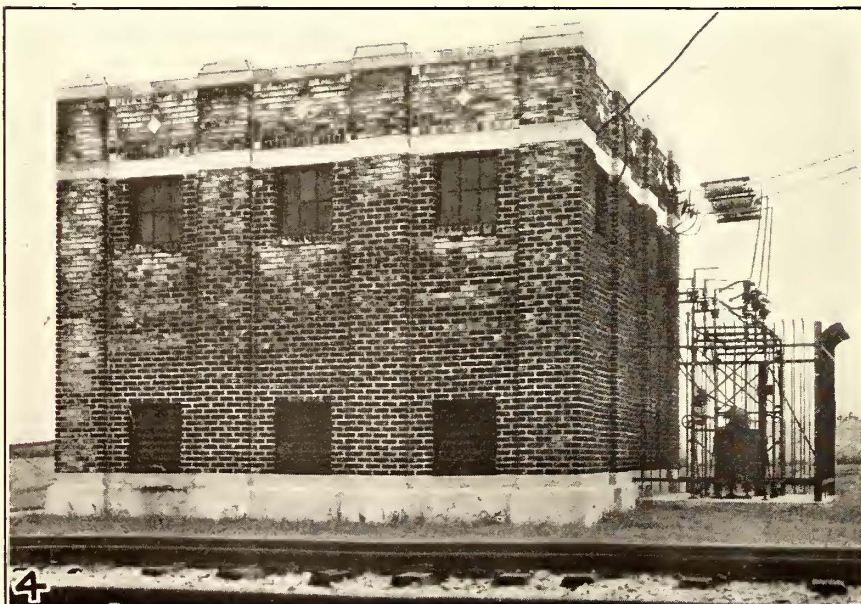
No. 1—Neat and compact 500-kw. substation at Martin's Siding.

No. 2—500-kw. rotary brush lifting mechanism, alternating-current panel and one transformer.

No. 3—Plan of the latest thing in the design of small automatic inclosed substations for railway use.

No. 4—Lightning protection of Martin's substation.

No. 5—Relay and direct-current panel with load-limiting resistors above.



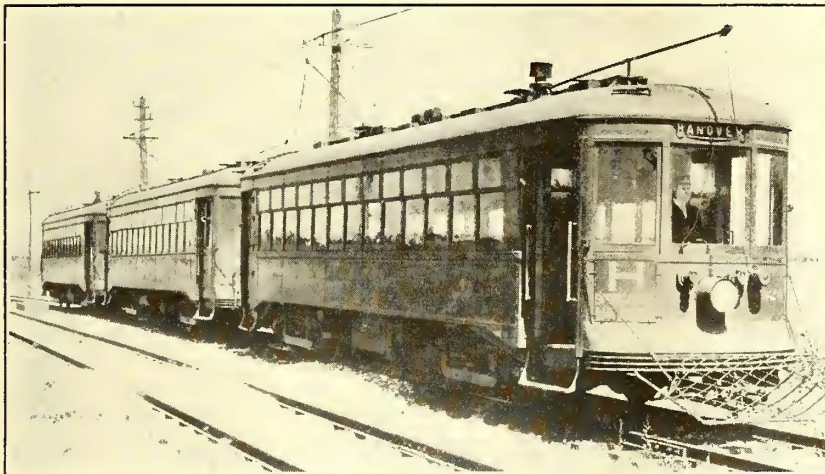
design of 1907. This was a messenger which supported, at intervals of 10 ft., a No. 0000 copper running wire. This was afterward changed by the addition of a No. 0000 galvanized steel running wire which was supported by 2-in. clips under the copper wire. This construction was heavy and rigid, but during its use with the 6,600-volt pantograph collection, the line was remarkably free from breaks, or interruption of any kind due to overhead troubles.

Upon the installation of the 1,600-volt direct-current system it was decided to continue to use the No. 0000 steel running wire, but to remove the No. 0000 copper wire, and to cut the hangers down to two to a span, a spacing of approximately 50 ft. The condition of the old No. 0000 copper running wire was such that its use as a running wire was impractical, and, as the steel wire was in position but practically worthless if removed, it was decided to use it in connection with sliding contact shoes on the trolley poles on the cars. The old copper wire has been moved over to the line poles and used as a part of the direct-current line feeder system. The use of the steel messenger and steel trolley

public because of a quality of service which has gained its confidence and support, many other benefits are being anticipated. They may be hard to detect at first but will bulk large over a period of several years. Track maintenance must necessarily demand less outlay and attention when the weight of the rolling stock is decreased by more than a third. A lighter car is also bound to have a subtractive effect on the power demand, a condition especially welcomed because the power taken to start the old cars on direct current was very great and the total amount taken within the city was considerable.

Improved Traffic Conditions in San Francisco

AN ACCOUNT was published on page 49 of the issue of this paper for July 9 of the routes on Market Street in San Francisco, on the lower end of which there are four tracks. Two of these belong to the Municipal Railway and two to the United Railroad. The accompanying table shows statistics of the cars



AT LEFT, THIS IS THE PRESENT TYPE OF EQUIPMENT WHICH IS GIVING SUCH SATISFACTORY SERVICE. AT RIGHT, INTERIOR VIEW OF THE HANOVER LINE PASSENGER CARS

wire necessitates feed taps at every third pole. The construction described above provides an overhead which is sufficiently resilient and flexible to permit the pole safely to follow the wire without undue wear on either wire or shoe.

In changing to direct current, consideration was given to stripping the old cars of all their alternating-current equipment, leaving only the apparatus required for direct current. Even though this were done it was found that the cars so revamped would still be approximately 15,000 lb. heavier than new steel Brill cars. It is quickly seen that the energy saving alone would justify the purchase of the new lighter cars, since they have the same passenger carrying capacity and also are able to maintain a better schedule. The transmission has also eliminated the use in the power station of two 450-kw. Westinghouse frequency converters, each consisting of a 2,300-volt, three-phase synchronous motor driving a single-phase, 660-volt, 25-cycle generator.

Taking everything into consideration the installation of the automatic substation is looked upon as the correct solution for that particular property. Schedules have been very closely adhered to and no failures of equipment have occurred, although a few minor adjustments to be expected on any new installation have been made. Besides an increased satisfaction to the

and passengers carried during the rush hours on the six lines of the Municipal Railway which operate over this part of Market Street for a considerable distance. The reduction outbound in loading in July, 1921, is

DAILY AVERAGES—SIX HEAVIEST LINES MUNICIPAL RAILWAY FROM MARKET STREET FERRY

	Cars	Passengers	Average Pass. per Car
Outbound 5 p.m. to 6 p.m.			
November, 1918.....	85	6,480	76.2
March, 1919.....	97	8,650	89.2
May, 1920.....	102	9,336	91.5
February, 1921.....	109	9,940	91.2
July, 1921.....	107	8,453	79.0
Inbound 7:35 a.m. to 9:15 a.m.			
October, 1919.....	139	11,221	80.7
May, 1920.....	160	11,327	70.8
February, 1921.....	161	12,001	74.5

attributed, at least in part, to some rerouting carried out in February.

Traffic west of the Twin Peaks district on the municipal railway has increased 24½ per cent in cars and 100½ per cent in passengers between March, 1919, and August, 1921. Part of this is due to discontinuance of bus operation and part to an extension of one of the lines.

The super-power report made under the direction of the U. S. Geological Survey now is in proof form and probably will be released for publication shortly.

The Urban Transportation Field Analyzed

The Trolley Bus, with Its Lower Investment and Corresponding Fixed Charges, Is Shown to Be the Most Economical Vehicle to Operate Except Where Heavy Rush-Hour Traffic Has to Be Handled or Where the All-Day Traffic Is Extremely Light

BY J. C. THIRLWALL

Railway Engineer General Electric Company, Schenectady, N. Y.

THE recent successful tests of the trackless trolley bus at the General Electric Company's works in Schenectady and on the lines of the Virginia Railway & Power Company at Richmond and Norfolk, Va., have created a demand by railway officials for accurate information as to the conditions under which such vehicles can be utilized to the best advantage and for a comparison of the relative operating costs of rail cars, gasoline motor buses and trolley buses taking electric power from a central station. Throughout this article the term "motor bus" applies to the gasoline driven vehicle and the term "trolley bus" applies to the vehicle operating on the highway that takes power from overhead wires.

An attempt has been made to tabulate on a comparative basis the respective costs of all three types of transportation under varying conditions of load and frequency of service including fixed charges on the total investment required in each case. An attempt is also made to show the difference in annual costs between a new line or an extension built and equipped at today's construction costs and the re-equipping of an existing route in which the tracks and structures were built at pre-war costs, materially less than now prevail.

A summary of the calculations indicates that for traffic which in rush hours would require safety cars to operate on a three-minute headway or less rail-borne traffic is more economical than the rubber-tired bus, and for the property that has rails, overhead, stations and shops available, which were built at pre-war cost, the rail car can successfully compete with its pavement rivals up to about six-minute minimum headways.

Beyond this point the electric trolley bus appears to have the advantage, since its slightly higher cost of operation is more than offset by the saving in fixed charges on the investment required.

The motor bus, though carrying the smallest investment charges, regardless of traffic density, is inherently so much more expensive to operate that it does not become a competitor of the rail car until minimum rail headways of ten minutes are reached on new routes and of twenty minutes on existing rail lines.

As between the motor bus and the trolley bus, the latter is the more economical up to headways of sixty minutes or longer. Only with very infrequent service do the greater investment charges of the trackless trolley system (covering interest, etc., on the overhead line and stations) offset its lower operating cost.

Tabulated, these costs are as follows, the most economical type of vehicle being indicated for minimum headways:

Rail cars.....	3 minutes or less
Rail cars or trolley bus.....	3 to 6 minutes
Trolley bus.....	6 to 60 minutes
Motor bus.....	60 minutes or more

Of course, as the tabulations show, the difference in favor of the trolley bus as compared to the rail car

operating on headways of seven and one-half or ten minutes to an existing route is too small to warrant even the suggestion that rails and equipment should be scrapped and replaced with the new form of transportation. It is not until minimum headways of fifteen or twenty minutes are reached that the estimated saving of the trolley bus over an existing rail route becomes sufficient to justify such a suggestion.

To illustrate these conclusions and to show the premises on which they are based a number of tables have been prepared and are here presented in which a direct comparison is made of the elements of investment cost for a rail system and for the two types of buses. The actual cost of laying rail in paved streets, of erecting overhead trolley lines or of building power stations, substations or shops varies considerably, of course, as between different localities, but the unit costs taken are believed to represent fair averages for present construction.

AVERAGE INVESTMENT COSTS ASSUMED

For instance, a figure of \$60,000 per mile has been taken for single track with turnouts laid in a paved street, \$75,000 for single track with more turnouts for shorter headways, \$100,000 for a route-mile of light double track for safety cars and \$120,000 for a route-mile of heavy track for double-truck cars. In some localities tracks may be laid for less than these figures; in most large cities they would be considerably exceeded, but they are believed to indicate with a fair degree of accuracy the magnitude of the biggest item of investment that can be saved by the use of the rubber-tired vehicle.

Overhead trolley lines using wooden poles with cross spans can be erected for about \$5,000 a mile where

TABLE I—AVERAGE CONSTRUCTION COSTS

Single track per route-mile.....	\$60,000	to	\$75,000
Double track per route-mile.....	100,000	to	120,000
Trolley lines per route-mile.....	5,000	to	6,500
Transmission line per route-mile.....	1,800		
Generating station per maximum kilowatt output.....	125		
Substation (automatic), per maximum kilowatt output.....	40	to	50
Shops per car used.....	1,500	to	2,500
Double-truck cars.....	12,000		
Safety cars.....	6,300		
Trolley buses.....	8,000		
Motor buses.....	8,000		

only one trolley wire and no feeders are required, and for double track, with ordinary feeders, should not exceed \$6,000 per route-mile. The double trolley required for the trolley buses costs about \$500 per mile more than the ordinary type of construction, \$1,000 more per mile when the line is run on both sides of the street. The transmission line is estimated at \$3,500 per mile, and it is assumed that the length of the transmission system is one-half that of the distribution lines.

Generating stations are estimated at \$125 per kilowatt of capacity required by the maximum load, including electric heating of cars and automatic substations

at \$40 to \$50 per kilowatt. Shop buildings and car-houses are figured at \$2,500 per car for the large double-truck cars and at \$1,500 per car for safeties and for buses.

Double-truck cars are assumed to cost \$12,000 each, safety cars \$6,300 and thirty-passenger buses, either gas or electric, \$8,000 apiece.

A summary of these unit cost figures is shown in Table I.

The rail car requires an investment in each of the foregoing items; the trolley bus dispenses with the track, but necessitates the use of all other details, while the motor bus requires only an investment in the vehicles themselves and in storage and shop facilities.

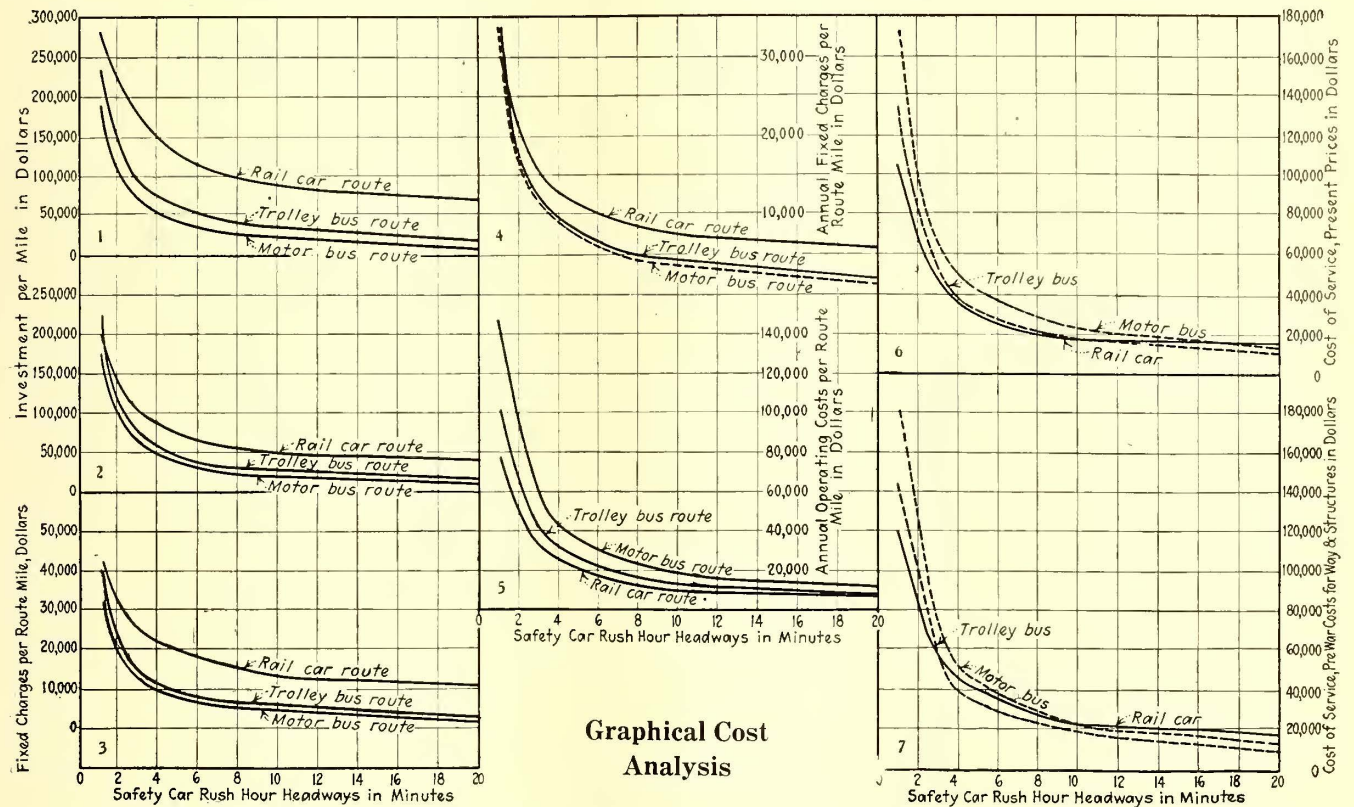
MOTOR BUS HAS SMALLEST INVESTMENT

On fairly long headways, *i.e.*, from eight to twenty minutes, the fixed charges on the rail route will exceed the operating costs, and even on a heavy traffic route

classes of service where its higher operating costs far outweigh its saving in fixed charges, but it can only continue to operate on selected short-haul routes and where it can evade the responsibilities of good service without attempting to provide the necessary extra equipment for properly handling the morning and night traffic peaks, for which every traction company is expected to equip itself.

OPERATING COSTS COMPARED

Table III is a comparison of operating costs per car-mile of four classes of cars. The rail car data are the average of the actual records of a number of companies using both safety cars and double-truck cars; the gasoline bus costs are derived from the records of five representative bus companies shown in Table II. Three of these use small cars seating less than twenty-three passengers; for these the gas and oil costs have been adjusted to a weight of 10,000 lb. and for two companies



Graphical Cost Analysis

Fig. 1—Present day investment per mile of route for rail service compared to investment for bus service of equal capacity.

Fig. 2—Investment per mile of route for rail service based on pre-war costs for track and structures and present costs for rolling stock compared to the investment per mile of route for bus service of equal capacity.

Fig. 3—Annual fixed charges per route-mile based on present construction costs.

Fig. 4—Annual fixed charges per route-mile based on pre-war

costs for track and structures and present costs for rolling stock.

Fig. 5—Annual operating costs per route-mile for rush-hour rail service. Headways compared to bus service of equal capacity. Longer headways during normal hours.

Fig. 6—Total annual operating costs and fixed charges per mile of route based on present construction costs.

Fig. 7—Total annual operating costs and fixed charges per mile of route based on pre-war costs for way and structures and present costs for rolling stock.

they will amount to 40 per cent of the total costs of operating the line. The handicap of these heavy investment charges has given the motor bus its opportunity and enabled the jitneys in many instances to compete successfully with the established traction lines. The motor bus has a higher power bill and a higher maintenance cost than the safety car, and the depreciation of its driving equipment is decidedly more rapid than that of electric motors and control on the rail cars. But even so, for many conditions of traffic, it is the more economical of the two methods of transportation. Its proponents have frequently tried to force it into

corrections have been made on the basis of using solid instead of pneumatic tires.

In the case of the trolley bus, the allowances for transportation charges and general expenses are assumed to be the same as with the safety car and the gasoline bus; its maintenance of way and structure expense covers repairs and renewals on the overhead trolley lines only; its maintenance of equipment is based on the body and chassis and tire expense of the gasoline car, and motor and control maintenance of the safety car. For instance, safety cars, on an average, cost only 1.7 cents per car-mile to maintain, of which only about 0.6

TABLE II—OPERATING COSTS OF MOTOR BUSES—CENTS PER BUS-MILE

	1	2	3	4	5	Average
Maintenance	2.1	1.0	1.5	4.4	5.6	2.9
Tire renewals	0.9	0.6	1.4	0.9	0.9	0.9
Body repairs	5.7	4.0	4.8	3.3	3.3	4.3
Engine, gearing and control	1.9	1.2	1.6	1.0	1.0	1.3
Shop and other expenses	10.6	6.8	9.3	9.6	10.8	9.4
Total maintenance	4.0	5.3	7.1	2.7	4.9	4.8
Gasoline	0.8	1.2	1.5	0.9	1.5	1.2
Lubricants	4.8	6.5	8.6	3.6	6.4	6.0
All other operating expenses	17.3	19.8	15.9	12.2	10.6	15.2
Total operating costs	32.7	33.1	33.8	25.4	27.8	30.6
Depreciation	3.2	2.4	6.7	9.1	4.9	5.3
Total maintenance with solid tire cost, on four and five	10.6	6.8	9.3	7.7	7.5	8.4
Gasoline and oil corrected for 10,000 lb. wt. on 3, 4, 5	4.8	6.5	10.8	5.6	7.7	7.1
Other expenses corrected for one-man operation, 1 and 2	12.2	12.3	15.9	12.2	10.6	12.6
Total operating cost of 10,000-lb. bus with solid tires and one-man operation	27.6	25.6	36.0	25.5	25.8	28.1

- NOTE:
 1. Chicago Motor Bus Company... 1919 10,000-lb. bus solid tires
 2. Fifth Avenue Coach Company... 1920 10,000-lb. bus solid tires
 3. Baltimore Transit Company... 1920 7,500-lb. bus solid tires
 4. Fort Worth Auto Bus Company... 1919 5,700-lb. bus solid rear tires
 5. Goodyear Heights Bus line... 1920 8,000-lb. bus pneumatic front tires

cents is for repairs to the electrical equipment. The motor buses cost on an average 8.5 cents, of which 2.0 cents goes for the maintenance of solid tires, 1.5 cents for the body and truck and 5 cents for the engine and transmission.

The trolley bus would presumably have the same cost for tires, body and truck upkeep, but only 0.5 cent for the motors and control, making its total maintenance 4 cents per mile, or 4.5 cents less than the gasoline vehicle.

On the power account, due to higher friction, the trolley bus will take more power per ton-mile than the rail car, but its lighter weight will somewhat more than offset this and make its total power cost a trifle less than that of a safety car. A motor bus weighing 10,000 lb. in frequent stop service can make only about 4 miles to a gallon of gas, or 5.5 cents per mile if gas is figured at 22 cents per gallon, and oil and grease add about 1.5 cents to this; it has therefore a total power expense of 7 cents per mile, or 4.7 more than the electric bus.

The depreciation of a motor bus is recognized to be much more rapid than that of a rail car; apparently this is due to the comparatively short life of its engine and transmission. The economic life of a street car

TABLE III—OPERATING COSTS—CENTS PER CAR-MILE

	Double-Track Car	Single-Track Safety Car	Trolley Bus	Motor Bus
Car capacity in passengers	52	32	30	30
Weight in pounds	36,000	16,000	10,000	10,000
Maintenance of way and structure	3.0	2.0	0.7	0.0
Maintenance of equipment	3.4	1.7	4.0	8.5
Power	5.9	2.5	2.3	7.0
All other expense	19.0	12.0	12.0	12.0
Total operating expense	31.3	18.2	19.0	27.5

and its equipment is at least fifteen years. There is no reason to doubt that the body and truck of any well built bus should last that long. But from all records available, the gas engine and transmission have a life of not over four to five years, and since their first cost is about 25 per cent of the equipped bus, the total depreciation is considerably higher than for the electric car. We have taken them respectively at 4.6 per cent on the rail cars and on the trolley bus and at 8 per cent on the motor bus.

Total fixed charges on the rail system are assumed to be 15 per cent, 9 per cent for interest, 2.8 per cent for taxes and insurance and 3.2 per cent for depreciation on

TABLE IV—FIXED CHARGES ON TOTAL INVESTMENT IN PER CENT

	Rail System	Trolley Bus	Motor Bus
Interest charges	9.0	9.0	9.0
Taxes and insurance	2.8	2.8	2.8
Depreciation (sinking fund)	3.2	3.7	6.9
Total	15.0	15.5	18.7

the entire physical property. Since the cost of cars, with their comparatively short life, is a bigger proportion of the total investment in a trolley bus installation, depreciation is figured at 3.7 per cent and total fixed charges at 15.5 per cent. For the motor bus installation, for the above reasons, total depreciation is figured at 6.9 per cent and total fixed charges at 18.7 per cent.

In the tabulation which follows the upper figures are based on entirely new construction at today's prices, the lower apply to the company which can use track, overhead, stations and shops constructed at pre-war values, assumed to be 50 per cent lower than at present.

In every case except that of "G," it is assumed that a greater number of buses than rail cars would be required for rush-hour service, on the basis that a modern double-truck street car can carry away 120

TABLE V—COSTS PER ROUTE-MILE FOR BUILDING AND EQUIPPING RAILWAY SYSTEM AND

	Case A—Light Traffic			Case B—Medium Traffic			Case C—Moderately Heavy Traffic			Case D—Heavy Traffic		
	Safety Car	Trolley Bus	Motor Bus	Safety Car	Trolley Bus	Motor Bus	Safety Car	Trolley Bus	Motor Bus	Safety Car	Trolley Bus	Motor Bus
Schedule speed (m.p.h.)	9	10	10	9	10	10	9	10	10	9	10	10
Normal headway—thirteen hours daily—(minutes)	15	15	15	10	10	10	7½	7½	7½	5	4.6	4.6
Rush hour headway—five hours daily—(minutes)	10	6½	6½	7½	5	5	4	2.7	2.7	3	2.1	2.1
Seats furnished per hour, normal headway	128	120	120	192	180	180	256	240	240	384	390	390
Maximum rush hour carrying capacity	390	405	405	520	540	540	975	990	990	1,300	1,300	1,300
Cars required, including spares	1.56	2.00	2.20	2.00	3.10	3.33	3.80	5.00	5.40	5.10	6.60	7.00
Annual car or bus miles	58,500	68,200	68,200	84,800	97,600	97,600	127,000	148,800	148,800	182,000	220,600	220,600
Cost of Road and Equipment:												
Trackway—Single track	\$60,000			\$75,000								
Trackway—Double track							\$100,000			\$100,000		
Overhead system—trolley and transmission	6,700	\$6,900		6,800	\$6,900		7,000	\$7,400		7,500	\$7,900	
Power station and substation	6,000	7,000		8,000	10,100		14,400	17,600		19,300	23,200	
Shops or garages	2,300	3,000	\$3,300	3,000	4,200	\$4,500	5,600	7,500	\$8,100	7,700	9,900	\$10,500
Rolling stock	9,800	16,000	17,600	12,600	22,400	24,000	23,800	40,000	43,200	32,200	52,800	56,000
Total investment	\$84,800	\$33,500	\$20,900	\$105,400	\$43,600	\$28,500	\$150,800	\$72,500	\$51,300	\$166,700	\$93,800	\$66,500
Fixed charges (as in Table IV)	\$12,700	\$5,200	\$3,900	\$15,800	\$6,800	\$5,300	\$22,600	\$11,200	\$9,600	\$25,000	\$14,500	\$12,400
Operating costs (as in Table III)	10,600	13,000	18,800	15,400	18,500	26,800	23,100	28,300	41,100	33,000	42,100	60,800
Total costs per year	\$23,300	\$18,200	\$22,700	\$31,200	\$25,300	\$32,100	\$45,700	\$39,500	\$50,700	\$58,000	\$56,600	\$73,200
Cents per car-mile	40.0	26.7	33.3	36.7	25.8	32.8	36.0	26.5	34.0	31.8	25.5	33.1
On basis of rack and structure costs—50 per cent of above												
Total investment	\$47,300	\$24,800	\$19,300	\$58,900	\$33,000	\$26,300	\$87,300	\$56,300	\$47,300	\$99,500	\$73,300	\$61,200
Fixed charges	7,100	3,800	3,600	8,800	5,100	4,900	13,100	8,700	8,800	14,900	11,400	11,400
Operating costs	10,600	13,000	18,800	15,400	18,500	26,800	23,100	28,300	41,100	33,000	42,100	60,800
Total costs per year	\$17,700	\$16,800	\$22,400	\$24,200	\$23,600	\$31,700	\$36,200	\$37,000	\$49,900	\$47,900	\$53,500	\$72,200
Cents per car-mile	30.3	24.6	32.8	28.5	24.3	32.4	28.6	24.8	33.5	26.3	23.7	32.7

*Seats 52, has a maximum load of 120 passengers and weighs 36,000 lb. With one-man operation costs would be reduced \$17,000 per year.

passengers without undue crowding, a safety car sixty-five and a thirty-passenger bus not over forty-five, if the buses are to be kept within the weight and price limits specified. A comparison based on a car for car replacement is obviously unfair, except where the maximum number of people to be carried is within the seating capacity of either type of vehicle.

A number of comparisons have been worked out for different densities of traffic from very light to extremely heavy, each based on a completely equipped line 4 to 5 miles long, and all costs reduced to the unit basis of a single route-mile.

With these prefatory statements, Table V is believed to be self-explanatory. It indicates clearly that the railway is still the most economical means of handling very dense traffic, and that for very short headways there is little to choose in first cost or operating charges between a comparatively small number of large-capacity double-truck cars of modern design and the larger number of safety cars required, as shown in case "E." To handle such traffic as this, headways with the comparatively small capacity buses become so short as to be prohibitive, and their higher operating costs far overbalance their savings in fixed charges.

But for many other conditions, particularly those which are typical of the majority of lines in medium sized cities, where the maximum traffic does not require headways of less than five or six minutes, the trolley bus should save enough in overhead charges to justify its use in preference to either rail car or motor bus.

CONCLUSIONS FROM ANALYSIS

For instance, Table V, Case "A" pictures a very common situation *i.e.*, a line on which an all-day headway of fifteen minutes with a medium sized railway car is sufficient, but on which the morning and evening loads require a ten-minute headway. We assume that safety cars would be used on the rail route and that they would maintain a schedule of 9 miles per hour. If buses were used, presumably they could run somewhat faster due to their ability to run past slower moving vehicles and because of their smaller load in rush hours. The figures are based on a 4.5-mile route, on which the safety cars require sixty minutes for the round trip and the buses fifty-four minutes. Even so, to carry

away an equal number of passengers during the rush hours will require eight buses on a 6.75-minute headway as against six safeties, ten minutes apart. One spare car is allowed in the case of the safety car line and for the trolley bus route, and two spares if motor buses are used, because of the greater chance of failure with the gasoline engine.

Power requirements are based on the rail cars taking, at the car, 150 watt-hours per ton-mile, and the trolley bus taking 195 watt-hours per ton-mile, for all energy requirements except heat. These figures are increased 15 per cent for line losses and 25 per cent more for conversion. Heaters are assumed to take a continuous maximum input, on either vehicle, of 12 amp.

Of the total investment required for a new rail line, under these conditions, 60 per cent is saved by using the trolley bus and 75 per cent by equipping with motor buses, and the saving is very material even against the company using old rail and structures. The fixed charges are, therefore, distinctly lower for the bus systems, but the motor buses cost so much more to operate that the total annual cost of the line using them is practically the same as for the new rail road, and 30 per cent higher than for the existing rail system.

The operating cost of the trolley bus, however, is so little more than that of the rail route that it does not offset the savings in the fixed charges, and its total cost of service is the lowest of the three systems.

Another common traffic condition is shown in Case "B," a route that would be satisfactorily handled with safety cars on ten-minute normal and 7.5-minute rush hour headways, and where buses would have to run on a five-minute spacing to give equivalent rush-hour capacity.

Here again the use of the trolley bus is the cheapest way to equip a new line or to extend an old one; the motor bus is the most expensive means.

As the traffic grows more heavy, as in Case "C," the advantage of the trolley bus over the rail car diminishes, but its advantage over the motor bus continues in the same proportion as before. The figures indicate that to re-equip an existing line would show a total loss rather than a gain by abandoning rail operation.

With headways as short as shown in Case "D" rail operation is practically as cheap as trolley bus service,

FOR PROVIDING EQUIVALENT PASSENGER CAPACITY WITH TROLLEY BUSES OR MOTOR BUSES

Case E—Very Heavy Traffic				Case F—Very Light Traffic			Case G—Very Light Traffic			Schedule speed (m.p.h.)
Double Truck Car*	Safety Car	Trolley Bus	Motor Bus	Safety Car	Trolley Bus	Motor Bus	Safety Car	Trolley Bus	Motor Bus	
8.5	8.5	9.5	9.5	10	10	10	10	10	10	30.. Normal headway—thirteen hours daily—(minutes)
4	2.4	2.15	2.15	20	20	20	30	30	30	30.. Rush hour headway—five hours daily—(minutes)
2	1.1	0.75	0.75	20	20	20	30	30	30	60.. Seats furnished per hour, normal headway
780	800	840	840	96	90	90	64	60	60	90.. Maximum rush hour carrying capacity
3,600	3,580	3,600	3,600	195	135	135	130	90	90	0.5.. Cars required, including spares
8	14.6	19.4	20.2	0.75	0.75	0.75	0.5	0.5	0.5	26,300.. Annual car or bus miles
243,000	423,000	530,000	530,000	39,300	39,300	39,300	26,300	26,300	26,300	
				\$55,000			\$55,000			Cost of Road and Equipment:
\$120,000	\$110,000									Trackway—Single track
7,500	7,500	\$8,000		6,700	\$6,900		6,700	\$6,900		Trackway—Double track
64,100	53,900	67,800		3,000	2,500		2,000	1,700		Overhead system—trolley and transmission
20,000	21,900	29,100	\$30,300	1,100	1,100	\$1,100	800	800	\$800	Power station and substation
95,900	91,500	154,700	161,700	4,700	6,000	6,000	3,100	4,000	4,000	Shops or garages
										Rolling stock
\$307,500	\$284,800	\$259,600	\$192,000	\$70,500	\$16,500	\$7,100	\$67,600	\$13,400	\$4,800	Total investment
\$46,200	\$42,700	\$40,200	\$35,900	\$10,600	\$2,150	\$1,320	\$10,100	\$2,100	\$900	Fixed charges (as in Table IV)
76,100	77,000	100,800	146,000	7,150	7,450	10,810	4,800	5,000	7,230	Operating costs (as in Table III)
\$122,300	\$119,700	\$141,000	\$181,900	\$17,750	\$9,600	\$12,130	\$14,900	\$7,100	\$8,130	Total costs per year
50.5	28.2	26.6	34.2	45.0	24.5	30.8	56.8	27.0	30.9	Cents per car-mile
										On basis of track and structure cost—50 per cent of above
\$202,000	\$198,000	\$217,000	\$177,000	\$37,600	\$11,250	\$6,550	\$35,400	\$8,700	\$4,400	Total investment
30,400	29,700	33,600	33,100	5,650	1,750	1,210	5,300	1,300	800	Fixed charges
76,100	76,900	100,800	146,000	7,150	7,450	10,810	4,800	5,000	7,230	Operating costs
\$106,500	\$106,600	\$134,400	\$179,100	\$12,800	\$9,200	\$12,020	\$10,100	\$6,300	\$8,030	Total costs per year
43.8	25.2	25.4	33.7	32.5	23.4	30.5	38.4	24.0	30.5	Cents per car-mile

TABLE II—OPERATING COSTS OF MOTOR BUSES—CENTS PER BUS-MILE

Table with columns for Maintenance, Tire renewals, Body repairs, Engine, gearing and control, Shop and other expenses, Total maintenance, Gasoline, Lubricants, All other operating expenses, Total operating costs, Depreciation, Total maintenance with solid tire cost, Gasoline and oil corrected for 10,000 lb. wt. on 3, 4, 5, Other expenses corrected for one-man operation, Total operating cost of 10,000-lb. bus with solid tires and one-man operation.

- NOTE: 1. Chicago Motor Bus Company... 1919 10,000-lb. bus solid tires; 2. Fifth Avenue Coach Company... 1920 10,000-lb. bus solid tires; 3. Baltimore Transit Company... 1920 7,500-lb. bus solid tires; 4. Fort Worth Auto Bus Company... 1919 5,700-lb. bus solid rear tires; 5. Goodyear Heights Bus line... 1920 8,000-lb. bus pneumatic front tires

cents is for repairs to the electrical equipment. The motor buses cost on an average 8.5 cents, of which 2.0 cents goes for the maintenance of solid tires, 1.5 cents for the body and truck and 5 cents for the engine and transmission.

The trolley bus would presumably have the same cost for tires, body and truck upkeep, but only 0.5 cent for the motors and control, making its total maintenance 4 cents per mile, or 4.5 cents less than the gasoline vehicle.

On the power account, due to higher friction, the trolley bus will take more power per ton-mile than the rail car, but its lighter weight will somewhat more than offset this and make its total power cost a trifle less than that of a safety car. A motor bus weighing 10,000 lb. in frequent stop service can make only about 4 miles to a gallon of gas, or 5.5 cents per mile if gas is figured at 22 cents per gallon, and oil and grease add about 1.5 cents to this; it has therefore a total power expense of 7 cents per mile, or 4.7 more than the electric bus.

The depreciation of a motor bus is recognized to be much more rapid than that of a rail car; apparently this is due to the comparatively short life of its engine and transmission. The economic life of a street car

TABLE III—OPERATING COSTS—CENTS PER CAR-MILE

Table with columns for Double-Truck Car, Single-Truck Safety Car, Trolley Bus, Motor Bus. Rows include Car capacity in passengers, Weight in pounds, Maintenance of way and structure, Maintenance of equipment, Power, All other expense, Total operating expense.

and its equipment is at least fifteen years. There is no reason to doubt that the body and truck of any well built bus should last that long. But from all records available, the gas engine and transmission have a life of not over four to five years, and since their first cost is about 25 per cent of the equipped bus, the total depreciation is considerably higher than for the electric car. We have taken them respectively at 4.6 per cent on the rail cars and on the trolley bus and at 8 per cent on the motor bus.

Total fixed charges on the rail system are assumed to be 15 per cent, 9 per cent for interest, 2.8 per cent for taxes and insurance and 3.2 per cent for depreciation on

TABLE IV—FIXED CHARGES ON TOTAL INVESTMENT IN PER CENT

Table with columns for Rail System, Trolley Bus, Motor Bus. Rows include Interest charges, Taxes and insurance, Depreciation (sinking fund), Total.

the entire physical property. Since the cost of cars, with their comparatively short life, is a bigger proportion of the total investment in a trolley bus installation, depreciation is figured at 3.7 per cent and total fixed charges at 15.5 per cent. For the motor bus installation, for the above reasons, total depreciation is figured at 6.9 per cent and total fixed charges at 18.7 per cent.

In the tabulation which follows the upper figures are based on entirely new construction at today's prices, the lower apply to the company which can use track, overhead, stations and shops constructed at pre-war values, assumed to be 50 per cent lower than at present.

In every case except that of "G," it is assumed that a greater number of buses than rail cars would be required for rush-hour service, on the basis that a modern double-truck street car can carry away 120

TABLE V—COSTS PER ROUTE-MILE FOR BUILDING AND EQUIPPING RAILWAY SYSTEM AND

Large table with columns for Case A (Light Traffic), Case B (Medium Traffic), Case C (Moderately Heavy Traffic), Case D (Heavy Traffic), Case E (Very Heavy Traffic), Case F (Very Light Traffic), Case G (Very Light Traffic). Rows include Schedule speed, Normal headway, Rush hour headway, Seats furnished, Maximum rush hour carrying capacity, Cars required, Annual car or bus miles, Cost of Road and Equipment, Total investment, Fixed charges, Operating costs, Total costs per year, On basis of track and structure cost, Total investment, Fixed charges, Operating costs, Total costs per year, Cents per car-mile.

passengers without undue crowding, a safety car sixty-five and a thirty-passenger bus not over forty-five, if the buses are to be kept within the weight and price limits specified. A comparison based on a car for car replacement is obviously unfair, except where the maximum number of people to be carried is within the seating capacity of either type of vehicle.

A number of comparisons have been worked out for different densities of traffic from very light to extremely heavy, each based on a completely equipped line 4 to 5 miles long, and all costs reduced to the unit basis of a single route-mile.

With these prefatory statements, Table V is believed to be self-explanatory. It indicates clearly that the railway is still the most economical means of handling very dense traffic, and that for very short headways there is little to choose in first cost or operating charges between a comparatively small number of large-capacity double-truck cars of modern design and the larger number of safety cars required, as shown in case "E." To handle such traffic as this, headways with the comparatively small capacity buses become so short as to be prohibitive, and their higher operating costs far overbalance their savings in fixed charges.

But for many other conditions, particularly those which are typical of the majority of lines in medium sized cities, where the maximum traffic does not require headways of less than five or six minutes, the trolley bus should save enough in overhead charges to justify its use in preference to either rail car or motor bus.

CONCLUSIONS FROM ANALYSIS

For instance, Table V, Case "A" pictures a very common situation i.e., a line on which an all-day headway of fifteen minutes with a medium sized railway car is sufficient, but on which the morning and evening loads require a ten-minute headway. We assume that safety cars would be used on the rail route and that they would maintain a schedule of 9 miles per hour. If buses were used, presumably they could run somewhat faster due to their ability to run past slower moving vehicles and because of their smaller load in rush hours. The figures are based on a 4.5-mile route, on which the safety cars require sixty minutes for the round trip and the buses fifty-four minutes. Even so, to carry

away an equal number of passengers during the rush hours will require eight buses on a 6.75-minute headway as against six safeties, ten minutes apart. One spare car is allowed in the case of the safety car line and for the trolley bus route, and two spares if motor buses are used, because of the greater chance of failure with the gasoline engine.

Power requirements are based on the rail cars taking, at the car, 150 watt-hours per ton-mile, and the trolley bus taking 195 watt-hours per ton-mile, for all energy requirements except heat. These figures are increased 15 per cent for line losses and 25 per cent more for conversion. Heaters are assumed to take a continuous maximum input, on either vehicle, of 12 amp.

Of the total investment required for a new rail line, under these conditions, 60 per cent is saved by using the trolley bus and 75 per cent by equipping with motor buses, and the saving is very material even against the company using old rail and structures. The fixed charges are, therefore, distinctly lower for the bus systems, but the motor buses cost so much more to operate that the total annual cost of the line using them is practically the same as for the new rail road, and 30 per cent higher than for the existing rail system.

The operating cost of the trolley bus, however, is so little more than that of the rail route that it does not offset the savings in the fixed charges, and its total cost of service is the lowest of the three systems.

Another common traffic condition is shown in Case "B," a route that would be satisfactorily handled with safety cars on ten-minute normal and 7.5-minute rush hour headways, and where buses would have to run on a five-minute spacing to give equivalent rush-hour capacity.

Here again the use of the trolley bus is the cheapest way to equip a new line or to extend an old one; the motor bus is the most expensive means.

As the traffic grows more heavy, as in Case "C," the advantage of the trolley bus over the rail car diminishes, but its advantage over the motor bus continues in the same proportion as before. The figures indicate that to re-equip an existing line would show a total loss rather than a gain by abandoning rail operation.

With headways as short as shown in Case "D" rail operation is practically as cheap as trolley bus service,

FOR PROVIDING EQUIVALENT PASSENGER CAPACITY WITH TROLLEY BUSES OR MOTOR BUSES

Table with columns for Case E (Very Heavy Traffic), Case F (Very Light Traffic), Case G (Very Light Traffic). Rows include Double Truck Car, Safety Car, Trolley Bus, Motor Bus, Schedule speed, Normal headway, Rush hour headway, Seats furnished, Maximum rush hour carrying capacity, Annual car or bus miles, Cost of Road and Equipment, Total investment, Fixed charges, Operating costs, Total costs per year, On basis of track and structure cost, Total investment, Fixed charges, Operating costs, Total costs per year, Cents per car-mile.

even in the case of new construction; on the old rail, it is decidedly more economical.

Case "E" shows a very heavy traffic route, on which could be used large modern double-truck cars, of the Peter Witt type, on four-minute and two-minute headways. It might be practicable to use safety cars on such a route, though the rush-hour headways would be pretty short, but no real advantage would be gained, their total cost of service being practically equal to that of the large cars. If the Witt cars could be operated by one-man, as many operators are coming to believe they can, they will show by far the lowest cost of any vehicle that could be employed.

The enormous number of buses that would be required for this kind of traffic, necessitating headways of forty-five seconds, throws them out of the competition. Their use would not only tremendously increase street congestion but would very considerably increase the cost of service.

The only place where the gasoline motor bus can successfully compete with the rail system is where traffic is so light that headways of twenty minutes or longer afford sufficient service. In cases "F" and "G" the cost of service with the trolley bus and the motor bus on twenty- and thirty-minute all-day headways are compared with a safety car installation operating at the same speed and frequency. With twenty-minute service the old rail route about balances in total cost with the motor bus line; at today's construction expense, the motor bus is distinctly cheaper. At thirty minutes the advantage is decidedly in favor of the gas car. But at either headway the trolley bus will have the lowest total cost of the three, and calculations indicate that its advantage over the gasoline driven vehicle holds up to headways of one hour or longer.

ELECTRICALLY PROPELLED UNITS MOST ECONOMICAL

In conclusion, we believe that there is still a broad field of transportation on city streets for which the rail car is best suited and in which it is the most economical means of carrying passengers, but there is another and perhaps equally important field, in which the trackless trolley bus can furnish equivalent service at a lower cost than can the rail system. Even in comparison with the rail system, the field for the gasoline motor bus is very limited (on headways of twenty minutes or longer), while as compared with the trolley bus, it has no place in a city transportation system, except where it is impossible to erect an overhead trolley line.

But the possibility that the trolley bus holds out of enabling transportation companies to extend their lines into the suburbs or into new sections of a city, with an investment 60 per cent to 80 per cent less than is required for a track system, and to be able to operate cars over the new route for two-thirds of the cost of motor buses, means that an important contribution to the art of transportation has been effected. With these vehicles, it should be possible to extend very considerably the services of the city transportation companies and to benefit simultaneously the traveling public and the electric railway security holder.

[NOTE.—Mr. Thirlwall's article was received prior to the publication of the article on the same subject last week and represents an independent study on the same subject. Mr. Thirlwall has been asked to comment on last week's article and writes that he will do so at an early date.—EDS.]

The "Rail-less" Car

J. G. Brill Company Has Developed the "Rail-less" Car, Which Utilizes a Novel Current Collector—Foot-Operated Master Controller System Used

AFTER an exhaustive study of existing vehicles begun some months ago the officers of the Brill Company recently started experimenting for the purpose of developing a type of "rail-less" car which in their opinion would meet the requirements of American transit interests. These requirements called for furnishing economical transportation under more or less special conditions. A short 600-volt d.c. double-wire line was ultimately erected in the Philadelphia plant and an experimental vehicle constructed, the flexibility of which is shown in the accompanying illustrations, as well as the ease with which it can get around other automobiles and trucks on the street.

CURRENT COLLECTOR AND CONTROL SYSTEM

These experiments made it apparent that the success of the vehicle depended primarily on the overhead current collector and the control apparatus. Several different types of current collectors were tried but in each case were found unsuitable. The design of the collector last developed and which apparently will give the best results is shown in the accompanying illustration. An examination will show two under-wire sliding shoes with grooves which engage the two overhead wires when directly over the center of the car. This device ingeniously includes a series of pivots which facilitate action in every direction, longitudinal, vertical and horizontal, as the "rail-less" car deviates from a path directly under the wires. A wooden trolley pole 19 ft. long is used in conjunction with a standard trolley base arranged to exert a total spring pressure of 38 lb. on the two overhead wires. This pressure has been found to be sufficient to keep both shoes of the collector in position as long as the car is not more than 16 ft. off center.

POWER CURRENT OUTSIDE CAR BODY

All electrical equipment controlling the 600-volt power current is located underneath the car body. Therefore, in case of a blowout in the electrical equipment there is less liability of danger to passengers. The current relay contactor system which was designed by Cutler-Hammer Company is operated by a foot master controller, located on the floor in front of the driver's seat, and interlocked with a reversing switch.

Either one or two 25-hp. motors, connected in tandem, such as used on standard safety cars, may be used on this vehicle, as the contemplated service requires. Such motor equipment permits operation at a maximum speed of from 25 to 30 m.p.h. Motors are mounted directly

Length over all.....	22 ft. 0 in.
Outside width of body.....	7 ft. 6 in.
Amount of street space occupied per passenger seat.....	6.68 sq.ft.
Outside width of chassis.....	34 in.
Over-all height.....	9 ft. 6 in.
Height of bus floor from ground.....	33½ in.
Tread of front wheels.....	60 in.
Tread of rear wheels (dual tires).....	68 in.
Wheelbase of chassis.....	120 in.
Body overhang at rear.....	60 in.
Minimum turning radius (on a loop).....	20 ft. 0 in.
Cross-seat centers.....	29 in.
Weight of body.....	2,800 lb.
Weight of chassis.....	3,750 lb.
Weight of electrical equipment.....	2,000 lb.
Weight of accessories.....	750 lb.
Total weight.....	9,300 lb.
Weight per passenger seat.....	332 lb.
Per cent weight on rear wheels.....	55

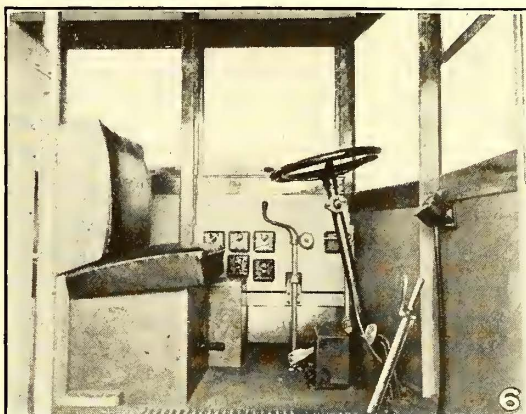
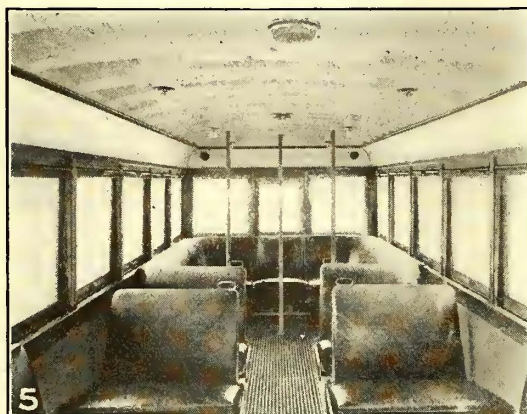
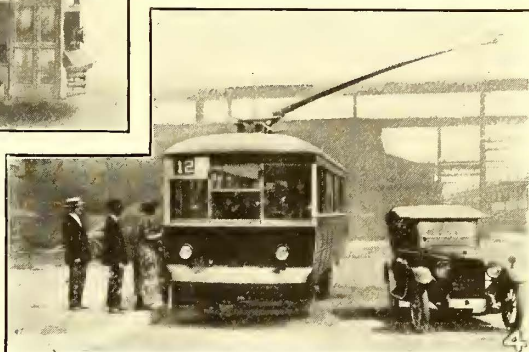
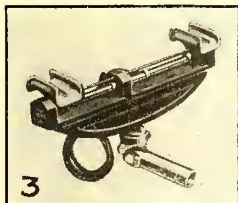
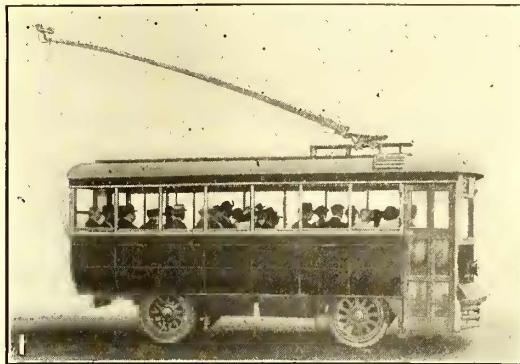
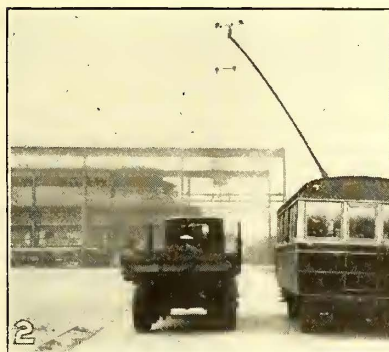
on the chassis frame and drive the rear wheels through a propeller shaft. A Sheldon rear end worm drive is used.

Overman cushion tires are used throughout. Those on the rear wheels are of the dual type. Both the service and emergency brakes are of the internal expanding type, the former being operated by a pedal under the driver's right foot and the latter by a brake handle near his right hand. The chassis and steering arrangement permit the turning of this car within a diameter of 40 ft. without disengaging the current collector from the wires.

In designing this "rail-less" car body particular attention

Stationary double steps are provided at this door opening. An emergency door, 22 in. wide, is located in the center of the rear end of the body with a hinged step which drops into position when this door is opened. All side and rear windows are fitted with single sash which drop into pockets. This reduces the weight of the car at the roof and lowers the center of gravity.

Another innovation included in this "rail-less" car is a driver's seat, the back of which may be adjusted by means of a simple mechanism to suit the leg length of the operator. It may be set back approximately 3 in. if additional room is required for a tall man or half that distance if that is all that is desired. This



THE "RAIL-LESS" CAR IN PICTURES

No. 1—Seating arrangement shown. Also note method of mounting trolley pole.
 No. 2—How easy it is for a truck to pass one by on the road.
 No. 3—Current collector for which patents have been applied for.
 No. 4—Showing flexibility and ability to load at the curb even with center trolley construction.

No. 5—Interior arrangement. Note the luxurious seat upholstery.
 No. 6—Interior at driver's seat. The left foot pedal operates the master controller in front of the steering wheel, the one on the right controls the service brake. The circuit breaker is under the seat.

was paid to developing one of substantial construction which would be suitable for rail-less service. A composite underframe was built with the side sills of yellow pine, the end sills of oak and the crossings of suitable steel channels securely tied together with steel angle brackets. This underframe is firmly attached to the chassis. The corner and side posts and the belt rail are of ash with poplar letter panels, all sheathed on the outside with No. 18 sheet steel.

The plain arch roof is supported on wooden rafters augmented by three steel rafters. Four Brill exhaust ventilators are mounted on the roof.

The two-leaf folding service door, 29 in. wide, on the forward right hand side is manually operated by a suitable handle near the driver's left hand. In opening, this door folds outwardly against the body corner post.

seat is stationary and like all other seats is upholstered in Fabrikoid imitation leather. Seating accommodations for twenty-eight passengers are provided. A transverse seat extends completely across the rear end with a single movable section which folds up against the emergency door, a longitudinal seat along the two rear windows on each side of the aisle, four cross seats with 32-in. cushions, a longitudinal seat for two passengers on the right-hand side next to the door opening and a single longitudinal seat behind the driver, all of the stationary type. Figuring 2.5 sq.ft. per passenger the maximum capacity of the bus is fifty passengers. With twenty-eight seats this gives twenty-two standees. The aisle width between the cross seats is 17 in. Three pipe stanchions between the longitudinal seats at the rear are provided for the use of standing passengers.

The interior finish is of natural ash with agasote below the windows.

Current for electric lighting is generally obtained from the trolley circuit, but a storage battery is carried on the floor to the left of the driver's seat for use in case of emergency.

Other details are given in the table on page 550.

Taxation for Railway Construction

Low Street Railway Fares Can Be Provided With the Help of the Landlord—Ample Authority in New York State to Impose a Special Assessment

IN AN ARTICLE which he contributed to the ELECTRIC RAILWAY JOURNAL for Feb. 5, 1921, Louis B. Wehle, a member of the recent Federal Electric Railways Commission, said: "There are cities in which extensions of rapid transit and subway can be paid for, either wholly or in part, out of special assessments upon enhanced property values so that the car fares can remain low and so allow the cities to avoid congestion, while at the same time securing justice to the old investors in the property."

This suggestion attracted much attention, and on request Mr. Wehle has elaborated the idea in an article which appears in the current issue of the *National Municipal Review*. An abstract of this article is published below:

Nobody wants high street railway fares. The company managers are compelled to urge them only as a last resort. If they were sure of low costs, they would much prefer low fares, which mean better and steadier business.

The question is how can low fares be assured? We know that fares must be sufficiently low to enable the cities to follow a normal uniform growth, avoiding congestion. But we know, too, that the service must at the same time insure rapid transportation from home to office or work shop. This means, particularly in the large cities, a continual extension of the rapid transit facilities which do not operate on the street surface. Such facilities are very costly; they entail a high capitalization and have everywhere either caused or threatened to force higher fares. And higher fares can thwart the very purpose of rapid transit extensions, since they will tend to create the very congestion which those extensions are intended to prevent.

THE WAY OUT: ASSESS THE LANDOWNER FOR CONSTRUCTION

From this dilemma there is a plain, simple escape. Not a new remedy, but an old one which has been in use in connection with other public improvements for many years all over the United States, and resort to that remedy has since 1909 been permitted in connection with street railways by the laws of New York State. The question is, when will the American cities adopt it?

When a city builds a new street or a fire hydrant, the landowners along that street or in the vicinity of the hydrant are assessed by the city to pay for it. Public opinion and the courts have approved for generations this procedure with reference to these and other improvements, such as sidewalks, sewers, water systems, parks, and more recently also in connection with electric light systems; and the landowner is thoroughly in accord with it because his is the primary benefit of the improvement, while the benefit to the taxpayer is only a general and more remote one.

So let it be with the rapid transit lines of a large city. Take New York as an example. New York City has pledged its credit to the extent of more than \$250,000,000 to build a vast subway system. The companies, in effect, operate the subways on a basis of rentals which pay for them at the end of a long term of years. The fares must be high enough to enable the companies (after first retaining certain earnings for their own account) to pay those rentals.

In other words, the taxpayers' credit builds the subways and then these same taxpayers, as car riders, put up the money with which the subways are paid for.

THE FEDERAL ELECTRIC RAILWAYS COMMISSION ON THE LANDOWNERS

But, what of the landowner? He frequently pockets a profit of from one hundred to several hundred per cent on his investment, a profit which the taxpaying and riding public has donated to him. Please read what the Federal Electric Railways Commission said about the New York landowner in its report to the President in August, 1920:

"Your commission would urge that in every community, where and to such extent as may be practicable, consideration be given to the advisability of requiring extensions and rapid transit systems of subway and elevated to be paid for, not out of new capital invested through the medium of bonds or stocks, which means for all time an added burden upon the car rider, but from special taxes assessed against the owners of property in the district the value of which is enhanced by such extensions. The principle is peculiarly applicable to improvements of city transportation systems, because of the enormous increases in real estate values created when new extensions open up new territory or when the creation of rapid transit facilities make outlying territory more available. . . .

"That such a solution is just is rather significantly shown by the fact that in a number of cities, landowners in outlying districts have offered spontaneously to contribute large sums to the company to assist it in constructing certain extensions. The present predicament of the street railway companies is in many places partly due to overbuilding, a fault traceable to political or business pressures exerted by speculators in suburban lands who had little or no financial responsibility in connection with the street railway extensions, which they caused to be built for their immediate benefit. This action of the suburban landowners of certain cities, on the other hand, is a significant expression of enlightened self-interest and a sound, constructive recognition of a fundamental principle of justice. The establishment of that principle by law, whether by changes in city ordinances, state statutes, or state constitutions should, in our opinion, not be delayed. This thought is especially recommended to the attention of a number of communities which are now facing the necessity of extensions or rapid transit improvements."

When the Federal Commission points out that in a number of cities landowners have voluntarily offered to contribute large sums to the company to assist in constructing extensions, we see that the principle of assessing the landowner has developed spontaneously as a resultant of the economic forces involved. The next step is to give to that spontaneous resultant a legal status, so that an obligation to contribute shall bear equally upon all landowners. It will doubtless surprise many to learn that this step has already been taken in the city of New York.

NEW YORK CITY'S NEGLECTED LAW

It seems to have been generally overlooked that the statutes of New York today provide in detail permissively for assessing landowners for the cost of street railway construction. The rapid transit act since its amendment in 1909 has provided that New York City may construct rapid transit railroads, paying for them with funds raised by the issuance of rapid transit bonds or of assessment bonds. Such line "shall be a local improvement the cost of bonds of which railroad may be met in whole or in part by assessment on the property benefited." It is then provided that the Public Service Commission, with the approval of the Board of Estimate and Apportionment or other analogous local body, "shall have power to determine whether all or any, and if any, what, portion of the cost and expense necessary to be incurred for any such road shall be assessed upon property benefited thereby," etc. The entire machinery for assessment is fully provided for, and the assessment and interest may be paid in installments over a period of nine years. But this permissive law has never been used. It seems to the writer that it might well be employed as it stands, but that if it were practicable to do so it should be

made more just and therefore perhaps more readily acceptable by amending it to provide that the cost of construction be defrayed in the first instance out of a general city bond issue, the determination of benefits to the landowner, and the amount of his assessment being then postponed until some time after the construction of the railway, when the results are largely matters of actuality instead of prophecy.

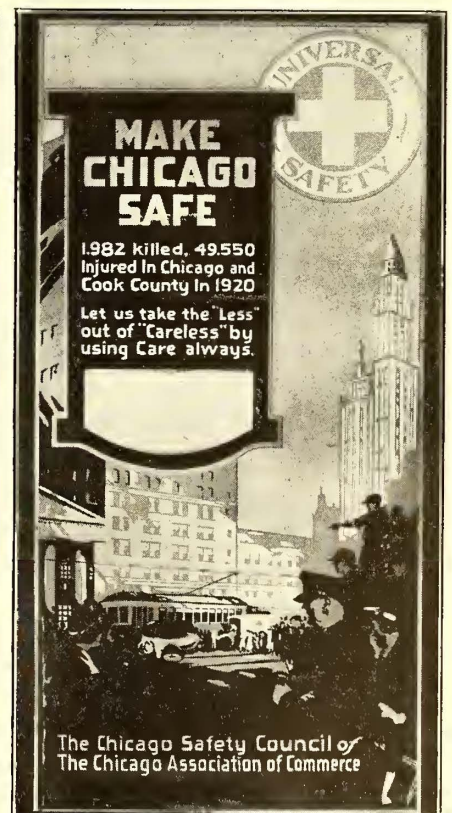
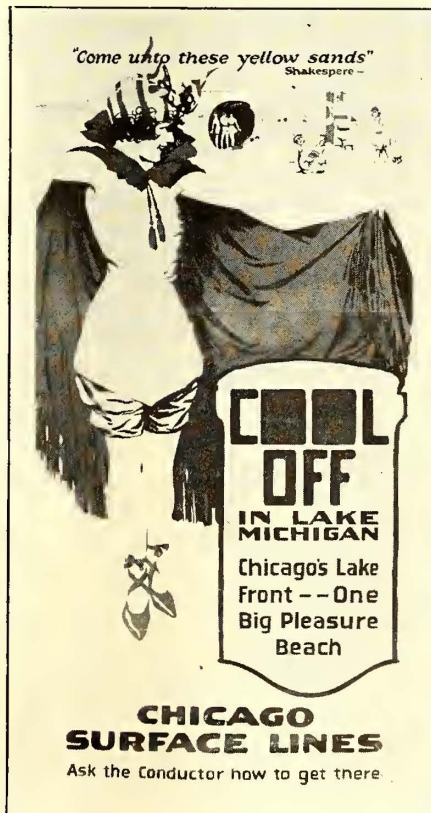
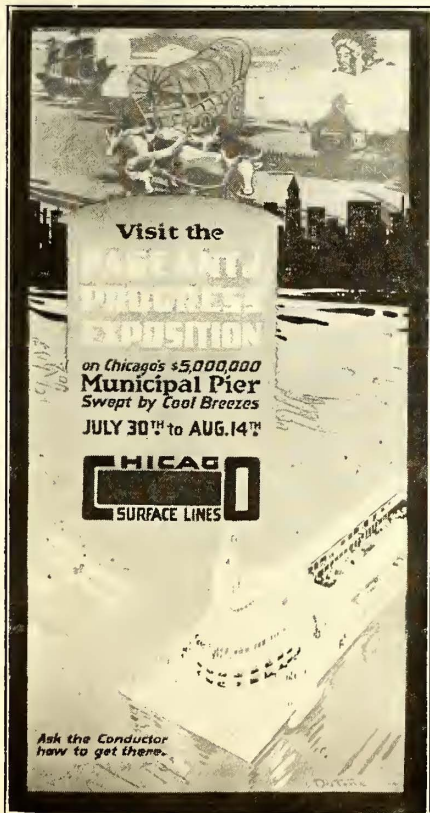
Stop and consider what it would mean in the future development of New York City if the landowners were to contribute one-fifth of their new land value toward paying for the subway or elevated line which creates that new value. First it would mean a continuance of relatively low fares and even possibly, in the end, a reduction of fares. It would lessen the strain on the city's credit, and definitely eliminate the possibility of certain large tax burdens. Then it would mean an avoidance of congestion with its train of evil consequences and would permit long-range city planning for the public health and welfare.

The subway and elevated extensions needed in New York City today darkly threaten its taxpayers and are a grave challenge to its credit. Daniel L. Turner, at that time chief engineer in the office of the Transit Construction Commissioner, issued in 1920 a thorough analysis and survey of the present and future traction needs of Greater New York. If the extensions are to keep pace with the city's needs, then, according to Mr. Turner, about \$250,000,000 of extensions must be built in the next twenty-five years. Even if we should proceed on a far more reduced basis, it seems certain that within the next ten years at least \$30,000,000 will have to be spent alone for extensions into new territory on Long Island, where streets have today not even been laid out. Can there be any doubt whatever that the new land values which will be created in that undeveloped territory will be fully as great as those created in 1908 by the extension from 137th Street to Spuyten Duyvil of the Broadway Subway? An assessment system should be devised which will fix upon the landowner in the heart of the city the obligation to contribute by assessment to the construction costs, whether he be benefited by central improvement such as additional trunk-line tracks, or by a suburban extension, and which will fix upon the suburban owner liability not only for the cost of the extension which most obviously

benefit his property, but also for the cost of the extra central tracks or tunnels made necessary in the heart of the city by such a suburban extension. It would be a difficult administrative and legal problem to work out the determination of benefits and assessments where so many intangible elements are to be dealt with. Yet scientific handling of the problem can doubtless evolve a system which would equitably place upon the land lying within a certain distance of the improvement; the amount of the actual increase in land value would be determined by appraisal some time after the construction; and the landowner would then be given the option to pay the assessment, if any, in installments over a period of years. "Assessment, if any," because in the case of central city property it frequently happens that a rapid transit improvement adds no value and sometimes even impairs value.

Attractive Car Posters for Selling Rides and Emphasizing Safety

DURING this summer the Chicago Surface Lines has utilized some unusually attractive three or more color car posters for calling attention in an inviting way to places of interest and events as a means of inducing car riding. Two of these posters were reproduced in the ELECTRIC RAILWAY JOURNAL for July 9, 1921, page 62, and two more are presented herewith, as well as a third having "safety first" as its theme. Just how many fares were secured as the result of the appeal of these attractive car cards is a matter of speculation, as there is no way to determine. But when one stops to think that approximately 3,000,000 people a day use the surface cars and are almost certain to see the poster, occupying as it does the prominent position in the front and rear bulkheads of every car directly in front of the aisle, the value of this adver-



THESE ATTRACTIVE POSTERS WERE ISSUED THIS SUMMER BY THE CHICAGO SURFACE LINES

tising medium will be understood. These posters are so large (18 in. x 36 in.) and so well gotten up that their merchandising value would seem to be very high.

Incidentally, some trouble was had with the trainmen tearing off the lower part of the posters as it obstructed their view through the bulkhead windows into the car. So on each of the cards reproduced herewith holes were cut at a point in the design where they worked in well and at about the level of the conductor's eyes, so that he could see through. This seems to have overcome the objection of the trainmen.

The safety poster was produced by the Chicago Surface Lines in conjunction with the transportation committee of the Chicago Safety Council and was used by the elevated lines and the Chicago, North Shore & Milwaukee Railroad also. The design and art work of all these Chicago posters was done by Barron G. Collier, Inc.

The Electric Railway, Track and All

Sales Managers of the Future Will Make the Electric Railway a 100 per Cent Investment by Selling the Use of Idle Tracks and Equipment

BY M. B. LAMBERT

Manager Railway Department, Westinghouse Electric & Manufacturing Company

THE auto truck and the auto bus and now the trackless trolley bus occupy the center of the stage in the technical and popular press, and hence also occupy much thought in the minds of those interested in their use and sale. This is quite natural and timely for two good reasons: First, these instruments of transportation have demonstrated their utility and economy in the transfer of passengers and goods from one place to another, within well-recognized limitations, and, second, far less invested capital is required for their use, largely because the "people" at large furnish the track and right-of-way almost free of charge. Time, of course, will adjust the latter; steps have already been taken in numerous communities and states toward levying additional taxes or fees on heavy tonnage trucks and auto buses operating regular passenger routes.

The time seems, therefore, very propitious to stop, look and listen and call attention to the old reliable electric railway, track and all, of yesterday, tomorrow and the future. What the auto bus and auto truck and the trackless trolley bus will do or can do is no longer in doubt; they have had a good running start and are well on their way, but the more a great many see of them the more firmly are they turning their heads back with favor on the old reliable street railway, track and all. Visualize the rehabilitated street railway, with light weight yet durable double-truck cars not exceeding 30,000 lb. each, and safety cars for many routes, and instead of the monster girder rails a much lighter construction replacing them, because the lighter cars will not require such heavy rails. With such equipment the operating cost will be far less. The all-around economy, safety, capacity for moving people rapidly and the logic of the whole proposition combined force one to the conclusion that the old reliable electric railway, track and all, is here to stay.

The electric railway, of course, will have a huge debt of gratitude to pay to the auto bus and the auto truck for forcing it to be up and doing its job. As a result of the auto bus and the auto truck, the electric railway will unquestionably take on new life and the development and improvements that it will undergo during the

next few years will not only greatly benefit civilization and the electric railway itself, but will also greatly benefit the auto truck and auto bus by helping to create greater usefulness for these vehicles in their respective fields.

The expensive tracks of hundreds of interurban, suburban and city railways are laying idle many hours of the day and night patiently waiting for the transportation salesman to recognize their value and sell their use to the community twenty-four hours each day. The track says to the pavement, when the latter crunches and cracks under the heavily loaded trucks: "I wonder why the city authorities allow you to be broken up while I lie idle here and those heavy loads could roll along on me more silently and with far less cost." The pavement groans back and says: "Wait until next year and the people find out what their taxes are for paving, then perhaps they will realize more fully the economic value of the electric railway, track and all."

The manager in charge of transportation sales of the electric railway of the future will study the whole transportation game and will make the most of every dollar's worth of investment. He will utilize every economical instrument of transportation in its proper field of usefulness, namely, the auto bus, the auto truck, the trackless trolley bus and the old reliable electric railway, track and all. He will study the transportation requirements of the community he serves for both passengers and goods. He will know what the needs of the civic authorities are in the movement of garbage, street cleaning, snow, etc., and jointly with them will establish receiving stations and move these materials in bulk to the dumping place. He will know the traffic requirements of all business houses in the community and, in co-operation with the city authorities, will establish receiving and distributing stations at advantageous points about the city so that all freight will roll over the tracks to these places at night and will be distributed by auto trucks early in the forenoon of each day, and thus will he help the city authorities to solve one of their ever-increasing problems, the congestion of business and pleasure vehicles on city streets.

One of the first things the sales manager of the interurban and suburban line will do naturally is to sell the use of idle tracks and equipment by hauling freight and package goods. The automatic substation and the efficient field control motors on electric locomotives and baggage cars now make it possible and profitable for the management of such roads to make the road work while everybody sleeps so that they will wake up each morning and find their goods ready for use, having traveled two or three hundred miles during the night over the old reliable electric railway, track and all.

Visualizing the whole problem in one broad glance, the electric railway is, after all, nothing more nor less than a very essential and useful tool in community life. Heretofore, only a very limited use has been made of this tool. It can and will be made, by the sales managers of the future, a 100 per cent investment, serving the communities in hundreds of ways, handling passengers and goods more economically, more reliably and more safely, with less congestion and more rapidity than any other instrument of transportation. Then the auto bus, the auto truck and the trackless trolley will fall in line in their proper place, merely as adjuncts or serving tenders to the old reliable electric railway, track and all.

Letters to the Editors

Annual Convention Issue

AMERICAN ELECTRIC RAILWAY ASSOCIATION
NEW YORK CITY, Sept. 26, 1921.

To the Editors:

I wish to extend to you my very sincere congratulations on the annual convention issue of the JOURNAL. I recognize in the keynote of "Salesmanship" the development of an idea expressed by Mr. McGraw in an interview early in the spring.

I think you have done a real job in presenting such a complete picture of the possibilities of merchandising transportation in every department of electric railway operation.

I am sure this will be of great value to the industry generally. It is full of optimism and should be an inspiration to electric railway managers throughout the country.

JAMES W. WELSH,
Secretary.

Track Voltage with Three-Wire System

WINNIPEG ELECTRIC RAILWAY COMPANY
WINNIPEG, CANADA, Sept. 10, 1921.

To the Editors:

The accompanying chart may be of interest to some of your readers as showing the value of the three-wire system for reducing track potentials and the stray currents assumed to result therefrom in underground structures adjacent to electric railways. This chart



TRACK POTENTIAL ON MILE SECTION IN WINNIPEG, USING TWO-WIRE AND THREE-WIRE SYSTEM

was taken last February at a time when railway loads are usually heavier on account of the severe weather, and the resistance of the earth is at a maximum by reason of its frozen condition, thus diverting less stray current than usual from the rails, and causing the latter to carry more current than during the summer months, thus causing a maximum fall of potential from point to point in the track. It covers about a mile of

track carrying the heaviest traffic on the principal business street of Winnipeg.

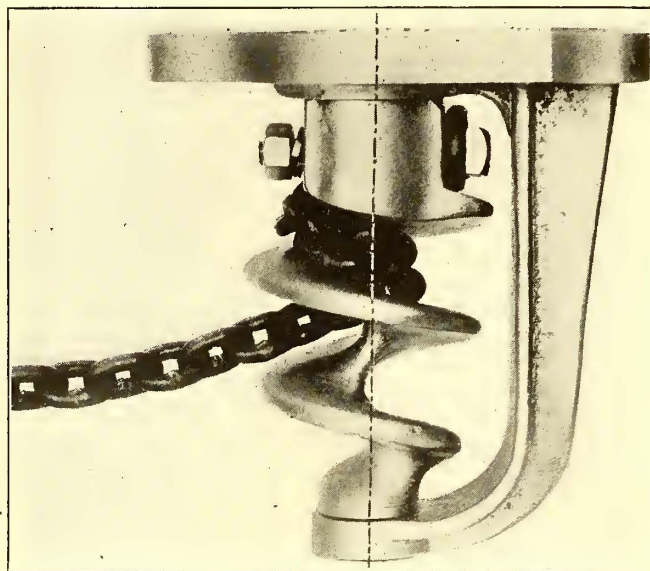
You will notice that during the morning peak, the average track potential drop is 10 volts. During the period of three-wire operation the average is practically zero, and the evening peak is almost imperceptible.

Our system is now completed and we are getting practically this same result over almost the entire city, even to the outskirts.

W. NELSON SMITH,
Consulting Electrical Engineer.

New High-Power Staff Brake

THE Ackley Brake & Supply Corporation, New York City, has developed a high-power gearless staff brake for electric railway service. This is the invention of Lars G. Nilson, and is called the Volute brake. It consists of a grooved winding drum designed for attachment to the lower end of a winding staff. The winding radius of this drum is large at the upper end to provide for quick take-up of the brake chain and tapers irregularly to the lower end. At a point about midway on the drum the effective winding radius passes through zero



NEW TYPE OF HIGH-POWER GEARLESS STAFF BRAKE

and the remaining portion of the groove has a slightly negative radius relation.

For any given pull exerted on the brake handle, the tension of the brake chain in winding depends inversely upon the distance of the center of the chain from the center of the staff. With the usual plain winding staff this center to center distance is about 1½ in. With the Volute design this distance is ½ in. in the brake application range. The Volute drum thus provides a multiplying power of about two and one-half times that of the plain staff brake. This has been demonstrated by both dynamometer tests and in operating service.

The Volute drum is made of cast steel and the deep flanges bounding the chain winding groove provide the necessary strength and thickness and serve to prevent the chain overlapping. The head of the drum is cored out to receive the squared end of the staff and a hole through the head and the squared staff provides for chain attachment. The frame for the drum is also made of cast steel in one piece. The upper top surface is corrugated to provide extra security against slipping when this is bolted to the car platform. The drum is

locked in the frame by means of a rust-proof bearing of brass at the top, which fits into the bearing well of the frame and is held by cupping over the well at several points. Slots are cut into the frame portion surrounding the well to shed dirt and keep water away from the bearing.

This type of winding drum provides for graduating both the application and the release of the brake. Following the take-up the chain is on the minimum radius of the drum and therefore the brake handle or wheel moves through a relatively large arc in applying the brake shoe pressure. This graduating feature is also of advantage in preventing wheel locking and facilitating proper coasting.

Some of the advantages claimed for this new type of brake are its simplicity and ruggedness, as there are but three essential parts, the drum, frame and bearing. This design of brake can be adapted to all types and sizes of cars and is the equivalent of a geared brake

with a ratio of more than 3 to 1. The weight and cost are much less than that of the geared type of brake as the complete brake with frame weighs less than one-half of the geared type. This type of brake takes very little more space than the plain staff brake and much less than any geared brake, and it can be readily installed without changes in the brake leverage system.

Among other applications of this brake the Atlantic City & Shore Railroad is equipping eighty cars with this type.

Graham Chassis Used in Danbury

THROUGH a misinterpretation of telegrams the type of motor-bus chassis shown in Fig. 3 on page 516 of the ELECTRIC RAILWAY JOURNAL for Sept. 24, 1921, was erroneously credited to the Reo Motor Car Company. The motor-bus body illustrated was built by the Paterson Vehicle Company and mounted on 1½-ton Graham truck chassis, giving very satisfactory service.

Bus Operators Admitted by Amalgamated

81,777 New Members Enrolled Since Last Meeting—351 Written Contracts—Constructive Spirit Evidenced Throughout at Atlanta Convention

THE Amalgamated Association of Street & Electric Railway Employees of America met for its seventeenth convention in Atlanta, Ga., on Sept. 12 to 20. The most striking and important development of this meeting was the expression by various officers of the association of their belief that the interest of street railway employees would be best served by a harmonious relation and co-operation between electric railway employees and the companies for which they work.

The opening meeting of the convention might have been a "get together meeting" between the employees, the officers of the local traction company and the State and city officials.

MEDIATION URGED

The policy of avoiding strikes wherever possible and of accepting mediation and arbitration before resorting to extreme measures was firmly maintained by the association. The association followed recommendations of International President W. D. Mahon, Detroit, and of the general executive board, and sustained very conservative policies regarding disputes with employing companies.

The association voted to urge that provisions for six-day working weeks and eight-hour days be incorporated in future proposed contracts between the organization and employing companies. The importance of educational work both inside and outside the association as a means for improving working conditions and of securing favorable legislation was stressed throughout the convention.

Samuel Gompers, president of the American Federation of Labor, was a visitor to the convention and spoke twice to the delegates. He urged them to keep up their courage during "the present period of industrial stagnation," and during their trials to "hold themselves in leash and move onward

and forward gradually and steadily in the industrial development of the country."

In the course of his remarks Mr. Gompers said that union men opposed any reduction in wages because reduced wages result in reduced purchasing power, which in turn would increase the already alarming and increasing amount of unemployment in the United States.

Practically no changes in the major policies and principles of the organization were made at the meeting, and the convention was featured by the constructive spirit evidenced throughout its deliberations. A very important innovation by the association was the recommendation that an old-age pension should be established, for the protection of union members who have retired after twenty-five years of service in the union. Under the recommendations, which will be voted on by the local unions, those entitled to the old-age benefit will receive \$800 a year when they retire from active work.

A motion to establish a greater defense fund for use in strikes was defeated, although the association considered the strike of the Troy and Albany traction employees as being just and voted to levy an assessment of 50 cents per member toward a fund to assist these two locals.

Reports showed that the association has enrolled 81,777 new members since the 1919 convention, and that there are now 351 written contracts between employers and affiliated locals. The audit committee announced that there was now a balance of \$1,031,535 in the association treasury. The total membership of the organization was reported as about 150,000.

MOTOR BUS OPERATORS ADMITTED

The one-man car question was debated with much interest. The association voted that one-man cars should

be fairly and legitimately opposed wherever possible, in order to promote the safety of the public. It was stated that one-man cars are already being abandoned in many cities, and are being replaced by motor buses. A motion to admit to membership street motor-bus operators was carried. The association went on record as advocating the passage of state laws making drivers of vehicles stop, look and listen before crossing interurban roads.

Full approval of the North Dakota State bond issue for co-operative state-owned enterprises was given by the association, and it was recommended that locals and individuals lend their financial support to the movement.

Among the resolutions adopted was one asking that Congress recognize the "republic of Ireland," and another asking President Harding to pardon Eugene V. Debs, socialist leader now incarcerated in the Atlanta Federal Penitentiary. Resolutions were also passed requesting Congress to pass a soldier bonus law.

All business sessions of the convention were closed to the public and the press, a guard being kept at the door at all times. There were 297 delegates present.

The Georgia Railway & Power Company, which operates the street cars of Atlanta, co-operated with the local association members in entertaining the visitors.

W. D. Mahon, Detroit, was re-elected international president for the twentieth consecutive time. W. B. Fitzgerald, Troy, N. Y., was re-elected first international vice-president; P. J. O'Brien, Springfield, Mass., second vice-president; L. D. Bland, Chicago, treasurer, and R. L. Reeves, Chicago, secretary. J. B. Lawson, Shreveport, La., was re-elected chairman of the general executive board at the post-convention session of that body. Delegates to the American Federation of Labor elected were: William Quinlan, Chicago; Fred Schultz, Cleveland, Ohio; James Rogers, New Orleans, La., and A. Conn, Toronto, Ont.

Oakland, Cal., will be the meeting place of the 1923 convention.

Radical Readjustment Proposed in New York City

Transit Commission Suggests, Among Other Things, Unification of Entire Transit System, Ownership by City, Operation by Three Operating Companies Under Management of One Holding Company, Surrender of All Existing Franchises of Whatever Nature

RECOMMENDING municipal ownership of all New York City's transportation agencies but at the same time recommending private operation, the New York Transit Commission has filed its plan of readjustment for New York City street railroads, the report being given to newspapers at 5 p.m., Thursday, Sept. 29, for Friday morning publication. The commission consists of George McAneny, chairman; LeRoy T. Harkness and John F. O'Ryan, appointed by Governor Miller under authority of an act passed by the New York State Legislature last spring. (See ELECTRIC RAILWAY JOURNAL, issues of April 2, 16 and 23.)

Ever since its appointment the commission has been making studies of the situation and the present report has been awaited with keen interest, particularly in New York City, where the traction situation is apparently the principal political issue.

The commission has stated its conclusions of the principles upon which any satisfactory solution to the New York situation can be based under fourteen headings. These are given in the panel on page 560.

The Transit Commission was organized the early part of this year and succeeded to the powers and duties of the former Transit Construction Commissioner. Within a week of taking office, it organized a bureau of valuation and through its bureau of accounts has made a comprehensive analysis of the finances of the operating measures of each of the roads. It will hold a series of public hearings at an early date to determine in particular the attitude of the companies toward the plan proposed, and opportunity will be afforded for criticism and constructive suggestion.

THE SITUATION DESCRIBED

The early part of the report of the commission describes the situation of the transportation lines in New York City, as well as the financial condition of the companies. It declares that on June 30, 1920, the aggregate of the net assets of all the companies was \$55,908,893 while the aggregate of the current liabilities was \$111,044,653. These included arrears of taxes unpaid, interest on underlying bonds, rentals overdue, and accounts and bills payable. The report says that the spectacle of the city depending on the present embarrassed and generally ill-equipped agencies for a service essential to its daily existence is a sorry one. Moreover, if the roads were fully restored tomorrow, there would be no promise against a recurrence of the conditions of today.

In the judgment of the commission

a complete change both in the organization and in the methods of financing the system, as well as its relation to the public, must be effected. To bring about such a change was frankly the purpose of the legislation under which the commission is acting.

NO CHANGE IN FARE

It is the further conclusion of the commission that until there has been ample demonstration of the general results of operation of the new plan and until the changes and economies the plan has in view are tested fully, there should be no change in the present rate of fare. The commission will require, therefore, that the rate for the first year following the initiation of the plan shall remain at 5 cents.

In any consideration of the rate of fare to be charged there should be taken into account the fact that one result of the past three years' policy of inaction has been to hide a substantial increased fare in the present disintegrated and depreciated service. Through the doubling of fares and the elimination of free transfers the net return per ride for each passenger carried on the surface lines in Manhattan and the Bronx has been increased from 3.674 cents in 1918 to 4.342 cents in 1921; in Brooklyn the average of 3.341 cents in 1918 has been increased to 4.415 cents in 1921. In other words, the surface lines in Manhattan, Brooklyn and the Bronx are already receiving a net increase of about one cent per passenger over the net return of 1918.

There has been no such direct increase upon the subway and elevated lines where continuous rides are the rule. There the added cost to the passenger has been in discomfort and loss of time. But even there the payment of the city's deficits through taxation is adding almost exactly one cent to the subway fare. In short, increased fares have not been avoided. They have been secured through indirection.

The commission appreciates that if proper and necessary service is to be restored, and the revenues gained through charging of double fares and the cutting out of transfers given up, this hidden increase must be first absorbed. In other words, savings must be effected that will offset the hidden rate. The commission appreciates as well that various fixed charges must be eliminated, and many costs reduced, to offset further burdens placed upon the present system.

If the present situation were accepted as the basis of fare fixing—a solution the commission declines to consider—without allowance for profits of any nature, preferential or otherwise, the

following deficiencies would have to be overcome:

(a) The gross revenues of the operating companies for the year ended June 30, 1921, was in round numbers \$133,000,000, and the costs of operation, taxes, rentals and interest, \$150,000,000. The deficits, heretofore cited, are therefore.....\$17,000,000

(b) The deficits in the interest and sinking fund account of the city which in 1921 amounted to \$9,500,000 will advance in 1922 to approximately \$10,000,000; the total to be provided from revenue for the city's account, therefore, will be 10,000,000

(c) The cost of eliminating double fares, and of restoring free transfers upon the surface lines will be for each year not less than 9,000,000

(d) And one-third of the cost of neglected repair work and incidental rehabilitation, if this expense can be spread over three years, would add not less than... 5,000,000

The total thus required (without allowance for the cost of restoring full train and car service, which cannot be estimated with any exactness, and without provision for the full replacement of worn-out and obsolete equipment) would be\$41,000,000

Against this sum there may be counted a reduction of \$5,000,000 to be secured through the wage adjustments of a month ago. This will bring the net additional indicated need on the present basis approximately to \$36,000,000.

\$36,000,000 OBSTACLE

It is true that the above figures are based upon the present accounts and financing of the companies. In a rate case the intensive scrutiny of accounts undoubtedly would result in heavy cuts. But the net figure of \$36,000,000 indicates the size of the obstacle to be overcome—after three years' policy of drift—to re-establish and maintain the 5-cent fare.

It will appear that if the only method of relief was upon the basis of present organization and financial structure, the prospect for maintaining the 5-cent fare would not be hopeful.

But it is the opinion of the commission that if the reorganization plan it presents be adopted, with (a) the rearrangement and more effective co-ordination of the transit system, (b) the reduction of rentals and interest charges that it has in view, (c) the elimination of taxes and other public charges, from which the municipalized lines naturally would be free, (d) the reductions of cost effected through consolidation of power plants and of other facilities used in common, and (e) the material savings that will occur in the reduction of overhead and operating charges, the indicated deficiencies may be substantially overcome and the 5-cent fare continued beyond the year of trial.

While naturally every endeavor will be made to attain this end, the question finally can be determined only by a demonstration of the results of

operation of the consolidated system such as the plan proposes.

The commission thinks that the enforcement of a plan based upon the principles cited, beyond securing the economies and benefits of consolidation and ending a condition of financial chaos and paralysis, will clean out the separate, special, private interests with their persistent friction and conflicting policies and substitute a new basic organization in which the interests of the city and of private investors would be common. If these principles be recognized and given effect, it will follow that while opportunities for the making of money through the speculative manipulation of transit securities will cease, *bona fide* investors, on the other hand, assured of adequate protection, should not hesitate to lend as further funds are required. The advantages that will flow to the traveling public from the plan are obvious. Nor does the commission see in it any unfairness either to the operating companies or to the present owners of their securities.

In readjusting securities on the basis of honest value which the commission has in view, it declares it will insist upon the elimination of "water" of every description and the frank recognition of a depreciation that investors have long since discounted. In requiring that existing "preferentials" be given up, as a part return for the stability the plan would give to real investment, the commission says it again seeks to cut out whatever has become unstable or artificial in transit finance. Preferential allowances held to be fair and necessary when the dual contracts were negotiated ten years ago are not fair under the conditions of today. If the subway operators argue that their preferentials should be continued, and that a fare should be fixed sufficient to cover them, they would claim in effect that they alone are entitled to 100 per cent protection against the losses and shrinkages of the war, while the city, the private investors and every other party to the old agreements have been required to carry very substantial losses, direct and indirect.

The elimination of inter-company leases will put an end to another form of abuse in transit finance and avoid the continuance of undue favor to any particular class of security holders. Under the plan all such leases would be discontinued and the lines of lessor companies merged with the unified system upon the same terms as to the recognition of actual value and the allotment of interest-bearing securities that apply to all others.

In accordance with the foregoing findings the commission submits the following general outline of its plan and of the mechanism through which it is to be put into effect:

THE PLAN

GENERAL SCOPE AND OBJECT

The plan provides for the valuation, consolidation and municipal ownership of all transportation facilities deemed by the transit commission to be useful

and essential. Such facilities are to be acquired without cost to the city by amortizing out of earnings the valuations fixed by the Transit Commission. All existing corporations and their franchises, inter-leases and securities are gradually to be eliminated or extinguished, except such underlying liens carrying a low rate of interest as the commission deems it advisable not to disturb. Existing securities, with such exceptions, are to be replaced by an issue of bonds of a consolidated company representing a fair and honest valuation of the properties. Payment of these bonds with interest, and a sinking fund charge sufficient to retire them within a reasonable period, which will be less than the term of the present subway leases, is to be secured by a purchase money mortgage and assured by a rate of fare based on cost, automatically determined by the condition of a contingent reserve or barometer fund.

Valuations according to existing security issues and present capitalization will be disregarded and the entire financial structure of the consolidated company will be based upon a new valuation, which, under the rapid transit legislation of this year, is rapidly being completed. By this means the "water" in present financing and capitalization will be eliminated and the new valuation will represent the real values in the transportation properties.

In view of the large investment of the city in and its ownership of the existing subway lines, the benefits of a unified system can best be secured through the immediate municipal ownership of all transportation facilities deemed useful and essential in a comprehensive system, and their operation, under effective public control by company agencies to be created for the purpose. If the city authorities shall oppose immediate municipal ownership of the transit system, with its present opportunity to reform completely the existing situation, the commission is prepared to consider the alternative course of vesting title to all properties not now owned by the city, including the subway leases, in the consolidated company, with provision for deferred ownership by the city. Such a course will permit the general features of the plan to be carried out, but will add to the difficulties and tend to impose a higher fare.

CONSOLIDATION

Under the plan, ownership will be acquired by the city without financial outlay on its part. Existing companies will turn in to the consolidated company, and through it to the city, all properties and rights in return for new leases which will provide for amortization out of the earnings of the consolidated system of the valuation fixed by the commission.

The existing, separate systems to be consolidated at the start into three new operating groups to be made up as follows:

Group No. 1: The subway and elevated railroads now operated by the Interborough Rapid Transit Company

and leased by it from the city and the Manhattan Railway Company.

Group No. 2: The subway, elevated and surface railroads now or formerly in the Brooklyn Rapid Transit system.

Group No. 3: The surface railroads of the Boroughs of Manhattan and the Bronx.

The surface railroads in Queens and Richmond, in whole or in part, to be allocated to Group No. 2 or Group No. 3, as may be determined.

Bus lines necessary for the logical development of the unified system to be created and allocated as feeders to the foregoing group. Where necessary or desirable, some of the existing surface lines may be transformed into bus lines.

All existing power facilities to be consolidated and operated for the common benefit of the entire system.

To pave the way for the eventual, complete consolidation into one system, and to secure the benefits of private operation under public control, the Transit Commission will cause to be organized four corporations—"A," "B," "C" and "D" companies—each with a nominal number of capital shares.

"A" company will be the controlling and financial company, and general supervisor of the affairs of "B," "C" and "D" companies, which will be exclusively operating companies. The shares of stock of the operating companies will be owned by "A" company, whose shares in turn will be held in trust by the Transit Commission, or by whatever body may succeed it.

"B" Company will operate under lease the properties embraced in Group No. 1, "C" Company the properties embraced in Group No. 2 and "D" Company the properties embraced in Group No. 3.

General financial control and supervision of the entire system will be lodged in a board of control, which will also constitute the directorate of "A" Company. It will consist of seven members, to be chosen as follows: One each by the board of directors of the three operating companies, "B," "C" and "D," three by the Mayor of the city, and the seventh member by vote of the other six, or, in the event of their inability to agree, then by the Transit Commission or by whatever body may succeed it.

The powers of the board of control are to be those of a financial nature, as above indicated, together with such other powers of supervision and direction as may properly be conferred upon it by the contracts to be entered into. It will be responsible for the distribution and management of all the surplus revenues of the operating companies after payment of their own operating expenses, will have sole charge of the issuing of all securities, will make all payments for interest, and have the custody and management of the amortization, contingent reserve, and other funds.

The functions of the Transit Commission in respect to construction should be vested in the board of control, and from time to time, as experience warrants, all the remaining func-

tions of the Transit Commission, except those involving exercise of the police power, to which the Public Service Commission will succeed, should be vested in the board of control, permitting the abolition of the Transit Commission. Legislation to this end will be recommended by the commission.

THE OPERATING COMPANIES

To provide for the eventual consolidation into one operating company, the board of control will have the power, after a specified number of years, to consolidate further the groups and operating companies provided for under this plan into one or two operating companies, as it may deem best.

It may be noted not only that this control differs from past methods, in that it is placed where it can be exercised most efficiently and economically, but that the city's participation is placed on an equality with that of the private investors, giving the city for the first time real and substantially complete home rule with respect to transit.

If, as expected under the plan, selfish and antagonistic interests are eliminated, and the interests of the city and the company investors made common, it should be possible to have a large part of the detail work now done by the staff of the Transit Commission performed by the staffs of the operating companies, and thus cut down the large force of public employees necessary under present conditions. In view of the base of the interests of the city and the company investors being common, the expenses of the board of control should be treated as an operating expense and paid out of railroad earnings.

The operating management of "B," "C" and "D" companies shall be vested in their respective boards of directors under the terms of their leases. The board of directors of "B" Company shall be elected by the holders of the bonds issued in exchange for the securities and properties constituting Group No. 1. Similarly, the directors of "C" and "D" companies will be elected by the holders of the bonds issued in exchange for the securities and properties constituting Group No. 2 and Group No. 3 respectively. Management will thus represent investment instead of speculation.

MECHANISM OF TRANSFER OF PROPERTIES TO THE CITY

The present subway leases to be reformed or superseded by agreement, so as to abolish all preferential payments and place company and city investments on a parity. Ownership of all subway equipment not already owned by the city to be vested in the city without outlay by the city in return for a new lease.

The reformed subway leases, comprising the Interborough System, together with the lines constituting the Manhattan Elevated Railroad System, to be assigned and transferred, with the consent of stockholders, or, failing

that, by means of foreclosure sale, to "A" Company in exchange for "A" Company bonds, equal in amount to the valuation of the properties of the Interborough and Manhattan Companies, made by the Transit Commission pursuant to Chapters 134 and 335 of the laws of 1921.

These bonds to be exchanged for outstanding securities issued against the properties transferred on terms to be fixed in the final statutory plan and contract, reached if possible by agreement between protective committees of security holders, but otherwise to be determined by the Transit Commission.

Pursuant to the terms of the final statutory plan and contract, "A" Company will forthwith, by appropriate instrument, vest in the city all of its right, title and interest in and to the properties acquired, in return for a lease of the properties transferred, comprising Group No. 1, to "B" Company for operation, under the general terms hereinafter stated.

The bonds of "A" Company, issued in exchange for the properties transferred to it and by it vested in the city, shall be secured by a purchase money mortgage which shall be a specific lien upon the properties transferred and a general lien upon all of the property of "A" Company, including its interest in the leases to the operating companies. These bonds shall bear interest at the rate of five per cent per annum, with an additional one per cent set aside to amortize the valuation as fixed by the Transit Commission. The bonds will be further secured by provision in the final statutory plan and contract for the maintenance of a rate of fare automatically determined to meet at all times cost of operation, bond interest, and one per cent for amortization.

Under conditions hereinafter stated, in order to provide an incentive to efficient and economical management, it will be possible for the bonds to earn an additional one and one-half per cent of interest.

In similar manner the lines now or formerly comprising the Brooklyn Rapid Transit System, surface, subway and elevated (and if it is finally deemed best, the surface lines in Queens and Richmond), will be transferred to "A" Company in exchange for its bonds, equal in amount to the valuation of said properties, as determined by the Transit Commission, which properties shall be by "A" Company vested in the city in return for a lease to "C" operating company upon terms similar to those provided in the case of "B" Company.

In a similar manner the lines now comprising the various surface lines in Manhattan and the Bronx, or such of them as shall be deemed by the Transit Commission to be useful and essential, shall be transferred to "A" Company in exchange for its bonds equal in amount to the valuation of said properties as determined by the Transit Commission, which properties shall be by "A" Company vested in the city in return for a lease thereof to "D" operating company, upon terms similar to those provided in the case of "B" and "C" Companies.

Upon the completion of the amortization period of the purchase money bonds issued by "A" Company, the city's title to all the transit lines will be free and clear of such liens, but the city shall have the right to extinguish the bonds underlying any line or lines at any time after ten years, upon payment of the then unamortized portion of the bonds.

"A" Company shall raise by the issue of notes, or other form of short term securities, sufficient funds for financing the unified system and providing necessary working capital during the early period of its development. Such funds shall be utilized, among other things, for the establishment of the contingent reserve or barometer fund hereinafter provided for. Such additional capital as may be needed for transit construction or equipment, other than that furnished by the city, shall be raised by the sale of new bonds to be issued by "A" Company, as may be determined upon by the board of control.

RATE OF FARE

There shall be no increase in the 5-cent rate of fare, unless, after one year's demonstration of the results of operation of the consolidated system, with its new and many opportunities for substantial economies, an increase is demonstrated to be necessary. Then and at the conclusion of each succeeding fiscal year the rate of fare will be determined automatically by the status of the contingent reserve or "barometer" fund, and shall be put into effect by the board of control. During each year of operation under the plan the rate of fare shall be adequate to provide for cost of operation and interest and sinking fund upon the bonds and other current obligations of the consolidated system, including provision for the maintenance of the contingent reserve or barometer fund.

This will operate as follows:

After payment of operating expenses and fixed charges (the fairness of the amounts of which is insured by the valuation of the properties by the Transit Commission and the control over expenditures by the board of control), the surplus moneys are to be paid into a contingent reserve or barometer fund. If the available surplus keeps this fund above a specified maximum, the fare is to be automatically lowered; if the fund falls below a specified minimum, the fare is to be automatically increased until the reserve is restored.

EXAMPLES CITED

For example: Assume that the normal amount of the barometer fund is fixed at \$25,000,000. If it rises to \$35,000,000, the fare is to be decreased; if it falls to \$15,000,000, the fare is to be increased.

In short, the purpose of this is, after fixing the base of proper valuation and determining the operating expenses and fixed charges, to make the decision as to the rate of fare as automatic as is humanly possible. Upon the new basis the public can be assured that all money expended is properly expended for necessary cost, and the rate of fare,

therefore, will reflect the actual and necessary cost of the transportation that the public gets, uninfluenced by any opportunity of private gain based upon stock ownership.

Transfers on all of the lines of each of the three operating systems will be established at proper points as rapidly as financial conditions will permit.

Each operating company will pay its own operating expense and retain its own maintenance and depreciation reserve as authorized by the terms of its lease, and turn over all surplus funds to "A" Company. "A" Company will pool the moneys so received and distribute same as follows:

(a) It shall pay to the holders of its securities the fixed return prescribed, and to the city the interest upon its rapid transit investment.

(b) It shall pay into an amortization fund the specified rate for the amortization of its bonds, and to the Comptroller of the city of New York a specified rate for the amortization of the corporate stock of the city issued for rapid transit construction.

(c) It shall make good any deficit in the cost of operation in any preceding year sustained by any one of the three operating companies.

(d) It shall out of the remaining surplus maintain the above mentioned contingent reserve or barometer fund.

INCENTIVE FOR EFFICIENT SERVICE

In order to provide an incentive for efficient and economical management, there shall be set aside each year by the board of control out of the surplus earnings of the unified system, after the payment of all obligations and the maintenance of the barometer fund, a

sum to be distributed or used for the joint benefit of the operating personnel of the unified system and the holders of the consolidated company's bonds. This fund, within the limits of the available surplus, shall, for the purpose of computing allotments prescribed, equal three per cent interest on the purchase money bonds issued by the consolidated company. When the amount so available has been determined by the board of control it shall be allocated, one-half for the benefit of the operating personnel as hereinafter indicated, and one-half for the payment of additional interest upon the outstanding purchase money bonds, but subject to the condition that with any increase or decrease of fare above or below the rate of 5 cents, such funds shall be decreased or increased, as the case may be, on the basis of one per cent interest on the bonds with each cent of fare variation.

In similar manner, out of the remaining one-half of the fund referred to, there shall be allocated under the contingencies mentioned a like amount for the benefit of the operating personnel of the unified system, which allocated sum shall be expended under the direction of the board of control for the collective benefit of the operating personnel.

If, however, the board of control so determines, the said sum may be expended under the direction of the board of control to provide benefits, such as insurance and pensions, for the operating personnel and to reward employees who in various groups have, during the preceding year, rendered conspicuously efficient service.

There will be included in the contracts for the transfer of the several lines

to the consolidated company provision for obligations to contract and to creditors and to holders of receivers' certificates of indebtedness, employing for this purpose, so far as can be agreed upon, the bonds and short term securities of the consolidated company, due allowance therefor being made in the price at which the respective properties are to be taken over.

TERM OF LEASES AND AMORTIZATION

The term of the leases shall be for so long as is necessary to amortize the valuation as fixed by the Transit Commission.

All leases to be subject to extinguishment or recapture by the city at the end of ten years upon payment of the then unamortized part of the valuation of the leased properties.

As the amortization funds will be managed by the board of control, on which the city will be adequately represented, their proper and conservative management in the city's interest will be assured. In order, however, to meet the objections to the past management of sinking funds, the final statutory plan and contract will require the adoption of the more clean-cut method of buying or calling in each year a part of the outstanding securities and canceling them. This will wipe out a definite part of the debt each year and, although its cost is somewhat greater than on the compound interest basis, the commission believes that it possesses many advantages. After some years the debt should sufficiently be reduced to ease greatly the cost of meeting fixed charges and thereby pave the way for bettered service or possibly decreased fares.

Fourteen Conclusions of Analysis of Transit Commission on Which Readjustment Plan Is Based

It is the conclusion of the commission that the plan of reorganization should be based upon the following principles:

1. That all existing lines—subway, elevated and surface—should be unified for purposes of future operation, and placed under control of a single supervisory authority in which the operating companies and the city shall participate upon equal terms.

2. That the railway properties still held in private ownership, whether under direct title, franchises, contracts or leases, should, so far as required for the purposes of the unified system, be transferred to the city, their owners receiving in return new securities, based upon the actual value of the lines for operating purposes.

3. That the continued possession of any of the roads for purposes of operation be conditioned upon the acceptance from the city of new leases, granted for restricted periods, and that the revenue derived from such operation be used only for the payment of actual operating costs and the interest and sinking fund charges upon the new securities—plus certain limited percentages of profit allowed when earned as an incentive to good management.

4. That the new securities be amortized in favor of the city, subject to the right of the city to retake any specified one of the lines upon the payment of any then unamortized proportion of the securities.

5. That provision be also made from the revenue of the roads for payment in each year of the interest and sinking fund charges upon the city's investment in the dual subways; as well as upon all subsequent rapid transit investments of the city.

6. That as a condition precedent to participation in the proposed reorganization the preferential allowance of profits granted to any one of the companies as a consideration for rights yielded under previous contracts or leases, as well as any claims based upon the unpaid accumulation of such preferential profits, be given up; and that all inter-company leases or other undertakings covering the use either of lines or equipment be canceled.

7. That the lines retained in the reorganized system be arranged so as to eliminate gradually all duplication of service so that the rapid transit roads will serve the long hauls and the surface cars—or buses—the local and connecting hauls.

8. That only such lines as in the judgment of the commission are adaptable to such a system be acquired, or accorded any value for purposes of such acquisition.

9. That as rapidly as may be possible financially, full and continuous service

be restored upon all of the lines, free transfers re-established and postponed repairs given proper attention.

10. That all train and car schedules be so arranged as to provide adequately for the comfort and convenient service of the traveling public at all hours of the day.

11. That in order further to relieve present conditions, and to provide for the great increases of traffic certain to develop in the near future, immediate provision be made for the planning and building of additional new subways.

12. That provision be made for winding up the affairs of the present operating companies at the earliest practicable time upon the basis of the adjustment suggested, for the satisfactory settlement by them of their current liabilities before transfer of their lines to the city and for the termination of all receiverships.

13. That in order to preserve a unified rate of fare on all the lines, all surplus earnings be pooled and that a proper fund be established, to consist of such surplus earnings and such temporary borrowings as may be necessary, to cover current contingent needs.

14. That the rate of fare shall not be fixed, in any discretionary sense, either by the commission, or by any other authority but that it shall be determined from year to year automatically according to the actual costs of operation.

Recent Happenings in Great Britain

British Railways Returned by Government to Owners—Wages Being Reduced—Motor Bus Trip of 300 Miles

(From Our Regular Correspondent)

The period of control by the government of British railways came to an end on Aug. 15. As noted in my last article the companies anticipated the change by restoring many pre-war facilities. On Aug. 19 the long and complicated railways bill, which has been before Parliament since last May, received Royal assent and became an act of Parliament. It has little or no bearing, however, on street tramways. One of the clauses authorizes the Minister of Transport to grant orders to railway companies for the requisition by the latter of light railways, but by an amendment which was adopted tramways are specifically excluded from the provision of the clause.

THIS year, like last, the government has failed to carry out its promise to pass into law the electricity supply bill, the plea being want of time. The promise now is to try to pass the measure next year. In this bill the owners of electric traction undertakings have considerable interest. The electricity supply act of 1919 is intended to develop the production and use of electricity for all purposes. Under its powers the Electricity Commissioners have delimited large supply districts and the work is still going on. The scheme provides for the formation of a joint electricity authority for each district, consisting of representatives both of public bodies and of private enterprise. The act, however, was passed in a truncated form, and it contains no powers for the electricity authorities to raise capital for the purpose of developing supply. To remedy this defect the present bill was introduced last year and again this year, but the ordinary parliamentary session of 1921 has come to an end without anything further being done. Until a bill of the sort is passed the act of 1919 will remain a dead letter for practical purposes. A great deal of opposition was aroused to the bill apparently because many representatives of private enterprise think that it will increase the present bureaucracy.

Under the sliding scale agreed on some time ago the first reduction of tramwaymen's wages, amounting to 3s. a week, came into operation during August. This was because the official index figure of the cost of living for July had fallen to 119 per cent above the August, 1914, level. The datum line figure is 135 per cent, and there is a reduction of 1s. a week in wages for every five points of a fall. The latest return shows that the index figure has ceased to fall, but it may resume its downward tendency before the next quarterly revision of wages in November.

The advisory committee of the electrification of railways (appointed by the Minister of Transport) has issued its final report. It confirms and supplements the interim report of July last year. The committee does not seek any hard and fast standardization of plant or equipment, but within limits leaves the railway companies to do what they consider best, subject to the approval of the Minister. Regulations will be

issued providing generally for a standard system of three-phase alternating current generation and of direct-current distribution at 1,500 volts from substations, with liberty to use a multiple or sub-multiple of 1,500.

Collection can be either by conductor rail or overhead wire. If a conductor rail is used, it may be either of the top contact or under contact type, and it is to be located 1 ft. 4 in. from the gage-line of the nearest track rail. In the case of the overhead wire conductor its normal situation will be over the center of the track at a height of 3 ft. above the maximum load gage and at a maximum height of 20 ft. above track rail level. No restrictions are placed on the drop in potential in earthed return conductors.

The London street traction authorities, both municipal and company, have succeeded in inducing the Commissioner of Metropolitan Police to reverse his decision that from Oct. 1 no excess passengers would be allowed in tramcars and omnibuses. The police proposal was to go back to pre-war regulations, in spite of the fact that long before the war such regulations had been abolished in most towns in Britain. They are a relic of the horse traction days when cruelty to animals had to be taken into consideration.

A deputation representing both company and municipal undertakings interviewed the assistant commissioner of police in the end of August and pointed out that it is absolutely impossible to run a sufficient number of cars and buses during the morning and evening rush hours to provide seating accommodation for all who want to travel. Some must stand inside or be left behind. It was also shown that the travel habit in London has so grown that it is now the greatest in any city in the world. Moreover, the police have no control as to overcrowding on the underground railways, so that restriction on the tramcars and buses would be unfair. The police promised to give further consideration to the matter and on Sept. 6 the commissioner announced that "straphanging" would be allowed to continue until a sufficient number of vehicles to meet the needs of the public were provided. Probably that means a long time, as it is not difficult to show that the police idea is impracticable. Even if the thing could be done, it would be ruinous financially, as great

numbers of vehicles would be idle except during the rush hours.

During the past session of Parliament a number of applications were made by local authorities to enable them to run motor omnibuses both inside and outside their areas. In a number of cases in the past municipalities have been empowered to work omnibuses outside their boundaries. The local legislation committee of the House of Commons, considering schemes of the kind this year, took into consultation representatives of the Ministry of Transport, and the result has been, as shown in a report by the committee, that it has limited the power granted outside a council's area to such routes as would be extensions of or in connection with existing omnibus routes. The Ministry of Transport is to decide on any claims against the municipalities for reconstruction or adoption of roads in the outside areas.

The extent of the development of the motor omnibus in England, during the summer time at any rate, is evidenced by the fact that the correspondent of a daily newspaper has succeeded in traveling all the way from Dover in the southeast of England to Blackpool in the northwest of the country by motor bus, with the exception of fourteen miles which were covered by tramcar. The journey occupied six days and the aggregate of fares was £2 16s.-6d. The distance in a straight line is nearly 300 miles.

A strong effort is being made by Railless, Ltd., for the extension of the use of the system of trackless trolley cars. In the end of August a representative party inspected the installation at York which has been in operation for about a year. One-man cars are used and the service is highly efficient. The system has worked successfully in a few other towns for some ten years, but has not been widely adopted. The York installation, being so recent, is of the most improved type. I mentioned some time ago that the Birmingham City Council is adopting the trackless system on a tramway route which requires reconstruction.

The *in situ* treatment of the tread of tramway rails has been adopted successfully in various places in England, but has not been found to be of much benefit on the London County Council Tramways. It may be recalled that by the alternate application of heat by a flame and of cold by water the tread of the rail is hardened, so that it wears longer. As neither rail nor paving has to be disturbed, the process has been called the *in situ* treatment. The London tramway undertaking differs from most others in the fact that the magnetic track brake is used as a service brake. The result is that at stopping places where there is a frequent service of cars the rail-tread becomes sufficiently heated by the track brakes to destroy the special tempering produced by the *in situ* process, so that the metal in the top of the rail reverts to something like the temper it would have if not so treated at all.

News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Elevated Road Urged

Proposal at Detroit Referred by Council
to Its Street Railway Commission
—Trackless Trolley Tested

The City Council of Detroit, Mich., has decided to submit the proposition of the Michigan Elevated Railway to the Street Railway Commission for a decision as to the feasibility of the plan and a possible route, with a view to making the elevated line part of the municipal system eventually.

The president of the elevated company appeared before the City Council asking permission to erect an elevated line on Elizabeth Street from the Michigan Central Depot to Woodland Avenue, a distance of about 1½ miles. It was claimed that cars could be operated over the distance proposed in four minutes and that the elevated company could operate on less than a 5-cent fare.

Members of the Council cited the fact that that body was without authority to grant permission for the construction of the elevated line since the city is empowered to build only surface lines. The matter will be cleared up somewhat at the November election since the proposed charter amendment if passed will give the city power to engage in transportation by methods other than surface lines. It was further cited that inasmuch as sooner or later the city railway system will be entirely controlled by the city, it would be better to await the result of the vote on the charter amendment to make sure that the city will have power to acquire the elevated system before granting the permission. The Mayor had decided to abide by the decision of the Council if the plan was approved.

The village of Ford, one of Detroit's down-river suburbs, is without street car service to Detroit, the Detroit United Railway having stopped operating its cars through the village at midnight, Sept. 22. The company's franchise in the village expired last March and when the company failed to grant the demands of the village for more frequent car service, an injunction was obtained restraining the company from operating through the village. Service was stopped by the company before the injunction went into effect. Officials of the village stated that since Detroit would sooner or later have municipal ownership, they did not want to be involved with a thirty-year franchise granted to the company while Detroit is willing to take over the system. If some satisfactory arrangement is not reached by the company and the village by Oct. 13, the company will be required to remove its tracks.

In a statement attributed to E. J. Burdick, assistant general manager of

the Detroit United Railway, it was pointed out that the company had endeavored to reach an amicable settlement, and in good faith offered to operate according to the village's demand for the period of one month, during which time the traffic might be checked. This offer was rejected by the village. The company feels that the village's action is not in accord with the wishes of the majority of citizens.

A new type of trackless trolley has been tried out on a stretch of the municipal line on Harper Avenue in Detroit for municipal street railway officials. It was demonstrated by the Trackless Transportation Company, New York, and known as the Imperial Omnibus.

Arbiters Uphold 60-Cent Rate

Employees of the Schenectady (N. Y.) Railway were upheld in their wage contention when former Mayor J. Teller Schoolcraft, chairman of the board of arbitration, announced on Sept. 22 the board had decided upon a wage of 60 cents an hour—the scale before the company put into effect, on June 1, a 25 per cent cut.

The decision holds that the 60-cent rate shall prevail in Schenectady as long as the company receives a 7-cent fare. Under the decision of the arbitrators, nothing but a reduction in the company's revenue through lowering of the fare would justify a wage cut.

The men submitted the wage question to arbitration last June, accepting the decreased rate of 45 cents an hour with the understanding that if they should be granted more than 45 cents, the award should date back to June 1. About 600 employees are affected. It is said the back pay will amount to more than \$75,000.

The decision is based wholly upon a letter which former General Manager James P. Barnes, vice-president of the Louisville (Ky.) Railroad, is said to have submitted to union officials in May, 1920, guaranteeing 60 cents an hour in consideration of the increase in fares to 7 cents on Schenectady lines. This letter was introduced in evidence at the hearing and was held valid. The majority of the arbitrators held the agreement should be binding upon the company until rescinded.

It is apparent from the decision and opinion of the majority that no weight was given to other evidence introduced, such as living costs and increased costs of operation and maintenance. Both sides agreed to abide by the decision at the time the question was submitted.

The scale on the United Traction Company's lines in Albany, Troy, Watervliet, Cohoes and Green Island now is 45 cents.

Philadelphia Wages Cut

Present Reduction One Cent an Hour—
This and Previous Cut Save Com-
pany Large Sum

The employees of the Philadelphia Rapid Transit Company agreed on Sept. 24 to accept a reduction in wages of 1 cent an hour. The cut will become effective on Oct. 1. The Co-operative Welfare Association, the employees' organization, computed the amount of the drop and fixed the effective date.

This is the second wage cut accepted by the employees in five months. On May 1 they agreed to a reduction from 72½ cents an hour to 65 cents. The last drop represents an 8-cent decline in the hourly rate from the peak wage standard set in the post-war period. The cut now about to go into effect was delayed from Aug. 15 to Oct. 1 to compensate for the delay in the wage adjustment upward occurring at the time of the earlier advances in the war-time period.

An official statement made by the company says:

The Buffalo wage adjustment was in general 5 cents an hour for all hourly rate occupations. Under the four-city average a reduction of 5 cents per hour in one city would represent a reduction of 1¼ cents applied to Philadelphia, but as we have not observed the fraction of ¼ cent an hour in our rates of pay, the reduction in Philadelphia on account of a 5 cent reduction in one of the four cities would be made 1 cent per hour.

In the monthly rate clerical occupations in the general offices and also in the clerical and supervisory monthly rate occupations at the depots, shops, yards, etc., in Buffalo these occupations did not participate equally with the trainmen and other operating department occupations in the war-time wage increases, so that the adjustment at this time in these rates in Buffalo is less than the reduction in the hourly rate occupations and was fixed generally at \$5 or \$2.50 per month.

Reductions of \$5 or \$2.50 a month in one of the four cities would, under the four-city average, produce a monthly reduction in Philadelphia of \$1.25, or 62½ cents respectively. P. R. T. adjustments in monthly rate occupations have been made by the \$5 unit, and while it may at any time be decided that a smaller unit, say \$2.50, would be proper, yet in this instance where the monthly reduction would be but \$1.25 or 62½ cents, the clerical and supervisory monthly rate occupations should not at this time be reduced as a result of the recent Buffalo wage reduction.

Resolved, That in accordance with the wage reduction of 5 cents an hour made effective in Buffalo on Aug. 15, 1921, the hourly rate occupations in Philadelphia be reduced 1 cent an hour, effective on Oct. 1, 1921.

The rate of wages in Philadelphia is governed by the standard in four other cities—Buffalo, Cleveland, Detroit and Chicago. The average in those cities fixes the wage paid in Philadelphia.

Trackless Trolley for Windsor.—The Hydro-Electric Power Commission of Ontario, in response to a demand for extensions to the electric railway system at Windsor, Ont., purchased two years ago from the Detroit United Railway, has decided to try out the trackless trolley.

Women Demand Settlement Insist That Electric Railway Service Shall Be Restored in Des Moines at Once

Business women in Des Moines, Iowa, took a hand in the railway muddle during the week ended Sept. 24, when a group of them went before the City Council with a demand that the Council take some action to relieve the situation at once. The delegation representing the ladies had more than 5,000 signed ballots expressing the wishes of that number of business women and school teachers as to the settlement of the traction problem.

The ballots asked for an expression on four different phases of the transportation question in a canvas lasting two days, 5,538 ballots were secured, and of this number all but nineteen voted for the re-establishment of electric railway service. Only sixty-six voted for buses as against street cars and 238 expressed themselves as being against an immediate 8-cent fare. As to the question of the immediate re-establishment of electric railway service 99 were opposed while the remainder felt that the need was critical.

Miss Luella Clark, spokeswoman for the delegation, told the Council that Des Moines "is facing its most critical situation now." She said:

We have been exposed to unusual and extraordinary risks until we are tired of it. The buses are inadequate. What we women want is adequate and decent transportation at once regardless of any desire of Mr. Harris to make us wait, or of any group of business men to teach us a lesson.

We have believed that you were not certain of the feeling of the majority of persons who were dependent upon city transportation, and that is the reason that this vote has been taken. Ballots were distributed to women who work downtown and to school teachers to secure tangible expressions as to the feeling of the women.

At the conclusion of the address to the Council by Miss Clark she and the twenty-five women who accompanied her were told that a determined effort would be made to start cars as soon as the franchise has been voted upon by the Council. It was the opinion of the Council that there were possibilities of appealing to Judge Wade to order restoration of service at the time the Council acted upon the franchise.

Corporation Counsel Miller was called out of a sick bed to attend the Council meeting. He told of a three-hour conference attended by M. Haddon McLean, president of the Des Moines City Railway; J. G. Gamble, attorney for the company, and himself, at which the financial provisions of the proposed franchise were discussed.

Judge Miller outlined to the Council and the business women the franchise situation as it exists today and stated that it will require \$1,500,000 available immediately to place the company in a position to restore service in full at once. Judge Miller also called the attention of the delegation to the fact that without an order from Judge Wade of the Federal Court the Council was powerless to restore service.

After waiting upon the Council the delegation of women visited F. C.

Chambers, general manager of the railway, and placed their case before him. Mr. Chambers was unable to give the women any definite encouragement as to restoration of service before the franchise difficulties were ironed out.

Union employees of the company indicated that they would contest certain provisions of the franchise suggestions made by Corporation Counsel Miller, particularly the arbitration clause and the one-man-car clause. Objection filed with the City Council by C. C. Putnam, attorney for the executive committee, proposed that the old arbitration clause be inserted in the new grant or that acceptance of the current contract between the company and the men, be made a condition of the franchise.

United Traction Strikers Appeal Contempt Judgment

John F. and William H. Murray have taken an appeal to the Appellate Division from the decision of Justice Charles E. Nichols adjudging Henry Carrigan and John Carr, former employees of the United Traction Company, Albany, N. Y., guilty of contempt of court. They were charged by the company with wilfully disobeying the injunction order granted by Justice Harold J. Hinman forbidding striking employees from interfering with the present workers, patrons or property of the company.

It was alleged they assaulted one of the men who has been on strike after he returned to work in Cohoes. The case was heard by Justice Nichols in Schoharie County. Carrigan was fined \$100 and Carr \$50, each to serve thirty days in jail if the fines were not paid. The Appellate Division expected to adjourn on Sept. 27 and it is improbable the appeal can be heard at this term.

Stone & Webster Approve Franchise

The proposed franchise for the Houston (Tex.) Electric Company meets with the approval of the Stone & Webster management and if the people should approve of it at the coming election on Oct. 4, the company will immediately begin improvements to the system amounting to \$1,000,000.

This statement was recently made by Luke C. Bradley, district manager at Houston. Mr. Bradley said that though there was financial depression he believed that the company could borrow the necessary money and that securities would be offered for sale which would establish co-operation between the people of Houston and the city in the development of its electric railway.

As referred to in the ELECTRIC RAILWAY JOURNAL of Aug. 27 the new franchise provides for certain changes and an extension of fifteen years from 1935. Valuation of the property of the Houston Electric Company has been placed at \$6,000,000 plus any capital expenditures since March, 1920. The new franchise provides for earnings of 8 per cent on agreed valuation.

Disagreement Delays Franchise Settlement

While the possibility still exists that some way will be found to get the Grand Rapids (Mich.) Railway out of the difficulties that beset it, the Council and the company appeared on Sept. 22 to be deadlocked over the matter of the valuation to be included in the new franchise for the company first taken up for consideration last February.

The city persists in sticking to a historical valuation of \$4,634,757 with enough additional as going value to bring the total amount up to \$5,076,000. This figure the company considers wholly inadequate. In a spirit of helpfulness the railway pruned its original figure to \$6,500,000 and then to \$6,270,000 as a final value. Thus the city and the company are still more than \$1,000,000 apart. The alternative has been proposed of submitting the matter to the Railroad Commission for decision, but the need for immediate action would seem to preclude this proposal being accepted, particularly as the commission would probably have to go over the whole case.

L. J. De Lamater, vice-president and general manager of the company, insists that the railway shall be allowed a valuation that will at least cover the bonded indebtedness. If the company is granted a new franchise it will agree to pay no dividends on its common stock for three years. It is now behind \$350,000 in the payment of dividends on the preferred stock. As to the financing necessary at the present time, the company is willing to submit its financial program to the city for approval.

The suggestion has even been made by Mr. De Lamater that the city purchase the road or that it take over the property, operate it at a 5-cent fare and make up any deficit in expenses by a charge against the taxpayers as a whole.

The City Commissioners ignored this proposal at the session of that body at which it was made. Mr. De Lamater said he realized that the proposal was an unusual one, but that "looking on it in a business way it is after all a practical idea."

Wage Conference Suggested at Richmond

Thomas S. Wheelwright, president of the Virginia Railway & Power Company, Richmond, Va., has addressed a letter to the members of local Amalgamated Association notifying them that he could not obligate his corporation to continue the present wage scale agreement for another year and suggesting that they appoint a committee to confer with him regarding a new contract.

The company now pays conductors and motormen from 43 to 47½ cents an hour on cars requiring both a conductor and a motorman, and 52½ cents an hour to the operator of a one-man car. A beginner gets 43 cents an hour and 47½ cents after he has been in the employ of the company one year.

Transportation Costs Sought Massachusetts Body Inquiring Into Matter Under Instructions From Last Legislature

In its effort to determine the comparative cost of different methods of transportation of passengers over the public highways, which the Legislature has instructed it to investigate, the Massachusetts Department of Public Utilities held its first public hearing at Boston, Mass., on Sept. 22. The hearing went into generalities, in which the Public Utilities Department itself and the electric railways were charged with having stifled the jitney service.

The principal aggressor was Senator Gardner W. Pearson, Lowell, who contended that the Public Utilities Depart-

divided responsibility, as is the case with two men, where one neglects a detail because he relies upon the other to attend to it. In addition to this the one-man car cannot start before the door is closed, and the door of the car cannot be opened before the car has stopped.

As to cost Mr. Kellogg explained that rapid transit must be provided, with its necessary heavy cost of construction, where the traffic density is great, 65,000 passengers going each way hourly, as in New York. On the other hand the motor bus is the best out in the suburban section where there are only a few passengers to move, because the initial cost of the motor bus is small and the flexibility of the service permits of its use elsewhere between the traffic peaks.

Pay of Laborers Cut

The wages of 300 common laborers employed by the Portland Railway, Light & Power Company, Portland, Ore., were reduced approximately 20 per cent recently, when an arbitration board of three, appointed to settle a dispute between the employees and the company, made a report. The old maximum wage was \$4.40 a day or 55 cents an hour for an eight-hour day. Under the new schedule, 47½ cents an hour will be paid to employees who have been in the service one year or more; 45 cents will be the maximum wage for men in service of the company six months; and 40 cents an hour will be the wage of those in service less than six months.

The board of arbitration requested, however, that all men now employed as common laborers who had been in the employ of the company less than six months be placed in the 45-cents-an-hour class. The majority report said:

The continuance of wages on a war-time schedule unquestionably produces unemployment. This fact was among those considered in arriving at a decision. The majority members of the board believe that general prosperity cannot return until general liquidation has been accomplished and wages, foodstuffs, merchandise, rents and all other basic elements have readjusted themselves to their proper relations. This readjustment must be world-wide.

Suburban Buses Must Serve

By a vote of 4 to 1, the head of the street department alone dissenting, the City Council of Lincoln, Neb., voted Sept. 5 in favor of a suburban bus ordinance which carried as a principal provision the rule that if a bus owner professes to serve he must actually do so. The Council attempts in this ordinance to classify the suburban bus as against the bus running to far-away points and the bus running wholly within the city. There is an ordinance already on the books pertaining to the city buses and there is no attempt to interfere with those coming in from far distant points.

The ordinance provides that suburban bus owners shall apply to the city for a license. They shall answer certain questions and pay a filing fee of \$5. If the Council grants the application, the operator shall give eight consecutive hours of service on seven days of the week if the suburban point is within 10 miles of the city. The ordinance will not take effect for fifteen days. This means that the suburban buses now in operation between Lincoln and Havlock and Lincoln and College View may operate through Fair Week.

Description	Kind of Passenger Traffic	Passengers One Way Per Maximum Hour	Can Only Be	Is Best	Can Also Be
			Handled Economically by	handled by	Handled Economically by
Very light		Up to 3,000	Motor bus	Motor bus	
Light		3,000 to 5,000		Motor bus	Street car
Medium		5,000 to 8,500		Street car	Motor bus
Heavy		8,500 to 12,000	Street car or train		
Very heavy		Above 12,000	Train	Train	

ment was responsible for "the breaking down of the street railway system in Massachusetts." Chairman Henry C. Attwill of the Commission sought in vain to draw some supporting specifications from the speaker.

Only one witness dealt with facts and figures, and after he had spoken the commission closed the hearing, without announcing what form its investigation will take in the future.

The expert testimony offered was by Clarence W. Kellogg, Stone & Webster Company. He discussed mainly the question of safety cars and pictured the different situations which call for various forms of transportation, such as the rapid transit system, the electric railway, the trolley bus and the motor bus, or jitney. His principal point was to show that in its proper place the one-man safety car, shows relatively fewer accidents and a lower cost of settling accidents than the average two-man car. The decrease in accidents per 10,000 miles amounts, he said, to 31.7 per cent.

Mr. Kellogg said that from a study made of seventeen companies carrying 240,642,000 passengers in eleven States, where there were almost as many miles operated by one-man cars as by two-man cars, the number of accidents per 10,000 miles was 3.69 on the one-man cars and 5.40 on the two-man cars. The average accident cost per 1,000 miles on the one-man cars was \$14.77 as against \$16.06 on the two-man type.

These figures on safety seem contrary to the prevailing general idea of the one-man car, and contrary to the argument which operators have used on various occasions against the car. Mr. Kellogg explained that it was but natural to expect more safety on the one-man type car because all the responsibility is thrown upon the operator. There is no opportunity then for

Between these extremes there is room for the regular electric railway and the trolley bus and it might be to the advantage of the street railway to use the several types in order that they may be co-ordinated for an economic handling of all the traffic.

Mr. Kellogg presented the accompanying tabulation, which are British conclusions as to the best vehicle for different kinds of traffic. It is based upon extensive studies in England.

Lower Wages in Effect

Wages of the trainmen of the Indiana Service Corporation, Fort Wayne, Ind., were reduced on Sept. 16 as recorded in the ELECTRIC RAILWAY JOURNAL, issue of Sept. 17.

The new scale in cents per hour for two-man and one-man car operators on the city lines is as follows:

First six months	41
Second six months	43
Second year	45
Third year	48
Fourth year	50

This new scale is 100 per cent greater than was in effect in 1914. The maximum pay for the interurban trainmen will be 48 cents over a spread of three years. The accompanying table gives a tabulation of wages in cents per hour paid to Fort Wayne city operators from 1914 to date.

FORT WAYNE CITY LINES						
Two-Man Cars						
	1914	1916	1917	1918	1919	1920
First six months	19	21	23	30	33	46
Second six months	20	21	23	31	34	48
Second year	21	22	24	33	36	50
Third year	22	23	25	34	37½	53
Fourth year	23	24	26	..	..	55
Fifth year	24	25	27	..	..	..
One-Man Cars						
First six months	..	..	25	33	36	46
Second six months	..	..	25	34	37	48
Second year	..	..	26	36	39	50
Third year	..	..	27	37	40½	53
Fourth year	..	..	28	..	..	55
Fifth year	..	..	29	..	..	..

Wages and Fares Coupled

Mobile Company and Employees Will Put Both Questions Up to Commission in Future

Another railway company—this time one in the far Southern State of Alabama—has found a means of putting squarely up to the public regulating authorities the necessity and responsibility for recognizing the wage problem in connection with a determination of rates. The Mobile Light & Railroad Company, through its president, J. Howard Wilson, has recently concluded a new temporary wage agreement with its union employees, which agreement contemplates a future wage adjustment by the Alabama Public Service Commission, at the same time that body undertakes to fix a new rate of fare.

TEMPORARY SEVEN-CENT FARE

The Mobile Company is at present operating on a temporary 7-cent cash-fare basis, with tickets at 6 cents. This rate was granted for two years, which period will expire on April 14, 1922. At that time it will devolve on the commission to fix a new fare. The law of Alabama requires that rates so fixed shall be sufficient to permit the utility to furnish adequate service, to maintain its plant, facilities and equipment in good order, and to enable it, in addition to other legitimate expenses, "to earn a fair net return on the reasonable value of its property devoted to the public service."

The new temporary wage agreement just consummated, effective from Sept. 1, provides for a reduction in the wage scale of 41, 43 and 48 cents an hour, for first, second and third year platform men, respectively. The previous rate was 43, 45 and 50 cents. The differential for operators of one-man cars was reduced from 5 to 4 cents an hour. Carpenters, machinists and blacksmiths were reduced 6 cents an hour. This scale is to continue in effect until April 15, 1922.

NEW RATE TO BE SOUGHT IN APRIL

Meanwhile, as provided in the new agreement, the railway is to request the commission to fix the new rate of fare to succeed the present one after the middle of April, while the employees are to place their wage question before the same body, requesting it to fix a scale of pay which "will be fair, just and impartial to the company and its employees, as well as to the riding public."

The commission will be asked to give due consideration to the cost of living, and to wage scales in effect in other cities for electric railway employees, and both the company and the employees have agreed to be bound by whatever decision the commission shall arrive at, and for whatever period the commission shall determine.

It is understood that if the Alabama Public Service Commission agrees to undertake the responsibility of fixing a wage scale in this instance, it will be

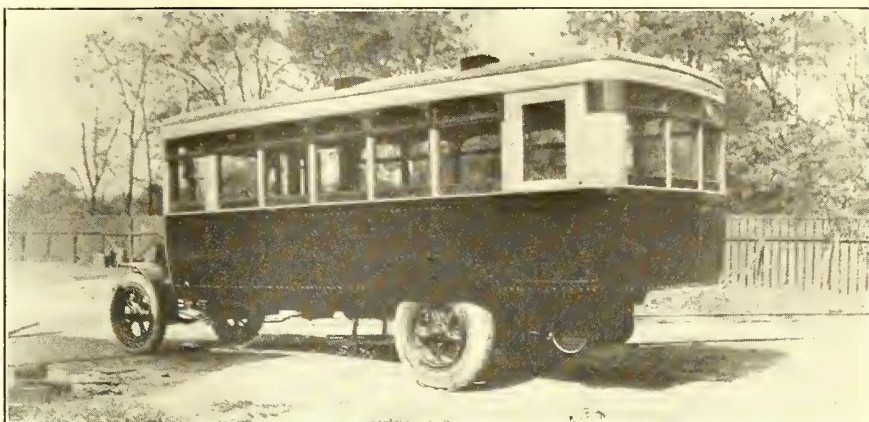
through voluntary action on its part, for there is no provision in the law for such procedure.

Auxiliary Motor Bus Lines to Akron Railway

Announcement is made by A. C. Blinn, vice-president and general manager of the Northern Ohio Traction & Light Company, Akron, Ohio, that auxiliary bus lines are to be established by the company in Akron within a short time. An initial order for three closed steel motor bus bodies has been placed with the G. C. Kuhlman Car Company, Cleveland, Ohio.

It is expected that additional buses will be purchased by the company as rapidly as traffic demands. It is also probable they will be utilized in Canton and Massillon, where the company has side lines connecting with its inter-urban lines between Uhrichsville and Cleveland.

The buses will seat twenty-five passengers and in addition will have room for ten or fifteen standees. The entrance



PACKARD-KUHLMAN BUS TO BE USED IN AKRON

is on the right hand side at the front. Folding doors and steps are a part of the equipment. The buses are to be lighted by electricity. There will also be a buzzer system with push buttons at each side post. They are equipped with regulation heaters, and fare boxes will be established at the right of the driver against the railing. The color is to be of a maroon with the name of the company in gold letters on each side.

The seats are to be upholstered in leather of a dark green color; floors are to be covered with linoleum. Window screens are attached to the bottom of the side and rear windows, all windows having inside curtains. Both cross and longitudinal seats are to be used.

The chassis is made by the Packard Motor Car Company, is to be equipped with approved type of wheels and pneumatic tires. The drive will be left hand. The springs are to be of longer and easier riding construction than used in ordinary commercial service. The cost of the new bus complete is approximately \$8,000.

First delivery of three buses is promised by the Kuhlman Car Company within eight or ten weeks.

Omaha Wages Cut

Trainmen Reduced About 12 per Cent Following Suggestion of Railway Commission

The Omaha & Council Bluffs Street Railway, Omaha, Neb., announced a reduction of approximately 12 per cent in the wages of trainmen, effective on Oct. 1. The scale which has been in effect is 53 cents an hour for the first three months of service; 55 cents, next nine months; 57 cents after first year of service. The new scale will reduce those rates per hour to 46, 48 and 50 cents, respectively.

This action by the company is pursuant to a recent recommendation by the Nebraska State Railway Commission. Other reductions will be made in the various departments, with the exception of the clerical staff, whose pay was not materially increased during the period of the war. The company said:

The Nebraska State Railway Commission suggested, in view of the company's falling off of revenues during the last year, on account of business depression and unemploy-

ment, and resulting in a decline of passenger traffic, as an alternative instead of decreased fares at this time, a policy of economy, the prime factor of which is a reduction of wages.

The directors recognized instantly, of course, the force and logic of the commission's utterances, and naturally had not, therefore, been unmindful of what you and everyone has known, that wages everywhere are being reduced from the abnormal war standards.

The reduction is in line with the suggestion of the State Railway Commission, and is based upon the average reduction found reasonable for steam railway employees by the United States Railroad Labor board.

It is a smaller reduction than the average reduction brought about last spring for packing house employees. It is likewise a much smaller per cent of decrease than taken by other employees of Omaha generally and employees generally throughout the industries of the nation.

Compared with reductions in the pay of street railway employees in other cities the reduction made by this company is less than the average reduction, which average, in these other cities is about 15 per cent. In some of the cities street car employees' wages have been reduced as much as 20 to 28 per cent.

Shortly before the war the Omaha company increased the scale for carmen from 28-33 cents an hour to 33-35 cents an hour. Then a further increase was made to 35-40 cents, following which occurred a strike a year ago last winter. Negotiations resulted in another increase to 51-55 cents and a year ago the scale of 53-57 cents was established.

\$15,000,000 Development Awaits Change in Public Sentiment

The Virginia Railway & Power Company has begun work on a new dam in the Appomattox River at Petersburg, replacing a very old dam which was abandoned some years ago and increasing the amount of power available in the Petersburg industrial district. This district includes the wonder city of Hopewell, built by the DuPonts during the war. Although Hopewell was a "war baby" it now gives promise of permanent manufacturing stability. The new installation will cost about \$75,000.

Some years ago elaborate plans were prepared for the development of the water power in the Appomattox River. It was then proposed to acquire more than 30,000 acres of land to protect the riparian rights, and build one or more large dams some distance above the city, the work to cost in all more than \$2,000,000. These plans were held in abeyance during the war period and may be abandoned because the cost of capital to carry out the undertaking is considered prohibitive. To finance the extension now being made it has been necessary to borrow money at 10 per cent, although the success of the undertaking is assured in advance.

Thomas S. Wheelwright, president of the Virginia Railway & Power Company, said on Sept. 27 that the company has for some years had in mind a general plan for the development of water power in the Rappahannock River at Fredericksburg, the James River at Richmond, the Appomattox at Petersburg and the Roanoke at Roanoke Rapids, N. C. Surveys were made of the watersheds of these four rivers to ascertain the average volume of water and the extent of the fall. Preliminary estimates were that the whole cost would be in the neighborhood of \$15,000,000, an amount impossible to raise, according to Mr. Wheelwright, until times change and until there is a decidedly different attitude on the part of the law-making and regulatory authorities toward such investments.

Preentious Bus Proposal Made in New York

A description of 100 bus routes to cover all five boroughs of New York City and over which it is proposed to operate 2,000 buses has been sent to the Board of Estimate by Benjamin Shepard, an attorney, of 154 Nassau Street, acting for Austin P. Fox of the City Transit Company. The company made application for franchises several months ago, and was asked for more specific information as to the routes and the type of bus.

In a letter accompanying the description of the routes Mr. Shepard says the buses can be put in operation within thirty days after approval of the franchise by installing from 100 to 500 buses, and a like number every thirty days thereafter. The fare would be 5 cents on the main lines, with transfer privileges, and 1 cent on each of the four bridge local lines. The average

cost of the buses, which would be of single and double deck types, would be \$10,000, and the entire outlay for buses more than \$20,000,000.

Mr. Shepard would not give the names of those who are to furnish capital for the enterprise.

Vancouver Residents Inconsistent

Following the rejection of a service-at-cost franchise by the City Council of Vancouver, B. C., petitions have been lodged with the Council by residents of various districts for extensions to the British Columbia Electric Railway's lines and improvements to service. The reply of W. G. Murrin, assistant general manager of the company, was that not a cent can be spent on improvements until the affairs of the company are so stabilized that it can raise money. The City Council threatens to put on motor buses. On one of the proposed lines, the first requirement of a motor bus or jitney service would be the paving of a mile of street, an expenditure which the city is not likely to incur at present.

Report of Traffic Survey Made in Nashville

The traffic survey report of Nashville, made by Ross W. Harris, consulting engineer at the instance of the Tennessee Public Service Commission jointly for the City of Nashville and the Nashville Railway & Light Company, has been submitted to these bodies with recommendations and suggestions for the elimination of vehicular and car congestion in the city.

Among the suggestions made were the shorter routing of cars on the longer lines, the elimination of parking of autos on certain narrow streets, the extension and opening of several of the business streets, the rerouting of cars on certain lines, new construction and transition of certain tracks. Mr. Harris said:

The streets of Nashville in the downtown districts are extremely narrow and afford insufficient capacity to accommodate the traffic as now regulated. It is observed that the parking of automobiles on certain streets in the downtown district has been extensively practiced and thus valuable street capacity is utilized by stationary vehicles greatly to the interference of street car passage and other moving bodies.

Since the report has been submitted the City Council of Nashville has passed a bill prohibiting the parking of autos and other vehicles on certain downtown streets, except during early morning hours to 7 a.m. and late evening hours from 7 p.m. This has helped considerably in giving a freer flow of traffic, thereby enabling the electric railway cars to make routes on better schedule.

In regard to the central transfer station which is in use in Nashville, Mr. Harris points out its advantages, but reports it is inadequate in size properly to serve the public, its facilities having been exceeded by the traffic demands. At the present time all electric railways enter and leave this central station.

Montreal Wage Reduction Held Not Unreasonable

The wage reduction of 12½ per cent put into effect by the Montreal (Que.) Tramways in August is likely to remain in force without further protest from the employees, as the result of the award of a board of arbitrators announced on Sept. 24. The board was granted by the Dominion Department of Labor on the application of the union, the department naming a chairman, the men choosing a representative, and the department then nominating a representative for the company after the latter had failed to take any action to do so.

The hearings before the board consisted entirely of evidence submitted by the men in opposition to the reduction, the company not recognizing the existence of the board in any way.

A majority award made by the chairman, Judge Bazin, and the department-appointed representative of the company, A. P. Frigon, held that in view of lowered living costs the company's financial position and the existing industrial crisis, the reduction is not unreasonable.

A minority report by A. Brossard, K. C., the union's representative, dissented and recommended that the scale in force before Aug. 16 be restored.

Both reports were discussed at a meeting of the union, held after the announcement of the award, and although the men refused to accept the majority award and claimed to be victims of injustice, no definite steps were taken further to oppose the reductions. The prevailing opinion is that in view of depression and unemployment conditions, the operatives will decide to let matters rest as they are.

Insufficient Notice of Wage Reduction

The order of the receiver of United Railways, St. Louis, Mo., reducing the wages of about 125 electrical workers from 10 to 15 per cent below the existing scale of from 55½ to 84½ cents an hour, has been held up by Judge Lamm, special master in the United States District Court, who found that sufficient notice had not been given the employees.

It was held that the wage award made to the employees by the Missouri Public Service Commission, sitting as a board of arbitration and effective Sept. 1, 1919, was a contract and could not be terminated by either the receiver or the electrical workers without giving sufficient notice. The receiver had posted a notice in August that the new wage scale would go into effect on Sept. 1. The master held that if a new notice were posted before Oct. 1, the wage cut could become effective on Nov. 1. This notice has been posted.

The city of New York has announced a public demonstration of the trackless trolley between Meiers Corners and Linoleumville, Staten Island, Oct. 8.

Financial and Corporate

Drastic Reorganization

Stockholders and Unsecured Creditors of Interurban Railway Completely Wiped Out

Companies are being organized in both New York and Pennsylvania to take over the properties of the Western New York & Pennsylvania Traction Company sold under foreclosure some time ago. These companies will be merged into a single corporation under the name of the Olean, Bradford & Salamanca Railway. It is expected that the new securities will be available for distribution shortly after Oct. 1, but the plans for the reorganization are subject to approval by the Public Service Commissions of both New York and Pennsylvania.

The reorganization is a drastic one in the sense that if the plan now proposed is carried out, the stockholders and unsecured creditors of the old company will have no interest or share in the new corporation. The entire electric railway property will be owned by the depositing bondholders.

Under the new plan the fixed charges of the new corporation will be substantially reduced. It is proposed to raise \$224,000 from the old first and refunding mortgage bondholders, or in the event of their failure to provide the necessary funds, it is intended to sell such securities on the same terms to an underwriting syndicate. The money will be used for such cash requirements as are necessary in connection with the purchase of the property.

As part of the foreclosure proceedings the property of the Western New York & Pennsylvania Traction Company in New York was purchased on behalf of the bondholders' committee at public sale on June 4, and the property in Pennsylvania was similarly purchased on June 15. Of the total of \$2,240,000 of bonds outstanding \$2,066,000 were deposited under the protective agreement.

The capitalization of the old company exclusive of \$1,000,000 of common stock was \$4,067,255, consisting of \$92,000 of first mortgage bonds of the Olean Street Railway (Bolivar Extension), \$136,000 of first mortgage bonds of the Olean Street Railway, \$2,240,000 of first and refunding 5 per cent bonds, \$599,355 of 6 per cent cumulative preferred stock, and \$1,000,000 of 5 per cent non-cumulative second preferred stock.

The capitalization of the new company will total \$4,260,000 consisting of \$92,000 of first mortgage bonds of the Olean Street Railway (Bolivar Extension), \$136,000 of first mortgage bonds of the Olean Street Railway, \$224,000 of first and refunding mortgage 7 per cent bonds Series A, \$1,120,000 of 7 per cent non-cumulative preferred

stock, and \$2,688,000 of common stock. Each depositor under the protective agreement dated April 19, 1920, for each \$1,000 of bonds of the present company with all coupons attached since Jan. 1, 1920, is to receive \$200 of common stock of the new corporation, whether or not the depositor has purchased the bonds and securities of the new corporation, and in addition to receiving the \$200 of common stock each depositor is to be entitled on payment of \$100 to purchase \$100 of first and refunding mortgage 7 per cent bonds, series A; \$500 of 7 per cent non-cumulative preferred stock, and \$1,000 of common stock.

Toronto Purchase Arbitration Hearings Continued

W. J. Hagenah, Chicago, expert for the Toronto Railway, continued his evidence before the Board of Arbitration last week much along the same lines as the previous week's testimony. Dealing with the value of track and roadbed, Queen Street was given the general value of 70 per cent; the track on Ossington from Queen to Dundas was found to be perfect and set down at 98 per cent of original value, while the average came to 80 per cent. Front Street between Church and Sherbourne, however, was worth only about 20 per cent, from Church to Yonge 60 per cent and from Yonge to York where the track was new it was placed at 95 per cent.

The Gerrard Street line was stated to have a present value of \$101,885, with a replacement value of \$145,509; its condition was 71 per cent new. Harbord between Spadina Avenue and Bathurst was rated at 75 per cent and 70 per cent west of Bathurst. The whole of the King Street line was averaged at 67 per cent, with a present value of \$102,658 and replacement value of \$145,041.

At this juncture W. N. Tilley, K.C., one of the city's counsel, suggested that the city of Toronto was not going to accept the basis of cost of labor and material averaged over the last three years as shown in Mr. Hagenah's report. After some discussion between the Board of Arbitration and counsel no decision was reached. Mr. Hagenah resumed his evidence.

All other streets were treated along similar lines, showing a varying percentage from 55 per cent up to 90 per cent. The board then determined to hear argument as to whether or not the three-year basis of cost should be accepted as the manner of determining the value of the railway plant at the time of taking over by the city of Toronto.

The hearing was then adjourned until Tuesday of the following week.

Segregation Details

Toledo Stockholders to Vote on Oct. 10 on New Financial Plan Separating Properties

Facts additional to those noted in the ELECTRIC RAILWAY JOURNAL for Sept. 24 are now available about the plans which will come up for approval at the special meeting of stockholders of the Toledo Railways & Light Company called for Oct. 10 in Toledo to change the name of the corporation from the Toledo Railways & Light Company to the Toledo Edison Company. Since the segregation of the railway properties in Toledo under the name of the Community Traction Company, the Toledo Railways & Light Company has been solely a generating and distributing company for electric light and power and gas. In connection with the change of name the Acme Power Company, operating a large central generating station in Toledo, will be consolidated with the Toledo Edison Company.

The authorized capital stock of the new company will be \$15,000,000 of common stock, \$6,000,000 of prior preferred 8 per cent cumulative stock and \$4,000,000 of preferred stock 7 per cent cumulative. In addition the company will have an authorized amount of \$13,500,000 first mortgage 7 per cent bonds, due 1941, and the \$1,875,400 of the Toledo Gas, Electric & Heating Company consolidated mortgage 5s, due 1935, will remain outstanding. Upon completion of the financing, the Toledo Edison Company will have outstanding only these two bond issues and will be well supplied with working capital.

Of the stocks of the Toledo Edison Company, the \$12,904,000 par value of common stock, or approximately 93 per cent of the outstanding amount, will be owned by Toledo Traction, Light & Power Company, which also will own \$1,500,000 par value of the Toledo Edison Company preference stock 7 per cent cumulative series A, \$7,925,000, or 100 per cent, of the Community Traction Company first mortgage 6 per cent gold bonds and \$500,000 par amount of the Community Traction Company 8 per cent cumulative preferred stock. Of the \$6,661,675 par value of Toledo Traction, Light & Power Company preferred, \$6,425,410 is owned by the Cities Service Company, and of the \$7,966,250 of the Toledo Traction, Light & Power Company Common stock outstanding, 95.71 per cent or \$7,624,500 is owned by the Cities Service Company. The Toledo Edison Company properties, as well as those of the Community Traction Company, are under the operating management of Henry L. Doherty & Company.

The Toledo Edison Company has sold to a banking syndicate headed by Harris, Forbes & Company, as syndicate managers, and the National City Company \$13,500,000 of its first mortgage 7 per cent gold bonds of the series due in 1941. Those bankers offered the issue at 96½ and interest to yield about 7.33 per cent.

In connection with the financing of

the Toledo Edison Company, the National City Company, New York, and the Union Trust Company, Cleveland, Ohio, have purchased \$2,500,000 of the Toledo Edison Company prior preferred 8 per cent cumulative stock, which is now being offered to investors.

Presentation of Reorganization Testimony Completed

Sanction is being sought from the Public Service Commission of Rhode Island to reorganize the Newport & Fall River Street Railway as the Newport Electric Corporation. The company operates the electric railways in Newport, Portsmouth, Middletown and Jamestown and furnishes electric light in these and other places. The petitioners contend that with the reduction in costs now apparent through the operation of one-man cars and as a result of other economies the new company should be able from the start to meet all the obligations imposed under the proposed plan for refinancing the properties.

Permission is being sought for approval of the issuance of \$160,000 of 7 per cent notes, maturing as follows: \$20,000 on Oct. 1, 1922; \$20,000 on Oct. 1, 1923; \$20,000 on Oct. 1, 1924, and \$100,000 on Oct. 1, 1925, secured by the \$240,000 bonds on deposit. Also an issue not to exceed \$160,000 of 8 per cent notes maturing Oct. 1, 1927. Of this issue \$40,000 is to be paid to the Newport County Electric Company for unpaid interest due on \$240,000 of first mortgage bonds which matured on Aug. 1, 1918, and which are now held by the reorganization committee of the Bay State Street Railway. Of the issue \$120,000 is to be offered to the stockholders at par in proportion of 10 per cent of their holdings and the proceeds up to \$80,000 are to be used to make cash payment on the first mortgage bonds in the hands of the receivers of the Bay State Company.

Frank D. Lisle, president of the company, presented the case before the commission. He outlined in detail the history of the company and its connection with the Old Colony Street Railway and the incidents which led up to the appointment of the receiver of the Bay State Street Railway. He said that the petitioning corporation, the Newport County Electric Company, was the successor of the Newport & Fall River Street Railway, the change of name having been granted at the January session, 1920, of the Rhode Island General Assembly. Mr. Lisle said that under the proposed plan there would be an increase of only \$80,000 in the capitalization notwithstanding that the petition called for the issuance of \$320,000 in new bonds.

After Mr. Lisle had concluded his statement Chairman Bliss of the commission announced that the matter would be taken under consideration, and requested Mr. Lisle to file certain papers and figures concerning the capitalization and valuation of the corporation and its properties.

Syracuse Going Behind on an Eight-Cent Fare

Figures made public by B. E. Tilton, vice-president and general manager of the New York State Railways, Syracuse Lines, and summarizing operations for the four months ended Aug. 31, showed that the local lines during that period ran short \$185,309 of earning surplus, contingencies and the 8 per cent return on valuation fixed by the Public Service Commission.

Total revenues aggregated \$745,677, including \$717,906 from transportation, and total operating expenses amounted to \$648,254, with a net revenue from railway operations of \$97,423. Offsetting this apparent revenue was an item of \$46,058 for taxes assignable to railway operations, leaving an operating income of \$51,365. To this was added the non-operating income of \$1,184, bringing the gross income to \$52,549.

Offsetting this gross income total is an item for \$237,859, representing the amount which should be earned for surplus, contingencies and the 8 per cent return allowed by the commission on the valuation of \$8,919,000, fixed by the commission's finding in the 8-cent fare decision April 19 last.

The gross income shown by the report ran short \$185,309 of reaching the amount which should have been earned by the Syracuse lines during the four-month period.

This deficiency is charged by company officials to the slump in riding which followed the business and manufacturing depression during the same period.

The receipts for August were \$15,111 less than the receipts for the same month last year, despite the 8-cent fare; the receipts for July \$12,500 less than the same month last year, while the receipts for June and May of the current year were respectively \$1,200 and \$30,000 ahead of the receipts for the same month last year. The difference for May is not a fair comparison because during five days in May, 1920 the system was shut down by a strike.

New Jersey Consolidation Disapproved

The application for consolidation of the associated companies of the New Jersey and Pennsylvania Traction Company, operating in Trenton and Princeton, was disapproved on Sept. 24 by the State Public Utility Commission because of the method of the transfer of stock of the companies. The proposed merger included the New Jersey & Pennsylvania Traction Company, the Lawrenceville & Princeton Railroad, the Trenton, Lawrenceville & Princeton Extension Company and the Princeton Street Railway. The New Jersey & Pennsylvania Company is the owner of the other companies, and the consolidation was sought to expedite the handling of the financial and other affairs of the concerns. The parent company has a capitalization of \$1,100,000.

The plan of the company in the pro-

posed consolidation was to reduce its \$500,000 stock outstanding to \$350,000 at par; the outstanding stock of the Trenton, Lawrenceville & Princeton Company amounting to \$200,000 to be reduced to \$132,000; the outstanding stock of the Trenton, Lawrenceville & Princeton Extension Company amounting to \$50,000 to be increased to \$53,000; the \$7,000 stock of the Princeton Street Railway to be reduced to \$5,000.

In commenting on the project the utility board stated:

This is a proceeding which has in the past met with the disapproval of this board. Where the securities of underlying companies are wholly owned by another company with which merger is to be effected, the only procedure necessary in such case is to cancel the stock of the underlying companies.

The board also maintained that where mergers are concerned and stocks are transferred, the securities of a company newly formed must bear a proper relation to the value of the property in the newly formed company after consolidation.

\$71,194,759 Historical Reproduction Cost

Valuation of the properties of the Pacific Electric Railway, Los Angeles, Cal., is placed at \$71,194,759 as representing historical reproduction cost undepreciated by Richard Sachse, chief engineer of the State Railroad Commission in a report made public on Sept. 19. The valuation is of Dec. 31, 1920. Operative property, which is the only part considered in rate making, is placed at \$63,412,675 according to the historical reproduction method. The report consists of three large volumes and represents two years work of the engineering department.

The report will be submitted in the hearing of the application of the Pacific Electric Railway for increase in rates set before the commission *en banc* for Oct. 11. It does not represent finding of value by the commission, it is pointed out, but will be considered together with such other exhibits as to valuation as may be presented at the hearing.

As is usual in those cases two other sets of valuations are made which, under the rulings of the courts, must be taken into consideration by the commission in arriving at present value. These are the historical reproduction cost less depreciation and cost new less depreciation. Historical reproduction cost less depreciation is placed at \$56,372,096, operative property being set down at \$50,752,455 and non-operative property at \$5,619,641.

Reproduction cost new under a five-year period ended Dec. 31, 1920, of both operative and non-operative property is given at \$103,600,000; less depreciation, \$82,700,000. The operative property under reproduction cost new undepreciated is \$92,400,000.

In addition to the valuation report there will be presented at the hearing by departments of the commission reports touching the financial, operating and traffic conditions of the company.

Receivers Seek Right to Abandon Part of Line

Harry A. Dunn and J. Frank Johnson, receivers for the Toledo & Western Railroad, Toledo, Ohio, has filed an application in federal court for instructions with respect to terminating a franchise for the operation of electric railway lines in Blissfield, Mich.

The action is being taken as the result of a movement to pave Adrian Street in Blissfield. The railway has a franchise to operate lines on Adrian Street and it is contended by the receivers that officials of the city are planning to require the company to pave its tracks and 3 ft. on each side of the tracks.

This improvement would cost \$30,000, the petitioners aver, and the company cannot afford to pay it. The receivers declared they had been advised by their attorney that the franchise could be terminated and it is on this matter that a court ruling is sought.

Petition for Indiana Merger Denied

The Public Service Commission of Indiana has denied the petition of the Indiana Electric Corporation for authority to buy seven Indiana public utilities and for authority to issue a total of \$12,100,000 of stocks, bonds and notes with which to finance the purchase and to assume a total of \$8,962,000 liens against two of the selling companies.

In denying the petition the commission said that it is favorably inclined toward the petitioner's project proposing a centralized power plant in the heart of the Indiana coal field, if such a project could be made to provide low-cost current, but that it is of the opinion that such a project could not be carried out along the lines proposed by the petitioner.

Commissioner George M. Barnard, who had charge of the case for the State, wrote the order. He summarized in the following brief statement the reasons why the commission declined to grant the request:

The commission is not unmindful of the possible benefits that might accrue to the citizens of the various communities through the establishment of a central generation plant, serving the consolidated properties. Under the law, however, any consolidation of utility properties must have a proper basis of value, a proper relation between value and securities and a sufficient annual income to carry proper capital charges. Permitting the consolidation on the basis proposed would have capitalized excessive values against the consumers. This, of course, is improper. The petition was, therefore, denied.

Valuation Hearing Postponed.—The hearing of the case of the valuation of United Railways, St. Louis, Mo., before the Missouri Public Service Commission, set originally for Sept. 27 at Jefferson City, has been postponed until Oct. 18, at St. Louis. Col. A. T. Perkins, manager for the receiver, and a staff of engineers, attorneys and accountants are completing the company's case to be presented to the commission.

Financial News Notes

Gold Notes Offered.—Stone & Webster, Inc., New York, N. Y., are offering at 96½ and interest to yield about 8 per cent \$750,000 7 per cent gold notes of the El Paso (Tex.) Electric Company. The due date is July 1, 1925.

Can't Suspend Service.—The Ohio State Utilities Commission recently refused the petition of the Ohio Service Company, Coshocton, Ohio, to abandon service at Uhrichville and Dennison, Ohio. The railway claimed that jitneys were responsible for the loss in revenue suffered by the railway.

Refunding Bonds Offered.—Chandler & Company, Inc., New York, are offering for subscription \$560,000 of Lexington (Ky.) Utilities first lien and refunding 6 per cent gold bonds, Series "B." The proceeds of the bonds are to be used to retire underlying bonds, for extensions and improvements and for other corporate purposes.

Income Considerably Reduced.—For the seven months ended July, 1921, the Twin City Rapid Transit Company, Minneapolis, Minn., realized a net income of only \$372,784 against a net of \$643,670 for the same period a year ago. The gross revenues were \$8,127,194 against \$7,100,242 for the first seven months of 1920.

510,700 Fewer Passengers in Toledo.—The Community Traction Company, Toledo, Ohio, carried 510,700 fewer passengers in August of this year than in July. Street Railway Commissioner Wilfred E. Cann believes that the increased fares in effect since July will make a much better financial showing. He has decided to lay off forty-five platform men to economize on labor.

New Company Elects Officers.—The Savannah Electric & Power Company, Savannah, Ga., organized as the successor under foreclosure to the Savannah Electric Company, has elected officers as follows: President, A. A. Lawrence; vice-president, W. H. Bedgood; secretary, Thomas F. Kearns; treasurer, E. S. Abrahams; directors, A. A. Lawrence, E. S. Abrahams, Louis A. Mills, W. H. Bedgood and Thomas F. Kearns.

May Save Line.—Despite the fact that officials of the Asheville & East Tennessee Railroad, Asheville, N. C., recently announced that service would be suspended on Oct. 1, citizens of Asheville and Weaverville are starting a campaign to raise \$5,000 for the continued operation of the line. One plan suggested is that the property owners along the line pay the railway a tax while others are asked to subscribe to stock.

Profit for Shore Line in July.—The Shore Line Electric Railway, Norwich, Conn., was operated at a profit of

\$7,439 during July, according to a report filed with the clerk of the Superior Court by Receiver Robert W. Perkins. This is the first month in 1921 that has shown a profit. All other months of the year show losses varying from \$1,027 in June to \$6,112 in February. The losses for the first six months were as follows: January, \$3,749; February, \$6,112; March, \$3,264; April, \$2,296; May, \$1,411; June, \$1,027.

Receiver Seeks Court's Instruction.—Application has been made for an order authorizing Rollo Wells, receiver of United Railways, St. Louis, Mo., to pay semi-annual interest due on Oct. 1 on \$9,790,000 St. Louis Transit Company bonds. Interest amounts to \$244,750. Application has also been made for extension of time within which to adopt or renounce contracts entered into between St. Louis Transit Company and Missouri Electric Railroad, Florissant Construction Company, Real Estate & Investment Company and Merchants Express Company.

Abandonment Announced in Spokane.—Discontinuance of service on the Lidgerwood line and removal of its tracks was announced on Oct. 9 by the Washington Water Power Company, Spokane, in a letter filed with City Clerk Fred Kellam. This step, the company states, is taken as the result of the controversy over paving North Division Street, in which the city tried to force upon the company a large expenditure, chiefly for the benefit of its competitors, the jitneys. The abandonment of the Lidgerwood line is the most important step thus far resulting from the releasing of jitneys by the City Council last June.

Public Service Issues Equipment Trust Certificates.—Plympton, Gardiner & Company, New York, N. Y., and Cassatt & Company, Philadelphia, Pa., are offering, at 100 and accrued interest, to yield 7.25 per cent, \$1,540,000 Public Service Railway 7½ per cent equipment trust certificates, series E. The certificates are dated Aug. 2, 1920, and mature semi-annually until 1930. They are secured on the following equipment: 200 safety cars, 100 trail cars, 15 snow plows and 15 snow sweepers. The cost of this equipment was \$2,434,400. The total cash paid was \$894,000, or 36 per cent of the cost of the rolling stock.

Interurban Bondholders Organize.—Thomas H. Jones, Williamson Building, Cleveland, Ohio, is secretary of a committee headed by I. F. Freiberger, vice-president of the Cleveland Trust Company, Cleveland, Ohio, which has been requested by the holders of a large amount of the first mortgage 5 per cent gold bonds of the Western Ohio Railway, Lima, Ohio, to act as a committee for the protection of the bondholders. The bonds mature on Nov. 1, 1921, and the railway will not be able to pay them at maturity. A bondholders' protective agreement is in course of preparation under which the Union Trust Company, Cleveland, is designated as depository. The bondholders are invited to forward their bonds for deposit with the May 1, 1921, and later coupons attached.

Traffic and Transportation

Jitney Problem Solved

Public at Springfield, Mo., Approves Plan of Buses Owned by Electric Railway

Through the persistent efforts of the electric railway management in Springfield, Mo., to provide adequate transportation facilities without the aid of the jitney as a competitor, the bus problem in this city has been solved.

Since 1914 constant effort had been made by the Springfield Traction Company to obtain relief from the unfair and destructive jitney competition, but city officials were reluctant to tackle the proposition. The buses were allowed to run promiscuously and at random at first. Then through an election, they were supposed to be placed under restriction which would confine them to territory not served by the railway. This plan would have produced fairly good results, but the terms of the ordinance adopted at the polls were not observed and as a result the railway was being seriously injured.

The company then endeavored to meet the situation by asking the city for permission to operate jitneys in place of cars on some of its weak lines, the company's buses to enjoy the same liberties as were accorded the privately-owned jitney buses. In this the privately-owned buses seemed to be favored.

As a last resort an initiative election was called in which the people of Springfield were asked to give the railway the exclusive right of operating buses on the streets of Springfield. The election was held on Aug. 2 and the result was a victory for the railway. This phase of the contest is especially of interest for the reason that the jitney bus owners recognized no union and their employees were not organized whereas the railway employees were all members of the railway union and gave their hearty support to the traction company in this election.

Following the election the traction company took over all buses and continued jitney service under the terms of the new ordinance adopted at the election and the plan now seems to be meeting with the general approval of the public.

The ordinance as passed by the people revokes all bus licenses in force prior to the passage of the ordinance and further provides that licenses to operate buses shall be issued only to a corporation duly incorporated under the laws of the State of Missouri relating to street railway companies which at the time of applying must be actually engaged in the operation of a railway system. However, no car lines now being operated shall be discontinued. The fare is 5 cents with regular transfer privileges.

Another important section of the ordinance states that no jitney bus route shall be established or operated in territory now or hereafter adequately served by a street car line, nor shall any jitney bus be required to operate in territory where there is not sufficient patronage reasonably to support it, after a fair trial.

Higher Court Will Decide Fare Issue

City Argues Fare Was Fixed by Contract—Receiver Contends Regulatory Authority Fixes Fare

Decision as to whether the present rates of fare charged by the Receiver of The Denver (Col.) Tramway Company are to be retained or whether the fare shall revert to the 6-cent rate formerly in effect now rests with the United States Circuit Court of Appeals of the Eighth District.

United States District Judge Robert E. Lewis, District of Colorado, on March 10, 1921, held that the 6-cent fare then in effect was confiscatory and issued an order authorizing the receiver to put into effect a fare not in excess of 8 cents cash and two tickets for 15 cents. The city of Denver was also enjoined from enforcing the collection of the 6-cent fare and from interfering with the collection of the higher rates. An appeal from the lower court's ruling in this case was taken by the City of Denver to the United States Circuit Court of Appeals and was argued orally on Sept. 13. John E. Carland, federal judge of Washington, D. C., presided and with him on the bench were Tillman Johnson, federal judge of Utah, and F. A. Youmans, federal judge of Arkansas.

The city of Denver in its brief filed with the higher court asked that the order of the lower court be reversed and that the entire case be dismissed, contending that the lower court had no jurisdiction in issuing the order inasmuch as the fare was fixed by contract and not in pursuance of regulatory authority and that therefore whether or not the 6-cent fare was confiscatory was immaterial and the injunction unwarranted.

The attorneys for the receiver contended that the fare was never fixed by contract but was fixed in the exercise of the regulatory powers of the city and that as a matter of law the city did not have the power or authority to fix a fare by contract but only to fix one by regulation. Furthermore that even conceding for the purpose of precedent that the fare was contractual and that the city had the power so to contract, nevertheless the contract, if ever there was one, was abrogated and superseded by the city when in the exercise of its

police power to regulate it passed an initiated ordinance authorizing a 6-cent fare and thereby changed the rate of fare from the franchise rate.

The case was taken under advisement.

One-Man Car Approved

Operation Indorsed by Milwaukee Safety Commission—Municipalities Cited as Users of Cars

The Milwaukee Safety Commission has indorsed one-man safety car operation in the city of Milwaukee by The Milwaukee Electric Railway & Light Company. The report of the committee to this effect was transmitted to the committee on railroads of the Council on Sept. 2. The commission held that the design and special safety equipment of the 800-type cars, as the safety cars are known in Milwaukee, make them safe in operation, and that from a safety standpoint there could be no objection found to their use.

As reported in the ELECTRIC RAILWAY JOURNAL of Aug. 20, page 299, the commission was asked to investigate one-man safety car operation in Milwaukee following the introduction in the Common Council of a resolution calling upon the City Attorney to petition the Wisconsin Railroad Commission to prohibit this form of operation in the city. The investigation made by the commission was for the purpose of determining whether one-man safety cars and the method by which they are operated are safe for passengers, pedestrians and vehicles. The investigation was divided into three phases—the safety appliances of the car itself, the method of operation of the car, and the results of its operation in other cities.

The safety appliances of the safety car were described to the commission at two of its meetings by H. A. Mullett, assistant general manager of the company, and W. H. Beattys, Jr., of the Safety Car Devices Company. The commission, as an official body, also made two investigation trips on the type of car under discussion, during which the control and air brake equipment of the car was demonstrated by an expert operator. Both of these trips were made under regular traffic conditions.

In addition, individual members of the commission on safety rode the cars incognito under regular operating conditions on the Twenty-seventh and Thirty-fifth Street crosstown lines of the company where one-man safety car operation has been in effect for some weeks. As a result of this phase of the investigation the commission was of the opinion that "the standard (*sic*) safety car known in Milwaukee as the '800-type' embodies every feature that has up to the present time been devised and proved practicable to make street car operation safe."

In addition to the descriptions of safety appliances of the car and of its demonstration under actual operating conditions, there was submitted to

the commission, on behalf of the company, a memorandum prepared by Alexander Shapiro, statistician, giving a survey of the one-man car operation on electric railways in the United States. The memorandum gave the origin and history, extent of past and present use, its advantages, refuted arguments which are as a rule made in attacking one-man safety car operation, and finally discussed the situation in Milwaukee. Stress was laid in this memorandum on the use of one-man safety cars by various municipal railways in the United States and on the favorable accident record of safety car operation. There was also submitted to the commission by The Safety Car Devices Company, a tabulation giving the accident record of safety cars on a number of electric railways in the United States as compiled by the American Electric Railway Association.

The second phase of the Safety Commission's investigation of safety car operation in Milwaukee concerned itself with the actual method of operation of the car. On this point its report says:

Safe operation of all vehicles, to a certain extent, is contingent upon the mental alertness of the operator. This commission has been assured by the electric company that no men are chosen for duty on the one-man cars who have not been with the company at least two years, and in addition have passed special tests to measure their fitness for this particular work.

As exceptional distractions to the operator of a one-man car should tend to increase the accident hazard, the commission made two requests of the electric company:

1. That motormen on these cars would not be permitted to collect fares while the cars were in motion. This guarantee has been given and the order is now in effect. It is the observation of the commission that the order is being strictly carried out by the operators of the cars.

2. The company was asked if it intended to run the "800 type" car with less than two men on heavy traffic lines. Their reply was that most decidedly the cars would not be run with one man on the lines where it is apparent or could be shown that the safety or operation would be in any way inferior to that existing with the present equipment.

With the pledges given by the electric company as outlined above, The Milwaukee Safety Commission believes the one-man standard safety car of the "800 type" to be a vehicle which will not tend to increase traffic accidents, but rather effect a reduction in them, particularly of the numerous so-called boarding and alighting type.

MAKE-UP OF COMMISSION

The Milwaukee Safety Commission is an official body appointed by the Mayor. Its membership consists of a number of local business men, representatives of various city departments such as the police, schools, etc., and representatives of various civic organizations. One of the members of the commission is John Anderson, chief engineer of power plants of The Milwaukee Electric Railway & Light Company.

The 800-type car referred to by the Milwaukee Safety Commission in its report is a double truck car seating approximately fifty-five people. It was especially designed for use in Milwaukee and may be operated by two men or one man. It is equipped with the standard Safety Car Devices Company control and air brake equipment for safety cars. It is an especially light, roomy and attractive car and has been very favorably received by the Milwaukee public.

Jitney Battled for Five Years

Seattle Finally Succeeds in Regulating Pirates Who Are Taking \$350,000 a Year from Municipal Railway

Seattle has won its fight of five years to clear the jitneys from its streets. The possibility does remain of further appeal of the matter direct to the United States Supreme Court, but the decision by the State Supreme Court on Sept. 13 denying the petition of the jitney men for a review of the case by the higher court would appear to be final. Following the Supreme Court decision, the remittitur or final order vacating the McGlothern injunction, which has hitherto protected the buses of the Sound Transit Company, was forwarded to Major Carl B. Reeves, Superintendent of Public Utilities. He immediately notified the jitney drivers that they were to clear the streets of their cars. The order was compiled within an hour's time, and without demonstration or difficulty of any kind. As a result all jitneys have now been removed from city streets, except the six cars allowed to operate as feeders to the Seattle Municipal Railway.

THE only recourse that the jitney drivers now have is a direct appeal to the Supreme Court of the United States, petitioning for a writ of error. In the event the federal tribunal should grant the request for a review of the case, the bus owners might then apply to the State Supreme Court for a continuation of the McGlothern injunction, but would have to post a bond conditioning payment of the damages resulting to the railway from the operation of the jitneys during this delay.

In opposing the application for a writ of review before the State Supreme Court, Corporation Counsel Walter F. Meier demanded a bond for \$300,000, while attorney for the jitneys asked that it be placed at not more than \$5,000.

LOWER FARES IN SIGHT

Following the removal of jitneys, Chairman C. B. Fitzgerald of the finance committee of the City Council announced that he is working on a proposition to reduce fares on the Municipal Railway from 8½ to 6½ or 5 cents. Mr. Fitzgerald is conferring with state accountants, estimating the cost of operating the railway, and projecting into the future possible savings that may be made. He states that the exact amount of revenues coming to the railways as a result of the ban on jitneys cannot be exactly stated until the receipts have been observed over a period of time, but he expresses the belief that these may be sufficient, with other savings, to make a reduction in fares possible.

Since it acquired the railway lines of the Puget Sound Traction, Light & Power Company on March 31, 1919, the city has been particularly energetic in its efforts to rid the municipal railway of jitney competition, which has bitten deeply into the earnings of the lines. D. W. Henderson, general superintendent of railways, on April 23 of this year, advised Mayor Hugh M. Caldwell that on the basis of jitney checks taken in January of this year, the municipal railways would have an increase of revenue amounting to \$350,000, if they could handle all the passengers carried on jitneys for a year, at the 8½-cent fare prevailing.

The battle against the jitneys was started, however, on Sept. 21, 1916,

when an ordinance regulating jitneys was introduced in the City Council. This ordinance authorized the Superintendent of Public Utilities to issue certificates expiring on the last day of each year, indicating the route, terminals and schedule of operation. Appeal from the decision of the Superintendent of Public Utilities was to the Board of Public Works, with further provision for appeal to the City Council. The rates of fare provided were: adult passengers, 10 cents; children under twelve years of age, 5 cents.

On May 11, 1920, an ordinance (No. 40886) was approved regulating jitneys which provided that applications for permits to operate should be investigated by the Superintendent of Public Utilities, who should submit report to the City Council, which, in turn, could either grant or deny the permit. The permits were to specify route, terminals, schedule and rate of fare and the maximum number of passengers allowed to be carried in the car for which permit was granted. Permits were to expire on the last day of the year in which issued.

PREVIOUS OPINION CITED

On June 9, 1920, the United States District Court for the Western District of Washington, Northern Division, in the case of Schoenfeld vs. The City of Seattle (Fed. 265-726) held that the operation of jitney buses on streets could be denied or restricted, on the theory that "the right to use the public streets of a city for the operation of jitney buses thereon as a private business is a matter of privilege, not of right, and can be prohibited by the city, or permitted, under such terms, including the regulation of fares, as the city may prescribe."

On July 6, 1920, there issued out of the Superior Court of King County in the case of H. P. McGlothern vs. The City of Seattle, Restraining Order and Order to Show Cause, which prevented the City of Seattle from enforcing the provisions of Ordinance No. 40886.

On July 6, 1920, the City Council of the City of Seattle adopted the report of its city utilities committee, reading as follows:

Your committee on city utilities recommends: That all applications now pending be denied, and that the reports of the Superintendent of Public Utilities thereon be placed on file. That the Corporation Coun-

sel be requested to prepare such ordinance as may be necessary to prohibit interurban buses from doing a local business within the city limits.

The committee, in making the above recommendation that applications for jitney permits now pending be rejected, which applications were to serve sections of the city already supplied with adequate street car service, wishes it understood that bona fide applications for permits to serve districts now without street car facilities for the purpose of enabling the people of such districts to reach the cars of the Municipal Street Railway and be transported to and from their homes for a 10-cent fare, divided 50-50 between the jitneys and the street railway, will be considered by the committee on their merits when received, bearing in mind tentative routes as follows:

From East Sixty-fifth Street and Ravenna Boulevard to connections with Cowen Park and Ravenna cars at Fourteenth Avenue N. E.; also from Fourteenth Avenue N. E. and East Fortieth Street to the Laurelhurst district; also from Beacon Avenue and Spokane Street to Beacon Avenue and Thirty-ninth Avenue S., and also on Beach Drive from Orleans Street to Bruce Street.

ROUTES OUTLINED AND THEN DROPPED

On July 19, 1920, temporary injunction was granted and order signed in the McGlothern case.

On Aug. 14, 1920, the Superintendent of Public Utilities, as a compromise with the jitney interests, submitted to the City Council various jitney routes, the main purpose of which was to keep them away from the street car lines, thus providing service where there seemed to be a public demand. Owing to the fact that the jitney interests could not come to any agreement among themselves as to the routings to be approved, the whole matter of routing was dropped by the City Council.

On Nov. 2, 1920, there was submitted to the electorate of the City of Seattle a measure initiated by the jitney interests, relating to the operation of jitneys which provided, in a mandatory way, for the issuance by the City Comptroller of permits immediately upon applications being filed and showing being made that surety bond required under Chapter 57 of the Laws of 1915, had been filed with the Secretary of State. The application was to specify the route, terminals and schedule. The vote on this initiative proposition was as follows: For, 24,915; against, 41,364.

On Nov. 17, 1920, the Superior Court disposed of the temporary injunction in the McGlothern case by the entry of a judgment denying a permanent injunction. By appeal to the Supreme Court the city was prevented from enforcing this ordinance.

On April 23, 1921, the general superintendent of the municipal railway advised the Mayor of the City of Seattle that on the basis of jitney checks taken on Jan. 26, 1921, if the street railway could handle all of the passengers carried on the jitneys for a year, at the 8½-cent fare, the railway would have an increase of revenue amounting to \$350,000. The check of Jan. 26, 1921, as compared with the check of Oct. 14, 1920, showed the following:

	Jan. 26, 1921	Oct. 14, 1920
Cars in operation.....	119	90
Passengers carried.....	11,065	8,899
Number of trips.....	1,908	1,633

On April 23, 1921, the general superintendent of railways submitted to the

Mayor a summary of jitney checks taken Saturday, April 16, 1921, and Tuesday, April 19, 1921, which showed 2,455 trips and 16,392 passengers carried.

STATE SUPREME COURT UPHELD CITY'S POWER OF REGULATION

On July 20, 1921, the Supreme Court of the State of Washington, in the McGlothern case, concurred in by five of the nine judges of the court, upheld the city's power to regulate jitneys under Ordinance No. 40886. In this case the Corporation Counsel secured an order in the Supreme Court modifying the terms of the temporary injunction so that there was no legal objection to the city's enforcement of the provisions of Ordinance No. 40886 as to all persons except McGlothern and the intervenors in his case.

On July 28, 1921, the Auto Drivers' Union, Local No. 234, the members of which were not covered by the McGlothern injunction, in a communication signed by its secretary, indicated its willingness to accept the routes and regulations agreed upon by the Superintendent of Public Utilities.

On Aug. 2, 1921, approximately 160 of the 220 jitneys operating in Seattle were advised by the city that they would not be allowed to operate after that date.

On Aug. 3, 1921, eighteen jitney drivers were arrested for operating without a permit and upon trial were fined \$25 each.

On Aug. 3, 1921, the attorney representing the jitneys which had been excluded from the public highways, appeared before the Supreme Court of the State of Washington and endeavored to secure an order allowing them to intervene in the McGlothern case, but their petition as granted was construed by the Corporation Counsel only to allow them to intervene as "friends of the court" and not to grant intervenor's rights.

On Aug. 19, 1921, application for rehearing by the Supreme Court was filed by the plaintiffs in the McGlothern case. The result of the filing of this petition was to keep the temporary injunction in effect.

COMPLAINT MADE AGAINST NON-UNION BUSES

On Aug. 26, 1921, the secretary of the Central Labor Council of the City of Seattle, in a communication to the Mayor, City Councilmen, Superintendent of Public Utilities, Corporation Counsel for the City of Seattle and Prosecuting Attorney for King County, complained that "the union jitney buses were put off the streets while the non-union buses continued to operate unmolested."

The communication further advised:

We feel that a great injustice is being done our members through this action and desire to request that you use your best offices to the end that a square deal may be given the union boys by allowing them to operate until such time as you are in a position to make the order prohibiting them from using the streets to apply to all alike, whether union or non-union.

Chicago Fare Case to Start on Oct. 3

Taking of evidence in the fare case against the Chicago Surface Lines will begin on Oct. 3. Announcement to this effect was made by the Illinois Commerce Commission on Sept. 16 at the conclusion of arguments lasting three days. The companies, through Attorney Harry P. Weber, had contended that the commission had no right to disturb the present situation on petition of the city because of the pendency of appeals brought by the city against the existing fare order. Chairman Smith stated that the commission was not bound by strict rules of pleading observed in the courts. He said the essential issue is the reasonableness of rates of fare charged by the companies and it is the duty of the commission to determine this as soon as possible.

It is likely that the hearings before the new commission will be extensive. The former commission spent more than a year on the case which resulted in the fixing of an 8-cent fare on July 1, 1920, and a valuation last November. The new state and city administrations are pledged to give a 5-cent fare if possible and it has been claimed that this can be done by the institution of economies. The companies have shown by figures that a reduction of even 1 cent in the rate of fare would have to be accompanied by a large wage decrease and that a 6-cent or 5-cent fare is impossible.

Hearings on the question of reducing fares on the Chicago Elevated Railroads were started before the Illinois Commerce Commission on Sept. 27. The company was cited to appear before the commission. This was said to be a surprise to the city authorities who had been centering their attack on the Chicago Surface Lines. The elevated lines have had a 10-cent fare with four tickets for 35 cents since last August. According to President Britton I. Budd this is not an excessive charge and he recently gave out some figures that the company was earning only 3 per cent on the valuation of \$86,250,000 fixed by the former commission.

The statement of President Budd showed that the earnings after operating charges were \$2,590,804 for the year ended June 30. After taking out interest charges there remained only \$102,016, compared with \$97,817 for the previous year.

City Must Respect the Law

Supreme Court Justice Cropsy in Brooklyn has granted an injunction restraining George Cornell from operating a bus line to Far Rockaway from Rockaway, in competition with the Ocean Electric Railway. The court held the bus line is being operated without a proper franchise. Justice Cropsy said:

There is no emergency shown here. It may be that more transit facilities are needed in the section in question, but if so the city should act in accordance with the law and have the service improved. The city cannot and should not proceed in an illegal manner.

Jersey Appeal Concluded

Argument Finished to Permit Railway to Charge Ten Cents Despite Commission Ruling

Decision has been reserved by Federal Judges Rellstab and Davis of the Trenton District and Federal Judge Victor Wooley of Delaware on the application of the Public Service Railway, Newark, N. J., to enjoin the Board of Public Utility Commissioners of New Jersey from interfering with the establishment by the company of a 10-cent fare. Argument was concluded at Trenton on Sept. 26, the case having been reopened to give interested municipalities a day in court as co-defendants.

CITIES ALLOWED TO INTERVENE

Argument in behalf of the municipalities generally was made by George L. Record and Frank H. Sommer. Mr. Record contended that the purpose of the company in the present proceedings is to establish, through the granting of a temporary injunction, a rate based upon the high prices and cost of operation prevailing during the war and the immediate post-war period. Final determination of the proceedings, he predicted, would consume three or four years, and in the meantime, if the company's application prevailed, the public will be compelled to pay exorbitant rates or will be forced to assume the burden of proof in a litigation to force a modification of rates.

E. G. C. Bleakley, as counsel for Camden, made the point that the practical effect of a 10-cent fare will be to decrease rather than to increase the gross receipts and that Camden, as well as other municipalities which tax the company on the basis of receipts, will be a consequent loser. Conceding for the purpose of argument that the company needs additional revenue, Mr. Bleakley said it is for the court to determine whether a 10-cent fare will accomplish that result. Another point urged by Mr. Bleakley was that any rate fixed should not be limited solely to cash fares, but that strip tickets should be issued at reduced rates. The practical effect of this, he said, would be to increase the number of riders and to lessen the delay of collecting fares, especially during rush hours.

At the hearing before the court on Sept. 15 argument by L. Edward Herrmann, counsel for the Public Service Commission, was concluded. He insisted, in short, that due consideration had been given by the commission to all the questions involved in the valuation. Mr. Herrmann sought to have admitted as evidence more than 13,000 pages of testimony taken by the board in the rate case and about 600 exhibits, but the court ruled that only such parts of this record as were pertinent would be admitted.

The methods used by Colonel Black in the so-called Ford, Bacon & Davis appraisal were attacked by the counsel for the commission, but Judge Wooley said that to his mind it did not make

any difference how the board arrived at a valuation. If the valuation was right, it was right and the plaintiff was out of court. If it was wrong, there might be confiscation of property. That was the real question to be settled in the federal court. The issue turned between the valuation of the board and that of the company. Judge Wooley indicated that the desire of the court was to have the utility commission answer in detail the charges of the company.

Mr. Herrmann cited the opinion of Justice Hughes in the Minnesota rate case where it was held that valuation in abnormal times must be a matter of judgment and reason coupled with the cost to reproduce the property. He regarded it as unreasonable that the railway, which never paid a dividend in excess of 3 per cent, should now be seeking a return of 7 per cent.

Attorney-General McCran argued for the State. He contended that the court could not fix a rate, but that the state could. The court could only consider the question whether or not the utility commission had fixed a rate which was confiscatory. Mr. McCran insisted that there had been a return of 7 per cent to the company on stock if proper allowance were made for the rentals paid to the subsidiary companies. In short, he insisted that unless the court decided the members of the commission were incompetent, the court must accept their finding as competent and just.

COMPANY MUST HAVE RELIEF

Richard V. Lindabury concluded the argument for the company and closed the case. He said that the situation was such that unless the court granted relief the company must lose its properties, with great loss to stock and bondholders and inconvenience to riders. He declared it was a matter of mathematics. Prices of all things were more than double while the fare was but a little more. In detail he showed that the increase in the price of labor ordered by the War Labor Board resulted in doubling the wages the company was obliged to pay. He told of all materials increasing in price 200 to 300 per cent and went into the merits of all applications of the company to get "a just and equitable rate" from the utility board, and ended by declaring that the utility board had not risen to the full heights of its duty to protect the company. He defended the action of the company in appealing to the federal court to prevent the confiscation of the property by the rate fixed by the utility board.

The commission recently allowed the company an increase of from 1 to 2 cents on its transfers, but refused to allow more than a 7-cent fare. Instead of taking this ruling to the state courts, the company sought a preliminary injunction in the federal court, claiming the order violated the federal constitution in that it was confiscatory and if allowed to stand the company would be forced into bankruptcy.

Transportation News Notes

Fare Boxes Pay Big.—Fare boxes recently installed on cars of the Community Traction Company, Toledo, Ohio, cost \$90,000 for the equipment and installation. They have paid for themselves twice over in three months, declares Street Railway Commissioner Wilfred E. Cann.

Tokens Will Replace Tickets.—Metal tokens will replace paper tickets on the lines of the East St. Louis & Suburban Railway, East St. Louis, Ill., according to a recent announcement of W. H. Sawyer, president of the company. The tokens can be purchased at the rate of two for 15 cents, the cash fare remaining at 8 cents.

Uniform Stage Rate Authorized.—On Sept. 7 the United States Stage Line, operating between Los Angeles and Imperial Valley points, was authorized by the California State Railroad Commission to place its rates on a uniform basis of 3½ cents a mile. This will result in sixty-three reductions and 21 increases in the stage company's rate schedule according to the announcement of the commission.

All One-Man Cars in St. Thomas.—The St. Thomas (Ont.) Municipal Street Railway has converted all cars for one-man operation. It is claimed that the change has resulted in improved service and financial advantage. Acting under recent provincial legislation the city started a Sunday service this year, but the railway committee has advised Council to discontinue Sunday operation as it is a losing venture.

Louisville Hearing in November.—The City of Louisville, under the direction of City Attorney Joseph F. Lawton and his assistant, is busy preparing the city's side of the argument in the suit which is pending against the Louisville Railway, the city disputing the right of the defendant to charge a 7-cent fare, the collection of which was authorized by decision of Judge Evans of the Federal District Court. The case was carried to the United States Supreme Court and it is expected that a hearing will be set for some time in November.

Jitney Ordinance Upheld.—Judge Dew in the Circuit Court at Kansas City, Mo., on Sept. 17 upheld the city ordinance that requires jitney operators to secure the signatures of 51 per cent of property owners on street over which they operate. The court denied a restraining order that would have prevented the city from interfering with jitney operators under the ordinance and declared the city has full control over streets. Mayor Cowgill followed the ruling with an order to arrest all jitney men violating the ordinance, including those taking "gifts" for rides in cars labeled, "this ride is free."

Personal Mention

Mr. Brown Back in Buffalo

After Four Years in New Orleans He Becomes General Manager of Two Separate Properties

Nelson H. Brown has been appointed general manager of the Buffalo & Lackawanna Traction Company and also general manager of the Depew & Lancaster Railway Corporation, Buffalo, N. Y. These two companies are separate and distinct properties, the Buffalo & Lackawanna Traction Company being in charge of Harry Evers, while the Depew & Lancaster Railway is owned by local interests and has as its president John J. Lenahan, Buffalo, N. Y.

Prior to being identified with these two companies, Mr. Brown was for four



N. H. BROWN

years manager of the New Orleans Railway & Light Company, New Orleans, La., and before going there was for five years general superintendent of the International Railway, Buffalo, N. Y. In all, he has spent twenty-seven consecutive years in street railway work.

Mr. Brown is a native of Tennessee, where he remained until the age of eighteen, when he accepted a position with the New York Central Railroad in the mechanical department at Syracuse, N. Y., in 1891. He continued with the New York Central until 1894 when he entered the street railway field with the Syracuse Rapid Transit Railway as a conductor and motorman. He was subsequently promoted to the positions of station clerk, station foreman and supervisor, when in February, 1907, he resigned to become identified with the Worcester (Mass.) Consolidated Street Railway as general inspector for the purpose of making an investigation of the property.

In September of the same year Mr. Brown was made superintendent of the Worcester & South Bridge Street Railway, which controls several small com-

panies radiating from Worcester. He held this position until September, 1912, when he resigned to accept the position of superintendent, claim agent and roadmaster of the Albany Southern Railway with headquarters at Rensselaer, N. Y.

Mr. Brown remained with the Albany Southern Railway until Jan. 1, 1913, when he was induced to accept a position as assistant superintendent of transportation of the International Railway, Buffalo, N. Y., on account of the broader field of opportunities which the position with that company opened to him. On Jan. 1 of the same year he was promoted to the position of superintendent of the Buffalo division and in November, 1915, was made general superintendent of the company. The International Railway operates all of the street railway lines in the cities of Buffalo, Niagara Falls and Lockport, including many interconnecting inter-urban lines. In 1917 Mr. Brown was transferred from this position to that of manager of the electric railway properties of the New Orleans Railway & Light Company, both of which are subsidiaries of the United Gas & Electric Corporation.

United Electric Official Resigns

Requesting that he be relieved of his duties not later than Oct. 1, Zenas W. Bliss, one of the state's representatives on the board of directors of the United Electric Railways, Providence, R. I., has resigned as president of the corporation. His resignation was received by the directors at their last meeting, but was then laid on the table for action at some future time.

Bank Commissioner George H. Newhall, the other representative of the state on the company's board of directors, was elected secretary and treasurer of the corporation when the temporary officers were chosen. Although he has not yet resigned from those posts, it was said that such action on his part would not come as a surprise.

Mr. Bliss was elected president of the company when the temporary officers were chosen and gives as the reason for his resignation at this time the fact that the affairs of the new organization are now in shape for the election of a permanent president. His letter to the directors is as follows:

As one of the incorporators of United Electric Railways, chartered in 1919, I assisted in the steps taken preliminary to organization under the charter, and was made temporary president upon organization. Later permanent directors were chosen by the stockholders. I was appointed a director by the Governor under the charter provisions, and was retained as temporary president. Authorization for the issue of securities was duly obtained, the properties of the traction system were acquired, and subsequently the properties owned by the Rhode Island Company were purchased.

As all things necessary to be done in

connection with the organization and the transfer of the properties acquired have been accomplished, and the properties are now being operated by the company, it is apparent that the time has come for the election of a permanent president; and I, therefore, hereby tender my resignation of the office of president, to take effect at the pleasure of the board, but not later than Oct. 1, 1921.

Mr. Buchanan Resigns

Will Leave Richmond to Develop and Expand the Trackless Transportation Field

C. B. Buchanan resigned on Sept. 27 as vice-president and general manager in charge of operation of the Virginia Railway & Power Company, Richmond, Va. His resignation was accepted by the board of directors effective Oct. 1. He has been connected with the Virginia Railway & Power Company since its reorganization in 1909 and is known as an expert in railway transportation and operation.

Mr. Buchanan designed and drew the



C. B. BUCHANAN

specifications for the Atlas-General Electric trolley bus which was recently given a demonstration in Richmond and Norfolk and which the Virginia Railway & Power Company expects to introduce there shortly as a commercial venture. He will go into business on his own account, opening an office in New York City for the development of the trackless trolley through the installation of trolibus lines and sales of cars.

Mr. Buchanan expressed the view recently that the trackless trolley was the coming thing in the electric transportation field and said he expected to handle the development of the trolibus throughout the country.

The board of directors of the Virginia Railway & Power Company abolished the office of vice-president in charge of operation, devolving the general duties of that office on the office of President Thomas S. Wheelwright. The office of general manager is divided. John E. Harvell was appointed general manager of the Richmond and Petersburg lines and T. Norman Jones, general manager of the Norfolk and Portsmouth lines.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE
MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES

BUSINESS ANNOUNCEMENTS

Mr. Buchanan entered the electric railway field as treasurer and auditor of the Memphis & Raleigh Springs Railroad, Memphis, Tenn., in 1891. After the sale and consolidation of the city and suburban railways in Memphis two years later, he took up the construction and operation of railways and lighting plants throughout the State of Mississippi and later managed the railway and lighting plant at Meridian, Miss.

Leaving there in 1901, Mr. Buchanan accepted positions as division superintendent of the Richmond Passenger & Power Company and general agent of the Richmond & Petersburg Electric Railway. Subsequently he served the several consolidated companies in Richmond as superintendent of transportation.

MADE HEAD OF RAILWAY PROPERTIES

With the reorganization of the railway and lighting properties in Richmond, Manchester and Petersburg by the Virginia Railway & Power Company in July, 1909, the title of general manager was abolished and Mr. Buchanan was appointed operator of railways with the title of general superintendent of railways. In July, 1911, when the railway, lighting and gas properties of the Norfolk & Portsmouth Traction Company, operating in Norfolk, Portsmouth and Suffolk, were purchased by the Virginia Railway & Power Company, Mr. Buchanan was appointed general manager of the combined properties.

Harry C. Stevenson, assistant to the president, Public Service Railway, Newark, N. J., returned recently from Belmar where he has been recuperating all summer from an operation. His associates have missed him a great deal and are glad to have him back.

S. B. Irelan was recently appointed receiver and general manager of the Montgomery Light & Traction Company, Montgomery, Ala., to succeed Ray Rushton, resigned. Until this appointment Mr. Irelan was vice-president and general manager of the Montgomery Light & Water Power Company to which office he was elected in 1917.

Elmer P. Haw, who occupies the position of superintendent of the street railway lines of the Panama Electric Company, Panama, is now in the United States visiting his brother in Davenport, Iowa. Mr. Haw is visiting in the states for the first time in ten years as he has lived in Central America since early manhood. He is by profession a civil engineer and has managed the street car lines of Panama City for the past 10 years. Twenty-five cars are operated in Panama City over 15 miles of track. Mr. Haw states that the citizens of Panama City are now considering the introducing of one-man cars. While in Davenport Mr. Haw intends to inspect the street car system there for suggestions in improving the line he superintends in Panama City.

Railway Equipment at a Level, Says W. H. Heulings, Jr.

Prices for electric railway equipment reached their peak in October, 1920, says W. H. Heulings, Jr., vice-president and general manager of sales of the J. G. Brill Company, writing in the September issue of *Aera*.

After October, 1920, there was a decided drop, he says, which by Jan. 1, 1921, was twenty-five per cent under the high peak. This was followed by an additional sixteen per cent by April 1.

Mr. Heulings believes a reduction in cost of labor and raw materials brought about this condition. He thinks prices for rolling stock, which have not varied for three or four months, will long continue at the present level.

Price adjustment, he says, will be gradual and take a long time. He believes some business can be done more advantageously now, as the return that new equipment will earn will be in excess of any reductions in initial cost that can be expected in the near future.

Price of Conduit Reduced Nearly 7 per Cent

Rigid iron conduit reacted to a further price drop on Sept. 16. Card 48 was issued as of that date, placing discounts four points higher. In carload lots $\frac{1}{2}$ -in. black now takes 45 per cent and $\frac{1}{2}$ -in. white takes 39 per cent discount. These figures are the same as those issued under date of Feb. 15, 1917, showing pipe to be back to where it was four and one-half years ago. Meanwhile the discounts have been reduced to a low figure of 21 per cent—a record high price in May, 1917, since which time they have tended upward to the present figure.

Department of Commerce to Publish Statistics on Wire

Representatives of thirty-four bare and insulated copper-wire manufacturers met at the Hotel Commodore, New York, on Sept. 13 to discuss the advisability of asking the Department of Commerce to include wire production statistics in its "Monthly Survey of Current Business." About two-thirds of those present voted to furnish the necessary figures, three objected, and the rest preferred to defer decision until they had had more time to consider the matter. There was every assurance at the meeting that, provided the Department of Commerce would collect, tabulate and print such wire statistics, at least 60 per cent of the copper-wire producers of the country would be represented at the outset.

W. M. Steuart, director of the Department of Commerce, who is director

of the survey, was present and described the department's plan and method of working. Statistics are furnished at the department's request. These are tabulated and printed monthly, and individual reports are kept entirely confidential. The definite form of report which the manufacturers will recommend to the Department of Commerce is now under consideration by a committee.

Brazilian Market for Railway Equipment

Since 1914 new railway construction in Brazil has been limited and only restricted quantities of rolling stock purchased, with the result that the present mileage and somewhat deteriorated equipment are entirely inadequate for the growing needs of the country, according to the Bureau of Foreign and Domestic Commerce. A crisis has developed in the Rio Grande railway system where the farms of the interior have produced more than the carrying capacity of the railways. Similar troubles are experienced in other districts. More or less additional equipment is needed for all the lines, of which there is a total of 17,477 miles.

Both the Government and private railways are unable to purchase the rolling stock or make the extensions so urgently needed, although some new purchases are under consideration and a small amount of new construction in progress. This inability is due to reduced receipts, resulting from reduced foreign trade, and the fact that public sentiment opposes any increase in the rates, and the reduced value of the currency as compared with the pound or dollar.

Although the present market for rolling stock is obviously far below the actual needs of the country, it is still important. Approximately 50 steam and electric locomotives have recently been shipped from factories in the United States or are in course of construction here. Further electrification and more business are expected.

The market for rolling stock is at present largely limited to the Rio Grande system (government owned); the three lines of the State of Sao Paulo, viz., the Paulista, the Mogyana, and the Sorocabana; the Central of Brazil (government owned); and the Inspeccoria Federal das Obras Contra as Seccas. The last-mentioned is the administrative bureau in charge of the reclamation projects being carried out in Ceara and the adjoining states. The Noroeste, the Oeste de Minas, the Viacao Bahiana, and the Ferrocarril de Goyaz have all had certain sums placed

at their disposal from the Federal budget for the purchase of limited quantities of materials. Other business would develop rapidly if the financial and legal obstacles could be overcome.

The United States has long held an unusually strong position in the Brazilian market for rolling stock, due largely to the pioneering of some of our manufacturers of such equipment. Of the importations of rolling stock practically all during the years 1917 and 1918 was shipped from the United States.

Chilean Contract Awarded

Westinghouse Company Closes \$7,000,000 Deal for Electrification of Chilean State Railway

Westinghouse Electric International Company has announced that it has received final confirmation of the contract to supply the equipment for electrifying the Chilean State Railway between Valparaiso and Santiago and to Los Andes.

The contract received from the Chilean Government through the company's Chilean agents, Errazuriz, Simpson & Company, associated with Spruille Braden, New York, covers the most important railway electrification since the beginning of the war and the largest ever undertaken by an American firm outside of the United States. The main line, which is 116 miles long and is now under steam operation, is the most important in Chile. It connects the leading seaport, Valparaiso, with the capital, while the line to Los Andes is 28 miles long and forms the Chilean end of the transcontinental line to Buenos Aires.

The contract, which has a total value of \$7,000,000, was secured in spite of keen competition from German and other European concerns. The award was given to the American firm because of its more complete and accurate engineering analysis of the proposition as well as its lower price.

The equipment to be furnished consists of eleven passenger locomotives, fifteen road freight locomotives and seven switching locomotives, together with five 4,000-kw. substations. The 3,000-volt direct current system will be used and all standards will be strictly American in character. Capacity of this equipment will be 50 per cent greater than the present traffic demands, and the plans have been so drawn that an increase of traffic capacity to three times the present amount can be readily accommodated. Owing to the abundance of water power in Chile and the high price of fuel, all of the Chilean railways will eventually be electrified and the present project is the first step in this process.

This contract represents the third large order for electric railway supplies received by Westinghouse International Company from foreign countries in the past few months. The other two came from France and Japan. Errazuriz, Simpson & Company will build the overhead trolley construction.

Rolling Stock

Gadsden, Bellevue & Lookout Mountain Railway, Gadsden, Ala., expects to purchase in the near future two one-man cars.

Delta Light & Traction Company, Greenville, Miss., recently purchased from the American Car Company, St. Louis, Mo., two Birney safety cars.

Eastern Pennsylvania Railways, Pottsville, Pa., recently purchased a Russell 30-ft. combination car with B-6 trucks and with two steel single-track snow-plow noses.

Hutchinson (Kan.) Interurban Railway is at present in the market for sufficient car seats for five cars which are being overhauled and re-equipped.

Hull (Que.) Electric Company, according to G. Gordon Gale, vice-president and general manager, has recently placed an order with the Ottawa Car Manufacturing Company for 2 one-man safety car bodies.

Evansville, Suburban & Newburgh Railway, Evansville, Ind., is now in the market for from 15 to 25 used 80,000-lb. capacity flat-bottom gondola cars, according to information received from Gus Muhlhausen, president and general manager of the company.

Track and Roadway

Illinois Central Electric Railway, Canton, Ill., expects to build a switch to the Buckheart Coal Company in Fulton County, Ill.

Toronto (Ont.) Can., The Transportation Commission has bought land for a car line loop at the Bloor and Jane Streets Terminus.

Trenton & Mercer County Traction Corporation, Trenton, N. J., has been granted permission by the Trenton City Commission to lay double tracks on Pennington Avenue, from North Warren to Willow Streets.

Eastern Massachusetts Street Railway, Boston, Mass., has started on an improvement in Central Street, Lowell. The work consists of the removal of old rails between Market Street and Towers Corner and the laying of new ones. The work will cost about \$10,000 and will take about two months to complete.

Dallas-Terrell (Tex.) Interurban Railway, which is to be built by Strickland interests, may be extended from Terrell to Tyler. This extension, which would be nearly 100 miles long and would traverse a rich agricultural section of Texas, is being sought by residents of Canton and other cities and towns along the line of the proposed extension.

Pacific Electric Railway, Los Angeles, Cal., has been ordered to do repair work on the East Orange Grove and East Washington Street lines in Pasadena. On the East Orange Grove line the railway will repair its right-of-way between Hill Avenue and the east end of the line. On the East Washington Street line the work to be done will be between Los Robles Avenue and the east city limits.

Columbus (Ga.) Railroad has completed its paving along Hamilton Avenue. New rails and ties have also been put down. Work of paving between the tracks from Seventeenth to Thirtieth Street has also been completed, keeping pace with the work of paving done by the city on Second Avenue. It was stated recently that the city may extend its paving on Second Avenue from Thirtieth Street to Thirty-first Street, in which event the company would also pave along its tracks this additional distance—about 1,000 ft.

Power Houses, Shops and Buildings

Toronto (Ont.) Can., The Transportation Commission will build an automatic substation on Eglinton Avenue, North Toronto.

Gadsden, Bellevue & Lookout Mountain Railway, Gadsden, Ala., expects to build a 100 room club-hotel as a feeder for its line.

Kansas City, Lawrence & Topeka Electric Railroad, Kansas City, Mo., contemplates purchasing one 300-kw., 60-cycle rotary converter.

Public Service Railway, Camden, N. J., will abandon the present freight room at the Riverside carhouse and the storeroom of the electric company, which has a large platform, is to be utilized for a freight house. Also, the freight terminal at Public Service Junction will be abandoned and store house of the gas company at 347 Warren Street will be used. This location will be an advantage on account of having platform facilities and being nearly at the center of the city.

Trade Notes

Ernest E. Lee Company, 115 South Dearborn Street, Chicago, has recently become the district representative for the Northern Equipment Company, Erie, Penn., manufacturers of boiler feed regulators and pump governors.

F. V. Shannon, vice-president and secretary of the Massey Concrete Products Corporation, Peoples Gas Building, Chicago, has resigned to accept another position. G. H. Redding has been elected secretary of this and affiliated companies, the position of vice-president remaining vacant for the present. David A. Hultgren has been appointed resident manager at Chicago.

Triumph Electric Company, Cincinnati, Ohio, for nearly thirty years manufacturers of 40-deg. Triumph polyphase induction and direct-current motors, has again been forced to move its Philadelphia office into more spacious quarters to adequately take care of the increasing demand of its business in that section. The new quarters are at 709 Arch Street. This territory is under the direction of District Manager Arthur H. Allen.

R. I. Baird, from 1909 to 1917 connected with the sales department of the Electric Storage Battery Company, Philadelphia, Pa., has returned to the service of that company. He is now in charge in the western district of the sales of Exide batteries for railway car lighting, etc. Mr. Baird's headquarters will be at the Chicago office of the company. The railway signal work is in charge of H. B. Crantford, who was formerly in the service of the Chicago, Milwaukee & St. Paul Railroad.

The Morton Company, which will supply sales counsel in advertising and merchandising, has been organized in Cleveland with headquarters at the Finance Building, 750 Prospect Street, Cleveland. C. O. Morton is managing director and A. B. Cole, long with the publication department of the Westinghouse Electric & Manufacturing Company, is president. Mr. Cole made a special study, a few years ago, of electric railway freight transportation and contributed a series of articles on this topic in the ELECTRIC RAILWAY JOURNAL. Other officers of the company are Geo. W. Randall, secretary; Roy M. Brown, vice-president; R. S. Andrews, vice-president, and F. E. Crawford, treasurer.

New Advertising Literature

Spot Welder.—A new bench-type spot welder, the S-4-B, has been placed on the market by the Taylor Welder Company, Warren, Ohio.

Pyrometer.—The Brown Instrument Company, Philadelphia, has just made improvements in the automatic compensating features of its "Thermo-Electric" pyrometers.

Control Switch.—The South Bend Current Controller Company, South Bend, Ind., announces its new R-C-O-C remote-control switch for station control of outdoor lighting and other loads.

Fittings.—The Erie Electrical Equipment Company, Inc., Johnstown, Pa., has issued discount sheets dated July 15 and two new catalog sheets on split porcelain insulators and pipe-frame fittings and caps.

Air Brakes.—The Air Brake Association has just added to its list of educational air brake books one of the new Westinghouse U.C. equipment under the title of "Questions and Answers on the U.C. Equipment." The book is particularly intended for those men engaged in railroad service who desire to inform themselves to a varying degree on the construction, operation and function of the new U.C. passenger air brake equipment. A ready comprehension of the general principles is possible without any previous knowledge of certain details.